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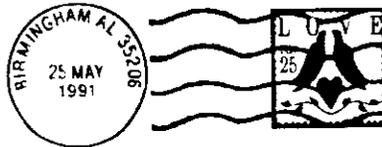
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# Advanced Facer/Canceler Operating System Guidelines

POSTAL RATE COMMISSION  
OFFICE OF THE SECRETARY



Handbook PO-424  
June 1992

UNITED STATES POSTAL SERVICE  
Washington, DC 20260-7116

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Advanced Facer Canceler System Operating Guidelines

Handbook PO-424, June 1992

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**A. Material Transmitted**

1. **Purpose.** This handbook provides operating guidelines and performance criteria for the new Advanced Facer Canceler System (AFCS) that is limited in use nationwide. It is for use on postal premises only and during regular workhours.
2. **Explanation.** The identifier PO-424 is part of the new numerical coding system that keys directives to the six policy manuals replacing the Postal Service Manual:
  - PO refers to the Postal Operations Manual (POM).
  - 424 relates to chapter 4 in the POM.

**B. Distribution**

1. **Initial.** This handbook is distributed to all regions and to those division post offices and others involved in the implementation, operation, or audit of the AFCS program.
2. **Additional Copies.** If your office did not receive the quantity needed, send a completed Form 7380, MDC Supply Requisition, to your material distribution center.

**C. Limited Use**

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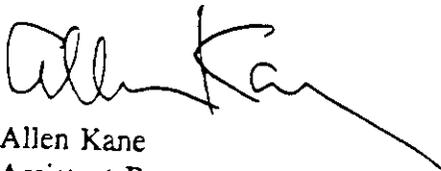
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Allen Kane  
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# OPERATOR/SUPERVISOR OPERATING GUIDELINES

## CONTENTS

Section 1	--	Introduction to the Advanced Facer Canceler System
Section 2	--	Equipment Description
Section 3	--	General Safety
Section 4	--	Controls and Indicators
Section 5	--	Operating Procedures
Section 6	--	Data Collection Computer Menu System
Section 7	--	Operations Reports
Section 8	--	Software Reference Guide

## SECTION 1

### INTRODUCTION TO THE ADVANCED FACER CANCELER SYSTEM

This section provides the theory and principles of operation of the Advanced Facer Canceler System (AFCS), Figure 1-1. The AFCS culls out mailpieces not meeting USPS letter mail specifications. It faces, cancels, and sorts mail within specifications. Sorting is according to location of indicia, and whether mailpiece is barcoded, handwritten, or machine printed. These characteristics permit mail to be designated for further processing by optical character readers, barcode sorters, or multiposition line sorting machines. A description of mail readability characteristics is included at the end of this section.

The AFCS is a microprocessor-controlled system. It culls mailpieces that are outside USPS specifications, locates indicia, prints cancelation marks across the indicia when required, then sorts mailpieces according to the selected sortplan. It is capable of a throughput of over 32,000 pieces per hour.

The AFCS was designed to require only one operator for its operation. No more than one operator should be assigned per machine at any time.

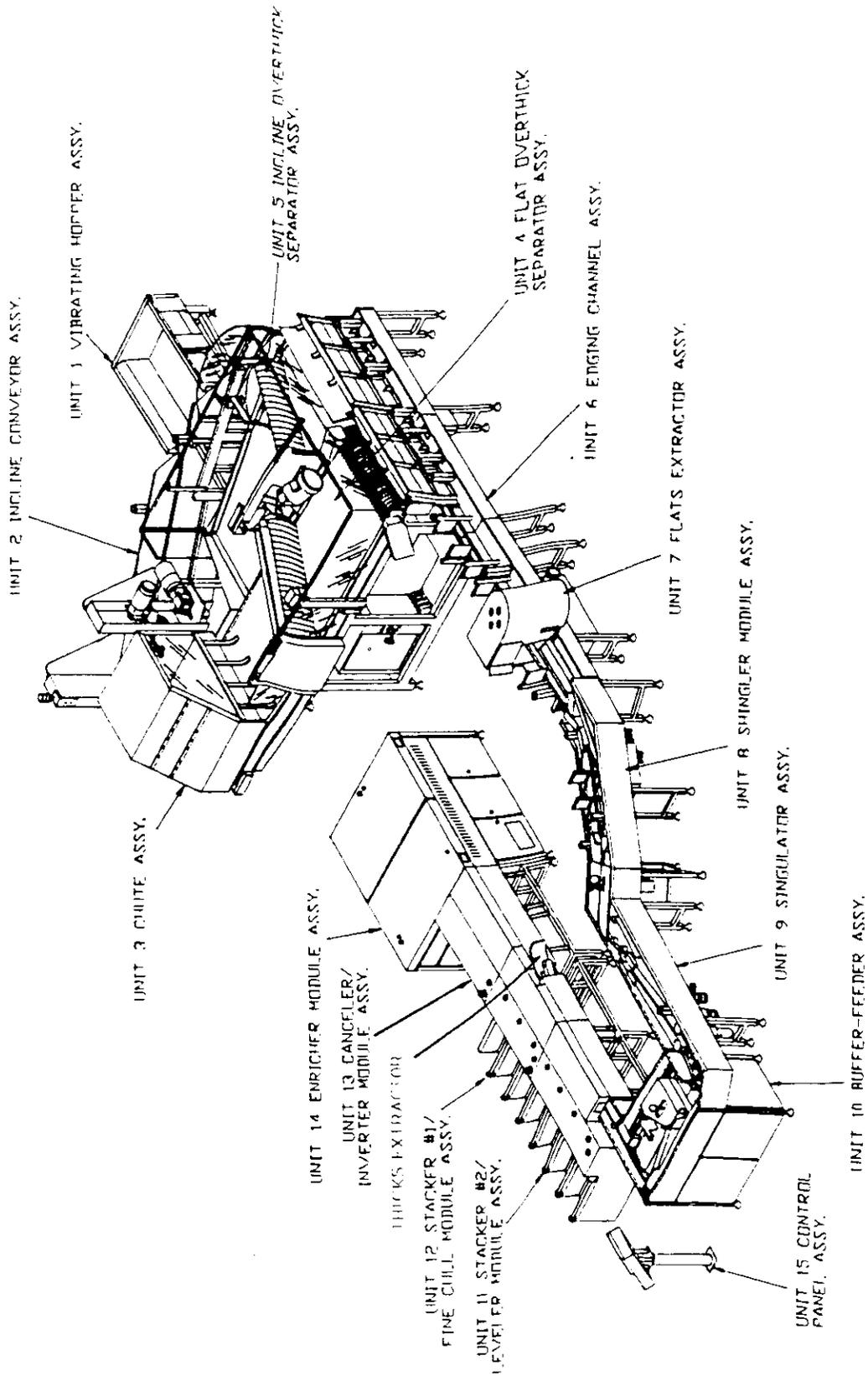


Figure 1-1. Advanced Facer Canceler System

## 1.1 CULLING

The culling process consists of removing from the mailstream mailpieces that are undersized, oversized, too stiff, or too thick. See Figure 1.1-1. Initially, rough culled mailpieces are placed in the Input Hopper and fed by vibration to the Incline Conveyor Belt. Mail is then transported to the Chute and falls on the conveyor belt of Overthick Separator, Flat. Overthick Separator, Flat shunts mailpieces exceeding 1/4 inch in thickness to Overthick Separator Incline. Overthick Separator Incline decreases the number of erroneously culled mailpieces.

Mail not culled by the Overthick Separators travels by conveyor belt to the Edging Channel. Eccentric rollers in this unit jog mailpieces resting on their short edges to align them on their long edges while being transported. Flaps mounted above the mailstream assist in turning mail down onto its long edge. The mail then passes on to the Flats Extractor.

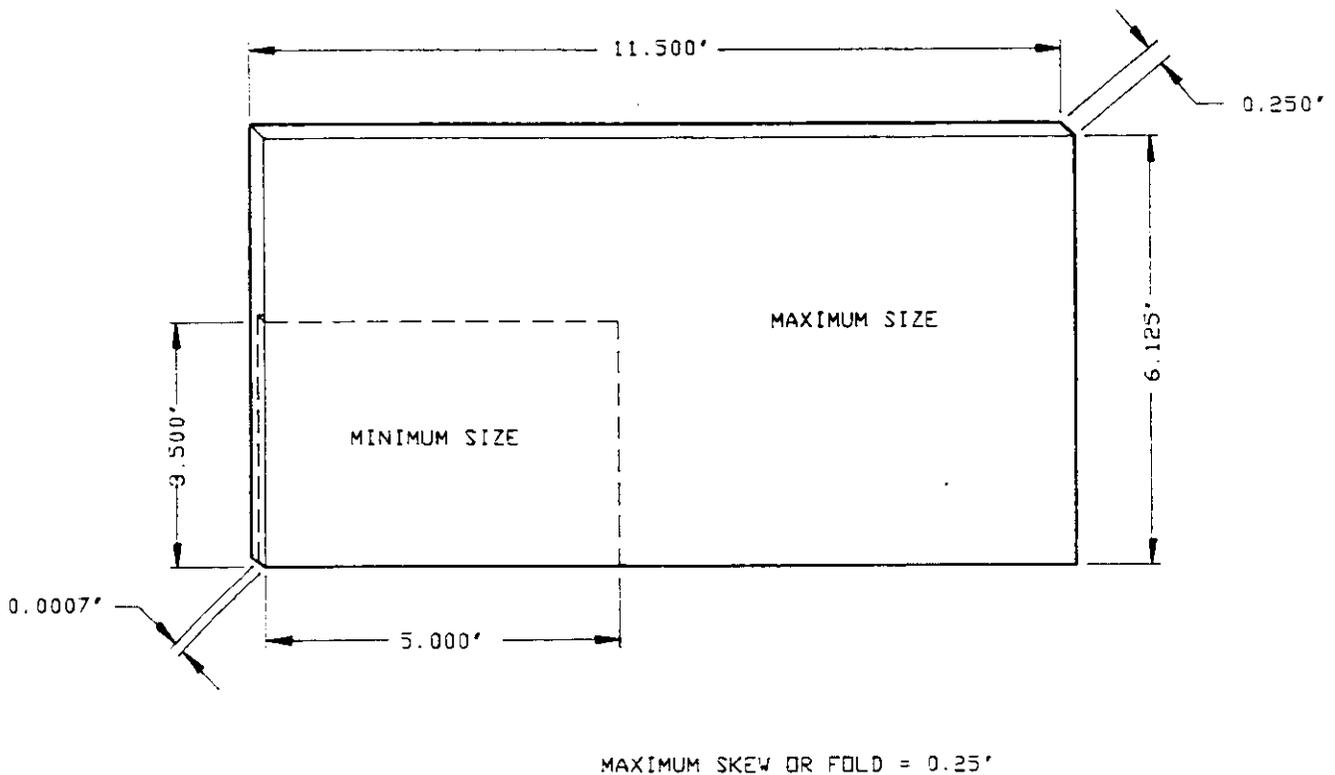


Figure 1.1-1. Fine Cull Specifications

Culling at the Flats Extractor is performed by a pair of vertically adjustable rollers above the mailstream channel. Mailpieces that are too tall are grasped between the rollers and extracted upwards. There they deflect to the side and fall into a hamper.

After the Flat Extractor, the mail passes to the Shingler. The Shingler has transport belts on one side of the mail path and spring-loaded metal fingers on the other side. Mailpieces coming in contact with these fingers reduce speed while those in contact with the transport belts accelerate speed. This causes overlapping, or shingling, to take place. This shingled mail ensures a steady supply of mail available to the Singulator.

The Singulator, operating in a manner similar to the feed mechanism on most USPS mail sorting equipment, picks off mailpieces one at a time and transports them to the Buffer/Feeder at timed intervals.

The Buffer/Feeder accepts the flow of singulated mail and stacks it in a buffer. It picks off mailpieces one at a time and feeds them through the Leveler/Stacker to the Fine Cull/Stacker. The Leveler allows the mail to settle against the bottom belt after passing the Buffer/Feeder.

The Fine Cull portion of the Fine Cull/Stacker contains the following groups:

- Too thick/too stiff detector.
- Light barriers for mailpiece size detection.
- Clock generator (tachometer generator and encoder).
- Diverter gate.

Three sets of light barriers and the stiffness detector perform the culling process. The first set of two light barriers measures the length of each mailpiece and the gap between mailpieces. If a mailpiece exceeds the maximum length, or if the gap between mailpieces is too small, the oversize mailpiece, or the two mailpieces that are too close together, are rejected and directed into a reject hamper.

Following this set of light barriers, mailpieces must pass a rocker arm assembly to detect stiffness or thickness. In the Enricher, the mail path makes a very sharp turn. The Fine Cull rocker arm assembly culls all mailpieces incapable of making this turn. Mailpieces exceeding 1/4 inch in thickness or that are too stiff are directed into a reject hamper.

The next set of light barriers measures mailpiece height. When a mailpiece that exceeds maximum letter mail height is detected, the diverter gate rejects it.

The third set of light barriers measures the angle of the front edge of each mailpiece to see if it is tilted (skewed) or bent. Mailpieces failing this test will be diverted to a reject hamper.

## 1.2 FACING AND INDICIA DETECTION

Facing and indicia detection are accomplished by the Indicia Detectors and the Inverter/Canceler. The Indicia Detectors look for FIM, stamps, and meter marks. If necessary the Inverter flips mailpieces over to examine the other side of the mailpiece.

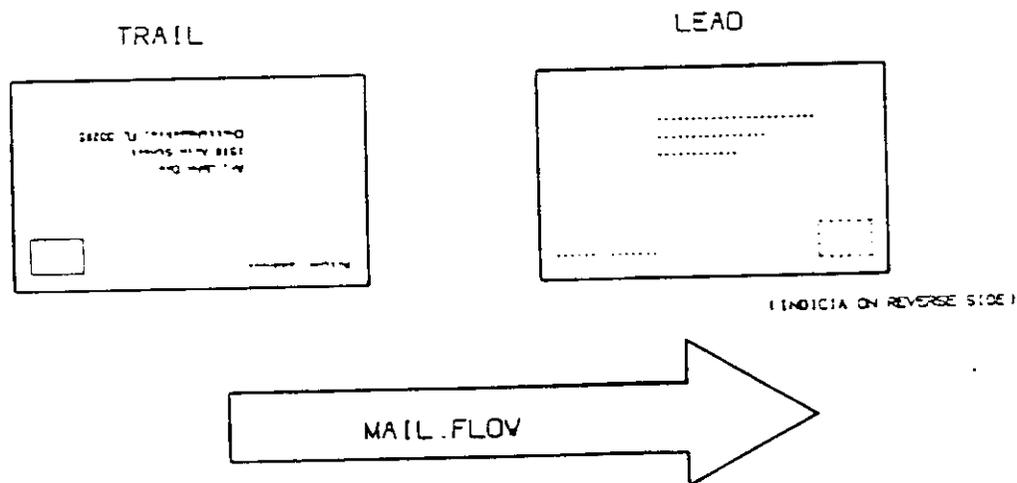


Figure 1.2-1. Trail/Lead Mailpieces

As a mailpiece moves along the letter path, it passes a light barrier, signifying the start of the scanning process. The mailpiece is scanned along its bottom edge for the presence of indicia. The resultant indicia data, if any, are analyzed for use in arriving at cancel and sort decisions.

As a mailpiece enters the Inverter, it is scanned first by the trailing indicia detector and then by the leading indicia detector. If no indicia is detected, the mailpiece is directed into the Inverter and turned upside down. It then rejoins the mailstream for scanning by Indicia Detector 2. After rotation, a leveler section in the Inverter allows the mail to settle against the bottom belt for alignment.

The mailstream goes through the same indicia detection process in the Enricher. Mailpieces with no indicia, or with invalid indicia, are subsequently routed to the reject bin of the Stackers.

### 1.3 STAMP/METER MARK/FIM DETECTION

The mailpiece first passes the meter photocell, which is activated by the presence of either a meter mark or a stamp. If there is no stamp, the stamp photocells do not activate, and the meter photocell produces a signal. If a stamp is present, the signal generates from one of the stamp photocells.

### 1.4 GLOSS DETECTION AND LINE FINDING

After passing the indicia detectors, the mail continues past two separate sets of gloss detectors and image scanners, one for trailing edge and one for leading edge.

Through firmware, the address is analyzed to determine whether or not it is machine readable (imprint, machine printed, typewritten, or equivalent) for use in making the sorting decision.

### 1.5 CANCELING

The Canceler portion of the Inverter/Canceler contains two canceling dies. If a mailpiece indicia that requires canceling is present, the signal from a trailing indicia detector is used to activate the canceling die for the trailing edge. The leading indicia detector and canceling die work together in the same way. If no indicia is found on a mailpiece by Indicia Detector 2, the mailpiece is not canceled.

### 1.6 JAM CONTROL

Light barriers located throughout the system serve as the means to detect jams. Transports are turned off when a light barrier is blocked. One of these light barriers is provided at each stacker bin. Other light barriers are located throughout the other system units.

In the event a light barrier is blocked too long, the transport motors stop, the JAM indicator on the Operator Control Panel flashes, and the JAM indicator nearest the blocked light barrier flashes. The Operator Control Panel display also pinpoints the jam location. The JAM indicators continue flashing until the jam is cleared and the system restarted.

### 1.7 SORTING

Stacker 1 is part of the Fine Cull/Stacker. Stacker 2 is part of the Leveler/Stacker. Together, they provide seven bins for mail sorting.

The basic sortplan is selected using the SORTPLAN SELECTOR switches on the Operator Control Panel. These switches may be set to CAT A, CAT B/C, or CAT D. CAT A is barcoded mail and includes FIM A and FIM C. CAT B is mail with script (handwritten) addresses. CAT C is mail with imprinted (machine readable) addresses. The indicia for

each category may be on the trailing or leading edge. The CAT D setting sorts the indicia type to bin 7 (reject). The chart below shows a typical sortplan for the basic mail categories.

**Stacker Bins and Mail Type (Typical Sortplan)**

BIN	MAIL TYPE
1	Barcoded; indicia at trailing edge (CAT A1)
2	Barcoded; indicia at leading edge (CAT A2)
3	Script (handwritten); indicia at trailing edge (CAT B1)
4	Script (handwritten); indicia at leading edge (CAT B2)
5	Imprint (machine printed); indicia at trailing edge (CAT C1)
6	Imprint (machine printed); indicia at leading edge (CAT C2)
7	Reject

The ENRICHER switch on the Operator Control Panel controls the sorting of the CAT B and CAT C mail. If the ENRICHER switch is set to the ON position, it enables the electronics that determine whether an address is handwritten or machine printed. If the ENRICHER switch is set to the OFF position, both CAT B and CAT C mail are directed to the CAT B bins.

The CANCEL ONLY switch on the Operator Control Panel controls whether mail is sorted by indicia type. If the CANCEL ONLY switch is set to the ON position, the AFCS cancels the mailpieces according to the settings of the CANCEL SELECTOR switches and directs the mailpieces into the bins in sequence from bin 1 to bin 6.

## 1.8 REPORTS

Performance monitoring and report generation are accomplished through use of a Data Collection Computer (DCC). A DCC can be connected to up to eight AFCS machines. The DCC does not control the AFCS; it accepts only certain information from the AFCS and uses these data to generate various operations reports.

A menu system permits selection of the various reports for viewing on the monitor or for printing. During the data collection activity, machine throughput is displayed constantly for each machine connected to the DCC. Reports produced include the following:

- AFCS Brief Single Machine Production Report.
- AFCS Single Machine Production Report.
- Single Machine Malfunction Report.
- Single Machine Status Log.
- Site Summary Report.
- AFCS Single Machine Maintenance Report.

These reports and the DCC menu system are discussed in detail in sections 6 and 7.

## 1.9 READABILITY

The Automation Supervisor must have a basic understanding of readability. The term *readability* refers to the ability of automated equipment to read the information necessary for processing a mailpiece.

Readability of mail processed on automated equipment has a major impact on the machine performance. Controlling this factor will contribute to optimum performance of the automated operations. Each facility must establish goals and procedures for improving readability.

The Automation Supervisor can increase the read rate of the AFCS with an understanding of machine capabilities and limitations and knowledge of the characteristics necessary for

readability. The supervisor must be able to recognize obvious readable mail in the Read Reject Stacker and notify maintenance if an excessive number of pieces are found.

When selecting mail to be processed on the AFCS or when evaluating mail found in the Read reject bin, there are a number of obvious characteristics that preclude the mail being

processed on automated equipment. A complete list of all the requirements for preparing mail for automated processing may be found in Publication 25, *A Guide to Business Mail Preparation*, dated August 1988. The following is a list of the most common and obvious readability problems:

- Address outside the scanning zone.
- Dark-colored envelopes (dark blue or green).
- Window envelopes with cloudy windows.
- Window envelopes with inadequate clearance for the address block (1/8 inch minimum).
- Poor print quality, very light printing, smeared or smudged characters, or dot matrix printing.
- Extraneous printing on or below the address line.
- Nonuniform line spacing within the address block.
- Excessive space between the state and ZIP Code.
- Inadequate space between the city, state, and ZIP Code.
- Type style - italics, script, or handwritten address block.
- Touching characters within the city, state, or ZIP Code.
- Skewed or slanted address line (+/- 5 degrees).
- Bleedthrough (opacity).

Questionable mail found in the Read Reject Stacker may read and accept if reprocessed on the AFCS. If there is a large quantity of staged mail whose readability is questionable,

process a small sample and measure the results. These decisions are generally made based on available mail volumes and processing capability.

In addition to readability, the Automation Supervisor must also be concerned about machinability. Mail machinability is dependent on the physical dimensions and/or condition of the envelope to be processed on automated equipment. (See Figure 1.1-1 for physical dimensions of letter mail.)

Mail machinability affects the throughput rates for automated equipment. In addition to physical dimensions, the condition of the mail will affect its machinability. Open flaps, bent edges or corners, and folded envelopes are the most common problems. These problems occur most often as a result of stacking open trays of mail on top of each other. Facilities that exercise care in containerizing and staging their mail have significantly improved their throughput rates. Tray carts with fixed shelves must be used to protect the machinability of open trays of mail.

## SECTION 2

### EQUIPMENT DESCRIPTION

#### 2.1 OPERATION

An operator or automatic feed system deposits rough culled mail to the Input Hopper. The AFCS first removes overthick and flats mail. Then it stacks the remaining mail into the Unit 10 Buffer. Mailpieces feed one at a time from this stack. The AFCS then culls overheight, underheight, overlength, underlength, too stiff, and skewed mailpieces. It also removes two mailpieces if the gap between them is too small.

Next, the AFCS looks for indicia and/or a Facing Identification Mark (FIM) on the front and back lower edge of the mailpiece. If the AFCS finds no indicia or FIM, it inverts the mailpiece. Otherwise, the mailpiece continues through the system. The AFCS looks for indicia and FIM a second time. This time it determines the kind of indicia (meter mark or stamp), the type of FIM, and the side or edge (leading or trailing) of the indicia or FIM on the mailpiece.

The AFCS then looks for a window on the mailpiece. The presence and location of a window speeds up the process of locating the address.

Next, the AFCS takes a video image of the address on the mailpiece. It uses the video image and window information to locate and determine whether the address is handwritten or machine printed. The AFCS then cancels the mailpiece if the mailpiece carries the kind of indicia that requires canceling.

Finally, the AFCS sorts the mailpiece to one of seven stacker bins. The throughput averages more than 32,000 pieces per hour.

The table on page 1-7 shows the type of mail the bins would receive with a typical sortplan. The barcoded mail in bins 1 and 2 would become input for a barcode sorter. The mail with handwritten addresses in bins 3 and 4 would become input for a letter sorting machine. The machine-printed mail in bins 5 and 6 would become input for an optical character reader/channel sorter.

#### 2.2 MAJOR ASSEMBLIES

Figure 2.2-1 shows the following assemblies:

- **UNIT 1 INPUT HOPPER.** The Input Hopper receives rough culled mail. It slopes toward the Incline Conveyor. An air-powered vibrator moves the mail toward the Incline Conveyor. Light barriers that sense mail volume in the Input Hopper are used to control mail loading.

- UNIT 2 INCLINE CONVEYOR. The Incline Conveyor transports mail from the Input Hopper to the Chute. A set of strippers or beaters spreads out mail leaving the top of the Incline Conveyor. A set of light barriers detects the volume of mail leaving the Inclined Conveyor and adjusts the conveyor speed. Incline Conveyor speed is inversely proportional to mail volume.

- UNIT 3 CHUTE. The Chute deflects mail from the Incline Conveyor to the Overthick Separator 1 conveyor belt.

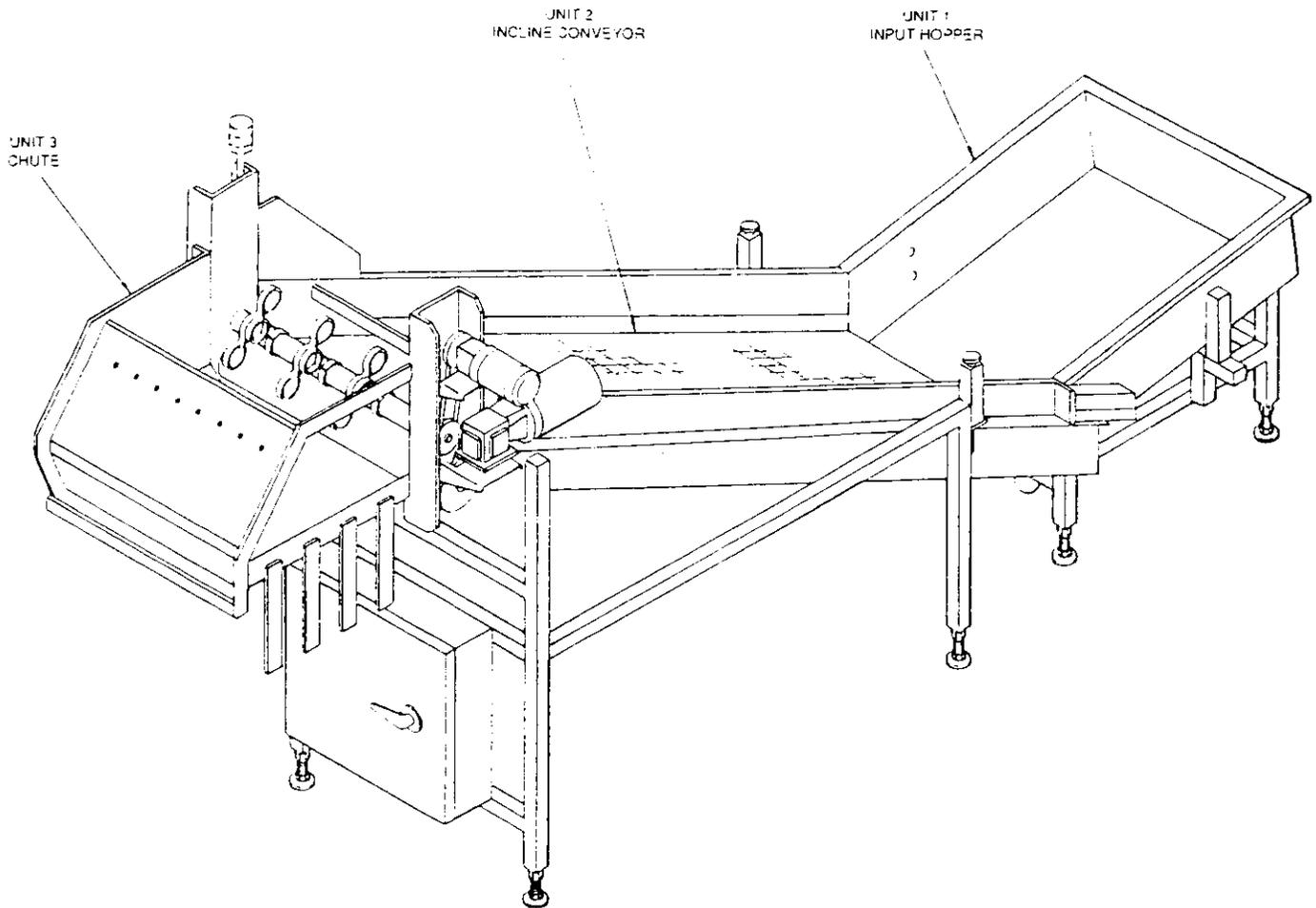


Figure 2.2-1. Unit 1 Input Hopper,  
Unit 2 Incline Conveyor, Unit 3 Chute

Figure 2.2-2 shows the following assemblies:

- UNIT 4 OVERTHICK SEPARATOR FLAT. The first thick separator contains a wide, horizontal, flat belt conveyor. Above the conveyor, a horizontal drum rotates counter to the direction of belt travel. The distance between the drum and conveyor, which is adjustable, creates a gauge roller that prevents the passage of mail that is too thick. A spiral-shaped friction belt, mounted on the drum surface, gives marginally thick items several chances to pass under the drum. The drum is positioned at an oblique angle to the direction of mail travel. This oblique position deflects overthick items to the side of the conveyor and into the next separator.

- UNIT 5 OVERTHICK SEPARATOR INCLINE. The second thickness separator receives the output of the first and provides valid mail items with a second opportunity to pass into the system. This second chance significantly reduces invalid culls. The secondary culling section operates very similarly to the primary system, except that the conveyor belt is at a slight angle to horizontal. Culled items from Overthick Separator, Incline are removed from the AFCS processing and directed into a USPS-supplied hamper. The remaining mail is delivered to the Edging Channel.

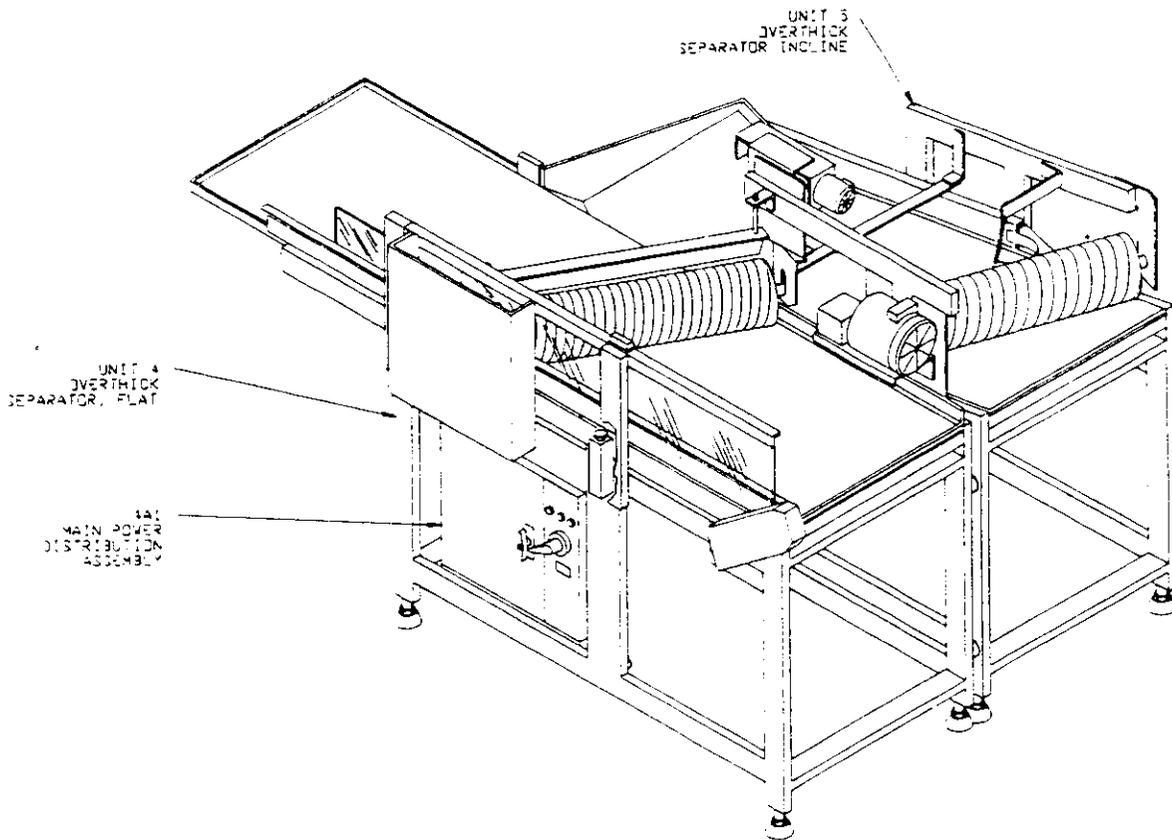


Figure 2.2-2. Unit 4 Overthick Separator Flat and Unit 5 Overthick Separator Incline

Figure 2.2-3 shows UNIT 6 EDGING CHANNEL. Mail successfully processed or rejected (i.e., Thicks) from the Overthick Separators enters the Edging Channel over an open grill. The grill allows nonmail items, such as paper clips and rubber bands, to fall out of the mailstream. Eccentric rollers and knock-down barriers position mailpieces on their long side. Eight light barriers monitor mail flow looking for jams.

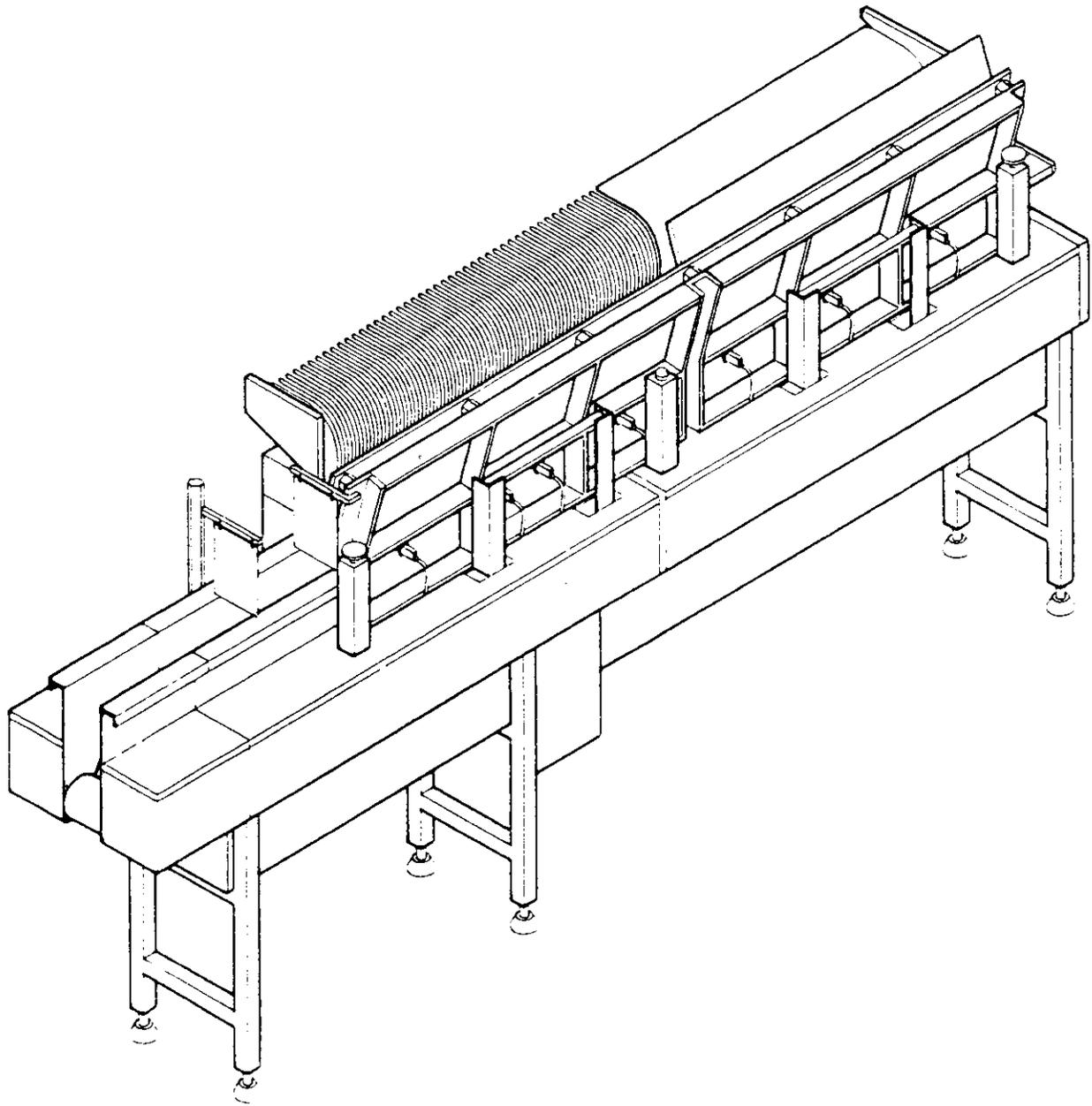


Figure 2.2-3. Unit 6 Edging Channel

Figure 2.2-4 shows UNIT 7 FLATS EXTRACTOR. The Flats Extractor includes additional knock-down barriers. After passing under the knock-down barriers, mail passes under a pair of angled rollers. These rollers, moving at high speed, remove flats from the mailflow. The Flats Extractor Deflector Chute can be mounted on either the outside or inside of the edging channel.

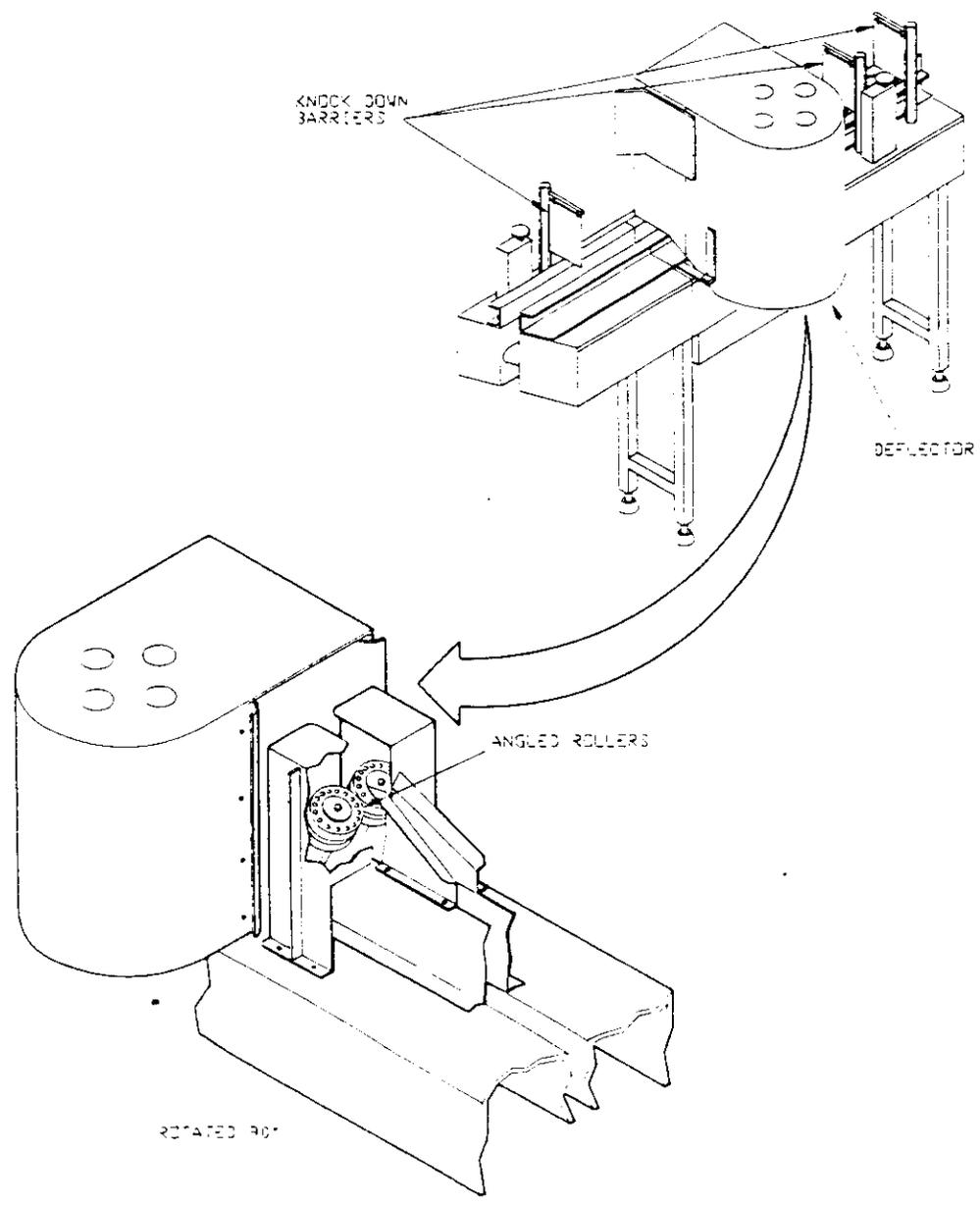


Figure 2.2-4. Unit 7 Flats Extracator

Figure 2.2-5 shows UNIT 8 SHINGLER. The Shingler consists of spring-loaded fingers on one side of the mail path and friction belts on the other side. The space between the fingers and belts allows the mailpieces to overlap. The fingers retard mailpieces while the belts accelerate mailpieces. These actions form the mailpieces into an overlapping mail stream.

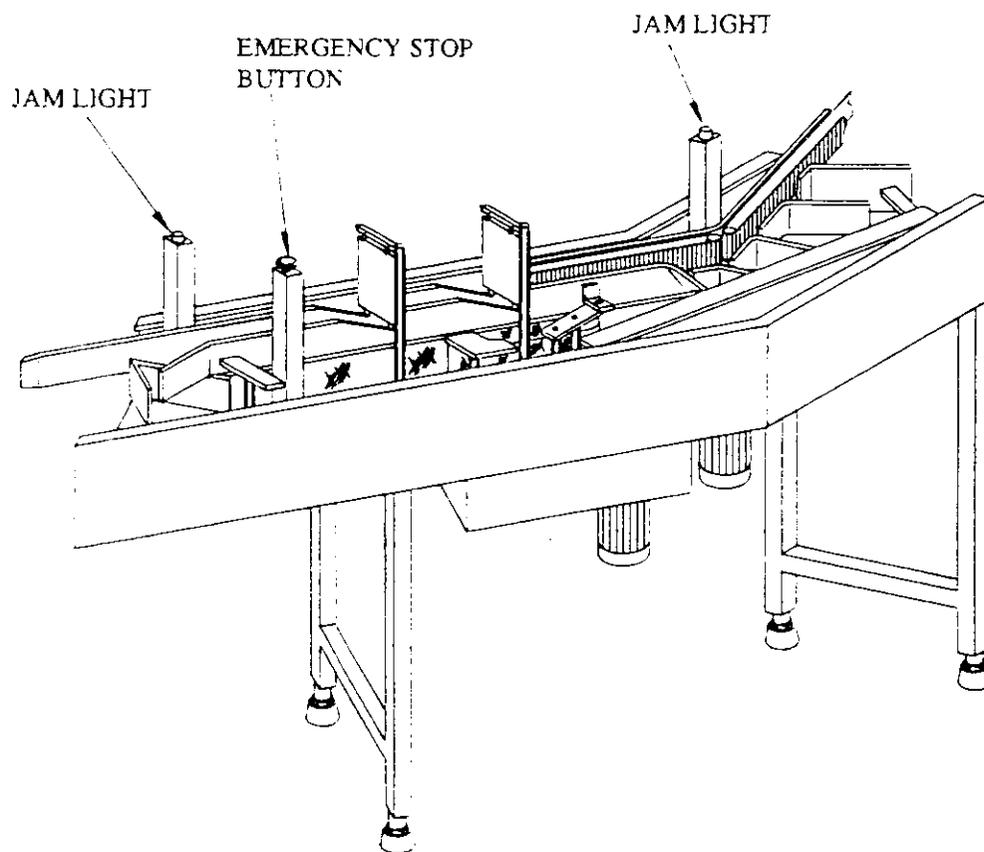


Figure 2.2-5. Unit 8 Shingler

Figure 2.2-6 shows UNIT 9 SINGULATOR. The Singulator picks up individual mailpieces from the shingled mail stream. The individual mailpieces then move through leveling belts to the bottom of the Singulator. They exit the Singulator and enter the Buffer/Feeder as leveled, individual mailpieces.

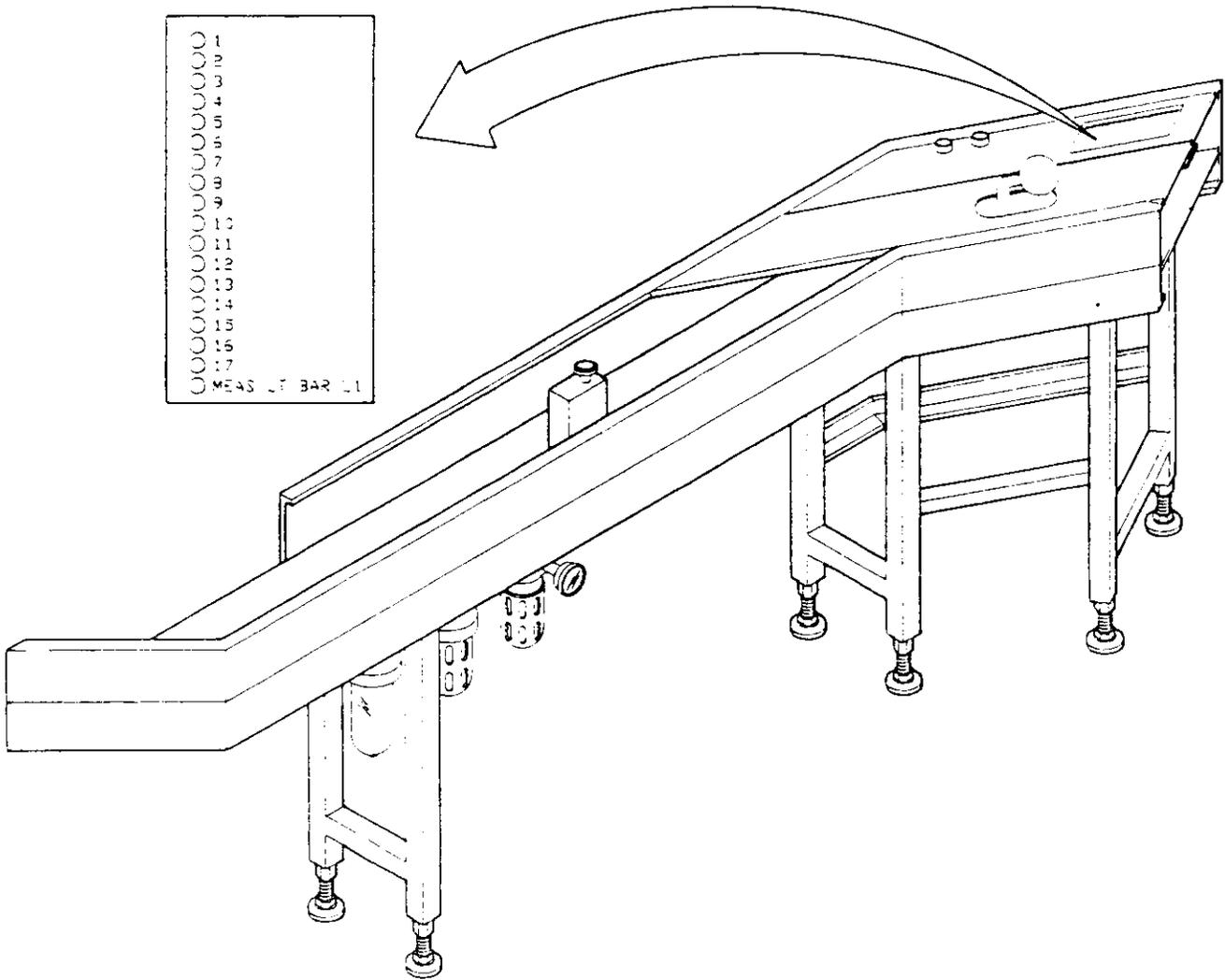


Figure 2.2-6. Unit 9 Singulator

Figure 2.2-7 shows UNIT 10 BUFFER/FEEDER. The Buffer/Feeder provides a high-speed, continuous flow of single mailpieces to the Fine Cull, Enricher, and Stackers.

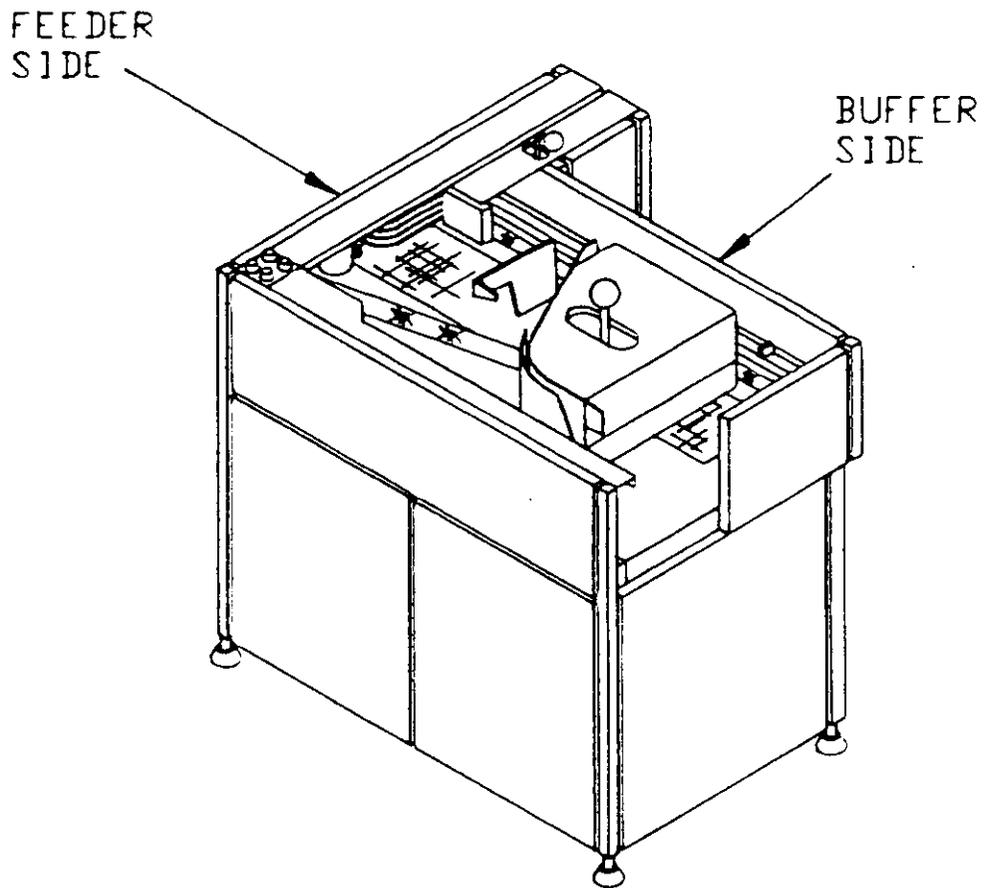


Figure 2.2-7. Unit 10 Buffer/Feeder

Figure 2.2-8 shows UNIT 11 LEVELER/STACKER. Leveling occurs as the mailpieces travel through the transport side of Unit 11 Leveler/Stacker. The Stacker side contains four sort bins.

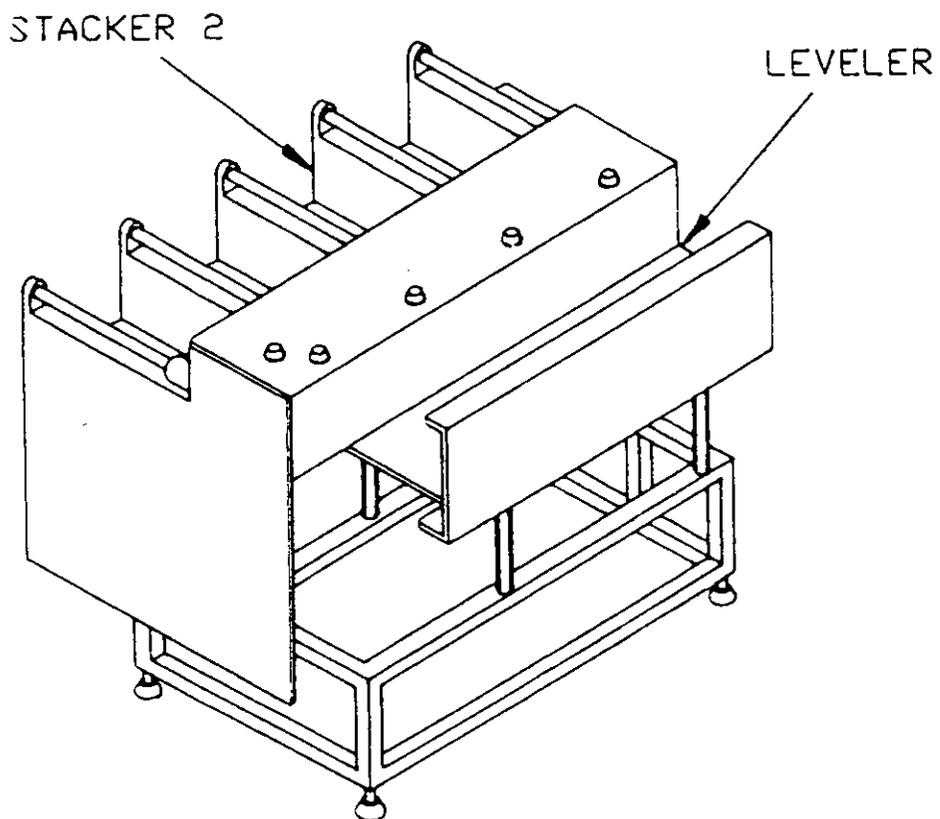


Figure 2.2-8. Unit 11 Leveler/Stacker

Figure 2.2-9 shows UNIT 12 FINE CULL/STACKER. As mailpieces travel through the transport area of the Fine Cull/Stacker, light barriers measure height, length, and gaps between mailpieces. A stiffness detector determines whether a mailpiece is too stiff or too thick for machine processing. The fine cull process removes the following types of mailpieces:

- Overheight, more than 6.125 inches.
- Underheight, less than 3.5 inches.
- Overlength, more than 11.5 inches.
- Underlength, less than 5 inches.
- Too stiff.
- Skewed.

The fine cull process also removes two mailpieces if the gap between them is too small. The stacker side contains the first three sort bins along the sort route.

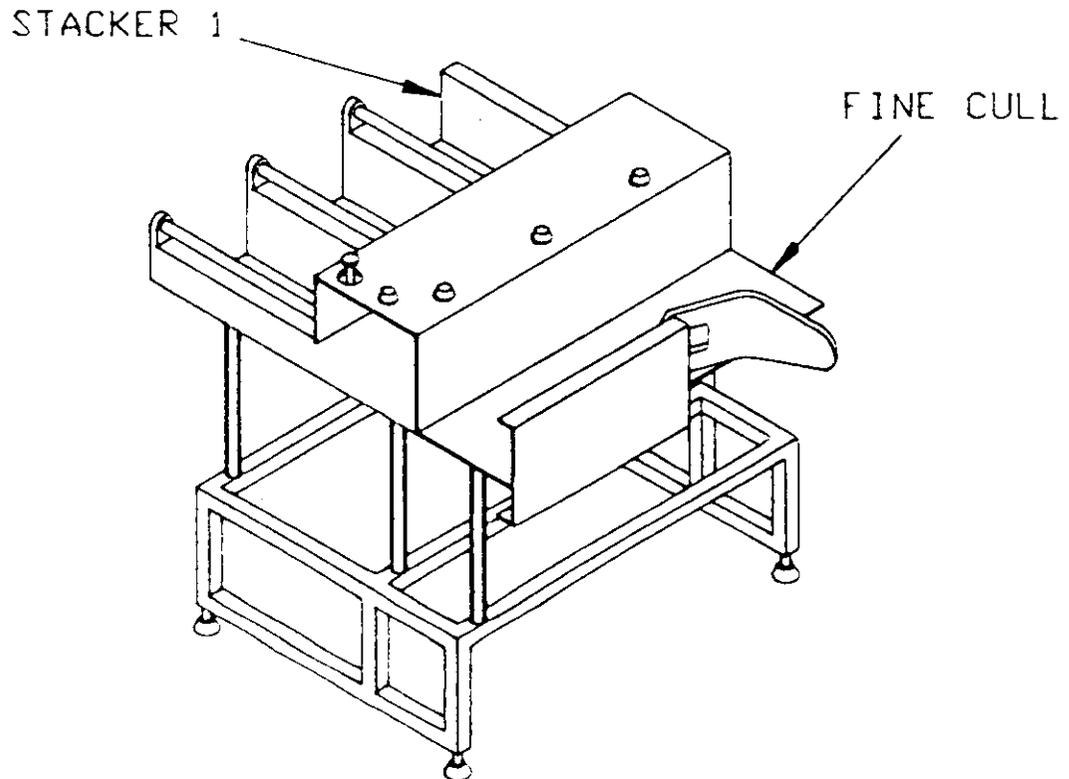


Figure 2.2-9. Unit 12 Fine Cull/Stacker

Figure 2.2-10 shows UNIT 13 INVERTER/CANCELER. The inverter section contains the first pair of indicia detectors and the Inverter. The indicia detectors look at both sides of the mailpiece, examining the lower edge for indicia and/or FIM. If it detects no indicia, the mailpiece is directed by the normally de-energized state of the diverter gate to the Inverter. The Inverter turns the mailpiece, causing the already examined lower edge to be on top. The mailpiece then exits Unit 13 Inverter/Canceler and enters Unit 14 Enricher.

The other side of Unit 13 contains the canceler. After a mailpiece leaves Unit 14 Enricher, it re-enters Unit 13, passing through the canceler section. If the mailpiece is stamped, it will be canceled. Then the mailpiece moves on to the sort side of Unit 12, which has seven stackers. The canceled mailpiece will be sorted as follows: i.e., FIM A, B, C, metered, or stamped.

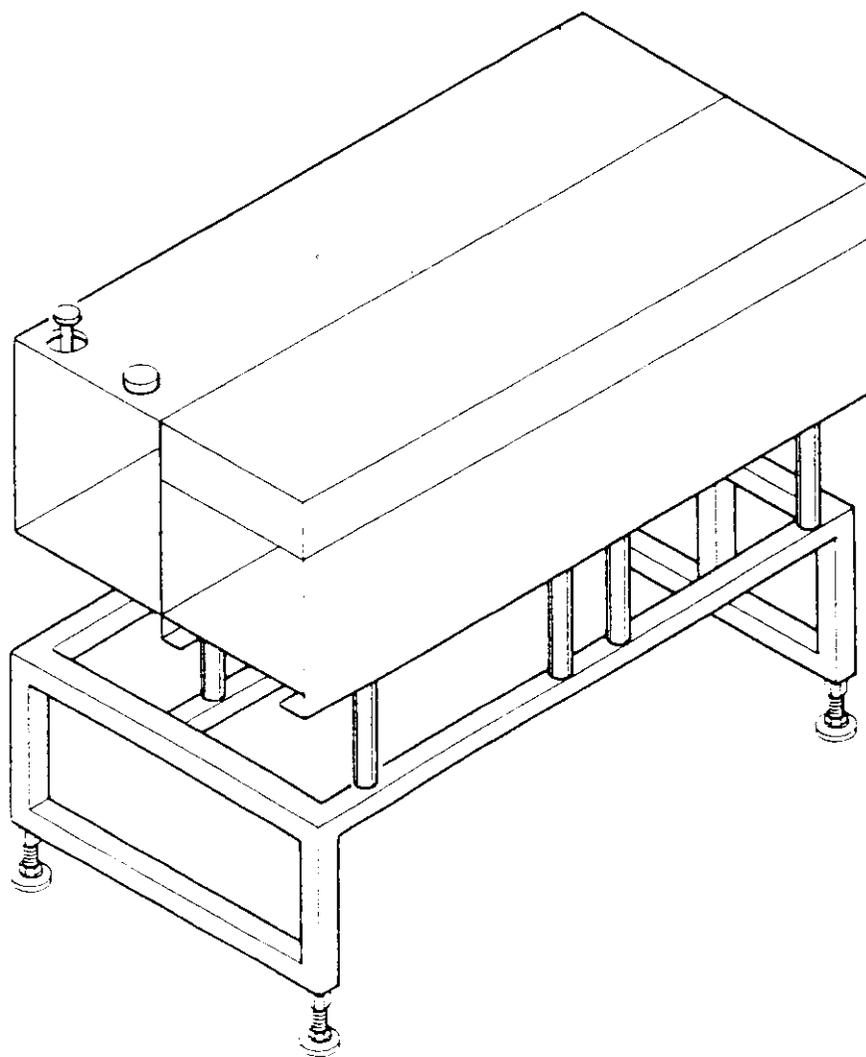


Figure 2.2-10. Unit 13 Inverter/Canceler

Figure 2.2-11 shows UNIT 14 ENRICHER. The Enricher contains the second indicia detector, window detector, and video scanner and houses the main computer. The second pair of indicia detectors recognize the mailpiece by determining indicia type (meter mark or stamp), FIM type, and indicia or FIM side or edge (leading or trailing). The Enricher then detects envelope windows and takes a video image of the address. It determines whether the address is handwritten or machine printed. The computer in the Enricher classifies each mailpiece according to detected information. Upon leaving the Enricher, the mailpiece goes to the Canceler section of the Inverter/Canceler.

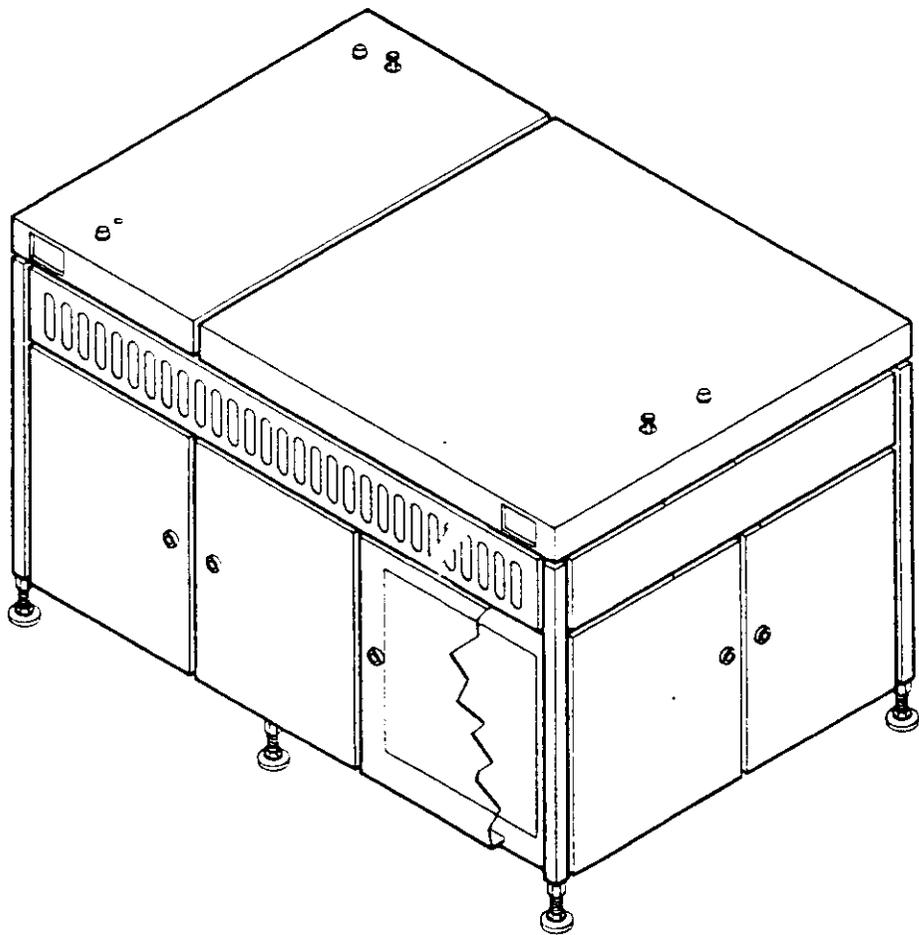


Figure 2.2-11. Unit 14 Enricher

**Figure 2.2-12** shows UNIT 15 OPERATOR CONTROL PANEL. The Operator Control Panel controls machine operation during normal operation and maintenance. The Operator Control Panel allows the operator to perform the following functions:

- Select sortplan - matches indicia type with stacker bins.
- Select type of indicia to be canceled.
- Select special modes of operation.
- Control system start and stop.
- Observe and access system status.
- Select maintenance tests.
- Observe, on nonresettable counters, total power-on time and total transport-run time.
- Select the following information for display:
  - Maintenance test information.
  - Malfunction information.
  - Jam location information.
  - Location of actuated emergency stop switches.
  - Operational messages.
  - Total mailpieces fed by Unit 10.
  - Total mailpieces culled by Unit 12.
  - Total mailpieces to Category A bins.
  - Total mailpieces to Category B bins.
  - Total mailpieces to Category C bins.
  - Total mailpieces to reject bin.

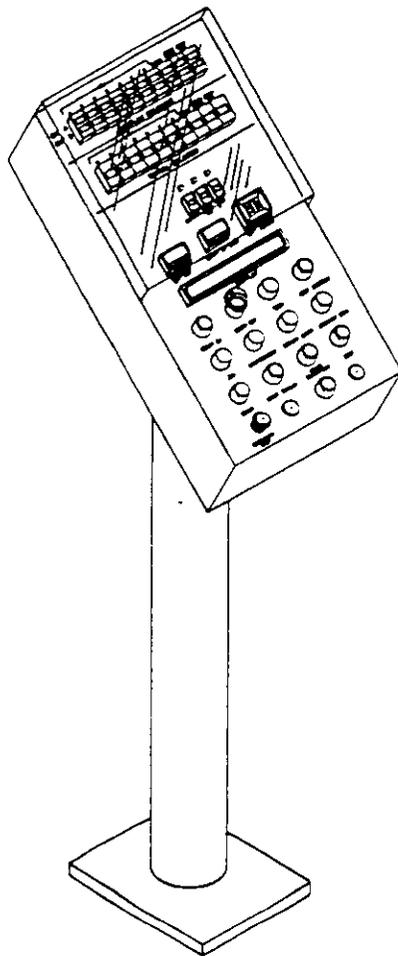


Figure 2.2-12. Operator Control Panel

## SECTION 3

### GENERAL SAFETY

#### 3.1 STANDARD PRECAUTIONS

The following are standard safety precautions that do not appear elsewhere in this material except where special emphasis or precaution is required. Personnel working on this equipment must understand and apply these precautions in all phases of maintenance.

Safety is the responsibility of every individual in the U.S. Postal Service. The supervisor is responsible for instructing personnel in safety practices applicable to the operation and maintenance of the equipment. Likewise, it is the responsibility of each individual operating and maintaining the equipment to understand and observe established safety standards and procedures. Handbook EL-803, *Maintenance Employee's Guide to Safety*, can be ordered from your materiel distribution center using Form 7380, MDC Supply Requisition.

#### 3.2 ELECTRONIC EQUIPMENT

The installation, operation, and maintenance of electronic equipment has several elements of danger. Carelessness can result in injury from electrical shock. The following precautions must be observed:

- Do not run equipment without proper authority.
- Do not operate unsafe or defective equipment.
- Do not engage in horseplay.
- Do not operate equipment without adequate safety guards.
- Avoid unsafe acts and conditions.
- Follow all safety precautions.
- Keep mentally and physically alert.
- Practice good housekeeping.
- Report all hazardous conditions and operations to your immediate supervisor.
- Use all designated safety devices.

### 3.3 ELECTRICAL FIRE

In the event of an electrical fire, use a Type C, BC, or an ABC extinguisher only. Do not use water, soda-acid, or any other liquid stream extinguisher. These present a shock hazard to the user and will cause considerable damage to the electrical equipment.

### 3.4 OPERATING SAFETY SUMMARY

- Do not wear loose-fitting clothing, jewelry, ties, or other articles that could become caught in the machine.
- Keep hair away from the equipment to avoid its becoming entangled in the machine.
- Keep fingers, hands, and arms clear of feed belts, screws, chains, gears, and pulleys.
- Never place your hand on any moving part while the equipment is in operation.
- Always sound warning alarm horn before starting the equipment.
- Stop equipment before opening any door or panel on the machine.
- Do not place food or drink on any part of the equipment, even if it is not in operation.

**WARNING**

Moving belts present a danger of severe physical injury to fingers if caught or pinched.

**WARNING**

The auger screws in Unit 10 and in each stacker pocket can catch and seriously injure fingers.

**WARNING**

Stop the machine before attempting to remove all mail from a stacker pocket. If machine must be kept running, leave approximately 2 inches of mail in the pocket.

**WARNING**

Motor cooling fans may catch and seriously injure fingers.

**WARNING**

Top access panels will fall if raised to the open position and the supporting gas-filled cylinders fail.

**WARNING**

Remove power from entire system by switching the main power disconnect to OFF.

**WARNING**

Pressing an EMERGENCY STOP switch removes power from the drive motors. It does not remove power from the entire machine.

### 3.5 IDENTIFICATION OF SAFETY STATEMENTS

**WARNING** identifies a hazard or procedure that could cause bodily injury or loss of life.

**CAUTION** identifies a hazard that could result in equipment damage or destruction.

**NOTE** identifies a condition or task that requires special attention.

## SECTION 4

### CONTROLS AND INDICATORS

This subsection describes the operating controls and indicators, emergency shutdown procedures, and normal operating procedures for the Advanced Facer Canceler System (AFCS).

#### 4.1 OPERATING CONTROLS AND INDICATORS

Illustrations keyed to tables are provided by unit, showing each operating control and indicator. The following list shows the units and their associated figures and tables:

- Advanced Facer Canceler System, **Figure 4.1-1.**
- Unit 2 Incline Conveyor, **Figure 4.1-2.**
- Unit 4 Overthick Separator, Flat, **Figure 4.1-3.**
- Unit 6 Edging Channel, **Figure 4.1-4.**
- Unit 7 Flats Extractor, **Figure 4.1-5.**
- Unit 8 Shingler, **Figure 4.1-6.**
- Unit 9 Singulator, **Figure 4.1-7.**
- Unit 10 Buffer/Feeder, **Figure 4.1-8.**
- Unit 11 Leveler/Stacker, **Figure 4.1-9.**
- Unit 12 Fine Cull/Stacker, **Figure 4.1-10.**
- Unit 13 Inverter/Canceler, **Figure 4.1-11.**
- Unit 14 Enricher, **Figure 4.1-12.**
- Unit 15 Operator Control Panel, **Figures 4.1-13, 4.1-14, and 4.1-15.**

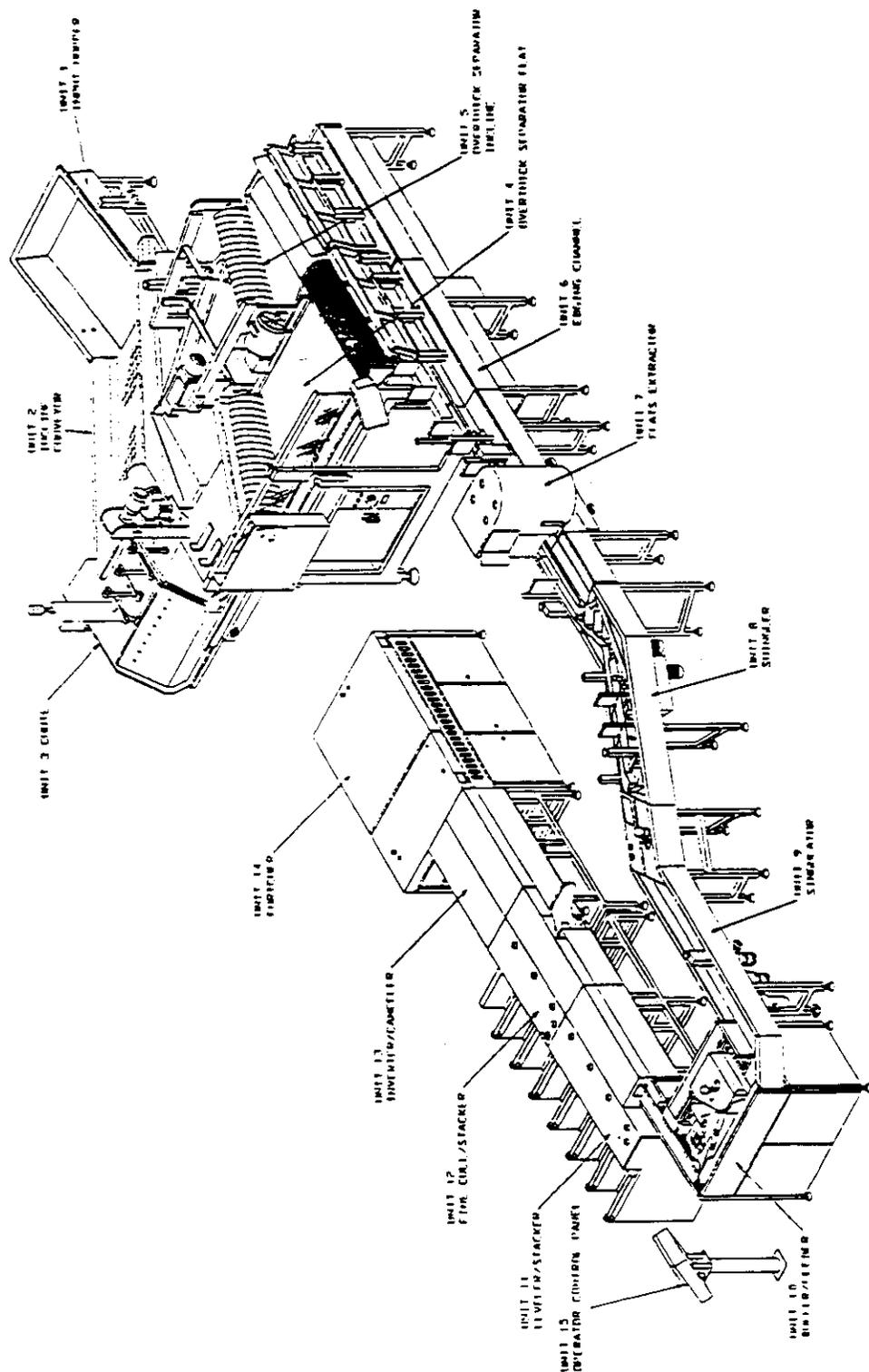


Figure 4.1-1. Advanced Facer Canceled System

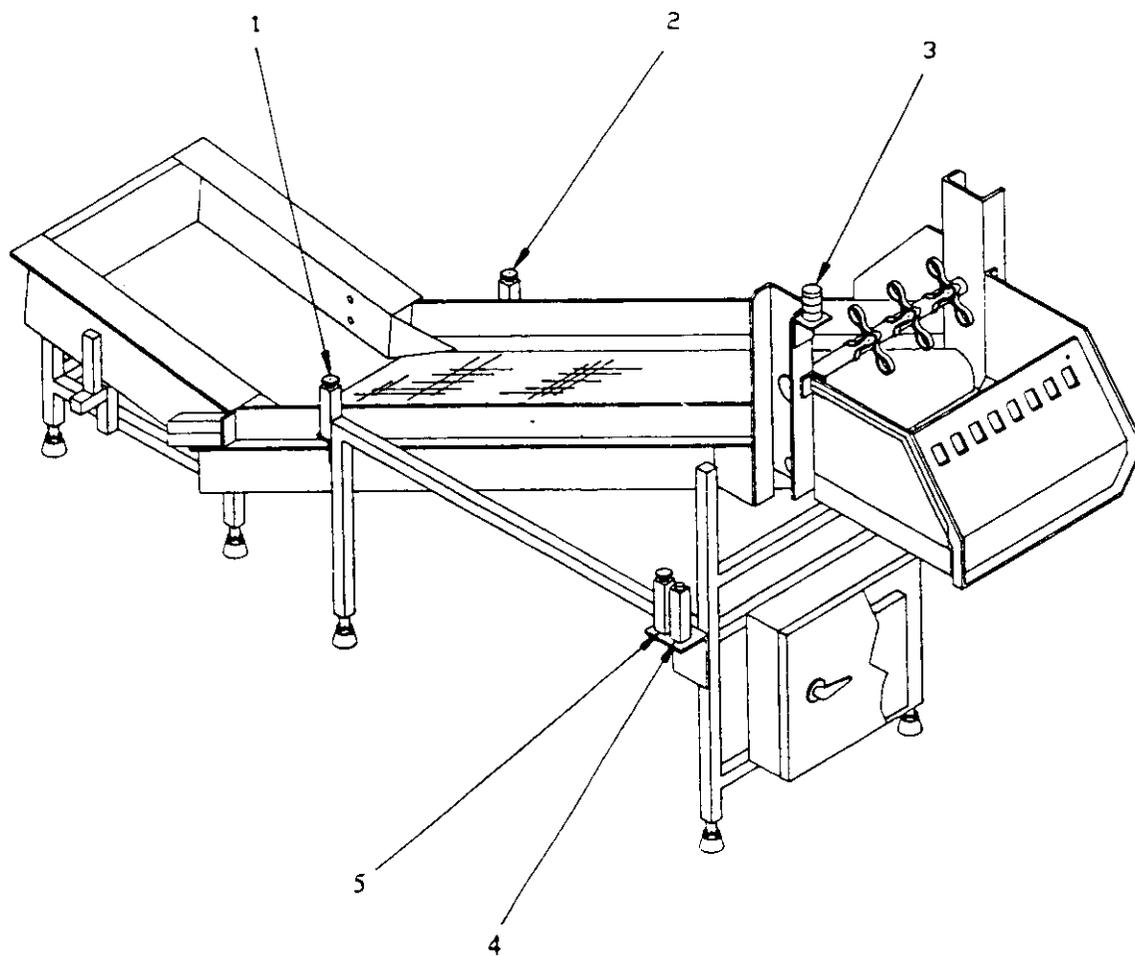


Figure 4.1-2. Unit 2 Incline Conveyor Controls and Indicators

**Unit 2 Incline Conveyor Controls and Indicators**

INDEX	CONTROL OR INDICATOR	FUNCTION
1	EMERGENCY STOP Switch and Indicator	Red, mushroom-headed, two-position switch. When pressed, immediately stops all moving parts of the AFCS. Built-in red indicator flashes to identify actuated switch. Resetting actuated switch allows restart of AFCS. To reset, turn mushroom head clockwise or pull up.
2	EMERGENCY STOP Switch and Indicator	See Index No. 1.
3	Hopper Status Lamps	Yellow lamp lights when Input Hopper is requesting mail. Red lamp lights when Input Hopper is almost empty.
4	JAM Lamp	Flashes red at mail flow jam location. Jams cause AFCS to stop.
5	EMERGENCY STOP Switch and Indicator	See Index No. 1.

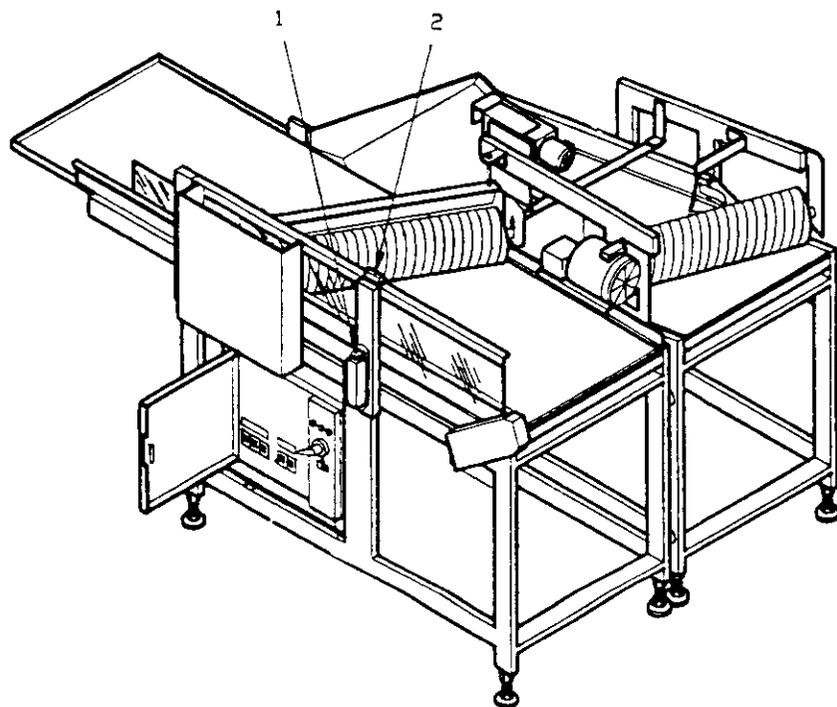


Figure 4.1-3. Unit 4 Overthick Separator,  
Flat Controls, and Indicators

## Unit 4 Overthick Separator, Flat Controls, and Indicators

INDEX	CONTROL OR INDICATOR	FUNCTION
1	EMERGENCY STOP Switch and Indicator	Red, mushroom-headed, two-position switch. When pressed, immediately stops all moving parts of the AFCS. Built-in red indicator flashes to identify actuated switch. Resetting actuated switch allows restart of AFCS. To reset, turn mushroom head clockwise or pull up.
2	Startup Indicator and Alarm	Startup warning lamp flashes for approximately 10 seconds and warning horn sounds for approximately 5 seconds when either START CULLER or START FACER/CAN switch on Operator Control Panel is actuated.

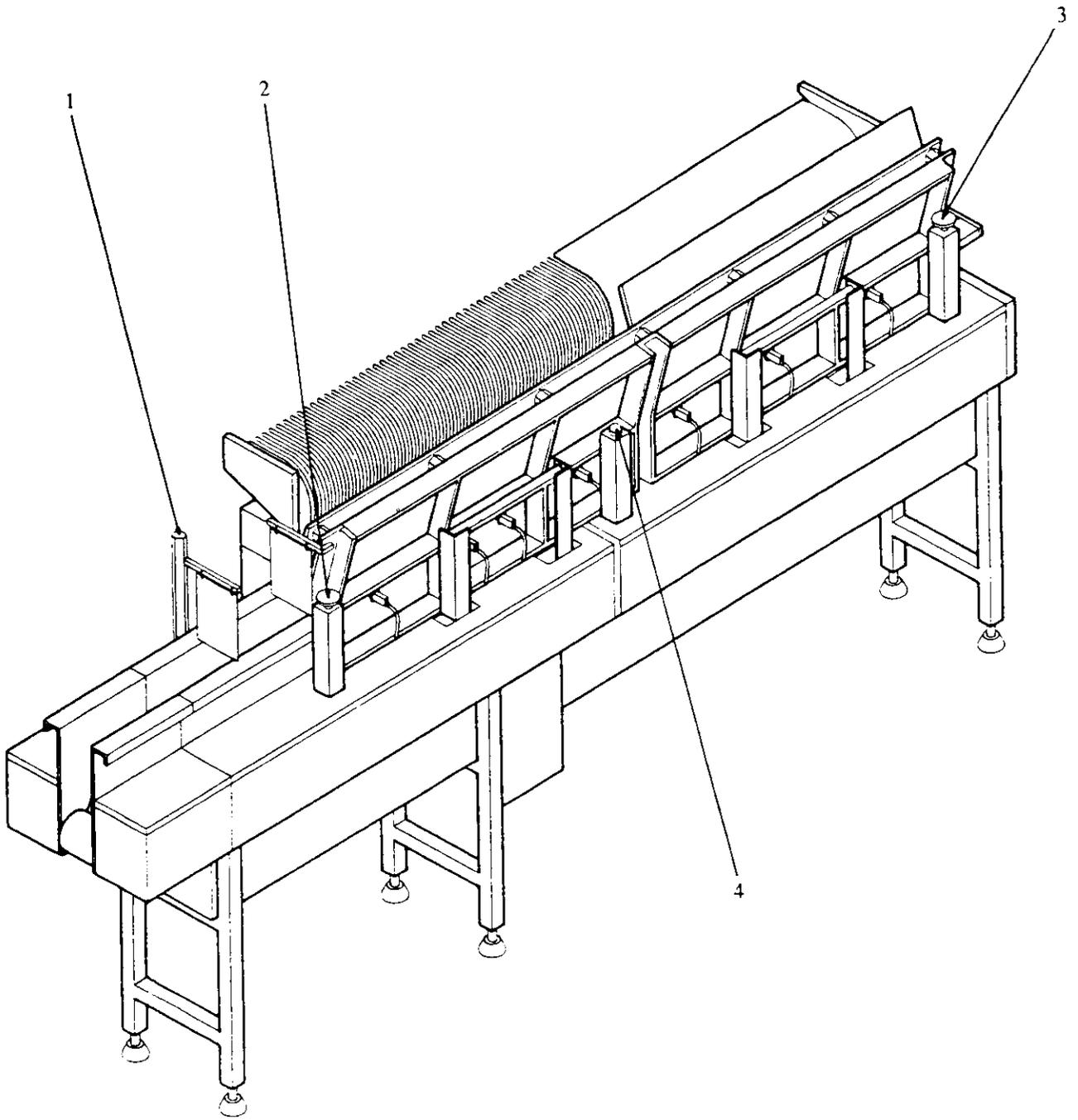


Figure 4.1-4. Unit 6 Edging Channel Controls and Indicators

### Unit 6 Edging Channel Controls and Indicators

INDEX	CONTROL OR INDICATOR	FUNCTION
1	JAM Lamp	Flashes red at mail flow jam location, or if either interlock switch has been opened. Jams cause AFCS to stop.
2	EMERGENCY STOP Switch and Indicator	Red, mushroom-headed, two-position switch. When pressed, immediately stops all moving parts of the AFCS. Built-in red indicator flashes to identify actuated switch. Resetting actuated switch allows restart of AFCS. To reset, turn mushroom head clockwise or pull up.
3	EMERGENCY STOP Switch and Indicator	See Index No. 2.
4	JAM Lamp	See Index No. 1.

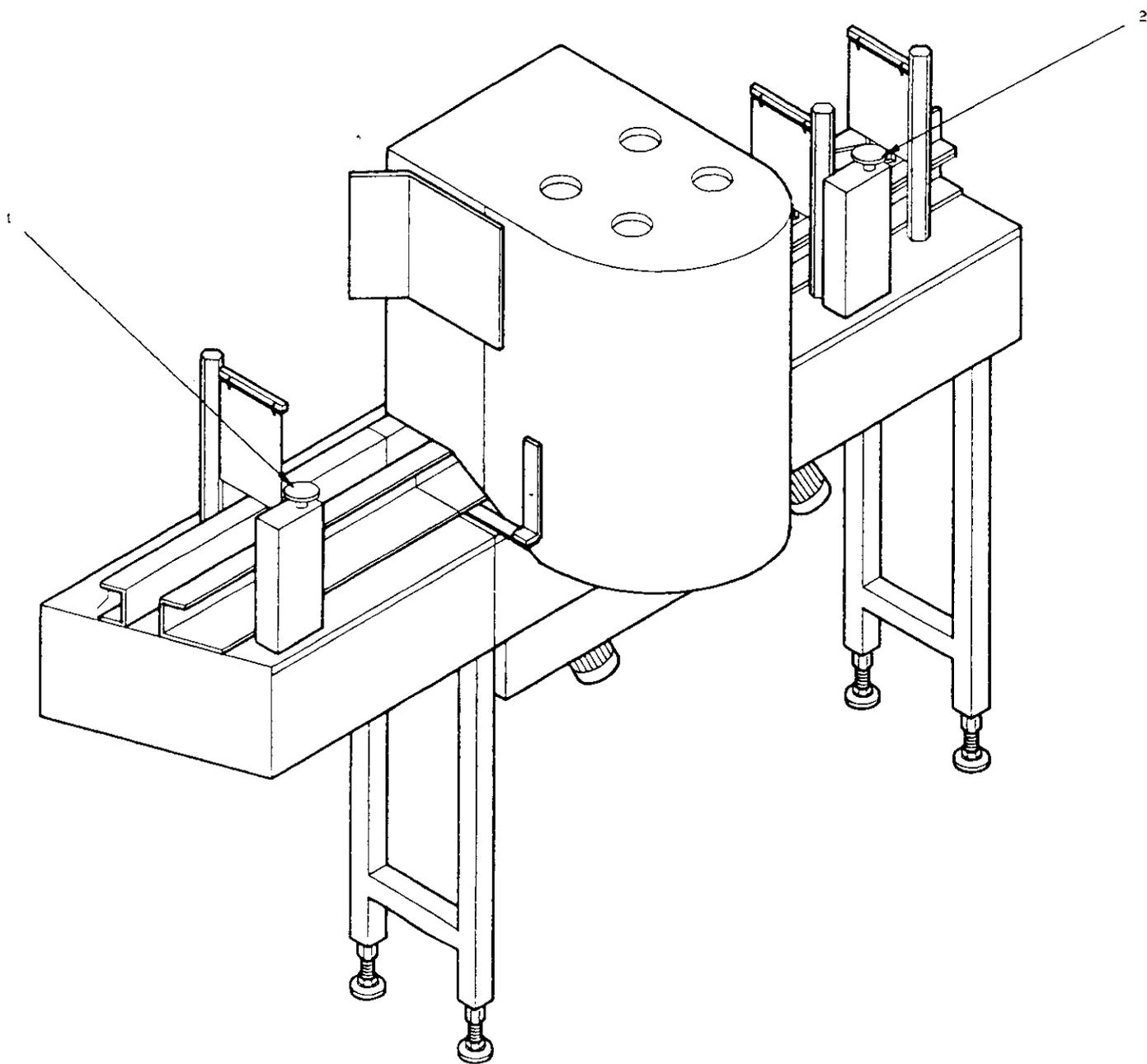


Figure 4.1-5. Unit 7 Flats Extractor Controls and Indicators

### Unit 7 Flats Extractor Controls and Indicators

INDEX	CONTROL OR INDICATOR	FUNCTION
1	EMERGENCY STOP Switch and Indicator	Red, mushroom-headed, two-position switch. When pressed, immediately stops all moving parts of the AFCS. Built-in red indicator flashes to identify actuated switch. Resetting actuated switch allows restart of AFCS. To reset, turn mushroom head clockwise or pull up.
2	EMERGENCY STOP Switch and Indicator	See Index No. 1.

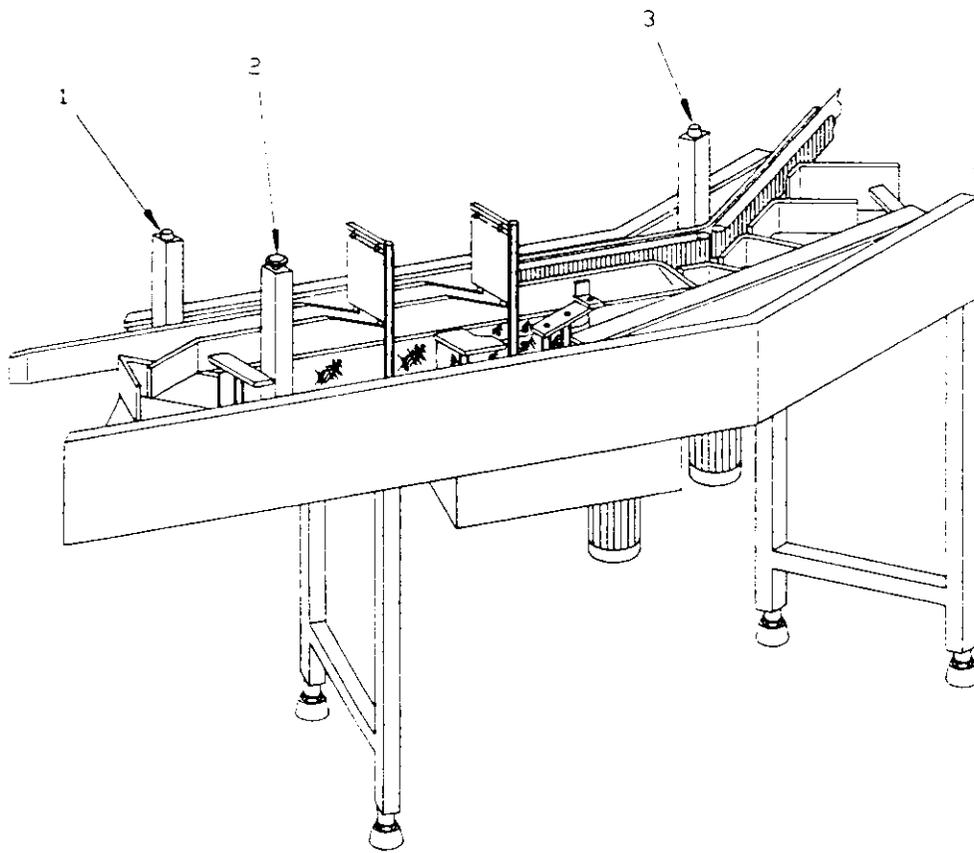


Figure 4.1-6. Unit 8 Shingler Controls and Indicators

### Unit 8 Shingler Controls and Indicators

INDEX	CONTROL OR INDICATOR	FUNCTION
1	JAM Lamp	Flashes red at mail flow jam location. Jams cause AFCS to stop.
2	EMERGENCY STOP Switch and Indicator	Red, mushroom-headed, two-position switch. When pressed, immediately stops all moving parts of the AFCS. Built-in red indicator flashes to identify actuated switch. Resetting actuated switch allows restart of AFCS. To reset, turn mushroom head clockwise or pull up.
3	JAM Lamp	See Index No. 1.

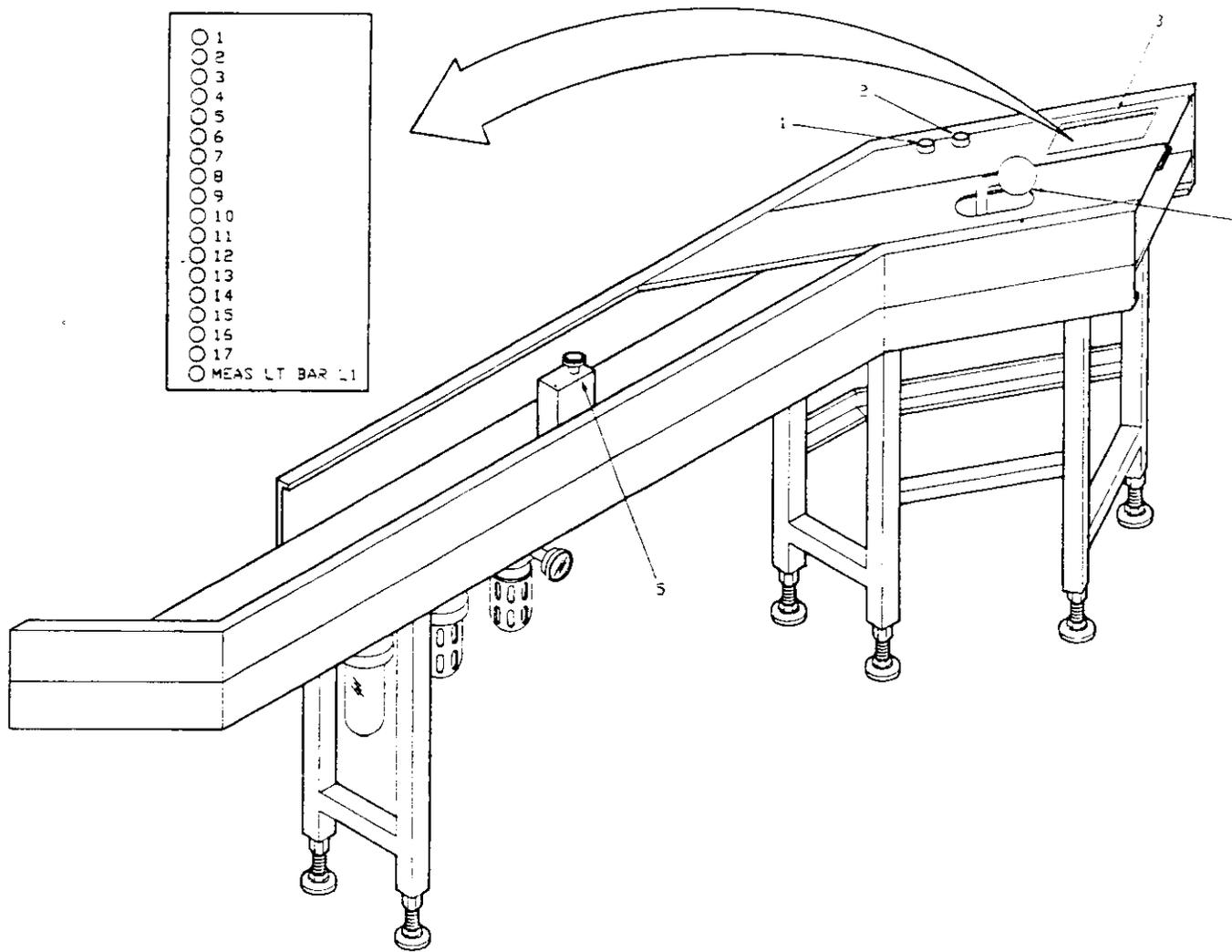


Figure 4.1-7. Unit 9 Singulator Controls and Indicators

### Unit 9 Singulator Controls and Indicators

INDEX	CONTROL OR INDICATOR	FUNCTION
1	JAM Lamp	Flashes red at mail flow jam location. Jams cause AFCS to stop.
2	SLIDE Lamp	Lights yellow when slide opens.
3	Indicator Panel	
	Slide Indicator	Normally lighted green. LED goes out when slide opens.
	1 through 17 Indicators	Normally lighted green. LEDs go out individually as mailpiece blocks each Singulator light barrier.
	MEAS LT BAR Li Indicator	Normally lighted green. LED goes out when mailpiece blocks the light barrier downstream from Singulator pickoff light barriers.
4	Slide Operating Lever	Opens Singulator pickoff mechanism to allow clearing of jams.
5	EMERGENCY STOP Switch and Indicator	Red, mushroom-headed, two-position switch. When pressed, immediately stops all moving parts of the AFCS. Built-in red indicator flashes to identify actuated switch. Resetting actuated switch allows restart of AFCS. To reset, turn mushroom head clockwise or pull up.

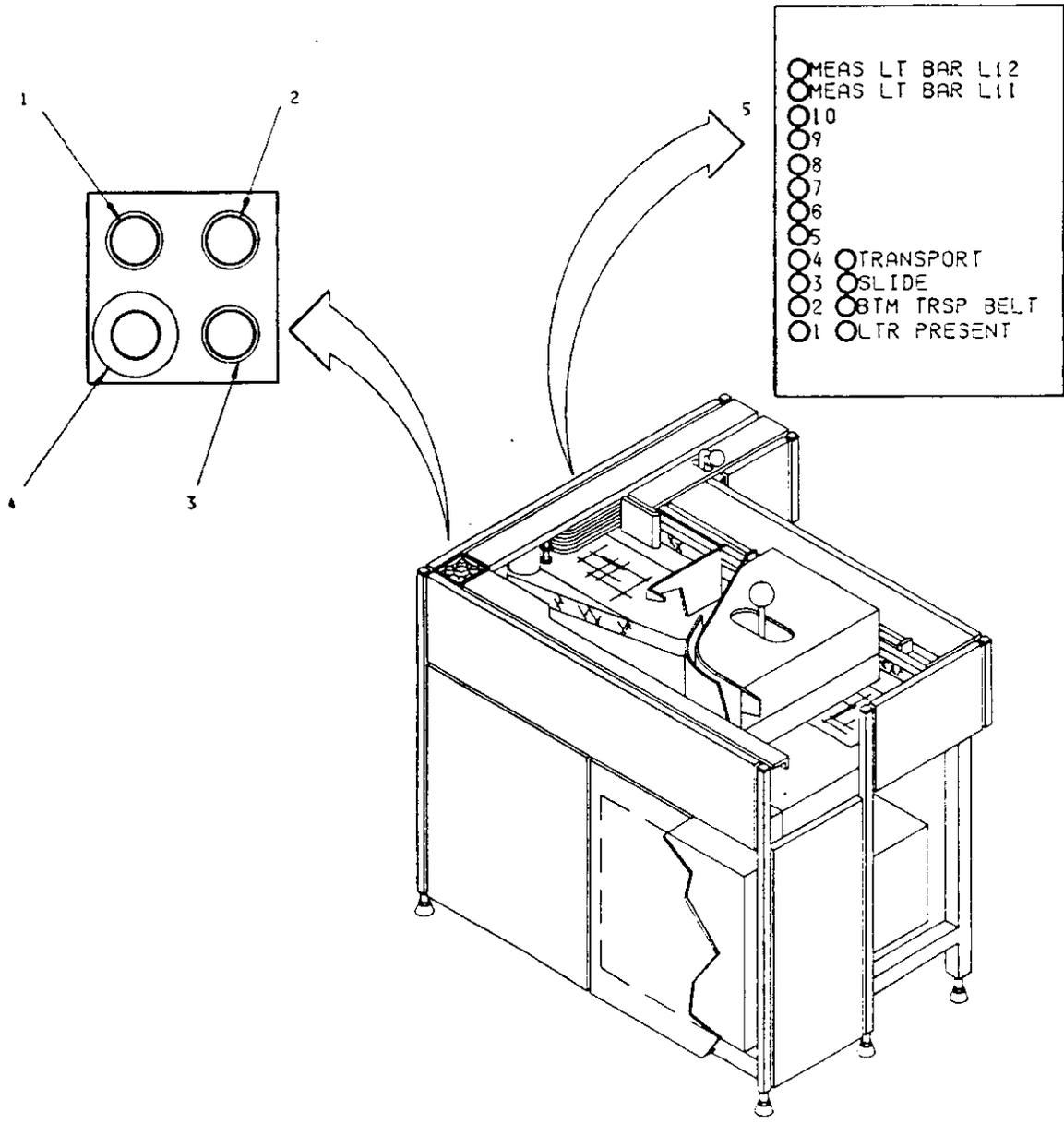


Figure 4.1-8. Unit 10 Buffer/Feeder Controls and Indicators

Unit 10 Buffer/Feeder Controls and Indicators

INDEX	CONTROL OR INDICATOR	FUNCTION
1	JAM Lamp	Flashes red when one of the following conditions exists: . Light barrier defective . Light barrier blocked longer than -- milliseconds (ms).
2	SLIDE Lamp	Lights yellow when slide opens.
3	MANUAL MODE Switch and Indicator	Lights white when pressed; shuts off belt drive auger.
4	EMERGENCY STOP Switch and Indicator	Red, mushroom-headed, two-position switch. When pressed, immediately stops all moving parts of the AFCS. Built-in red indicator flashes to identify actuated switch. Resetting actuated switch allows restart of AFCS. To reset, turn mushroom head clockwise or pull up.
5	Indicator Panel	
	MEAS LT BAR Li2 Indicator	Normally lighted green. LED goes out when mailpiece blocks second light barrier downstream from Buffer/Feeder pickoff light barriers.
	MEAS LT BAR Li1 Indicator	Normally lighted green. LED goes out when mailpiece blocks first light barrier downstream from Buffer/Feeder pickoff light barriers.
	10 through 1 Indicators	Normally lighted green. LEDs go out individually as mailpiece blocks each Buffer/Feeder pickoff light barrier.

Unit 10 Buffer/Feeder Controls and Indicators (cont'd.)

INDEX	CONTROL OR INDICATOR	FUNCTION
	TRANSPORT Indicator	Normally lighted green. LED goes out when there is no mail between the paddle and the pickoff belts.
	SLIDE Indicator	Normally lighted green. LED goes out when slide opens.
	BTM TRSP BELT Indicator	Normally lighted green. LED goes out when bottom transport belt stops.
	LTR PRESENT Indicator	Normally lighted green. LED goes out when paddle is forward or carriage is at 0 percent position.
6	Slide Operating Level	Opens Feeder/Buffer pickoff mechanism to allow clearing of jams.
7	Carriage Motor Operating Lever	Disengages carriage drive motor from bottom belt drive chain to allow manual positioning of carriage.

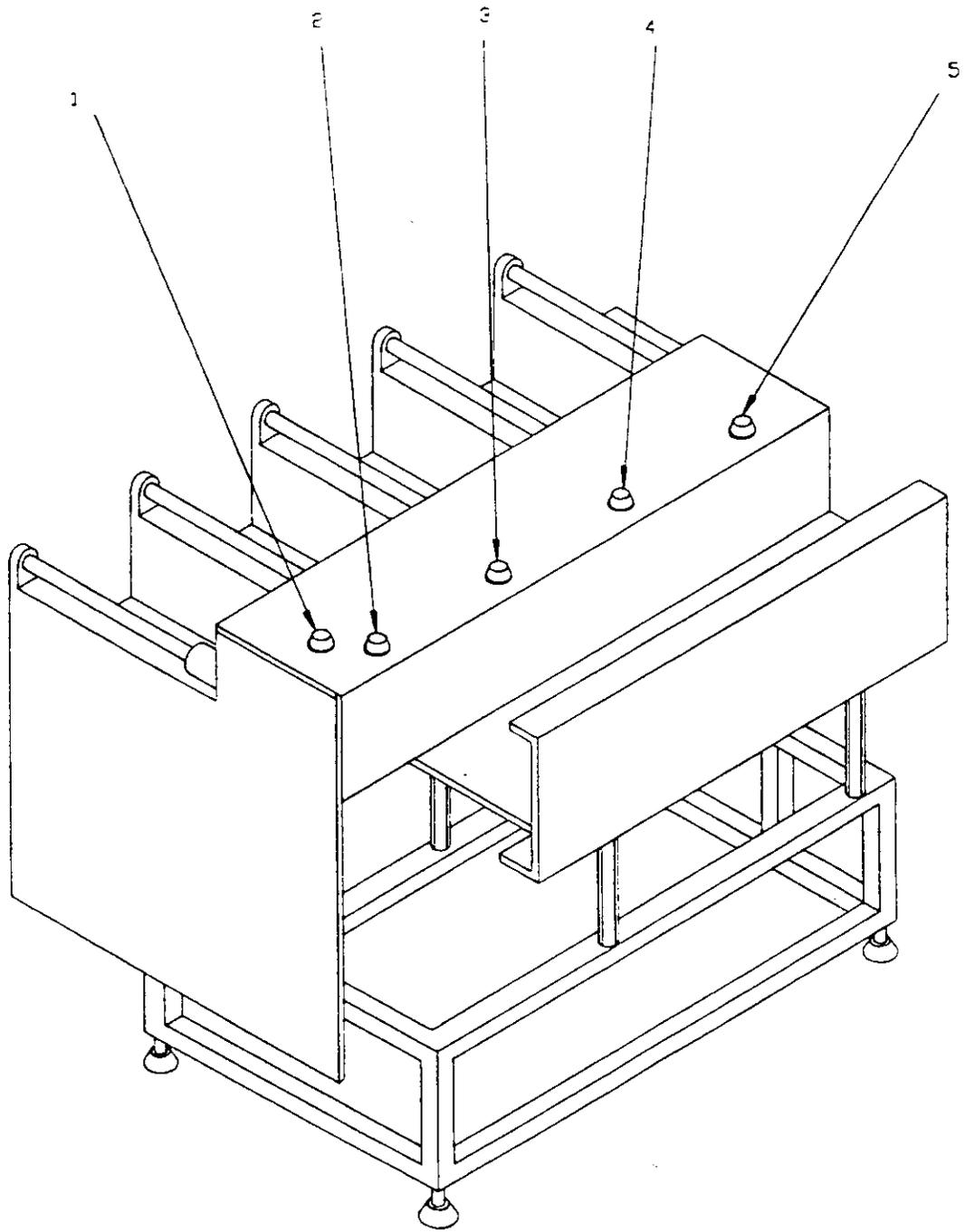


Figure 4.1-9. Unit 11 Leveler/Stacker Controls and Indicators

### Unit 11 Leveler/Stacker Controls and Indicators

INDEX	CONTROL OR INDICATOR	FUNCTION
1	JAM Lamp	Flashes red at mail flow jam location. Jams cause units 11 through 14 to stop. Units upstream from Unit 10 will continue until Buffer/Feeder becomes full. If the jam is not cleared by that time, the rest of the AFCS will stop.
2	Stacker Full Lamp	Flashes red when the associated stacker fills to 3/4 capacity.
3	Stacker Full Lamp	See Index No. 2.
4	Stacker Full Lamp	See Index No. 2.
5	Stacker Full Lamp	See Index No. 2.

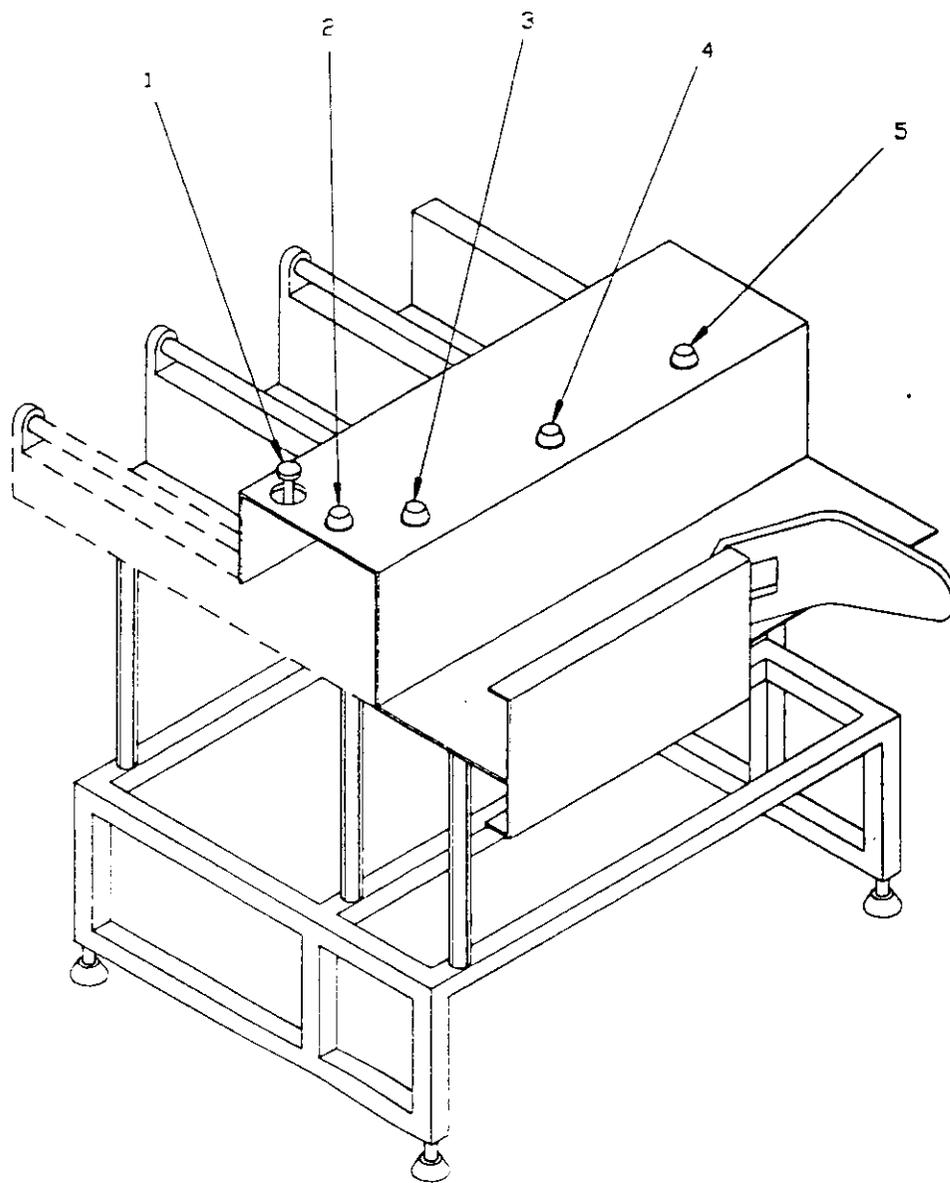


Figure 4.1-10. Unit 12 Fine Cull/Stacker Controls and Indicators

### Unit 12 Fine Cull/Stacker Controls and Indicators

INDEX	CONTROL OR INDICATOR	FUNCTION
1	EMERGENCY STOP Switch and Indicator	Red, mushroom-headed, two-position switch. When pressed, immediately stops all moving parts of the AFCS. Built-in red indicator flashes to identify actuated switch. Resetting actuated switch allows restart of AFCS. To reset, turn mushroom head clockwise or pull up.
2	JAM Lamp	Flashes red at mail flow jam location. Jams cause Units 11 through 14 to stop. Units upstream from Unit 10 will continue until Buffer/Feeder becomes full. If the jam is not cleared by that time, the rest of the AFCS will stop.
3	Stacker Full Lamp	Flashes red when the associated stacker fills to 3/4 capacity.
4	Stacker Full Lamp	See Index No. 3.
5	Stacker Full Lamp	See Index No. 3.

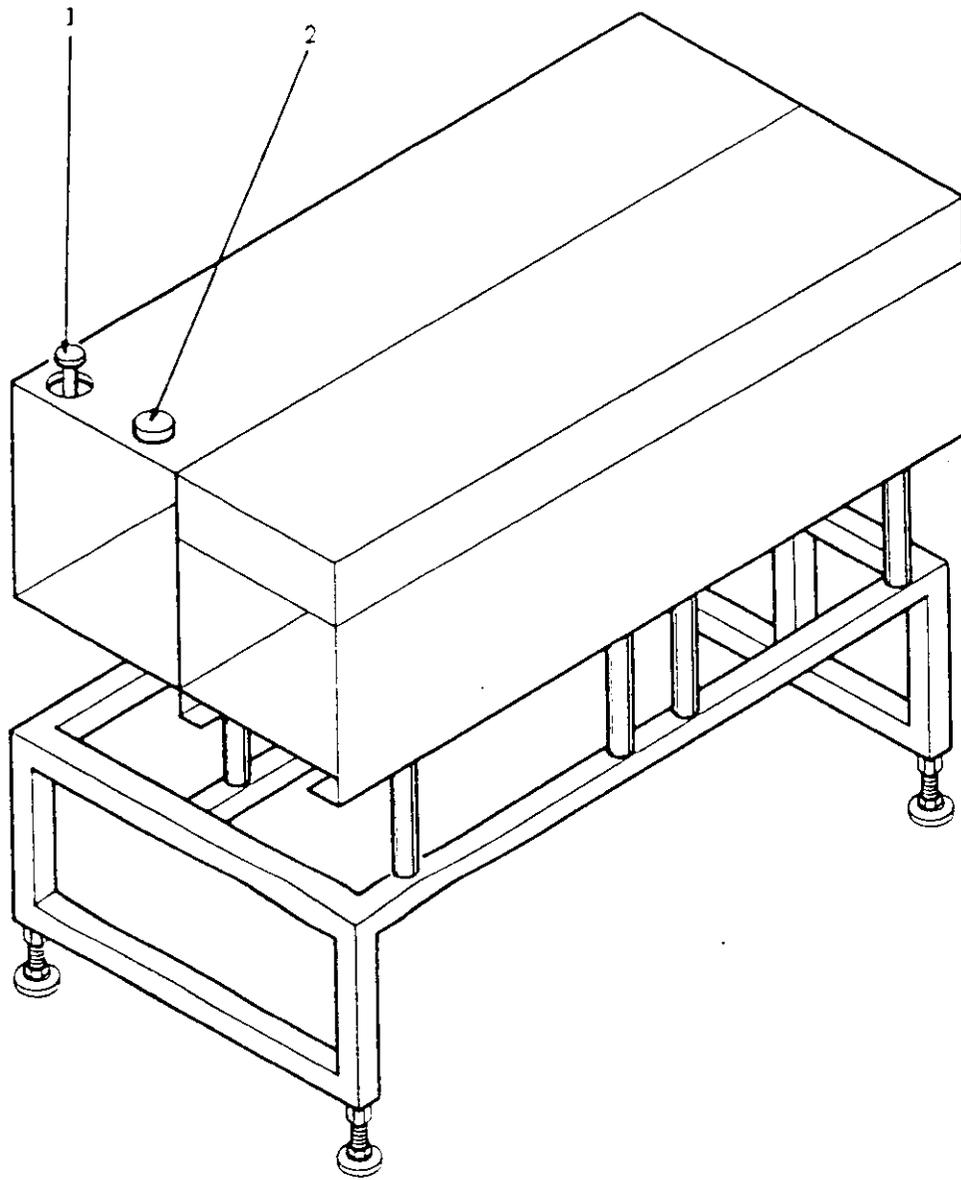


Figure 4.1-11. Unit 13 Inverter/Canceler Controls and Indicators

### Unit 13 Inverter/Canceler Controls and Indicators

INDEX	CONTROL OR INDICATOR	FUNCTION
1	<b>EMERGENCY STOP</b> Switch and Indicator	Red, mushroom-headed, two-position switch. When pressed, immediately stops all moving parts of the AFCS. Built-in red indicator flashes to identify actuated switch. Resetting actuated switch allows restart of AFCS. To reset, turn mushroom head clockwise or pull up.
2	<b>JAM Lamp</b>	Flashes red at mail flow jam location. Jam causes Units 11 through 14 to stop. Units upstream from Unit 10 will continue until Buffer/Feeder becomes full. If the jam is not cleared by that time, the rest of the AFCS will stop.

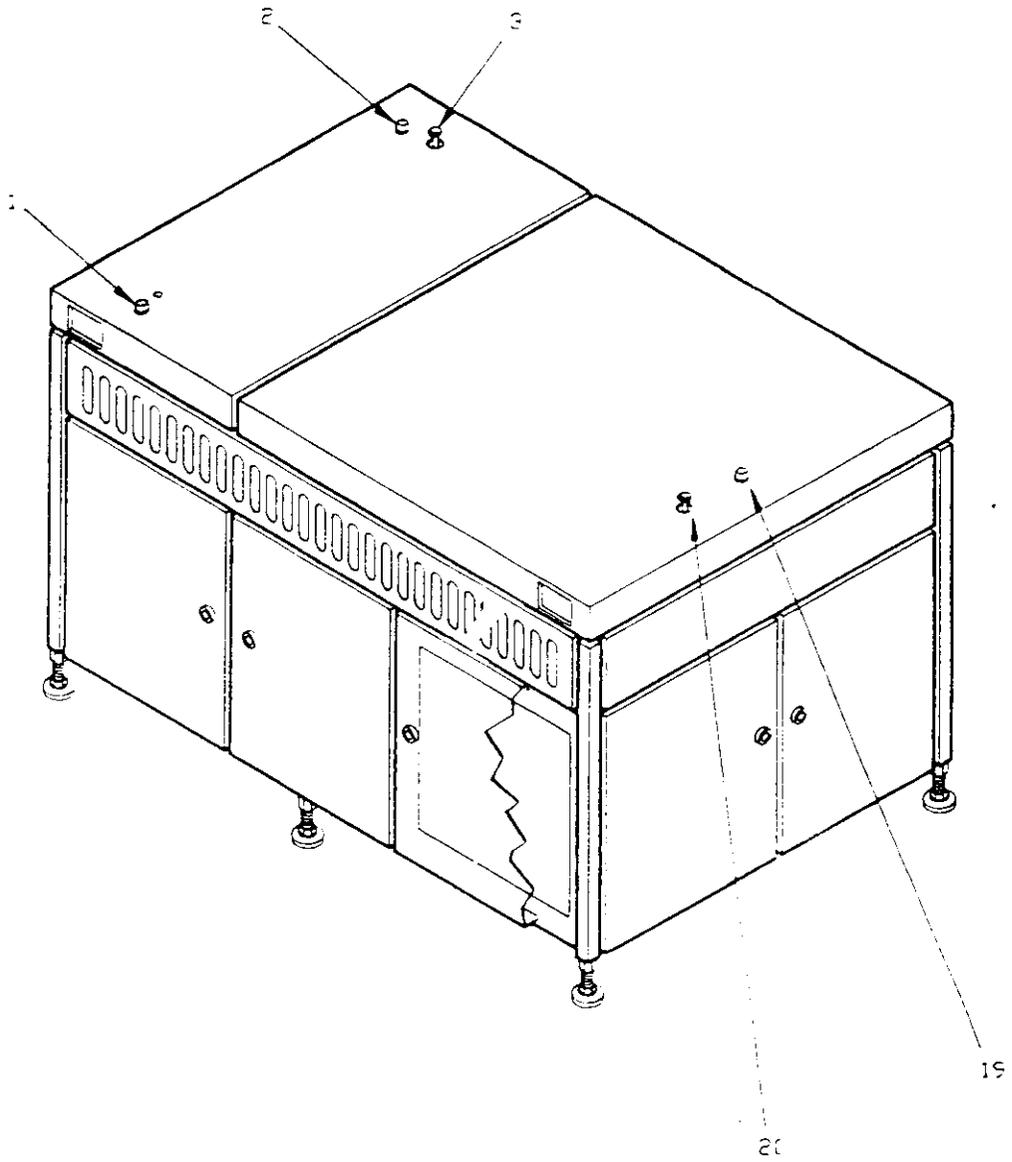


Figure 4.1-12. Unit 14 Enricher Circuit Breaker  
Panel Controls and Indicators

### Unit 14 Enricher Panel Controls and Indicators

INDEX	CONTROL OR INDICATOR	FUNCTION
1	JAM Lamp	Flashes red at mail flow jam location. Jams cause Units 11 through 14 to stop. Units upstream from Unit 10 will continue until Buffer/Feeder becomes full. If the jam is not cleared by that time, the rest of the AFCS will stop.
2	JAM Lamp	See Index No. 1.
3	EMERGENCY STOP Switch and Indicator	Red, mushroom-headed, two-position switch. When pressed, immediately stops all moving parts of the AFCS. Built-in red indicator flashes to identify actuated switch. Resetting actuated switch allows restart of AFCS. To reset, turn mushroom head clockwise or pull up.
4	EMERGENCY STOP Switch and Indicator	See Index No. 3.
5	JAM Lamp	See Index No. 1.

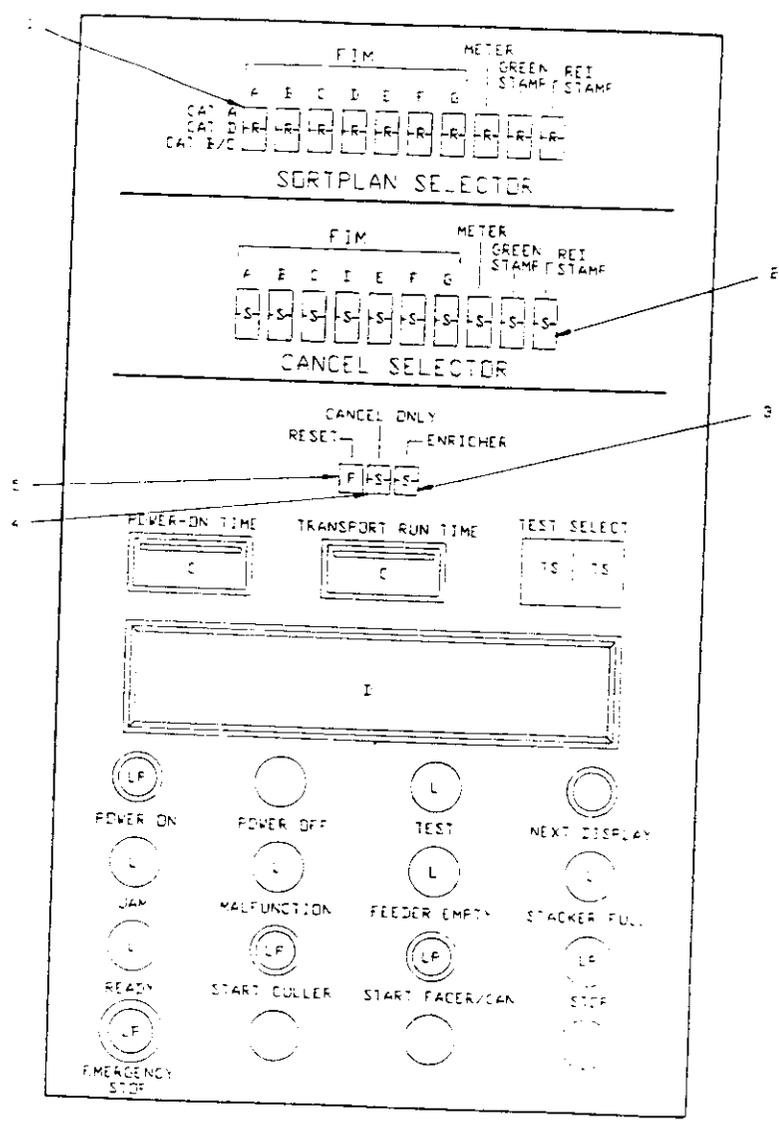


Figure 4.1-13. Unit 15 Operator Control Panel, Selector Section Controls and Indicators

**Unit 15 Operator Control Panel, Selector Section  
Controls and Indicators**

INDEX	CONTROL OR INDICATOR	FUNCTION
1	<b>SORTPLAN SELECTOR</b> Switches and Indicators	Three-position rocker switches for each indicia type. When set to CAT A, the indicia type sorts to stacker bins 1 and 2. When set to CAT D, the indicia type sorts to stacker bins 7. When set to CAT B/C, the indicia type sorts to stacker bins 3 and 4 or stacker bins 5 and 6, depending on the Enricher results. ENRICHER off sorts to stacker bins 3 and 4. When placed in the CAT A or CAT B/C position, a lamp in the switch lights accordingly.
2	<b>CANCEL SELECTOR</b> Switches and Indicators	Two-position rocker switches for each indicia type. When set on, the indicia type is canceled. A lamp in the switch lights red to indicate the switch is on.
3	<b>ENRICHER Switch and Indicator</b>	A two-position rocker switch. When set to ON, enables the electronics that determine whether an address is handwritten (CAT B mail) or machine printed (CAT C mail). When set to OFF, AFCS directs both CAT B and CAT C mail to the CAT B stacker bins. A lamp in the switch lights red to indicate the switch is on.
4	<b>CANCEL ONLY</b> Switch and Indicator	A two-position rocker switch. When set to ON, selects a special mode of operation. The AFCS cancels mailpieces according to the settings of the CANCEL SELECTOR switches and directs mailpieces into the stacker bins in sequence from bin 1 to bin 6.  A lamp in the switch lights red to indicate the switch is on.

Unit 15 Operator Control Panel, Selector Section  
Controls and Indicators (cont'd.)

INDEX	CONTROL OR INDICATOR	FUNCTION
5	RESET Switch	A momentary pushbutton switch. When pressed, sets to zero all main computer statistical counters.

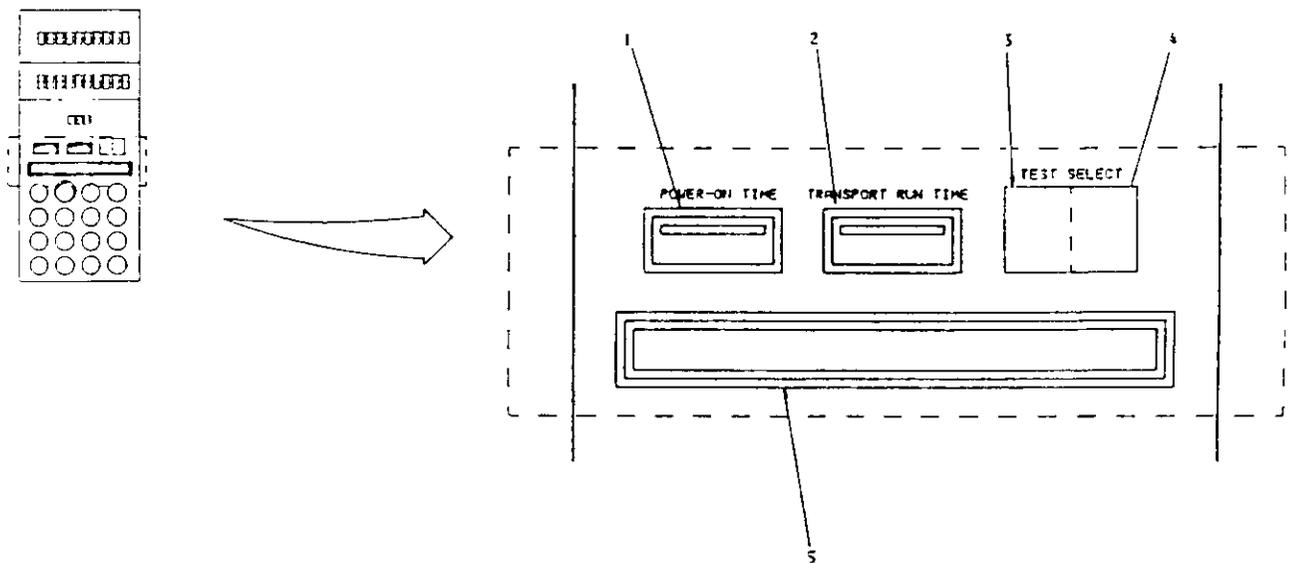


Figure 4.1-14. Unit 15 Operator Control Panel Monitor, Section, Controls and Indicators

Unit 15 Operator Control Panel, Monitor Section  
Controls and Indicators

INDEX	CONTROL OR INDICATOR	FUNCTION
1	POWER ON TIME	An 8-digit, nonresettable counter displays total power on time in hours to one decimal place.
2	TRANSPORT RUN TIME Counter	An 8-digit, nonresettable counter. Displays total transport motor run time in hours to one decimal place.
	TEST SELECT SWITCHES	A pair of thumbwheel switches with 100 (00 through 99) possible positions. Must be set to 00 for normal operation. Positions 01 through 99 select various maintenance tests.
3	Tens Switch	Selects tens digit of TEST SELECT setting.
4	Units Switch	Selects unts digit of TEST SELECT setting.
5	Alphanumeric Display	A single-line, 20-character, vacuum-fluorescent, alphanumeric display.

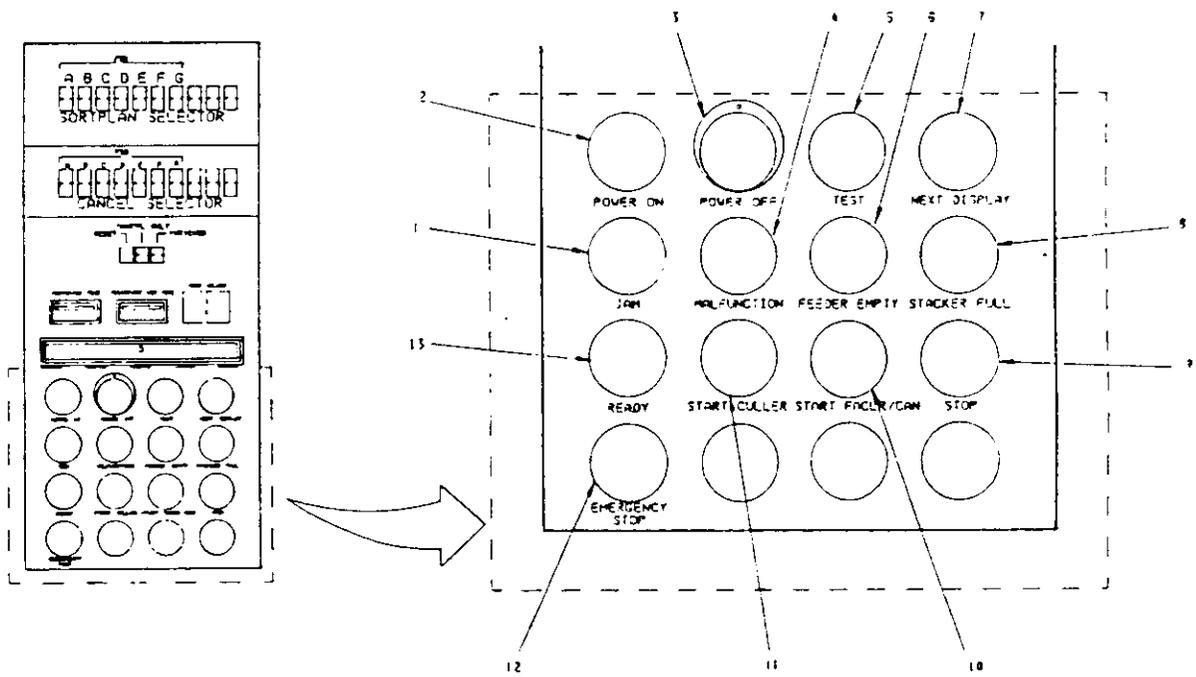


Figure 4.1-15. Unit 15 Operator Control Panel, Malfunction Indication and Function Section, Controls and Indicators

Unit 15 Operator Control Panel, Malfunction Indication  
and Function Section Controls and Indicators

INDEX	CONTROL OR INDICATOR	FUNCTION
1	JAM Lamp	Flashes red when a jam occurs. The AFCS stops. The alpha-numeric display shows the jam location. A JAM lamp at the jam location flashes red.
2	POWER ON Switch and Indicator	A lighted pushbutton switch. When pressed, applies power to AFCS. Internal lamp lights white to indicate power is on.
3	POWER OFF Switch	A pushbutton switch. When pressed, removes power from AFCS. A movable plexiglass cover prevents accidental actuation.
4	MALFUNCTION Lamp	Flashes red to indicate a machine malfunction. The AFCS stops and the alphanumeric display shows the malfunction source.
5	TEST Lamp	Lights yellow when AFCS starts in maintenance test mode. Indicates that TEST SELECT switches are set to a number other than 00.
6	FEEDER EMPTY Lamp	Lights yellow when the Buffer/Feeder runs without mail in it or when there is no mail between the Buffer/Feeder paddle and the pickoff belts.
7	NEXT DISPLAY Switch	A pushbutton switch. When pressed, brings new information to alphanumeric display.
8	STACKER FULL Lamp	Flashes red when a stacker bin fills to capacity.

**Unit 15 Operator Control Panel, Malfunction Indication  
and Function Section Controls and Indicators (cont'd.)**

INDEX	CONTROL OR INDICATOR	FUNCTION
9	STOP Switch and Indicator	A lighted pushbutton switch. Immediately shuts down Units 1 through 10. Delays shutdown of Units 11 through 14 until all mailpieces in them are processed.
10	START FACER/CAN Switch and Indicator	A lighted pushbutton switch. When pressed after READY lamp lights, starts motors in Units 10 through 14.
11	START CULLER Switch and Indicator	A lighted pushbutton switch. When pressed after READY lamp lights, starts motors in Units 1 through 10.
12	EMERGENCY STOP Switch and Indicator	Red, mushroom-headed, two-position switch. When pressed, immediately stops all moving parts of the AFCS. Built-in red indicator flashes to identify actuated switch. Resetting actuated switch allows restart of AFCS. To reset, turn mushroom head clockwise or pull up.
13	READY Lamp	Lights when AFCS is ready to operate. This means the following conditions have been met: <ul style="list-style-type: none"> <li>. Power on</li> <li>. Covers and doors closed</li> <li>. Malfunctions corrected</li> <li>. Jams cleared</li> <li>. Indicia detector lamps warmed up</li> </ul>

## 4.2 EMERGENCY SHUTDOWN PROCEDURE

EMERGENCY STOP switches are located around the AFCS at intervals not to exceed 4 feet, as shown in Figure 4.1.2-1. The EMERGENCY STOP switches on this figure are shown by their reference designators.

The switch is a large, red, mushroom-headed pushbutton switch tht latches when pressed. Any EMERGENCY STOP switch may be activated without reaching over any unguarded moving parts. Pressing any one of these switches stops all moving parts in the AFCS.

The latched switch is reset by turning the mushroom head in a clockwise direction or pulling the mushroom head up. After the switch is reset, the AFCS is restarted with a normal start procedure.

### WARNING

Pressing an EMERGENCY STOP switch removes power from the drive motors. It does not remove power from the entire machine. To remove all system power, open the main power disconnect in Unit 4.



## SECTION 5

### NORMAL OPERATING PROCEDURES

#### 5.1 OPERATIONAL SAFETY

Care must be used in operating this equipment. Injuries may result from electrical shock or the improper operation of mechanical devices. It is the responsibility of all personnel, from the supervisor to the operator, to understand the hazards involved in equipment operation and to observe established safety standards and procedures.

#### 5.2 PRE-START CHECKS

1. Clear system for operation. Verify that:
  - Doors are closed.
  - Covers are in closed position.
  - Jam conditions are cleared.
2. Check that TEST SELECT switch on Operator Control Panel is set to 00 for normal mail processing operation.

#### 5.3 POWER-ON SYSTEM (NORMAL START)

1. Power-on system as follows:
  - a. At the Operator Control Panel, press the POWER ON pushbutton switch. Switch lights when pressed.
  - b. Verify that Operator Control Panel display activates and responds with WAIT message while microprocessors undergo self-test. Other messages that may appear during power-on or other CPU reset are shown in the table on page 5-3.
  - c. Verify that Operator Control Panel display indicates PCS FED after a short period.
  - d. Perform visual checks as follows:

- (1) On all units, check that EMERGENCY STOP and JAM indicators are not flashing.
- (2) At the Operator Control Panel, check that the READY indicator lights.
- (3) At the Buffer/Feeder Operator Panel, verify that green light-barrier LEDs on the diode array are on.
- (4) Check that the green SLIDE LED is on.
- (5) Verify that the stacking carriage is in the leftmost position.
- (6) At the Singulator Operator Panel, verify that all green light-barrier LEDs on the diode array are on.
- (7) Verify that the green SLIDE LED is on.

Operator Control Panel Displays - CPU Reset

DISPLAY	MALFUNCTION	CORRECTIVE ACTION
ILLEGAL MACHINE	Machine number at AM card cage is 0 or > 16.	Switch power off and enter a machine no. between 1 and 16.
RESET/POWERFAIL	Reset or powerfail during power on (watchdog !?).	Check power supply. Wait until READY lamp is on.
RESET/RAM CLEARED	Warm startup message and RAM data not buffered.	Check RAMs and back-up battery socket. Wait until READY lamp is on.
POWER ON/RAM CLEAR	Power-on startup message and RAM data not buffered on very first power-on.	Check RAMs and back-up battery socket. Wait until READY lamp is on.
*** WAIT ***	Display after power on reset.	Wait until WAIT is extinguished.
MAL STACKER <Q1> MAL ENRICHER <Q4> MAL CANCELER <Q1> MAL CANCELER <Q2> MAL CANCELER <Q3> MAL ENRICHER <Q1> MAL ENRICHER <Q2> MAL ENRICHER <Q3> MAL IND DET 1 <Q1> MAL IND DET 1 <Q2> MAL IND DET 1 <Q3> MAL IND DET 2 <Q1> MAL IND DET 2 <Q2> MAL IND DET 2 <Q3> MAL IND DET 1 <Q4> MAL INVERTER <Q1/Q2> MAL INVERTER <Q3> MAL INVERTER <Q4> MAL INVERTER <Q5/Q6>	The light barrier test at the designated barrier results in:  ALWAYS LIGHTS  ALWAYS DARK  DARK AFTER SINKING  DARK AFTER SINKING	  Remeasure light barrier.1  LB covered or defective.  Clean LB or adjust LB.  Clean or adjust light barrier.
MAL LB ALLW. LIGHT	In the case LIGHT, this message appears, also, since there is a technical defect.	

2. Select the sortplan. This allocates mailpieces to specified pockets in the stacker. Mailpieces are grouped into four categories for sorting purposes:

- CAT A - Facer Identification Mark (FIM) allocated to pockets 1 and 2.
- CAT B - Script allocated to pockets 3 and 4.
- CAT C - Imprinted allocated to pockets 5 and 6.
- CAT D - Rejects allocated to pocket 7.

At the Operator Control Panel, use the SORTPLAN SELECTOR switches to assign mailpieces with different indicia to the desired stacker pocket. Adjust indicia cancelation for the desired combination by using the CANCEL SELECTOR switches and the CANCEL ONLY switch.

3. Select Category B/C.

4. Load the mailpieces. The Input Hopper controls operate as follows:

- The red lamp on the Inclined Conveyor lights if the Input Hopper is almost empty.
- The yellow lamp on the Inclined Conveyor lights if the Input Hopper is requesting mail.

#### 5.4 ACTIVATE SYSTEM

1. At Operator Control Panel, verify that READY lamp is lighted.

2. Start motors in Units 1 through 10 as follows:

- a. At the Operator Control Panel, press the START CULLER switch.
- b. Observe that lamp in switch lights.
- c. Verify that startup warning lamp on Overthick Separator, Flat flashes for not less than 10 seconds and warning horn sounds for not less than 5 seconds. The machine will start 5 seconds after the horn stops.

3. Start motors in Units 11 through 14 as follows:

- a. At the Operator Control Panel, press the START FACER/CAN switch.

- b. Observe that lamp in switch lights.
  - c. Verify that startup warning lamp on Overthick Separator 1 flashes for not less than 10 seconds and warning horn sounds for not less than 5 seconds. The machine will start 5 seconds after the horn stops.
4. Check system operations as follows:
- a. Verify that system is running smoothly (feeding, culling, separating, facing, canceling, and sorting).
  - b. Ensure that safety procedures are being followed.
  - c. Ensure that operator personnel are following correct operating procedures.
  - d. Ensure that no unauthorized personnel are in the area of operation.

#### 5.5 CHANGE PROGRAM (SORTPLAN)

1. Terminate current operation as follows:

##### NOTE

In order to clear the machine of mail, the AFCS must be stopped before changing sortplans.

- a. At the Operator Control Panel, press the STOP switch. Observe that:
    - (1) Culler motors stop first.
    - (2) Mail is cleared from the Enricher area and Enricher motors stop.
  - b. Observe that lamps in the START CULLER and START FACER/CAN switches go out.
2. Sweep pockets as described in section 5.6.
3. Set new sortplan on Operator Control Panel as follows:
- a. Set SORTPLAN SELECTOR switches.
  - b. Set ENRICHER switch for desired sort scheme.

4. Restart system.

## 5.6 SWEEP POCKETS

When required, sweep pockets as follows:

**WARNING**

**Leave approximately 2 inches of mail in the pocket when removing mail from a stacker.**

1. Press the STOP switch on the Operator Control Panel.
2. Use one hand to lift up the separating blade while holding the mail stack with the other hand.
3. Slide the separating blade toward the stacking-in point at the rear of the pocket and reinsert it in the stack approximately 2 inches away.
4. Using both hands, press the mail stack firmly into a small tray.
5. Position the full mail tray in its designated location.
6. Restart using normal START procedures.

## 5.7 CHECK SYSTEM OPERATION

System operation may be checked at the display on the Operator Control Panel. Run-time messages displayed during AFCS operation are shown in the table on page 5-7. The display is changed by pressing the NEXT DISPLAY switch on the Operator Control Panel.

## Operator Control Panel Displays - Run-Time Messages

DISPLAY	EXPLANATION
PCS FED nnnnnn	Actual pieces fed counter (nnnnnn = number of mailpieces).
OP-TIME HH:MM:SS	Operational time since last RESET in hours:minutes:seconds.
FED-TIME HH:MM:SS	Elapsed time the AFCS was processing mail (Feeder pickoff).
STOPWATCH HH:MM:SS	Stopwatch time (start and stop with RESET switch).
PCS /h MEAN nnnnnn	Throughput mean value per hour.
PCS /h ACT nnnnnn	Actual throughput value per hour.
REJECT % nn	Rejected mailpieces in percent (only evaluated if rejects exceed 100 pieces).
NON MACH nnnnnn	Nonmachinable mailpiece counter.
CAT A nnnnnn	Number of mailpieces sent to CAT A stacker bins.
CAT B nnnnnn	Number of mailpieces sent to CAT B stacker bins.
CAT C nnnnnn	Number of mailpieces sent to CAT C stacker bins.
REJECTS nnnnnn	Number of mailpieces sent to REJECT stacker bin.
.....*.....*.....*.....	Indicia results displayed: .....*.....*.....*..... detector: 1 2 3 4 Every indicia result is displayed at the appropriate position with the following characters: . FIMs -- FIMA, FIMB, FIMC, FIMD, FIME, FIMF, FIMG . Stamp green -- STG . Stamp red -- STR . Meter mark -- MET
Informative messages	These messages may appear on the display to inform the operator of certain conditions:
**COUNTERS CLEAR**	Statistics counter cleared after pressing RESET on Operator Control Panel.
SING SLIDE OPEN	Singulator slide is open. Close slide for mail feeding.

## 5.8 OPERATE AFCS FROM BUFFER/FEEDER

1. Prepare AFCS for CANCEL ONLY operation as follows:
  - a. Verify that Enricher area is clear for operation.
  - b. Ensure that TEST SELECT switch on Operator Control Panel is set to 00 for normal operation.
  - c. Check that required switches on AC Main Power Distribution Panel and branch circuit breaker assemblies are set to ON.
2. Power-on system as follows:
  - a. At the Operator Control Panel, press the POWER ON switch. Observe that lamp in switch lights.
  - b. Verify that the display indicates WAIT, then PCS FED.
3. Perform the following visual checks:
  - a. Verify that no EMERGENCY STOP or JAM indicators are activated.
  - b. Ensure that all panels are in place and all covers closed.
4. Press CANCEL ONLY switch.

**CAUTION**

**Failure to chain carriage back may result in  
equipment damage.**

5. At Buffer/Feeder, chain carriage back by looping carriage chain over handle.
6. Load mailpieces into Buffer/Feeder as follows:
  - a. Using both hands, empty mailpieces from tray into Buffer/Feeder transport. Ensure that mailpieces are stacked with indicia leading and upside down.
  - b. Lift separating blade and slide mailpieces into position.

- c. Slide separating blade to end of last mailpiece and lower into position.
7. Start Buffer/Feeder as follows:
    - a. At the Operator Control Panel, press the START FACER/CAN switch.
    - b. Verify that startup warning lamp on Overthick Separator 1 flashes for not less than 10 seconds and warning horn sounds for not less than 5 seconds. The machine starts 5 seconds after the horn stops.
    - c. Press the MANUAL MODE switch on the Buffer/Feeder indicator/control panel.
    - d. Check system operation as follows:
      - (1) Verify that system is running smoothly.
      - (2) Ensure that operator personnel are following correct operating procedures.
      - (3) Ensure that no unauthorized personnel are in the area of operation.

### 5.9 STOP OPERATION (NORMAL STOP)

1. Verify that Flats Extractor, Singulator, and Buffer/Feeder are empty (if required).
2. At the Operator Control Panel, press the STOP switch. Observe that:
  - a. Lamps in START CULLER and START FACER/CAN switches go out.
  - b. The Buffer/Feeder stops feeding immediately.
  - c. Mail is cleared from the Enricher area and all motors stop.
3. Sweep pockets as described in section 5.6.
4. Record counter readings as follows:
  - a. At the Operator Control Panel, press NEXT DISPLAY switch to read each counter. The display indicates which counter is being viewed (see table on page 5-7).

- b. Record readings for each counter.
5. Check all areas around the machine for stray mail.

**5.10 EMERGENCY STOP**

EMERGENCY STOP messages are displayed on the Operator Control Panel whenever an EMERGENCY STOP button is pressed (see table on page 5-11).

**Operator Control Panel Displays - Emergency Stops**

DISPLAY	EMERGENCY STOPS
EMERG CULLER EMERG SING/SHINGLER EMERG SINGULATOR EMERG FEEDER EMERG FC	Release EMERGENCY STOP button to run the AFCS.

1. Perform appropriate corrective action for the unit affected.
2. Restart AFCS as follows:
  - a. Reset the EMERGENCY STOP switch by turning the mushroom head clockwise or pulling it up.
  - b. Perform a normal start procedure.

**5.11 MAIL FLOW JAM STOP**

This stop activates a mail flow jam. Observe that the JAM lamp flashes red at mail flow jam location and the AFCS stops. The Operator Control Panel display indicates the jam location as shown in the table on page 5-12.

Clear JAM using the following procedure:

**WARNING**

**Press EMERGENCY STOP switch to prevent accidental restart of machine.**

1. Press EMERGENCY STOP.
2. Open dust cover and ensure that rollers have stopped at JAM location.
3. Remove jammed mail.
4. Ensure that transport belts are correctly aligned.
5. Close dust cover doors.
6. Reset EMERGENCY STOP switch.
7. Restart AFCS using normal start procedure.

To remove mailpieces from Buffer/Feeder or Singulator, perform the following at step 3 in above procedure.

- a. Move slide operating lever to the open position.
- b. Remove jammed mail.
- c. Move slide operating lever to the closed position.

Operator Control Panel Displays - Jams

DISPLAY	LOCATION
JAM CULLER INPUT	Inclined Conveyor.
JAM CULLER OUTPUT	Edging Channel.
JAM SING/SHINGLER	Shingler.
JAM SINGULATOR	Singulator.
JAM SING DIODE ARR.	Singulator, diode array.
JAM SING MEAS. LB	Singulator, measuring light barrier.
JAM STACK CARRIAGE	Buffer/Feeder, sensor light barrier.
JAM FEEDER	Buffer/Feeder, measuring light barrier or shaft encoder light barrier.
JAM FCUL Q1/Q2	Fine Cull, first light barrier pair.
JAM FCUL Q3/Q4	Fine Cull, second light barrier pair.
JAM FCUL Q6	Fine Cull, last light barrier.
JAM IND DET 1 < Q1 >	Inverter, indicia detector 1, first light barrier.
JAM IND DET 1 < Q2 >	Inverter, indicia detector 1, second light barrier.
JAM IND DET 1 < Q3 >	Inverter, indicia detector 1, third light barrier.
JAM INVERTER < Q1/Q2 >	Inverter, twisting module, first light barrier pair.
JAM INVERTER < Q3 >	Inverter, twisting module, first single light barrier.
JAM INVERTER < Q4 >	Inverter, twisting module, second single light barrier.
JAM INVERTER < Q5/Q6 >	Inverter, twisting module, second light barrier pair.
JAM LEVELER	Inverter, leveler after diverter.

Operator Control Panel Displays - Jams (cont'd.)

DISPLAY	LOCATION
JAM IND DET 2 <Q1>	Inverter, indicia detector 2, first light barrier.
JAM IND DET 2 <Q2>	Inverter, indicia detector 2, second light barrier.
JAM IND DET 2 <Q3>	Inverter, indicia detector 2, third light barrier.
JAM ENRICHER <Q1>	Enricher, first light barrier.
JAM ENRICHER <Q2>	Enricher, second light barrier.
JAM ENRICHER <Q3>	Enricher, third light barrier.
JAM ENRICHER <Q4>	Enricher, fourth light barrier.
JAM CANCELER <Q1>	Canceler, first light barrier.
JAM CANCELER <Q2>	Canceler, second light barrier.
JAM CANCELER <Q3>	Canceler, third light barrier.
JAM STACKER <Q1>	Stacker 1, entrance light barrier.
JAM STACKER 1...3	Stacker 1, bin 1, 2, or 3.
JAM STACKER 4...7	Stacker 2, bin 4, 5, 6, or 7.

### 5.12 STACKER FULL STOP

Mail pressing against the stacker blade, trips the Stacker full microswitch and stops the Buffer/Feeder feed. The STACKER FULL lamp on the Operator Control Panel lights red and the display shows **\*\*STACKER FULL\*\***.

Sweep pockets (See section 5.6) and restart the AFCS following the normal start procedure.

### 5.13 MALFUNCTION STOP

This stop occurs from an AFCS electronics or mechanical failure.

The MALFUNCTION lamp on the Operator Control Panel flashes red and the machine stops.

Use the following procedure:

1. Check the display for the reason for the malfunction. Malfunction display messages are listed in the table on page 5-15.
2. Resolve the malfunction.
3. Restart the machine using normal start procedures.

### Operator Control Panel Displays - Malfunctions

DISPLAY	EXPLANATION	ACTION
MAL SING TRANS-CLOCK	Transport clock for failure in Singulator.	Check transport clock generator, especially for paper or dust.
MAL SING WATCH-DOG	Control failure in Singulator.	Check Singulator control.
MAL SING 5V	5-volt power supply supply failure in Singulator.	Check 5-volt power supply.
MAL SING TECH	Singulator reports an illegal or undefined state.	Check Singulator for proper setup.
SING SLIDE OPEN	Singulator slide is open.	Close slide for mail feeding.
MAL FACER TRACKING	Overflow of letter tracking in the control computer. This message can be caused by disturbing the light path.	Check if a light barrier always reports LIGHT or if there is a loose contact at the read-in light barrier. Check CLOCK WAVE.
! ILLEGAL MESSAGE!!	Program Error	Press reset button on P-MPU86.
**COUNTERS CLEAR**	Statistics counter cleared after pressing "RESET" on control panel.	None.
**STACKER FULL**	Stacker is full.	Empty Stacker.
*** COVER OPEN ***	Cover/door open.	Close cover/door.
** FEEDER FULL **	Intermediate stacker 100% full.	Empty intermediate stacker.

Operator Control Panel Displays - Malfunctions (cont'd.)

DISPLAY	EXPLANATION	ACTION
MAL EN TRACKING	Enricher dialogue with too many errors, or signals EN_FEHL and EN_INFO are active after ENRICHER_RESET. This message appears only in the operating modes in which the Enricher is activated.)	Check Enricher hardware.
WATERFALL OPEN	Waterfall protection open.	Close protector.
INCLINE COVER OPEN	Control cabinet cover beneath incline belt is open.	Close protector.
TOO MANY GAP-ERRORS	Too many errors in inter-mailpiece gaps.	Check free run stretch.
MAL FCUL DIVERTER	Fine Cull diverter error.	Check diverter position.
MES. BUF OVERFLOW!!!	The malfunction display buffer is overfull.	Self-regulating as message buffer empties.
SORTPLAN ERROR	Occurs when a short circuit causes an indicia type to be sorted both CAT A and CAT B/C.	Check SORTPLAN SELECTOR switches on Operator Control Panel.
- CANCELLER - - ERROR -	Software error of control computer.	Reset appropriate PCBs.
MAL STACKER	Gate in Stacker 1 or 2 defective.	Check gates.

### Operator Control Panel Displays - Malfunctions (cont'd.)

DISPLAY	EXPLANATION	ACTION
MAL FC INVERTER	Twisting gate in Inverter stuck or defective.	Check gate.
MAL FC IND-DETS A	Timeout error of the indicia detector group in Inverter.	Reset indicia (restart).
MAL FC IND-DETS B	Timeout error of the indicia detector group in Enricher.	Reset indicia (restart).

#### 5.14 INTERLOCK STOP

This stop occurs from an open AFCS door or protective cover. If the machine will not start, or stops during mail processing with no other indication, proceed as follows:

1. Check display at Operator Control Panel. The following displays indicate an open door or cover:
  - \*\*\* COVER OPEN \*\*\* - A cover or door is open in the Facer/Canceler section.
  - \*\*\* EMERG CULL \*\*\* - A cover or door is open in the Culler section.
  
2. If the \*\*\* EMERG CULL \*\*\* display is showing, press the NEXT DISPLAY switch. One of the following displays will indicate where in the Culler section the Open Interlock is located.
  - WATERFALL OPEN - The waterfall protective cover is open.
  - INCLINE COVER OPEN - The cover of Unit 4 power distribution box is open.

3. Locate and secure the open door or cover. Be sure that the interlock is firmly engaged.
4. Restart the machine using normal START procedures.

## SECTION 6

### DATA COLLECTION COMPUTER MENU SYSTEM

#### 6.1 INTRODUCTION

This section provides information on the menu system for the Data Collection Computer (DCC). The DCC is not a part of the AFCS; it accepts only certain information from the AFCS and uses these data to generate various operation reports. This section provides an overview of the menu system. Section 7 discusses the operation reports. Section 8, Software Reference Guide, provides information on general software operation, file maintenance utilities, and computer security. For more information on using the DCC, refer to section 8.

#### 6.2 KEYBOARD

The DCC menus step the user through the various DCC activities. The use of the keyboard in all menus is similar. The following keyboard conversions are used:

- Cursor keys: up (↑), down (↓), left (←), right (→).
- Return or enter key (↵-Enter).
- Control (Ctrl) key and some other key simultaneously, such as Ctrl End (^End).

Other keys may be used depending on the particular menu.

Items may be selected by pressing the letter indicated on a menu. Entering information is done by typing the data in the appropriate fields.

#### 6.3 ACTIVITY SELECTION

Two main activities are performed using the DCC. These are data collection and utility. Once an activity is selected, the DCC steps through a series of menus related to that activity. The activities are selected from the DCC startup menu shown in **Figure 6.3-1**.

DCC = STARTUP = MENU	
Data Collection	(D)
Utility	(U)
eXit	(X)

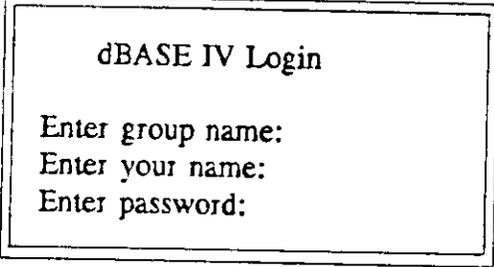
Figure 6.3-1. DCC Startup Menu

To proceed with DCC use, select the activity desired by pressing D for Data Collection or U for Utility.

#### NOTE

Always press X for eXit on the startup menu before turning off power to the DCC.

Selecting either DATA Collection or Utility brings up the login menu shown in Figure 6.3-2.



```
dBASE IV Login
Enter group name:
Enter your name:
Enter password:
```

Figure 6.3-2. DCC dBASE IV Login Menu

To proceed with the activity, properly log in on this menu by entering the group name, your user's name, and the correct password. Press -Enter after each entry. The group name and your name are echoed to the screen, which means that you can see them. The password is not echoed.

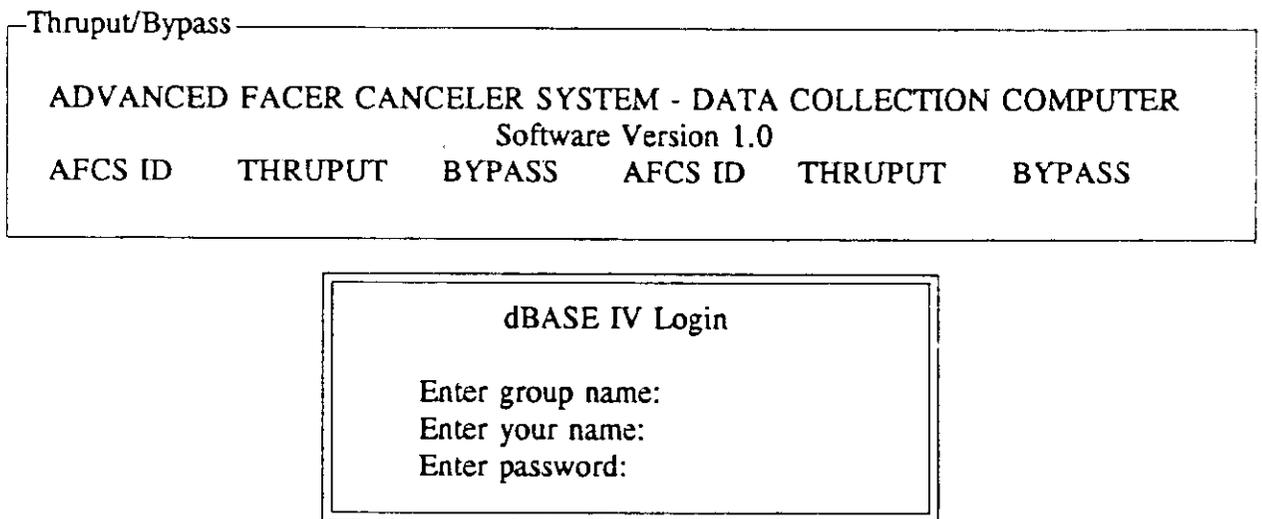
#### 6.4 DATA COLLECTION MENUS

When the user selects D on the DCC startup menu, the DCC proceeds to the screens related to data collection. The data collection screens are in a two-window format.

- The top window displays operation information. This is a real-time display. If the DCC is communicating with the AFCS machines, the information in this window changes as the AFCS processes mail. The real-time display is color coded to call attention to system conditions.
- The normal display for the AFCS ID, THRUPUT, and BYPASS fields is white on blue.
- If an AFCS machine is not communicating with the DCC, its ID number and THRUPUT display in red on white.

- If the throughput is unchanged since the last poll (i.e., mail not being processed), but the machine is communicating, the THRUPUT field displays in red on white.
- If raw data from polling are being processed for an AFCS machine, all three fields display in yellow on blue. In a system with several AFCS machines installed, the yellow moves through the list of machines as polling progresses and data processes.
- The bottom window displays menu selections or messages.

Figure 6.4-1 shows how the login menu is displayed on the first data collection screen after selecting D on the startup menu. To proceed with the data collection activity, log in on the login menu. To return to the startup menu, press the Esc key.



**Figure 6.4-1.**  
**First Data Collection Screen after Startup Selection**

After correct login, the bottom window scrolls up the dBASE IV title and copyright displays shown in Figures 6.4-2 and 6.4-3. The user does not have to press -Enter at the copyright display, but doing so speeds up the change to the next screen.

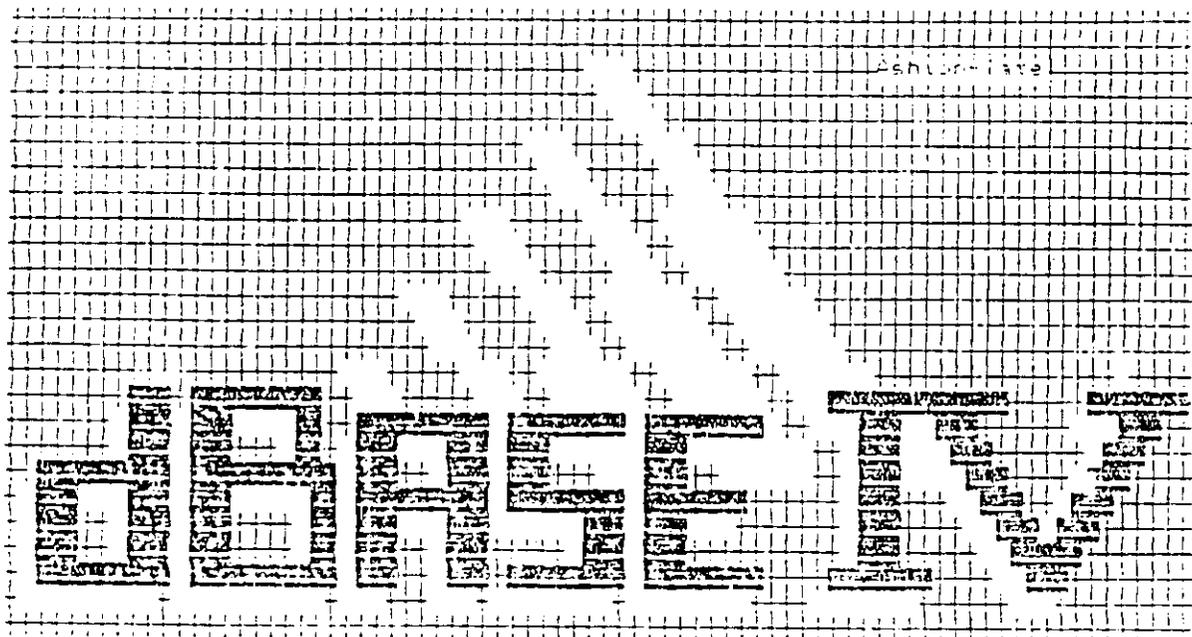


Figure 6.4-2. DCC dBASE IV Title Display

<p>This software is licensed, to:</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>Ashton-Tate  Ashton-Tate  Ashton-Tate  Ashton-Tate  Ashton-Tate  Ashton-Tate</p>
<p>dBASE IV Runtime</p> <p>Copyright (c) Ashton-Tate Corporation 1985, 1986, 1987, 1988.  All Rights Reserved. dBASE, dBASE IV, and Ashton-Tate are  trademarks of Ashton-Tate Corporation.</p>	
<p>Press <b>↵</b> to assent to the License Agreement and begin dBASE IV</p>	

Figure 6.4-3. DCC dBASE IV Copyright Display

### 6.4.1 DCC INITIALIZATION MENU

The first specific data collection menu to appear is the DCC initialization menu shown in Figure 6.4.1-1. The words "DCC initialization" may be misleading. Selections from this menu do not initialize the DCC as a whole, but rather the data collection process.

Thruput/Bypass

ADVANCED FACER CANCELER SYSTEM - DATA COLLECTION COMPUTER					
Software Version 1.0					
AFCS ID	THRUPUT	BYPASS	AFCS ID	THRUPUT	BYPASS

#### DCC INITIALIZATION

REPORTS ONLY (NO POLLING) ?	N (Y or N)
AUTOMATIC HOURLY SUMMARY REPORT ?	Y (Y or N)
START HOUR OF AUTOMATIC SUMMARY REPORT	15 (hour)

Figure 6.4.1-1. DCC Initialization Menu

Selecting reports only (no polling) allows the printing of various reports without new or current polling of the AFCS machines. These reports are printed from data already stored in the computer. Selecting Automatic Hourly Summary Report produces a printed Site Summary Report every hour. If this option is selected, the user must also indicate the hour at which these reports are to start.

#### NOTE

**This menu is available only on startup. If the users wish to change selections, they must return to the DCC startup menu and reselect data collection.**

To use the DCC initialization menu, proceed as follows:

- Use ↑ or ↓ or ←Enter to move to the different selections.
- Enter appropriate response (Y, N, or start hour) at the menu selection.
- After making all the selections, press ^End.

The bottom window displays INITIALIZATION IN PROGRESS. This means the DCC is starting communications with the AFCS machines. The report selection menu is then displayed.

#### 6.4.2 AFCS REPORT SELECTION MENU

The report selection menu shown in Figure 6.4.2-1 is the same for both the report only and Automatic Hourly Report selections. If report only is selected, the top window of this screen contains no data. If the machines are polled, the data in the top window changes as the counters update.

Thruput/Bypass

ADVANCED FACER CANCELER SYSTEM - DATA COLLECTION COMPUTER					
Software Version 1.0					
AFCS ID	THRUPUT	BYPASS	AFCS ID	THRUPUT	BYPASS
1	90	1.11%	5	0	----
2	0	----	6	0	----
3	0	----	7	0	----
4	0	----	8	0	----

#### AFCS REPORT SELECTION MENU

Single Machine Production Report	(P)
Single Machine Malfunction Report	(M)
Brief Single Machine Production Report	(B)
Single Machine Status Log	(L)
Site Summary Report	(S)

UPDATE OF COUNTERS      ENTER SELECTION:

Figure 6.4.2-1. AFCS Report Selection Menu

Press corresponding key (P, M, B, L, or S) for desired report. The screen displays the operator entry menu for the selected report.

If a report is not desired, press function key F5 to return to DCC startup menu.

Several informative messages may appear at the bottom of the report selection menu. These messages appear in red.

- **UPDATE OF COUNTERS** - indicates counters are being written to a dBASE file. This occurs once a minute and upon exit from program.
- **UPDATE OF STATUS LOG** - indicates status log data are being written to a dBASE file. This occurs once an hour, upon selection of Status Log Report, and upon exit from program.
- **BACKUP OF COUNTERS** - Indicates counters are being written to a backup file. This occurs once an hour and upon exit from program.
- **BACKUP OF STATUS LOG** - Indicates status log data are being written to a backup file. This occurs once an hour and upon exit from the program.

After the user makes a selection at the report selection menu, the bottom window displays a menu associated with that selection.

#### **6.4.3 SINGLE MACHINE REPORT MENUS**

The Single Machine Production Report, Single Machine Malfunction Report, and Brief Single Machine Production Report menus are essentially the same. Under their respective titles, the menus all require the following entries:

- **MACHINE ID.** - Enter the I.D. Number of the AFCS machine for which the report is desired.
- **REPORT START DATE** - Enter the date from which the report data are to start in MM/DD/YY format (for example: 04/11/90). Typically, 31 days of history is available for a machine.
- **REPORT END DATE** - Enter the date on which report data are to end in MM/DD/YY format. This may be the same as the start date, if only 1 day of data is required.
- **Number of copies** - Enter the number of report copies desired.

Movement and entry in this menu is the same as described above. When all the entries are finished, press ^End.

#### 6.4.4 SINGLE MACHINE STATUS LOG MENU

The single machine status log menu requires entry of the MACHINE ID and number of copies. Status data are available only for the current and previous day. After completing the entries, press ^End.

#### 6.4.5 SITE SUMMARY REPORT MENU

If the Site Summary Report is selected from the DCC initialization menu (6.4.1), only the current day summary is available. To access the 31-day history of the site, the Site Summary Report must be selected from the report selection menu (6.4.2). This selection brings up the site summary report menu.

1. Enter the report start and end dates in MM/DD/YY format.
2. Enter the number of copies desired.
3. When the entries are completed, press ^End.

The bottom window displays

SITE SUMMARY REPORT IN PROGRESS.....

As the DCC compiles the data, the cursor moves from dot to dot in the message. If the DCC is simultaneously polling up to eight AFCS machines, the report may take up to 10 minutes to be produced. The moving cursor indicates that the system is still running. When the report is complete, the display returns to the report selection menu.

#### 6.4.6 BACKUP MENU

Upon exiting from the data collection activity, the DCC asks if the user wants to backup data files to a floppy disk. This is generally a good idea, since the floppy disk provides current backup data in case of problems. Follow the guidelines for your site on performing such backup.

1. The screen displays BACKUP DATA FILES TO A FORMATTED FLOPPY DISK and Enter Disk Drive (A or B).

#### NOTE

If backup is not desired, hit any key other than A or B. The DCC will return to the startup menu.

2. Press A or B for the disk drive choice.

3. Screen displays INSERT A FORMATTED FLOPPY DISC IN DRIVE A (if you have selected drive A; B if you have selected drive B) and Press Any Key when Ready.
4. Insert a floppy disk in the selected drive and press a key (typically -Enter).
5. Screen displays the message BACKUP OF DATA TO FLOPPY.
6. When finished, remove the floppy disk and store appropriately.

If the user presses a key without inserting a floppy disk when prompted, the DCC overwrites the window with the following message (drive designator may be B):

Drive not ready on A:

Cancel Retry Ignore

If the user desires the backup to continue, insert a floppy disk and press R for Retry. If the user does not want the backup, press C for Cancel. The DCC exits the Data Collection Program.

## 6.5 UTILITY MENUS

When the user selects U on the DCC startup menu, the DCC proceeds to the screens related to utility. Since there is no real-time display from polling, the utility displays occupy the full screen.

Login is the same as for the data collection activity. After the dBASE IV title and copyright displays, the DCC displays a selection menu for the available utilities.

Cursor movement and editing in the utility screens is facilitated by several keys or combinations of keys. These keys are activated by the Browse/Edit function of the dBASE IV program.

- F4 - Next. Move to next field (opens a memo field).
- F3 - Previous. Move to previous field (opens a memo field).
- F9 - Zoom. Enlarge/shrink memo fields to/from full-screen display.
- Shift -F8 - Ditto. Copy data from corresponding field of previous record into current field.

- ↑ - Move up one row (Browse) or move to previous field (Edit).
- ↓ - Move down one row (Browse) or move to next field (Edit).
- Page Up - Display previous screen.
- Page Down - Display next screen.
- Home - Move to first field of current record (Browse) or move to beginning of current field (Edit).
- End - Move to last field of current record (Browse) or move to end of current field (Edit).
- Tab - Move to next field.
- Shift-Tab - Move to previous field.
- ↵ - Enter - Move to next field.
- Esc - Leave Browse/Edit screens without saving changes to current record or move out of memo field without saving changes to text.
- ^→ - Move to beginning of next word.
- ^← - Move to beginning of previous word.
- ^Page Up - Move to same field in first record.
- ^Page Down - Move to same field in last record.
- ^Home - Move into a memo field.
- ^End - Save changes and leave Browse/Edit screens or save changes and move out of memo field.
- ^T - Delete from cursor position to beginning of next word.
- ^Y - Delete from cursor position to end of current field.

### 6.5.1 AFCS UTILITY SELECTION MENU

Figure 6.5.1-1 shows the utility selection menu. Editing is allowed only in the two Update selections. Updating the software security is protected by the master password. There is only one valid master password. Updating the site information is protected by an assigned password. This password encompasses both a data group and a level of security. The assigned password is entered at login. The DCC requests the master password if software security update is selected.

AFCS UTILITY SELECTION MENU			
Update	Site Information	(Site)	(S)
View	Data File	(Counters)	(C)
View	Status Log File	(Statlog)	(L)
Backup	Data to Floppy	(Daily)	(B)
Restore	Backup Data	(Hour)	(H)
Restore	From Floppy	(Daily)	(D)
View	Code Assignment		(A)
Print	Code Assignment	(Report)	(R)
Update	Software Security	(Password)	(P)
Exit			(X)

ENTER SELECTION:

Figure 6.5.1-1. AFCS Utility Selection Menu

Press the corresponding key (S, C, L, B, H, D, A, R, or P) for the utility desired. Pressing X exits from the utility activity and returns the user to the startup menu.

## 6.5.2 SITE INFORMATION DISPLAY

Figure 6.5.2-1 shows a sample site information display. This sample shows the maximum of 16 AFCS machines at a site, with machines 1 through 8 connected to the first DCC.

MACHINE_NO	MACHINE_ID	SERIAL_NO	CONNECTED	SITENAME
1	1	001	T	ElectroCom Automation
2	2	002	T	ElectroCom Automation
3	3	003	T	ElectroCom Automation
4	4	004	T	ElectroCom Automation
5	5	005	T	ElectroCom Automation
6	6	006	T	ElectroCom Automation
7	7	007	T	ElectroCom Automation
8	8	008	T	ElectroCom Automation
9	9	009	F	
10	10	010	F	
11	11	011	F	
12	12	012	F	
13	13	013	F	
14	14	014	F	
15	15	015	F	
16	16	016	F	

Browse ||D:\dcc\database\BSITE

|| Rec 1/16

|| File ||

||

View and edit fields

**Figure 6.5.2-1. Sample Site Information Display**

The data may be viewed or changed by using the keys or key combinations described under 6.5. The machine ID may be up to five alphanumeric characters. The SITENAME entry is the site name that appears on the operations reports.

When finished viewing or editing the site information, press Esc to exit without saving any changes. Press ^End to save the changes to the site information file. Either form of exit returns the user to the utility selection menu.

### 6.5.3 COUNTERS DISPLAY

A sample counters screen is shown in the figure below. Only part of the counters display can occupy the screen at one time as there are 97 columns of counter data (see 6.5.7). This is a Browse Only display. Pressing Esc returns the user to the utility selection menu.

MACHINE_ID	RUNDATE	BEG_TIME	END-TIME	PA7	DT0
1	03/02/90	66311	67800	11867	
2	03/02/90	66311	67860	12504	
3	03/02/90	66311	67920	13077	
4	03/02/90	66311	67980	13635	
5	03/02/90	66311	68040	14207	
6	03/02/90	66311	68100	14345	
7	03/02/90	66311	68160	14345	
8	03/02/90	66311	68220	14345	
1	03/03/90	66311	68280	14647	
2	03/03/90	66311	68340	15214	
3	03/03/90	66311	68400	15789	
4	03/03/90	66311	68460	15789	
5	03/03/90	66311	68520	15789	
6	03/03/90	66311	68580	15789	
7	03/03/90	66311	68640	15789	
1	03/04/90	66311	68760	15789	
2	03/04/90	66311	68820	15789	
3	03/04/90	66311	68880	15789	

Browse || D:\...database\COUNTERS || Rec 1/224 || File ||  
 View and edit fields || ||

Figure 6.5.3-1. Sample Counters Display

#### 6.5.4 STATUS LOG DISPLAY

Figure 6.5.4-1 is a sample status log display. This display shows the status of events by machine, with beginning and end times. (See 6.5.7 for counter code explanations.)

MACHINE_ID	COUNTCODE	EVENT	DATE	HOUR	MINUTE	SECOND
1	MCA	BEG	04/11/90	15	18	
1	MCA	END	04/11/90	15	21	
1	DTO	BEG	04/11/90	21	5	
1	DTO	BEG	04/12/90	10	28	
1	DTO	END	04/12/90	10	33	
1	DTO	BEG	04/12/90	10	33	
1	DTO	END	04/12/90	10	33	
1	MSG	BEG	04/12/90	14	44	
1	MSG	END	04/12/90	14	45	

Browse || D:\dcc\database\STATLOG || Rec 1/9 || File ||  
View and edit fields

Figure 6.5.4-1. Sample Status Log Display

#### 6.5.5 BACKUP PROCEDURE

Backup of the data files on hard disk must be done at least once daily. After selecting B from the utility selection menu:

1. The screen displays BACKUP DATA FILES TO A FORMATTED FLOPPY DISK and Enter Disk Drive (A or B).

#### NOTE

If backup is not desired, press any key other than A or B. The DCC returns to the utility selection menu.

2. Press A or B for the disk drive choice.
3. Screen displays INSERT A FORMATTED FLOPPY DISC IN DRIVE A (or B, depending on your drive selection) and Press Any Key when Ready.
4. Insert a floppy disk in the selected drive and press a key (typically ←-Enter).
5. Screen displays the message BACKUP OF DATA TO FLOPPY.
6. When finished, remove the floppy disk and store appropriately.

If the user presses a key without inserting a floppy disk when prompted, the DCC overwrites the window with the following message (drive designator may be B):

Drive not ready on A:
Cancel Retry Ignore

If you desire the backup to continue, insert a floppy disk and press R for Retry. If you do not want the backup, press C for Cancel. The DCC returns to the utility selection menu.

### 6.5.6 RESTORE PROCEDURE

Restoring counter or status log files from the hard drive or backup floppy disks is discussed in section 8. Select either H or D from the utility selection menu, as appropriate, and follow the instructions on subsequent menus.

### 6.5.7 CODE ASSIGNMENT DISPLAY

Figure 6.5.7-1 shows a counter code assignment screen. Only part of the code assignment display can occupy the screen at one time because there are 97 rows of code data. This is a Browse Only display. Opening a memo field under LONGDESCR allows the long description of that code to be displayed. The code list may also be printed out on the DCC printer by selecting R at the utility selection menu.

The codes form the column heads for the counter data in the counters display (see 6.5.3). The meaning of the codes is shown in the table on page 6-16.

CODENUM	COUNTCODE	CODEDESCR	LONGDESCR
1	PA7	PCS ACCEPT BY 7 PM	MEMO
2	DTO	DCC COMM TIMEOUT	MEMO
3	TPO	OP TIME	MEMO
4	TRN	FED TIME	MEMO
5	TMN	MAINT TIME	MEMO
6	PFD	PCS FED	MEMO
7	NOM	NON MACH	MEMO
8	SA1	PCS STACKER A1	MEMO
9	SA2	PCS STACKER A2	MEMO
10	SB1	PCS STACKER B1	MEMO
11	SB2	PCS STACKER B2	MEMO
12	SC1	PCS STACKER C1	MEMO
13	SC2	PCS STACKER C2	MEMO
14	SRJ	PCS STACKER REJ	MEMO
15	CTA	CAT A	MEMO
16	CTB	CAT B	MEMO
17	CTC	CAT C	MEMO
18	RJI	REJ IND	MEMO

Browse || D:\...database\CODELOOK

|| Rec 1/97

|| File ||

View and edit fields

Figure 6.5.7-1. Code Assignment Screen (Partial Display)

### Explanation of Counter Codes

NO	CODE	DESCRIPTION	MEANING
1	PA7	PCS ACCEPT BY 7PM	Mailpiece counter containing the number of mailpieces accepted by 7 p.m. Mailpieces accepted equals mailpieces fed (PFD) minus rejected mailpieces (SRJ).
2	DTO	DCC COMM TIMEOUT	Occurrence counter indicating a timeout of a transmission from the given AFCS. This counter is incremented only after two retries.
3	TPO	OP TIME	The elapsed time since the AFCS machine was powered up.
4	TRN	FED TIME	The elapsed time the AFCS was processing mail. The AFCS ASCII time in hours, minutes, and seconds is converted to seconds by the DCC.
5	TMN	MAINT TIME	Time the AFCS was not processing mail due to maintenance. This elapsed time counter is incremented during jams, malfunctions, and maintenance test (Operator Control Panel TEST SELECT switches set to a number other than 00). The AFCS ASCII time in hours, minutes, and seconds is converted to seconds by the DCC.
6	PFD	PCS FED	Mailpiece counter containing the number of mailpieces fed. This counter is incremented after mailpiece passes the Fine Cull unit.
7	NOM	NON MACH	Mailpiece counter containing the number of nonmachinable mailpieces separated by the Fine Cull unit.
8	SA1	PCS STACKER A1	Mailpiece counter containing the number of mailpieces sent to bin 1 of Stacker 1.

Explanation of Counter Codes (cont'd.)

NO	CODE	DESCRIPTION	MEANING
9	SA2	PCS STACKER A2	Mailpiece counter containing the number of mailpieces sent to bin 2 of Stacker 1.
10	SB1	PCS STACKER B1	Mailpiece counter containing the number of mailpieces sent to bin 3 of Stacker 1.
11	SB2	PCS STACKER B2	Mailpiece counter containing the number of mailpieces sent to bin 1 of Stacker 2.
12	SC1	PCS STACKER C1	Mailpiece counter containing the number of mailpieces sent to bin 2 of Stacker 2.
13	SC2	PCS STACKER C2	Mailpiece counter containing the number of mailpieces sent to bin 3 of Stacker 2.
14	SRJ	PCS STACKER REJ	Mailpiece counter containing the number of mailpieces sent to bin 4 of Stacker 2 (reject bin).
15	CTA	CAT A	Mailpiece counter containing the number of mailpieces sent to the CAT A indicia stacker bins.
16	CTB	CAT B	Mailpiece counter containing the number of mailpieces sent to the CAT B indicia stacker bins.
17	CTC	CAT C	Mailpiece counter containing the number of mailpieces sent to the CAT C indicia stacker bin.
18	RJI	REJ IND	Mailpiece counter containing the number of mailpieces rejected by indicia detection function.

Explanation of Counter Codes (cont'd.)

NO	CODE	DESCRIPTION	MEANING
19	RJM	REJ MECH	Mailpiece counter containing the number of mailpieces rejected due to mechanical reasons.
20	PCN	MAIL CANC	Mailpiece counter containing the number of mailpieces that were canceled. This includes stamped, metered, and FIM mail.
21	RLS	TRAIL STAMP	Mailpiece counter containing the number of mailpieces for which a stamp was detected on the trailing edge. This includes FIM mail with a stamp.
22	RLM	TRAIL METER	Mailpiece counter containing the number of mailpieces for which a meter mark was detected on the trailing edge.
23	RLF	TRAIL FIM	Mailpiece counter containing the number of mailpieces for which a FIM code was detected on the trailing edge. This includes FIM mail with a stamp.
24	TSS	LEAD STAMP	Mailpiece counter containing the number of mailpieces for which a stamp is detected on the leading edge. This includes FIM mail with a stamp.
25	TSM	LEAD METER	Mailpiece counter containing the number of mailpieces for which a meter mark is detected on the leading edge.
26	TSF	LEAD FIM	Mailpiece counter containing the number of mailpieces for which a FIM code is detected on the leading edge. This includes FIM mail with a stamp.
27	FMA	FIM A	Mailpiece counter containing the number of mailpieces for which a FIM A code is detected.

Explanation of Counter Codes (cont'd.)

NO	CODE	DESCRIPTION	MEANING
28	FMB	FIM B	Mailpiece counter containing the number of mailpieces for which a FIM B code is detected.
29	FMC	FIM C	Mailpiece counter containing the number of mailpieces for which a FIM C code is detected.
30	MD	FIM D	Mailpiece counter containing the number of mailpieces for which a FIM D code is detected.
31	PMI	PCS MULT INDICIA	Mailpiece counter containing the number of mailpieces for which multiple indicia are detected (e.g., FIM detection on both sides or FIM detection on one side and stamp detection on the other side).
32	POV	PCS OVERLENGTH	Mailpiece counter containing the number of mailpieces where overlength is detected (e.g., overlapping documents).
33	JCI	JAM CULLER INPUT	Jam occurrence counter for Inclined Conveyor.
34	JCO	JAM CULLER OUTPUT	Jam occurrence counter for Edging Channel.
35	JSS	JAM SING/SHINGLER	Jam occurrence counter for Shingler.
36	JSG	JAM SINGULATOR	Jam occurrence counter for Singulator, microswitch S2.
37	JSM	JAM SINGU MEAS. LB	Jam occurrence counter for Singulator, measuring light barrier.

Explanation of Counter Codes (cont'd.)

NO	CODE	DESCRIPTION	MEANING
38	JFD	JAM FEEDER	Jam occurrence counter for Buffer/Feeder, measuring lightbarrier or shaft encoder light barrier.
39	JSC	JAM STACK CARRIAGE	Jam occurrence counter for Buffer/Feeder, sensor light barrier.
40	JSP	JAM FCUL	Jam occurrence counter for Fine Cull.
41	J12	JAM IND DET 1 <Q1>	Jam occurrence counter for Inverter, first light barrier.
42	J14	JAM IND DET 1 <Q2>	Jam occurrence counter for Inverter, indicia detector 1, second light barrier.
43	J16	JAM IND DET 1 <Q3>	Jam occurrence counter for Inverter, indicia detector 1, third light barrier.
44	J12	JAM INVERTER <Q1/Q2>	Jam occurrence counter for Inverter, twisting module, first light barrier pair.
45	J14	JAM INVERTER <Q3>	Jam occurrence counter for Inverter, twisting module, first single light barrier.
46	J16	JAM INVERTER <Q4>	Jam occurrence counter for Inverter, twisting module, second single light barrier.
47	J18	JAM INVERTER <Q5/Q6>	Jam occurrence counter for Inverter, twisting module, second light barrier pair.
48	J22	JAM IND DET 2 <Q1>	Jam occurrence counter for Inverter, indicia detector 2, first light barrier.
49	J24	JAM IND DET 2 <Q2>	Jam occurrence counter for Inverter, indicia detector 2, second light barrier.
50	J26	JAM IND DET 2 <Q3>	Jam occurrence counter for Inverter, indicia detector 2, third light barrier.

Explanation of Counter Codes (cont'd.)

NO	CODE	DESCRIPTION	MEANING
51	JE2	JAM ENRICHER < Q1 >	Jam occurrence counter for Enricher, first light barrier.
52	JE4	JAM ENRICHER < Q2 >	Jam occurrence counter for Enricher, second light barrier.
53	JE6	JAM ENRICHER < Q3 >	Jam occurrence counter for Enricher, third light barrier.
54	JC2	JAM ENRICHER < Q4 >	Jam occurrence counter for Enricher, fourth light barrier.
55	JC4	JAM CANCELER < Q1 >	Jam occurrence counter for Canceler, first light barrier.
56	JC6	JAM CANCELER < Q2 >	Jam occurrence counter for Canceler, second light barrier.
57	JC8	JAM CANCELER < Q3 >	Jam occurrence counter for Canceler, third light barrier.
58	JC1	JAM STACKER < Q1 >	Jam occurrence counter for Stacker 1, entrance light barrier.
59	JS1	JAM STACKER 1....3	Jam occurrence counter for Stacker 1, bin 1, 2, or 3.
60	JSS	JAM STACKER 4....7	Jam occurrence counter for Stacker 2, bin 1, 2, 3, or 4. These bins are considered 4, 5, 6, and 7 in the overall Stacker bin numbering scheme.
61	MWF	WATERFALL OPEN	Occurrence counter containing the number of times the waterfall protective cover was open.

Explanation of Counter Codes (cont'd.)

NO	CODE	DESCRIPTION	MEANING
62	MMS	MACH STOPS	Occurrence counter containing the number of machine stops due to jams, malfunctions, emergency stops, etc.
63	MC2	MAL CULLER 24V	Malfunction occurrence counter containing the number of 24-volt power supply failures in the Flats Culler.
64	MCF	MAL CULLER FUSE	Malfunction occurrence counter containing the number of fuse failures in the Flats Culler.
65	MCC	MAL CUL CKT-BREAKER	Malfunction occurrence counter containing the number of motor circuit breaker failures in the Flats Culler.
66	MCW	MAL CUL WATCHDOG	Malfunction occurrence counter containing the number of processor errors in the Flats Culler.
67	MC5	MAL CULLER 5V	Malfunction occurrence counter containing the number of 5-volt power supply failures in the Flats Culler.
68	MCT	MAL CULLER TECH	Malfunction occurrence counter containing the number of illegal state reports from the Flats Culler.
69	MS5	MAL SINGULATOR 5V	Malfunction occurrence counter containing the number of 5-volt power supply failures in the Singulator.
70	MSG	MAL SINGULATOR TECH	Malfunction occurrence counter containing the number of illegal state reports from the Singulator.

Explanation of Counter Codes (cont'd.)

NO	CODE	DESCRIPTION	MEANING
71	MSW	MAL SING WATCHDOG	Malfunction occurrence counter containing the number of control failures in the Singulator.
72	MS2	MAL SINGULATOR 24V	Malfunction occurrence counter containing the number of 24-volt power supply failures in the Singulator.
73	MSF	MAL SINGULATOR FUSE	Malfunction occurrence counter containing the number of fuse failures in the Singulator.
74	MST	MAL SING TRANS-CLOCK	Malfunction occurrence counter containing the number of transport clock generator failures in the Singulator.
75	MFS	MAL FEEDER SIGNALS	Malfunction occurrence counter containing the number of Buffer/Feeder status message signal failures.
76	MFT	MAL FEEDER TECH	Malfunction occurrence counter containing the number of technical malfunctions in the Buffer/Feeder.
77	MFD	FEEDER FULL	Malfunction occurrence counter containing the number of feeder full occurrences in the Buffer/Feeder.
78	MCA	MAL FC CANCELER	Malfunction occurrence counter containing the number of not ready failures in the Canceler.
79	M42	MAL FC 42V	Malfunction occurrence counter containing the number of 42-volt power supply failures in the Canceler.

Explanation of Counter Codes (cont'd.)

NO	CODE	DESCRIPTION	MEANING
80	MPF	MAL FC POWER FAIL	Malfunction occurrence counter containing the number of voltage failures in the Canceler.
81	MTC	MAL FC TRANS-CLOCK	Malfunction occurrence counter containing the number of transport clock generator failures in the Canceler.
82	MCB	MAL FC CKT-BREAKER	Malfunction occurrence counter containing the number of motor circuit breaker failures in the Canceler.
83	MI1	MAL DC IND DET 1	Malfunction occurrence counter containing the number of Inverter trailing indicia detector lamp failures.
84	MI2	MAL FC IND DET 2	Malfunction occurrence counter containing the number of Inverter leading indicia detector lamp failures.
85	MI3	MAL FC IND DET 3	Malfunction occurrence counter containing the number of Enricher trailing indicia detector lamp failures.
86	MI4	MAL FC IND DET 4	Malfunction occurrence counter containing the number of Enricher leading indicia detector lamp failures.
87	MNA	INDICIA NEED CALIB	Malfunction occurrence counter containing the number of times indicia detector calibration was lost.
88	MLE	MAL FC LAMP ENR	Malfunction occurrence counter containing the number of Enricher lamp failures.

Explanation of Counter Codes (cont'd.)

NO	CODE	DESCRIPTION	MEANING
89	MEN	MAL EN TRACKING	Malfunction occurrence counter containing the number of times Enricher dialogue had too many errors, or signals EN_FEHL and EN_INFO were active after ENRICHES_RESET.
90	MFM	MAL FAM TRACKING	Malfunction occurrence counter containing the number of times mail tracking was lost.
91	MFL	STACKER FULL	Occurrence counter containing number of stops due to full Stacker bins.
92	MCL	COUNTERS CLEAR	Occurrence counter containing number of times counters were clear. Note: Only counter cleared on power-up.
93	ECL	EMERG CULLER	Emergency stop counter for Flats Culler. This includes stops due to interlock failure.
94	ESS	EMERG SING/ SHINGLER	Emergency stop counter for This includes stops due to interlock failure.
95	ESG	EMERG SINGULATOR	Emergency stop counter for Singulator. This includes stops due to interlock failure.
96	EFD	EMERG FEEDER	Emergency stop counter for Buffer/ Feeder. This includes stops due to interlock failure.
97	EFC	EMERG FC	Emergency stop counter for Canceler. This includes stops due to interlock failure.

### 6.5.8 SOFTWARE SECURITY MENUS

Pressing P at the utility selection menu initiates the dBASE IV Protect function. The DCC immediately asks for the master password. (This master password is assigned when the system is first initialized at the site. See section 8.)

Once the master password is entered properly, the DCC presents the User's menu shown in Figure 6.5.8-1. This and subsequent software security menus have the selections Users, Files, Reports, and Exit at the top. The various menus are accessed through these selections by using ← or →.

Users	Files	Reports	Exit
Login name			
Password			
Group Name			
Full Name			
Access Level			1
Store user profile			
Delete user from group			

Figure 6.5.8-1. Software Security Users Menu

Use the Users menu to add, change, or delete user profiles and to establish or change user access levels. For example, to add a new user, Joe Smith, the following steps would be taken:

#### NOTE

To select a menu option, move the highlight with ← or → and press ↵Enter, or press the key corresponding to the first letter of the menu choice.

1. When the Users menu appears, enter your login name, password, and group name, pressing ↵Enter after each entry.
2. The display then shows not only what the user entered, but also his full name and access level. At this point, changes can be made to any of the data fields.

3. Select the various data fields to be changed and enter the data for Joe Smith. For example, Joe's login name is Joe; his password is pocket; and his group name is Operations. Assume his access is limited to viewing files (say, level 6). After all the data are entered, the Users menu looks like Figure 6.5.8-2.

Users	Files	Reports	Exit
Login name			JOE
Password			pocket
Group name			OPERATIONS
Full name			Joe Smith
Access level			6
Store user profile			
Delete user from group			

Figure 6.5.8-2. Sample Users Menu Entry

4. Once the entries are completed, the highlight is on Store file privileges. Press ←Enter to store the new profile.

The initial Files menu looks like Figure 6.5.8-3. The highlight is on New file. Pressing ←Enter displays an accompanying file list as shown in Figure 6.5.8-4.

Users	Files	Reports	Exit
	New file		
	Group name		
	File access privileges		
	Field access privileges		
	Access level		1
	Establish field privileges		
	Store file privileges		
	Cancel current entry		

Figure 6.5.8-3. Software Security Files Menu

Users Files Reports Exit

New File
Group name
File access privileges
Field access privileges Access level                   1 Establish field privileges
Store file privileges
Cancel current entry

..\DATABASE
< D: >
< parent > BCOUNTER.DBF BSITE.DBF BSTATLOG.DBF CODELOOK.DBF COUNTERS.DBF SITE.DBF STATLOG.DBF STATREPT.DBF

Figure 6.5.8-4 Sample List of Files

**CAUTION**

**The only file that must be restricted is the BSITE.DBF file. Restricting any other files in the AFCS application may render the DCC system unusable for its stated purposes.**

A file privilege level scheme for the BSITE.DBF file is established by moving the highlight to BSITE.DBF and pressing ←Enter. BSITE.DBF appears in the New file option. Selecting File access privileges produces the display shown in Figure 6.5.8-5. The access levels go from 1 for most restrictive to 8 for least restrictive. The default value is 8, as shown in the figure. When assigning access levels, ensure that the most critical activities, such as extending privileges and updating files, are the most restricted. For example, updating files could be restricted to only those personnel with an access level of 1 in the Maintenance group. Follow the standard procedure for your particular site when assigning file privileges.

Users Files Reports

Exit

New file	BSITE.DBF	File access levels
Group name	MAINT	
File access privileges		
Field access privileges		
Access level	1	Read privilege 8
Establish field privileges		Update privilege 8
Store file privileges		Extend privilege 8
Cancel current entry		Delete privilege 8

Figure 6.5.8-5. Sample File Privileges Display

Since the security information is maintained in an encrypted file, keep a hard copy of the user information in a secure area. To print a report showing User name, Password, Group, Full name, and Level, select the Reports menu. The display shown in Figure 6.5.8-6 appears. Selecting the User Information option displays the prompt Send report to the printer? (Y/N). Press Y to obtain a hard copy printout. If the user presses N, the output is displayed on the screen. This is useful for checking any new user information entered.

Users Files Reports Exit

User Information
File Information

Figure 6.5.8-6. Software Security Reports Menu

Selecting the Exit menu gives the user three options, Save, Abandon, and Exit. You can save all new and updated user profiles and updated file privilege schemes worked during the session or abandon them without saving. (Profiles and schemes can be saved several times in a session, from the Users or Files menu.) Choosing the Exit option ends the current session. New and updated user profiles and updated file privilege schemes are encrypted and saved if they have not already been.

## SECTION 7

### OPERATIONS REPORTS

#### 7.1 INTRODUCTION

Three separate production reports are available to Operations personnel for use in determining and tracking machine performance. These reports are available through the DCC and print out in hard copy on the DCC printer.

#### 7.2 AFCS BRIEF SINGLE MACHINE PRODUCTION REPORT

The AFCS Brief Single Machine Production Report (Figure 7.2-1) provides an overview of the time that a single machine was powered on, the time that machine was idle, and the time that the machine was not processing mail due to maintenance. The report can be generated for a specific date or as a roll-up report spanning two dates entered on the menu screen. Production totals in the report show pieces fed, pieces rejected, pieces accepted, and pieces canceled. Throughput is shown per run hour and per operational hour. The section of the report labeled STACKER TOTALS lists the stackers as A1, A2, B1, B2, C1, C2, and REJ and shows the total number of pieces directed to each stacker bin.

SITE DATA

SITE NAME:	FORT WORTH, TEXAS 76110	MACHINE #:	3
DATE:	6/JUN/89-6/JUN/89	TIME:	5:43

TIME COUNTS

START TIME:	2:02	END TIME:	5:43	OPERATIONAL TIME:	3:41
RUN TIME:	2:50	MAINT TIME:	0:43	IDLE TIME:	0:08

PRODUCTION TOTALS

PCS FED :	102307	PCS REJECTED :	8766	
PCS ACCEPTED :	93726	PCS CANCELED:	582	
THRGH/RUN HR:	33142	THRGH/OPR HR:	25508	
STACKER TOTALS	A1 :	14375	C1 :	17465
	A2 :	13274	C2 :	16185
	B1 :	9276	REJ:	8184
	B2 :	15364		

Figure 7.2-1. Sample AFCS Brief Single Machine Production Report

### 7.3 AFCS SINGLE MACHINE PRODUCTION REPORT

The AFCS Single Machine Production Report (Figure 7.3-1) provides the same information as the AFCS Brief Single Machine Production Report, with amplified production and maintenance information. A report can be generated for a specified date or as a roll-up report spanning two dates. Production totals are provided for pieces input, fed, accepted, canceled, and rejected (with the reason for the rejection), and the accept rate. The report also shows pieces of nonmachinable mail, throughput per run hour and per operational hour, accept per run hour, bypass rate, and percentage of overlength mail and mail with multiple indicia. Stacker totals are the same as for the brief report, with a further breakdown to show stamp, meter, and FIM detection by lead, trail, and total pieces.

The maintenance section of the report shows number of jams by machine area. The final section of the report indicates the number of times during the reporting period that emergency stop switches were activated, by machine area, and the number of times the machine was stopped due to full feeder or stackers or open waterfall cover.

### SITE DATA

SITE NAME: FORT WORTH, TEXAS 76110 DATE: 6/JUN/89-6/JUN/89	MACHINE #: 3 TIME: 5:43
---	----------------------------

START TIME: 2:02	END TIME: 5:43	OPERATIONAL TIME: 3:41	
RUN TIME: 2:50	MAINT TIME: 00:43	IDLE TIME:	00:08

### PRODUCTION TOTALS

PCS INPUT	:	102356	NON MACH	:	49
PCS FED	:	102307	THRGH/RUN HR	:	33142
PCS ACCEPTED	:	94126	THRGH/OPR HR	:	25508
PCS CANCELED	:	28943	ACCEPT/RUN HR	:	7864
PCS REJECTED	:	8184	BYPASS RATE	:	7.99%
REJ INDICIA	:	2822	% MULTI INDICIA	:	00.62%
REJ MECH	:	5362	% OVERLENGTH	:	02.03%
% ACCEPT BY 7PM	:	73.48%			
STACKER TOTALS		A1 :	14375	C1 :	17465
		A2 :	13274	C2 :	16185
		B1 :	9276	REJ :	8184
		B2 :	15364		
		STAMP	METER	FIM	
TRAIL:		15687	14989	23256	
LEAD :		13256	11021	17250	
TAL :		28943	26010	40506	
FIM A:	5814	B:	1219	C:	7912
CAT A:	7918	B:	2537	C:	2512
				D:	8311

Figure 7.3-1. Sample AFCS Single Machine Production Report (Sheet 1 of 2)

## MAINTENANCE REPORT

JAMS	Q1	Q2	Q3	Q4	Q5
IND DET 1	2	2	2		
IND DET 2	0	0	0		
ENRICHER	1	1	3		
INVERTER	4		0	1	1
CANCELER	0	3	0		
JAM STACKER 1..4 :	0		JAM STACKER 5..8 :	2	
JAM CULLER INPUT :	2		JAM CULLER OUTPUT :	0	
JAM SING/SHINGLER :	0		JAM SINGULATOR :	1	
JAM SING MEAS. LB :	0		JAM FEEDER :	4	
JAM STACK CARRIAGE:	4		JAM SEPARATOR :	0	

## EMERGENCY REPORT

EMERG CULLER :	0	EMERG SING/SHINGLER :	0
EMERG SINGULATOR :	0	EMERG FEEDER :	3
EMERG FC :	1	WATERFALL OPEN :	2
STACKER FULL :	9	FEEDER FULL :	2

**Figure 7.3-1. Sample AFCS Single Machine Production Report  
(Sheet 2 of 2)**

### 7.4 SITE SUMMARY REPORT

The Site Summary Report (Figure 7.4-1) is generated for a specific date or for a time period spanning two dates as a roll-up report. Up to eight machines can be included in the report, and the time span can cover up to 31 days. This report can reveal any large differences in performance among machines. Contents of the report are correlated from data available on the AFCS Single Machine Production Report.

SITE NAME: FORT WORTH, TEXAS 76110		DATE: 6-5-89/7-2-89		TIME 11:50	
MACHINE NO:	1	2	3	4	
TOTAL TIME:	239:50	260:32	269:32	253:15	
RUN TIME:	218:11	241:41	248:31	238:06	
% OFF TIME:	9.03	7.20	7.800	6.09	
PCS FED:	16896834	17009821	18928394	18384754	
PCS FED/R TIME:	77437	70361	76155	77198	
PCS ACCEPTED:	6927834	5567890	7982343	5746345	
PCS ACP/R TIME:	31749	23031	32115	24124	
BYPASS:	908321	1009293	809234	1009234	
% BYPASS:	8.89	10.32	8.04	10.30	
% OVERLENGTH:	2.39	1.03	0.80	2.45	
% MULTI INDICIA:	5.92	11.36	10.23	9.80	
% ACP BY 7 PM:	79.01	65.00	80.90	83.10	
TRAIL:	7982934	6983745	7091823	7423123	
LEAD:	6847362	6273564	7019283	6987485	
FIM A:	85746	98273	82736	98273	
FIM B:	67890	95890	67890	123890	
FIM C:	85746	98273	82736	98283	
FIM D:	67890	85890	77390	123990	
CAT A:	49283	39283	49384	62832	
CAT B:	50498	29384	64736	59867	
CAT C:	69586	69829	59687	73645	
PCS STACKER A1:	2367890	1432534	1398475	1092938	
PCS STACKER A2:	1928374	4123918	990827	2635019	
PCS STACKER B1:	3092893	2187485	2491823	3123958	
PCS STACKER B2:	3019287	4567890	3312845	3570012	
PCS STACKER C1:	991911	2937890	4128722	3571621	
PCS STACKER C2:	4982933	999299	3102934	1928374	
JAMS CULLER:	9	12	18	13	
JAMS SING:	9	8	8	5	
JAMS SEPARATOR:	20	12	9	15	
JAMS IND DET 1:	143	72	99	91	
JAMS INVERTER:	101	84	79	93	
JAMS IND DET 2:	102	82	87	89	
JAMS ENRICHER:	19	20	21	20	
JAMS CANCELER:	74	76	64	99	
JAMS STACKER:	9	12	18	13	
MACH STOPS:	21	20	30	25	
MAL CULLER:	19	14	23	19	
MAL SINGULATOR:	9	8	8	5	
MAL FEEDER:	5	8	17	9	
MAL FC:	20	12	9	15	
MAL INDICIA:	22	21	21	20	
MAL ENRICHER:	9	8	11	9	
MAL TRACKING:	2	1	0	3	
COUNTERS CLEAR:	21	15	9	11	
EMERG:	9	12	18	13	

Figure 7.4-1. Sample Site Summary Report (Sheet 1 of 2)

SITE NAME: FORT WORTH, TEXAS 76110		DATE: 6-5-89/7-2-89		TIME 11:50	
MACHINE NO:	13	14	15	16	Totals
TOTAL TIME:	239:50	260:32	269:32	253:15	12532:14
RUN TIME:	218:11	241:41	248:31	238:06	1292:58
% OFF TIME:	9.03	7.20	7.80	6.09	7.93
PCS FED:	16896834	17009321	18928394	18384754	142439606
PCS FED/R TIME:	77437	70361	76155	77193	602302
PCS ACCEPTED:	6927834	5567890	7982343	5746345	52448824
PCS ACP/R TIME:	31749	23031	32115	24124	222038
BYPASS:	908321	1009293	809234	1009234	7472164
% BYPASS:	8.89	10.32	8.04	10.30	9.39
% OVERLENGTH:	2.39	1.03	0.80	2.45	2.22
% MULTI INDICIA:	5.92	11.36	10.23	9.80	7.08
% ACP BY 7 PM:	79.01	65.00	80.90	83.10	77.00
TRAIL:	7982934	6983745	7091823	7423123	58963250
LEAD:	6847362	6273564	7019233	6987485	54255388
FIM A:	84746	98273	82736	98273	730056
FIM B:	67890	95890	67890	123890	711120
FIM C:	85746	98273	82736	98283	730076
FIM D:	67890	85890	77390	123990	710840
CAT A:	49283	39283	49384	62832	401564
CAT B:	50498	29384	64736	59867	408972
CAT C:	69586	69829	59687	73645	545494
PCS STACKER A1:	2367890	1432534	1393475	1092938	12533674
PCS STACKER A2:	1928374	4123918	990827	2635019	19356276
PCS STACKER B1:	3092893	2187485	2491823	3123958	21792318
PCS STACKER B2:	3019287	4567890	3312845	3570012	23505350
PCS STACKER C1:	991911	2937890	4128722	3571621	17972070
PCS STACKER C2:	4982933	999299	3102934	1928374	22027080
JAMS CULLER:	9	12	18	13	84
JAMS SING:	9	8	8	5	60
JAMS SEPARATOR:	20	12	9	15	112
JAMS IND DET 1:	143	72	99	91	810
JAMS INVERTER:	101	84	79	93	714
JAMS IND DET 2:	102	82	87	89	780
JAMS ENRICHER:	19	20	21	20	160
JAMS CANCELER:	74	76	64	99	626
JAMS STACKER:	9	12	18	13	84
MACH STOPS:	21	20	30	25	192
MAL CULLER:	19	14	23	19	150
MAL SINGULATOR:	9	8	8	5	60
MAL FEEDER:	5	8	17	9	78
MAL FC:	20	12	9	15	112
MAL INDICIA:	22	21	21	20	168
MAL ENRICHER:	9	8	11	9	54
MAL TRACKING:	2	1	0	3	12
COUNTERS CLEAR:	21	15	9	11	112
EMERG:	2	12	18	13	84

Figure 7.4-1. Sample Site Summary Report (Sheet 2 of 2)

## 7.5 AFCS SINGLE MACHINE MALFUNCTION REPORT

The AFCS Single Machine Maintenance Report (Figure 7.5-1) can be generated for a specified date or as a roll-up report spanning two dates. Total number of malfunctions is shown for each major module. The report also shows machine tracking errors and total machine stops.

### SITE DATA

SITE NAME:	FORT WORTH, TEXAS 76110	MACHINE #:	3
DATE:	6/JUN/89-6/JUN/89	TIME:	12:42

### MALFUNCTION REPORT

MAL CULLER	MAL SINGULATOR
5V : 7	5V : 0
24V : 0	24V : 0
CKT-BREAKER: 0	TRANS-CLOCK: 4
FUSE : 0	FUSE : 0
TECH : 1	TECH : 2
WATCHDOG : 0	WATCHDOG : 0
MAL FC	MAL FEEDER
CANCELER : 3	TECH : 1
42V : 0	SIGNALS : 0
POWER FAIL : 5	
TRANS-CLOCK: 0	
CKT-BREAKER: 3	
MAL INDICIA	MAL ENRICHER
IND DET 1 : 0	LAMP ENR: 0
IND DET 2 : 6	TRACKING: 0
IND DET 3 : 0	
IND DET 4 : 1	
NEED ADJUST: 7	
MAL FAM TRACKING: 1	
MACH STOPS : 9	

Figure 7.5-1. Sample AFCS Single Machine Malfunction Report

## SECTION 8

### SOFTWARE REFERENCE GUIDE

#### 8.1 INTRODUCTION

This section provides information about general software operation, file maintenance utilities, and computer security for the Data Collection Computer (DCC). The DCC enables the user to obtain operations reports on the Advanced Facer Canceler System (AFCS). These reports and the procedures for obtaining them are discussed in sections 6 and 7. To operate properly, the DCC must be informed of the particular site configuration (how many machines, identification numbers, etc.). Procedures for generating/updating the site configuration are also provided in section 6.

#### 8.2 GENERAL SOFTWARE OPERATION

The DCC software operates through a menu system. These menus step the user through the various DCC activities. Key use in all the menus is similar. The following key conventions are used:

- Cursor keys: up (↑), down (↓), left (←), right (→)
- Return or enter key (↵-Enter)
- Control (Ctrl) key and some other key simultaneously, such as Ctrl End (^End).

Other keys may be used depending on the particular menu.

The menu system and activities that may be performed are discussed in detail in section 6.

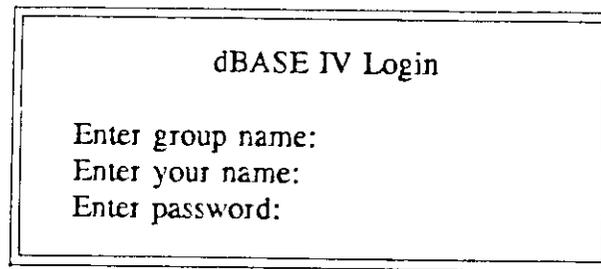
When the DCC is turned on, it will run a series of checks on itself. Typically, everything is okay and an initial startup menu (**Figure 8.2-1**) appears on the screen. The startup menu allows the user to select the activity desired. The selections are Data Collection, Utility, and eXit.

DCC=STARTUP=MENU	
Data Collection	(D)
Utility	(U)
eXit	(X)

Figure 8.2-1. DCC Startup Menu

If the system finds potentially corrupted files or data, a message will be displayed before the startup menu appears. The user can then try to restore the information using the procedures discussed in 8.3.2.

Selecting either Data Collection or Utility at the startup menu brings up a login menu (Figure 8.2-2). To proceed with the activity, the user must properly log in on this menu by entering the group name, his or her user name, and the correct password. The group name and user name are echoed to the screen, which means that the user can see them. The password is not echoed.



```
dBASE IV Login
Enter group name:
Enter your name:
Enter password:
```

Figure 8.2-2. DCC dBASE IV Login Menu

After a proper login, the screen will display in sequence a title, copyright notice, and function menu for the activity selected. The user then chooses the appropriate items to execute, modify, or view, depending on the activity selected.

### 8.3 FILE MAINTENANCE UTILITIES

File maintenance utilities in the DCC consist of file backup to floppy disk and restoration of data. Both functions are accessed through the same menu. To perform either activity, proceed as follows:

1. Select Utility from the initial startup menu (see Figure 8.2-1) by pressing U on the keyboard.
2. The login menu (see Figure 8.2-2) will appear on the screen. Enter the correct information for each item, pressing ←Enter after each entry.
3. Upon proper login, the screen will display the dBASE IV title and copyright screens. The user does not have to press ←Enter at the copyright display, but doing so speeds up the change to the next screen.
4. At the AFCS Utility Selection Menu (Figure 8.3-1), select the file maintenance function desired.

AFCS UTILITY SELECTION MENU			
Update	Site Information	(Site)	(S)
View	Data File	(Counters)	(C)
View	Status Log File	(Statlog)	(L)
Backup	Data to Floppy	(Daily)	(B)
Restore	Backup Data	(Hour)	(H)
Restore	From Floppy	(Daily)	(D)
View	Code Assignment		(A)
Print	Code Assignment	(Report)	(R)
Update	Software Security	(Password)	(P)
Exit			(X)

**Figure 8.3-1. AFCS Utility Selection Menu**

5. Follow the instructions given on subsequent menus to perform the desired function.

### 8.3.1 BACKUP

The backup function is essentially a copy operation that saves data files from the computer's hard drive to floppy disk. To back up files, select B from the utility menu and proceed as instructed on the next menu.

It is advisable to back up the data files at least daily. When data collection activity (see section 6) is terminated, a daily backup must be run. This provides a good fallback in case the restore procedure is required.

### 8.3.2 RESTORE PROCEDURES

If the operating system finds potentially corrupted files or data when the DCC is powered up, a message will be displayed and the startup menu will appear on the screen. If data restoration is desired, proceed as follows:

1. Select U from the startup menu to access the file utilities. After proper login, the utility menu will appear on the screen.
2. View the counter files (selection C on the menu).

## NOTE

Specific procedures for scrolling and moving through viewed files are given in section 6.

3. View the status log file (selection L).
4. If everything appears to be okay on both the counter and the status log files, proceed with normal operations.
5. If there appears to be a data loss or corruption in the counter or status log files, attempt to restore the files from the hourly backup data in the hard drive as follows:
  - a. Select H from the menu.
  - b. Follow the instructions provided on the next menu.
6. View the files again. If now okay, proceed with normal operations.
7. If data are still not good, try to restore the files from the last daily floppy disc as follows:
  - a. Select D from the menu.
  - b. Follow the instructions provided on the next menu.
8. View the files again. If there are still difficulties, try to restore from the previous daily backup floppy.

## NOTE

While it is unlikely that the restoration process would proceed this far, it would be theoretically possible to repeat the restoration procedure through the 31st daily floppy.

This refers to restoring the preceeding daily floppy diskettes. Each daily floppy contains a 31 day window of data. By stepping back through the backup diskettes, a new 31 day range of data is loaded into the DCC. As soon as the Data Collection software is started, the data older than 31 days is removed. Therefore, these older data diskettes should be used in the Reports Only mode. It is recommended that a set of seven (7) 3-1/2" floppy diskettes be used

for the daily backups of the DCC data files. This rotation of backup diskettes will ensure that if necessary to restore data, the oldest possible data will be only 1 week old.

9. At any point in this procedure that the files appear to have been restored to an uncorrupted condition, proceed with normal operations.

If the DCC goes down during normal operations, status log information not saved up to the last hourly backup will be lost. However, the counters in the AFCS itself are nonvolatile. Machine counter data will stay stored until normal operations resume. The start time might be lost, but it can be recalculated. It is not necessary to restore the DCC hourly counter files if communications with the AFCS can be reestablished the same day. If communications cannot be reestablished the same day, counter data in the DCC up to the loss of communications can be restored using the above procedures and a partial log for that day generated.

If power to the DCC is lost, a backup power supply will continue to supply power to the computer for a half hour. Normal DCC operations can proceed during this period. If the power outage approaches 30 minutes, perform the termination sequence for the current activity (see section 6). Once the startup menu appears, select X to exit before turning off power to the DCC.

#### 8.4 COMPUTER SECURITY

The DCC provides several levels of security. The first of these is mechanical. There is a key that may be used to lock out the keyboard. Since the keyboard is how the user communicates with the DCC, this effectively prevents unauthorized use of the computer when locked. The key is used only to provide a physical lock for the DCC cover to prevent unauthorized access to the internal workings of the computer.

The dBASE IV RunTime software that allows the user to perform data collection and file maintenance activities is doubly protected by passwords. The user password is required to perform proper login, as discussed above. The master password is required to perform any update of site information files or user passwords. The passwords are assigned through the dBASE IV PROTECT program, which is accessed via the utility menu.

When the system is first initialized at the site, it will display the startup menu. The appropriate personnel may then generate the site information data and assign passwords. This can be done in either order, but once the master password is assigned, no updates can be made without it.

To generate the initial site information, use the procedures provided in section 6. To assign the passwords, proceed as follows:

1. Assign the master password:
  - a. Select Utility from startup menu (if not already in utility menu).
  - b. Select P on the utility menu and follow the instructions provided to assign the master password.

#### NOTE

**If the password is lost the password file can be deleted from DOS. Then by using the printout of the site's user information as per Pg 6-28 the maintenance personnel can rebuild the password files without having to install the software.**

2. Assign user passwords as appropriate, following the instructions on the screen. Once user passwords are assigned, the DCC will display the login menu whenever the activities are selected from the startup menu.

The DEC 325 computer also provides a unique boot password option. This will prevent booting the system until the boot password is entered. The procedure for establishing a boot password is provided in the DEC 325 documentation. If the boot password is activated, the user must enter it at DCC power-on to boot the computer. Since the boot password is firmware based, the system could not be booted from the floppy disk unless the user knew the password.

#### NOTE

**If the boot password is activated, it is very important not to forget it. If the password is lost by site personnel, the password firmware will have to be cleared and the system reconfigured to use the computer.**

The DEC 325 also has a temporary keyboard password that may be activated. The default on this password is to be the same as the boot password. The keyboard password allows a user to prevent unauthorized access via the keyboard while away from the computer for an extended period. Refer to the DEC 325 documentation for the specific procedure to establish a keyboard password. If the user chooses a password other than the default, that password is active only until the system is rebooted. Upon reboot, the keyboard password reverts to the default.

#### NOTE

**Once again, it is important not to forget this password if it is activated. Since its default is the boot password, the boot password must also be available.**



# **BURROUGHS OCR/CS Operating Guidelines**

**HANDBOOK PO-411  
JUNE 1985**

**THIS MANUAL IS A MANAGEMENT GUIDELINE. NO FLSA NONEXEMPT EMPLOYEE MAY REMOVE THIS TEXT OR REPRODUCE COPIES OF ANY SECTION THEREOF FOR USE OFF POSTAL PREMISES OR OFF-THE-CLOCK.**

U.S. POSTAL SERVICE  
WASHINGTON, DC 20260

Burroughs OCR/CS Operating Guidelines  
Handbook PO-411

Transmittal Letter 1  
June 1, 1985

**A. MATERIAL TRANSMITTED**

This transmits the first issue of Handbook PO-411, Burroughs OCR/CS Operating Guidelines.

**B. PURPOSE**

This handbook establishes guidelines to maximize the performance and overall utilization of the Burroughs OCR/CS.

**C. DISTRIBUTION**

1. **Initial.** This publication is being distributed to Headquarters, all districts, regions, management sectional centers, and selected post offices.
2. **Ordering Copies.** Additional copies may be requisitioned on Form 7380, Supply Center Requisition, from the area supply centers.

**D. COMMENTS AND QUESTIONS**

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*William Campbell*  
Assistant Postmaster General  
Mail Processing Department

## CONTENTS

### Chapter 1 — Introduction

- 110 Purpose
- 120 General Information

### Chapter 2 — Postal Numeric Encoding Technique

- 210 Introduction
- 220 POSTNET Code Structure
  - 221 Bars and Half Bars
  - 222 Code Characters
  - 223 Position Weights
  - 224 Correction Digit
  - 225 Standard Formats
    - 225.1 Nine-Digit Format
    - 225.2 Five-Digit Format
  - 226 Error Detection and Recovery
    - 226.1 Substitution Errors
    - 226.2 Detection of Substitution Errors
    - 226.3 Substitution Errors Affecting Only a Single Code Character
    - 226.4 Failure to Satisfy "Multiple-of-Ten" Requirement
    - 226.5 Other Substitution Errors
- 230 Decoding Template
- 240 Bar Code Specifications
  - 241 Bar Shape
  - 242 Bar Height
  - 243 Bar Width
  - 244 Bar Spacing (Pitch)
  - 245 Bar Code Location
  - 246 Skew
  - 247 Baseline Shift

### Chapter 3 — OCR/CS System

- 310 OCR/CS System Orientation
- 320 Functional Description
  - 321 Operating System
  - 322 Letter-Preparation System
    - 322.1 Feeding System
    - 322.2 Detection System

- 323 Transport System
- 324 Letter-Processing System
  - 324.1 Scanning System
  - 324.2 Bar Code Printing System
- 325 Letter-Sorting System
  - 325.1 Bar Code Reading System
  - 325.2 Stacker System
- 330 Physical Description
  - 331 Logic Section (Computer Complex)
    - 331.1 System Controller and Recognition Unit
    - 331.2 Hard-Copy Terminal (Teletypewriter)
    - 331.3 Video Monitor (CRT)
  - 332 Mechanical Transport Unit (MTU)
    - 332.1 Feeder Unit
    - 332.2 Scanner Unit
      - .21 Window Envelope Detector
      - .22 Prescanning System
      - .23 Main Scanning System
    - 332.3 Mechanical Delay Unit
    - 332.4 Printer Unit
    - 332.5 Bar Code Reader Unit
    - 332.6 Stacker Unit
  - 333 Default Code
- 340 OCR/CS Control Panels, Indicators, and Alarms
  - 341 Introduction
  - 342 Feeder Unit Controls and Indicators
    - 342.1 Operation Panel
    - 342.2 Display Monitor
      - .21 Display Options
      - .22 Display Messages
    - 342.3 Status Panel
    - 342.4 Counter Panel
  - 343 Ink Jet Printer Unit Indicators
  - 344 Stacker Unit Indicators and Alarm Lamps
    - 344.1 Jam Alarm Indicators
    - 344.2 Stacker Full Indicators
  - 345 Transport Control Unit
    - 345.1 Mode Switch
    - 345.2 Verifier Switch
  - 346 Interlock Switch

- 347 Emergency Stop Switches
- 350 Reject Stackers
  - 351 Read Reject Stacker (Stacker #1)
  - 352 Mechanical Reject Stacker (Last Stacker)
- 360 OCR Machinable and Readable Mail
  - 361 Machinable Mail
    - 361.1 Dimensions
    - 361.2 Envelope Construction --  
OCR Machinability
  - 362 OCR Readability
  - 363 Address Block -- OCR Read Area  
(Exhibit 363)
- Chapter 4 -- Duties and Responsibilities**
- 410 Procedures
- 420 Supervisor
- 430 Mail Processor
- Chapter 5 -- Operating Instructions**
- 510 Introduction
- 520 Operating Procedures
  - 521 Normal Operations
  - 522 Prestartup Procedures
    - 522.1 Supervisor
    - 522.2 Maintenance Personnel
  - 523 Startup Procedures
  - 524 Run Procedures
  - 525 Turnoff Procedures
- 530 Alarm Conditions
  - 531 Definition
  - 532 Emergency Stop Alarm
    - 532.1 Emergency Shutdown  
Procedures
    - 532.2 Restarting After Emergency  
Shutdown
  - 533 Stacker Full Alarm
  - 534 LB Alarm
  - 535 Verifier Alarm
  - 536 OCR Alarm
  - 537 JAM Alarm
  - 538 Interlock Alarm
- 540 Abnormal Operations
  - 541 Hardware Malfunctions
  - 542 Software Stoppages
  - 543 Restart
  - 544 Operator Maintenance
- 550 Additional Operating Instructions
  - 551 Policy Guidelines
  - 552 Staffing
    - 552.1 Supervision
    - 552.2 Employees
  - 553 Mail Sources
  - 554 Operation Numbers
  - 555 Settings for Switches and Dials
  - 556 Training
  - 557 Maintenance
- 560 Identification and Reaction to  
Malfunctions
  - 561 Procedures
  - 562 Visual Inspection
  - 563 Ink Jet Printer and Stacker Units
  - 564 Run Performance Reports
- Chapter 6 -- Management Information**
- 610 Introduction
- 620 Performance Reports
  - 621 General Information
  - 622 Mail Processing Data Report
    - 622.1 Mailpieces
    - 622.2 Accepts
    - 622.3 Rejects
    - 622.4 Verifier Alarm
    - 622.5 Prebarcoded
    - 622.6 Foreign Mail
    - 622.7 GAR
    - 622.8 Stacker
  - 623 OCR Diagnosis Data Report
    - 623.1 INT (Interrupts)
    - 623.2 TR Alarm
    - 623.3 Accepts
    - 623.4 Rejects
    - 623.5 Rejects (OCR Read)
    - 623.6 MISC (Information Prescan  
Process)
    - 623.7 Reject Sequence Alarms  
(SQALM)
    - 623.8 Reject Sequence Alarms  
(SQQME)
    - 623.9 Reject Sequence Alarms  
(SQTME)

- 623.10 Reject Sequence Alarms (SQLNE)
- 623.11 Reject Sequence Alarms (SQCAL)
- 623.12 OSL (Misc Information Main Scan)
- 624 Timeout

**Chapter 7 — Safety**

- 710 Introduction
- 720 Supervisor's Responsibilities
- 730 Employee's Responsibilities
- 740 Operational Safety Summary

**EXHIBITS**

Exhibit	Title
<b>Chapter 2</b>	
230	Decoding Template (Item 04)
240	Bar Code Specifications
<b>Chapter 3</b>	
320	Functional Block Diagram of OCR/CS
330	Burroughs Optical Character Reader (OCR)
332.2	Scan Zone
332.4	Bar Code Spray Decision Table
332.6	OCR Sweep-side Diagram
342	Feeder Unit Controls and Indicators
342.1	Operation Panel and Display Monitor
342.3	Status Panel
342.4	Counter Panel
343	Ink Jet Printer Front Door Control Indicators
344	Stacker Unit Indicators
345	Transport Control Unit
346	Interlock Switch
363	Address Block — OCR Read Area
<b>Chapter 5</b>	
523	Feed Table — Loading Mail
<b>Chapter 6</b>	
622	Mail Processing Data Report
623	OCR Diagnosis Data Report

## CHAPTER 1

### INTRODUCTION

#### 110 PURPOSE

This handbook establishes methods and techniques needed to maximize the utilization of the automation system. It provides operating guidelines for all levels of management in the regions, districts, and local offices.

#### 120 GENERAL INFORMATION

The Postal Service has developed a system which automates letter-mail distribution and will result in significant productivity improvements. The heart of this system consists of: the representation of the ZIP Code by a bar code on the mailpiece, utilizing the Postal Numeric Encoding Technique (POSTNET), the Optical Character Reader/Channel Sorter (OCR/CS), and the Bar Code Sorter (BCS). With this new equipment and the concept of bar coding, the Postal Service automates the process of reading addresses and sorting letters into stackers according to destination. The OCR sprays a bar code representation of the destinating address ZIP Code on each mailpiece. This reduces the need for reading the address portion of the envelope in the subsequent distribution steps and allows for BCS distribution.

## CHAPTER 2

# POSTAL NUMERIC ENCODING TECHNIQUE

### 210 INTRODUCTION

The POSTNET bar code system was developed by the USPS for encoding ZIP Codes on letter mail. This encoded information is then read by the bar code reading equipment which will perform sortations. POSTNET accommodates both the 5-digit and the expanded 9-digit ZIP Codes (ZIP+4). To fully understand the automation concept, it is imperative to understand the design of the POSTNET bar code.

### 220 POSTNET CODE STRUCTURE

#### 221 BARS AND HALF BARS

As shown in the following example, the basic elements of a POSTNET code are bars and half bars:



#### 222 CODE CHARACTERS

A combination of 5 bars is used to represent each digit. Each 5-bar combination consists of 2 full bars and 3 half bars. Ones (1's) are full bars and zeros are half bars. Thus, the digits of zero (0) through nine (9) have been assigned the following codes:

0	11000	5	01010
1	00011	6	01100
2	00101	7	10001
3	00110	8	10010
4	01001	9	10100

Only these ten combinations of bars and half bars are valid and represent all possible combinations. The two full bars and three half bars convention for representing a number is important to the POSTNET concept because of the error-recovery feature of the system (see section 226). A combination other than two full bars and three half bars will be interpreted by the system as an error.

#### 223 POSITION WEIGHTS

Each code character is fully defined by the combination of bars which are assigned mathematically. Within each 5-bar combination, each position has been assigned a specified weight. With the exception of 0 (zero), the numerical value of each valid combination may be determined by summing the "weights" of the two positions which are occupied by the 1's (full bars). From left to right, the positions are weighted 7,4,2,1, and 0. Thus, for example, the combination (01010) has 2 full bars in the second (weight 4) and fourth (weight 1) positions. Summing 4 and 1 yields 5, which is the assigned value of 01010. The combination (11000) has a total weight of 11. This combination has been assigned the value of 0 (zero) and is the only exception of the summing of weights rule.

#### 224 CORRECTION DIGIT

Each time a bar code field is printed, one additional digit is encoded along with the ZIP Code digits. This digit, known as the correction digit, is used as part of the error-recovery system. It is represented by two full bars and three half bars, as is each digit of the ZIP Code. The correction digit selected brings the sum of all the digits in the bar code field to the next higher multiple of 10. Examples:

- The 9-digit ZIP 12345-6789 is to be encoded in POSTNET format. Summing the 9 digits yields 45. A correction digit "5" will result in the sum of the 10 digits being an integral multiple of 10.
- The 9-digit ZIP 20036-5993 is to be encoded in POSTNET format. Summing the 9 digits yields 37. A correction digit "3" will result in the sum of the 10 digits being an integral multiple of 10.
- The 5-digit ZIP 14609 is to be encoded in POSTNET format. Summing the 5 digits yields 20. A correction digit "0" will result

in the sum of the six digits being an integral multiple of 10.

**225 STANDARD FORMATS**

The POSTNET System uses only 2 standard formats containing 52 and 32 bars, respectively. Reading of any number of bars other than these 2 formats will be interpreted by the system as an error.

**225.1 Nine-Digit Format**

The standard 52-bar, 9-digit ZIP format is the basic configuration for encoding the full 9-digit ZIP Code. It is printed as a single 52-bar field, all bars uniformly spaced:

F	SCF	Zone (Delivery Unit)	Sector/Segment	C.D.	F
1	2-16	17-26	27-46	47-51	52

- a. Bar 1 is a frame bar and will always be a full bar called a frame bit.
- b. Bars 2-16 represent the 3 digits of the sectional center facility (SCF), each digit expressed by 5 bars.
- c. Bars 17-26 represent the 2 digits of the zone (delivery unit), each digit expressed by 5 bars.
- d. Bars 27-46 represent the 4 digits of the Sector/Segment number, each digit expressed by 5 bars.
- e. Bars 47-51 represent the correction digit.
- f. Bar 52 is a frame bit and will always be a full bar.

**225.2 Five-Digit Format**

The standard 32-bar, 5-digit ZIP format is used for the initial coding of a mailpiece on which there is not enough information available to determine the full 9-digit ZIP Code. It is printed as a single 32-bar field with all bars uniformly spaced. It may represent either the 5-digit ZIP (SCF plus zone or delivery unit) or the three digits of the SCF plus a zero representing each of the last two digits of

the zone numbers. The latter situation is known as a DEFAULT CODE and is discussed in section 333.

F	SCF	Zone (Delivery Unit)	C.D.	F
1	2-16	17-26	27-31	32

- a. Bar 1 is a frame bar and will always be a full bar called a frame bit.
- b. Bars 2-16 represent the 3 digits of the SCF, each digit expressed by 5 bars.
- c. Bars 17-26 represent the 2 digits of the zone (delivery unit) number (or default code 00 if the zone number is unknown or indeterminate). The 2 digits are each expressed by 5 bars.
- d. Bars 27-31 represent the correction digit.
- e. Bar 32 is a frame bit and will always be a full bar.

**226 ERROR DETECTION AND RECOVERY**

**226.1 Substitution Errors**

A substitution error is the reading or printing of a short bar as a long bar or vice versa. POSTNET has been designed specifically to detect substitution errors and provide a means of recovering from the error to the greatest extent practical. The following information applies to both the 32- and the 52-bar code field. The term "correctable" does not mean the physical modification for the bar code; rather, the ability to determine the correct value of the affected character, and to sort accordingly, rather than reject the mailpiece.

**226.2 Detection of Substitution Errors**

A substitution error is detected when a coded digit (a sequence of 5 bars) has other than 2 full bars and 3 half bars. All substitution errors are detectable, with the exception of "offsetting" errors in which either 1 or 2 full bars are misprinted or misread along with an equal number of half bars. Experience has shown that this type of error seldom occurs.

### 226.3 Substitution Errors Affecting Only a Single Code Character

An error which affects only one digit is always correctable. The digit is identified by its failure to meet the test of having exactly 2 full bars and 3 half bars. The correct value of the single affected character is determined by subtracting the sum of the 9 (or 5) valid characters from the next higher multiple of 10. If the sum of 9 (or 5) valid characters is itself a multiple of 10, the affected character is 0.

### 226.4 Failure to Satisfy "Multiple-of-Ten" Requirement

If a complete bar code is read in which no substitution errors are detected, but in which the sum of the individual characters is not a multiple of 10, the mailpiece must be rejected. This is an indication of offsetting substitution errors and will probably result in a missort, if not rejected.

### 226.5 Other Substitution Errors

Substitution errors affecting more than one digit cannot be corrected. The mailpiece will be sorted to the "Read Reject" stacker.

## 230 DECODING TEMPLATE

A POSTNET Code Decoding Template has been designed by the Postal Service to assist in the decoding and verifying of bar codes. See Exhibit 230. This transparent template may be used to segment the individual code characters of the bar code into the numeric digits of the ZIP Code. The chart in the upper right corner of the template has been provided as a code reference. As stated before, 1 (one) represents a full bar and 0 (zero) represents a half bar. The large shaded area located near the right of the ZIP+4 and 5-digit overlays indicates the correction digit area. The smaller hashed areas at the extreme ends of the two overlays indicate the location of the full bar frame bits. The POSTNET Code Decoding Template may be ordered from the area supply centers (supply number Item 04).

## 240 BAR CODE SPECIFICATIONS

### 241 BAR SHAPE

The shape of each bar must conform to the minimum and maximum bar characteristics, as shown in Exhibit 240. Each full bar must completely cover the minimum requirements for a full bar, but not exceed the maximum requirements shown in the exhibit. Each half bar must completely cover the minimum half bar requirements, as outlined in Exhibit 240, but must not exceed the maximum requirements depicted for the half bar.

### 242 BAR HEIGHT

The height of the bar will be 0.125 inches (plus or minus 0.010) for a full bar and 0.050 inches (plus or minus 0.010) for a half bar.

### 243 BAR WIDTH

The width of the full bar and half bar is the same. In no instance will the bars be less than 0.015 or more than 0.025 inches wide.

### 244 BAR SPACING (PITCH)

The horizontal spacing must be 21 bars per inch (plus or minus 1) (one pitch = 0.0475 plus or minus 0.0025 inches from centerline).

### 245 BAR CODE LOCATION

The location of the bar code on the mailpiece has been chosen to ensure code readability by the letter-sorting equipment. Also considered was the area on the face of the mailpiece which would most likely be clear of extraneous information. Excluding vertical misalignment of the mailpiece due to transport considerations, the baseline of the bar code must be 0.245 inches (plus or minus 0.025) from the bottom edge of the mailpiece. The start position (left-most bar) of either the 52-bar code or the 32-bar code must be no greater than 4 inches or less than 3.875 inches from the right-hand edge of the mailpiece. The final (right-most bar) of the 32-bar code must terminate not less than 2.300 inches from the right-hand edge of the mailpiece.



**POSTNET CODE  
Decoding Template**

0-11000	5-01010
1-00011	6-01100
2-00101	7-10001
3-00110	8-10010
4-01001	9-10100

	SCF	ZONE	SECTOR/SEGMENT
ZIP + 4			
5 DIGIT			

Item 04

EXHIBIT 230 — DECODING TEMPLATE (Item 04)

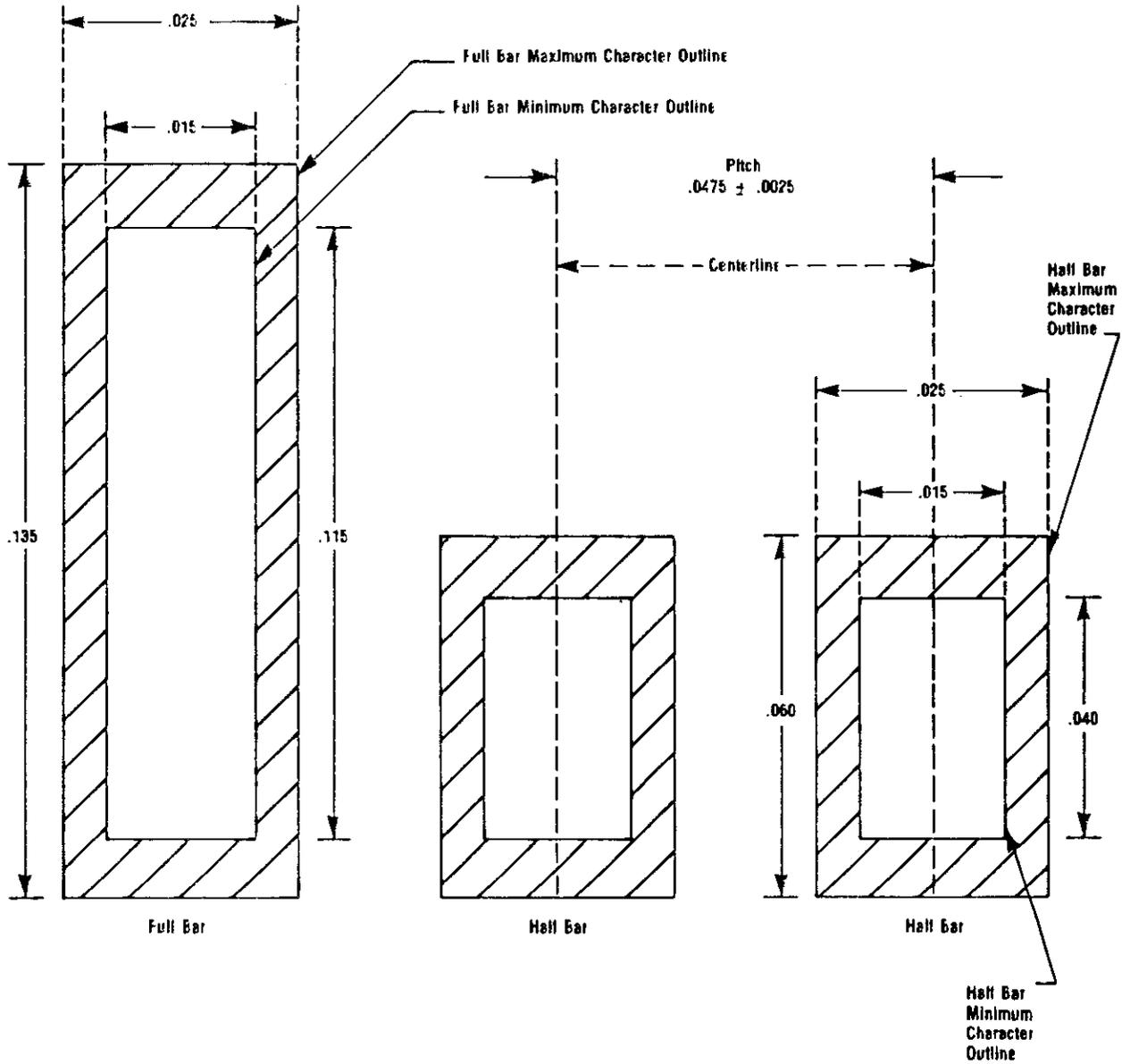


EXHIBIT 240 — BAR CODE SPECIFICATIONS

## CHAPTER 3

### OCR/CS SYSTEM

#### 310 OCR/CS SYSTEM ORIENTATION

#### 320 FUNCTIONAL DESCRIPTION

The OCR/CS processes culled, faced, canceled letter mail which has been fed into the system. Before reaching the processing stage, the letters are fed past devices that determine whether or not the mailpiece is machinable and if it is a window envelope or prebarcoded mailpiece. Non-machinable mailpieces are purged from the system and sent to the doubles stacker. The machinable mailpieces proceed along the system to the scanning area where the address is found and read. The information read is sent to a computer which is programmed to evaluate the various elements of the data. Based on this evaluation, the computer determines the address ZIP Code on the mailpiece. The computer then compares the city, state, and ZIP Code evaluation which it has made for the address block, with data stored in the computer files, and determines the correctness of the ZIP Code. In cases where no ZIP Code has been provided, the computer directory files are used to establish the correct ZIP Code for destinations resident in the local directory. Once the correct ZIP Code for the mailpiece is determined, a bar code representing the ZIP Code is printed in the lower right-hand corner of the envelope. The printed bar code is then verified for correctness. Distribution of the mailpiece to an assigned stacker now takes place on the basis of the ZIP Code-to-stacker sortation data stored in the computer. Mailpieces that are identified at the start of the scanning process as having preprinted bar codes are sorted on the basis of this information, and the OCR bar code printing system is inhibited if bar code priority has been established. As shown in Exhibit 320, the activities of the OCR are performed by several functional systems. The following paragraphs provide a general description of each functional system.

#### 321 OPERATING SYSTEM

The Operating System supplies power to the entire OCR system and enables rapid isolation of faults (interruption of power within a system) in the event of a malfunction.

#### 322 LETTER-PREPARATION SYSTEM

The Letter-Preparation System consists of a Feeding System and a Detection System.

##### 322.1 Feeding System

This is where letters are culled and hand-loaded onto a feed table which has forks that move the mailpieces toward a pickoff device. The mailpieces are singulated and fed to the Detection System.

##### 322.2 Detection System

This system determines if the mailpieces are machinable or nonmachinable. Nonmachinable mailpieces are sent to the doubles stacker and machinable mailpieces are aligned and fed to the Letter-Processing System. The Detection System consists of:

- a. **Stiffness Detectors**, which determine the stiffness of mailpieces through the use of microswitches.
- b. **Length Detection Control**, which utilizes a light beam unit to determine if the length of the mailpiece is within normal limits.
- c. **Doubles Separator**, which takes action on mailpieces that are fed as doubles or letters that are shingled.
- d. **Aligning Device**, which consists of tilted belts that bias down, toward the base plate, mailpieces that were fed as floating or skewed letters.

### 323 TRANSPORT SYSTEM

The Transport System consists of a series of belts that maintain a continuous, smooth flow of mailpieces through the OCR.

### 324 LETTER-PROCESSING SYSTEM

The Letter-Processing System consists of the Scanning System and the Bar Code Printing System.

#### 324.1 Scanning System

This system locates the address block and sends the last two lines of information to the Logic Section. The mailpiece now proceeds past the Bar Code Printing System.

NOTE: Occasionally, the ZIP Code for a mailpiece may not be readily determined, and the mailpiece will receive no bar code or may be sprayed with a bar code representing a default code. The first condition is a "Timeout" (see section 624). The second condition, "Default Code," is defined in section 333.

#### 324.2 Bar Code Printing System

As the mailpiece passes this system, the Ink Jet Printer (IJP) is activated. The bar code, that has been determined to represent the ZIP Code for the mailpiece, is sprayed on the lower right-hand corner of the envelope. As stated before, the IJP is inhibited if a bar code is detected as already being present on the envelope. This ensures that a second bar code will not be sprayed over one that is already present. The IJP will not spray a bar code if there is noise in the bar code area on the envelope.

NOTE: Noise is the presence of a disturbance in either the read zone or the bar code area of the envelope. This can be in the form of a logo, color changes in the paper, typing or writing, etc.

### 325 LETTER-SORTING SYSTEM

The Letter-Sorting System consists of the Bar Code Reading System and the Stacker System.

#### 325.1 Bar Code Reading System

This system verifies the readability and accuracy of the bar code which the OCR has just sprayed on the mailpiece. This verification takes place when the

OCR is in a normal operational mode and the verifier switch is in the ON position.

#### 325.2 Stacker System

This system is composed of separations, known as stackers, where mailpieces are assigned according to a predetermined sortation program. The number of stackers on an OCR is dependent on the configuration of the equipment assigned to a particular office. There are three configurations of OCRs — 32, 44, or 60 stackers. The number one stacker is known as the Read Reject stacker. The Read Reject stacker receives mailpieces with misprinted or smeared bar codes, mailpieces on which the bar code does not match the ZIP Code (Verifier Reject), and mailpieces on which no bar codes have been sprayed because of failure to make a ZIP Code determination (Non-OCR Readable). The last stacker of the system is known as the Mechanical Reject stacker. The purpose of this stacker is to receive mail which may have been readable, but did not get to a sort stacker due to a mechanical problem such as a machine stoppage. Mailpieces which are not accepted into a sort stacker because of a faulty diverter on the sort stacker will be sent to the Mechanical Reject stacker.

### 330 PHYSICAL DESCRIPTION

The Burroughs OCR is a computer-controlled, high-speed, mail-sorting system. It is capable of reading and interpreting address information on mailpieces and then sorting, by a predetermined program, at a rate of approximately eight pieces per second, or over 28,000 pieces per hour. As illustrated in Exhibit 330, the Burroughs OCR is comprised of 9 separate units which can be classified into two major groups: The Logic Section (Computer Complex) and the Mechanical Transport Unit (MTU). The Burroughs OCR will accept mail with the following dimensions:

	HEIGHT	LENGTH	THICKNESS
MAXIMUM:	6-1/8"	10-3/8"	1/4"
MINIMUM:	3-1/2"	5-1/2"	0.007"

NOTE: Mail containing keys, pens, or other stiff or bulky objects should not be fed through the OCR or BCS (Bar Code Sorter).

### 331 LOGIC SECTION (COMPUTER COMPLEX)

The Logic Section consists of the System Controller with Video Monitor, Recognition Unit, and Hard-Copy Terminal (Printer). See Exhibit 330. These devices interact with each other to control the operation of the Mechanical Transport Unit and manage the overall sortation process. Neither the mail processor nor the supervisor uses the computer complex. NOTE: The terms Unit and Module are interchangeable when referring to the various parts of the MTU.

#### 331.1 System Controller and Recognition Unit

The System Controller and Recognition Unit are special-purpose computers that function as an integrated unit to accept digitized video signals, representing the address block information on the faces of the mailpieces, from units within the Mechanical Transport Unit (MTU). Analysis of this information takes place and output data signals representing the ZIP Code for each mailpiece is generated back to units in the MTU which cause the bar code representation to be sprayed on each envelope.

#### 331.2 Hard-Copy Terminal (Teletypewriter)

The Hard-Copy Terminal is used as the maintenance interface for the control processor. Its primary function is communication. Using the Hard-Copy Terminal, it is possible to request printed data and reports. As an input device, it will be used to enter commands, establish sort programs, change from one sort program to another, etc.

#### 331.3 Video Monitor (CRT)

The Video Monitor is a 12-inch, black and white Cathode Ray Tube (CRT). The CRT provides visual communication from the computer complex and can display appropriate data of interest to maintenance personnel and supervisors. In the normal operating mode, the CRT will display information regarding gross accept rate (GAR) and machine status. This information, together with the mail-processing and diagnostic report, is valuable in determining problems with throughput and, therefore, should be monitored and reviewed by the supervisor.

### 332 MECHANICAL TRANSPORT UNIT (MTU)

The Mechanical Transport Unit (MTU) consists of the Feeder Unit, the Scanner Unit, the Delay Unit, the Bar Code Reader Unit, and the Stacker Unit. These units interact with each other and with the Logic Section to achieve the following functions:

- a. To move unsorted mail into the mainstream of mailpieces.
- b. To ensure that the mail is separated and has equal spacing between pieces.
- c. To optically scan a reading zone for address and bar code information. See Exhibit 332.2, Scan Zone.
- d. To print bar codes on the mailpieces that represent the proper ZIP Codes for the mailpieces.
- e. To verify that the bar code imprinted on the mailpiece is a correct representation of the ZIP Code for that mailpiece.
- f. To sort mailpieces into separate stackers according to the address, ZIP Code, or bar code information on the mailpiece, taking into consideration the sort program being used for the run.

The specific units that comprise the MTU are described in the following sections. See Exhibit 330.

#### 332.1 Feeder Unit

The Feeder Unit accepts unsorted, faced mail and converts it into a flow of mailpieces moving at a constant speed. The mailpieces are singulated and equally spaced before the next phase of processing. It is at this point that the Detection System removes all nonmachinable mailpieces and sends them to the doubles stacker (see section 322.2). Controls and indicator panels located on the Feeder Unit provide operating control over the system and status signals from the MTU and Logic Section to the mail processor, supervisor, and maintenance personnel. The mailpieces continue to the Scanner Unit, which is the next stage of processing.

### 332.2 Scanner Unit

This unit accepts mail from the Feeder Unit and optically scans each mailpiece. The Scanner Unit includes a Window Envelope Detector, a Prescanning System, and a Main Scanning System.

**.21 Window Envelope Detector.** This detector determines the existence of a window on the envelope, checks its size and location, and sends the coordinates of the window to the Logic Section. The letter is then scanned in the area of these coordinates to obtain the address block information necessary to produce the bar code. This focusing of the address block finding process to within the window increases the efficiency of the read.

**.22 Prescanning System.** This system scans an area on the lower portion of the mailpiece, the Scan Zone (Exhibit 332.2), to determine the most likely location of the Address Block (Exhibit 363) and detect the presence of a previously printed bar code. The Address Block and bar code information must be located in the Scan Zone in order for the mailpiece to be properly read, barcoded, and sorted.

**.23 Main Scanning System.** This system reads the address block to determine if the city, state, and ZIP Code match. If they match, the ZIP Code is converted to a bar code format. If they do not, a ZIP Code is assigned on the basis of the city and state, which is then converted to bar code format. The Burroughs OCR uses a Flying Spot Scanner. Mailpieces approaching the Main Scan area break a light beam which generates an interrupt to the Logic Section. Computerized circuits are activated at the Logic Section to control the activity of the Main Scanner and transmit the resulting video to the Recognition Unit for processing.

### 332.3 Mechanical Delay Unit

The Mechanical Delay Unit acts as a bridge between the Scanner Unit and Printer Unit. Mailpieces travel in a straight line through the unit, causing a time delay between the read and print functions. This delay is necessary to allow the required time for the computer complex to make decisions needed for the printing, verifying, and sorting processes.

### 332.4 Printer Unit

The Printer Unit is located between the Mechanical Delay Unit and Bar Code Reader Unit. The Printer Unit is composed of the Code Printer head and the Ink Jet Printer (IJP). This unit has the function of spraying the POSTNET Bar Code, corresponding to the ZIP Code of the mailpiece, in the proper location on the envelope. This bar code is used to carry out secondary sortation on other mail-sorting equipment. Exhibit 332.4 is an OCR Bar Code Spray Decision Table which will help to clarify the information contained in section 332 and section 332.4.

### 332.5 Bar Code Reader Unit

This unit is located between the Printer Unit and the Stacker Unit and contains the Transport Control Unit and the Bar Code Reader. The Transport Control Unit contains switches which determine how the OCR system will process the mail. The verifier switch allows the Bar Code Reader Unit to verify the accuracy of the bar code which the Printer has just sprayed on the mailpiece. These switches are discussed in section 340.

### 332.6 Stacker Unit

The OCR Stacker Unit is composed of modules of stackers in six and two stacker combinations (see Exhibit 332.6). The stackers have the function of providing an area for the collection of sorted mailpieces according to a predetermined sortation program. The number of stacker modules and the number of stackers (32, 44, or 60), depends on the particular OCR configuration installed in a particular facility. The configurations of OCR/CS machines are as follows:

- a. 32 stacker = five 6-stacker modules and one 2-stacker module.
- b. 44 stacker = seven 6-stacker modules and one 2-stacker module.
- c. 60 stacker = ten 6-stacker modules.

NOTE: Diverters or gates deflect the mailpieces into the proper stackers. The final stacker, called the Mechanical Reject stacker, does not have a gate and catches all unsorted mailpieces.

### 333 DEFAULT CODE

If the ZIP Code read on the mailpiece does not correspond to the range for the city/state read; the ZIP Code information will be discarded. The directory will be consulted for the ZIP Code for the city/state read. If the city is a single-ZIP city, the five-digit ZIP Code for that city will be selected. If the city is a multi-ZIP city, the three digits representing the SCF will be used, followed by two zeroes representing the zone. The resulting ZIP Code containing two zeroes is known as a default code. (NOTE: Currently, the Burroughs OCR does not replace the zone digits of a multi-ZIP Code city if those digits were well read.)

### 340 OCR/CS CONTROL PANELS, INDICATORS, AND ALARMS

#### 341 INTRODUCTION

Operating controls, indicators, and alarms (both visual and audible) are located throughout the OCR system. Their overall function is to provide safe and efficient operation of the equipment. The following exhibits and narrative will illustrate the location and physical properties of the control panels, indicators, and alarms. This will not include any controls, indicators, switches, circuit breakers, or adjustment areas that are used exclusively for preventive or corrective maintenance.

#### 342 FEEDER UNIT CONTROLS AND INDICATORS

Exhibits 342.1 and 342.3 depict the controls and indicators which are visible in the area of the Feed Unit. Exhibit 342.4 depicts the Counter Panel which is behind the feed unit door. Functional descriptions of each are as follows.

##### 342.1 Operation Panel

The Operation Panel (Exhibit 342.1) is located to right of the feed table and contains the following controls and indicators:

- a. **PRE-BAR CONTROL Switch** — Purpose is to establish the priority between the address block and the prebarcoded information on the mailpiece, which the system will use for processing the piece. (Prebarcoded mail is mail with bar

codes that were printed by a previous OCR or by a mailer.) There are two positions for this switch, and red lights are provided above these two positions to indicate the selected position. If the switch is turned to another position while the system is processing mail, the light remains unchanged and the system will continue to handle prebarcoded mail according to the original position.

1. **OCR:** The address block will be consulted to determine the ZIP Code.
2. **BAR CODE:** The preprinted bar code is consulted to determine the ZIP Code. If the read is unsuccessful (or no bar code exists), the address block information will be used to determine the ZIP Code for the mailpiece.

b. **SORTING MODE Switch** — Used to select one of the six possible sorting modes which can be programmed into the system. A red light is provided above each setting to indicate which mode has been selected. If the switch is turned to another position while the system is processing mail, the red light will not change, and the system will continue to use the sorting mode which was originally selected. If the switch is turned to another position while the system is in a STOP state, the red light above the new position will flash. The flashing will stop and the system will operate under the new mode if the ALARM STOP switch is pressed.

c. **ALARM STOP Switch** — Used to:

1. Silence the audible alarm and stop the flashing of the alarm lamp on the Status Panel.

2. Confirm a change in the sorting mode.

d. **FEEDER ON/FEEDER OFF Switch** — Controls the fork-feed mechanism and the suction chambers of the pickoff device, thereby sending mail to the belts of the detection system. When this switch is lit up blue, it is in the FEEDER ON position; when the switch is lit up red, it is in the FEEDER OFF position. If there is no mail on the feed table, the switch should be in the FEEDER OFF position.

e. **CLEAR Switch** — Used whenever there is mail remaining in the transport path after the system shuts down. When it is held down, the drive motors and belts continue to rotate, but the feeder system does not operate. Thus, if there is mail which has been fed into the system but which has not reached a stacker, it is sent to the last stacker, which is known as the **MECHANICAL REJECT STACKER**. After a machine stop, the mail in the transport path must be cleared before the **START** switch is used; if not, misorts may occur. Before using the clear switch, check to see that all personnel are clear of the equipment.

f. **START Switch** — Used to start the drive motors and to prepare the transport for operation. A built-in lamp and audible startup alarm indicate that the transport is ready.

g. **STOP Switch** — Used to stop the drive motors, thereby bringing the transport to a stop. A built-in lamp remains lit until the **START** switch is pressed.

h. **POWER LINE Light** — Indicates that the main power switch is ON and that the system is receiving power. This switch is located in the rear of the Bar Code Reader Module. When necessary, it can be put in the OFF position which will shut down the main power supply.

### 342.2 Display Monitor

The Display Monitor (Exhibit 342.1) is located just above the Operation Panel and consists of a ZIP Code/accept rate display which provides information about the results of the scanning process. The display is interrupted each time the transport is stopped and resumed when the transport is started. The monitor provides several display options:

a. The 5-digit ZIP Codes and the accept rate for all mail which has been processed up to a given point in time. (The accept rate appears after the 10th letter is processed, and continues to change as more mail is processed. The count is interrupted each time the transport is stopped.)

b. The 5-digit ZIP Codes and an accept rate which is recalculated each time 200 mailpieces have been processed. (This accept rate does not

consider previously processed mail. It is based only on the last group of 200 mailpieces.)

c. The 9-digit ZIP Codes.

d. The total number of letters processed and the accept rate. (Again, these counts are interrupted each time the transport is stopped.)

**.21 Display Options.** Option (a) is displayed automatically. The other option is selected via the keyboard of the System Controller. To select option (b), press the HTAB key then the "B" key.

**.22 Display Messages.** During the Recognition process, if part or all of the ZIP Code is unreadable, the Display Monitor will indicate the source of the problem as follows:

a. If there is a single unrecognizable digit in the ZIP, a dash (-) will be displayed at the position of that digit.

b. If the prescanner is unable to find the address block, 5 (Ls) will be displayed; e.g., LLLLL.

c. If the Main Scanning System is unable to determine the ZIP Code, 5 (Ps) will be displayed; e.g., PPPPP.

d. If there is a sequencing problem, (transfer of information from one subsystem of the Recognition process to another), 4 (Hs) will be displayed, followed by a number; e.g., HHHH1.

### 342.3 Status Panel

The Status Panel (Exhibit 342.3) is located at the back of the feeder module just above the transport belts. It provides audible and visible indications about the ready status or alarm conditions of the Transport and Logic Sections. It also indicates the amount of time that the belts have been running. There are three groups of lights on the panel. The lights on the left would be on before processing began and would indicate that part of the OCR was in a nonoperational mode. If any of these lamps are lit, the mail processor should notify the Supervisor. The lights in the middle section indicate conditions which occur during processing. These are conditions to which the mail processor can respond. The lights on the right-hand side indicate faults in the power

system, main scanner, or printer. These are conditions to which maintenance personnel must respond.

A. Indicators on the left side of the Status Panel.

1. The WARMING UP light indicates that the main power switch has been on for less than three minutes, and that the system is still warming up. The Transport cannot be operated while this light is on.
2. The MAINT EOCR light indicates that the test switch on the System Controller is ON, thereby disabling all communication between the Transport and Logic Sections.
3. The MAINT ETR light indicates that the mode switch on the Transport Control Unit has been turned to one of the test modes. The system will operate if this light is on, but processing may not occur in a fashion suitable for use with live mail.
4. The SAFETY light indicates that one or more of the safety switches on the transport is in the SAFETY position, thereby making the transport inoperable.

B. Alarm indicators in the center of the Status Panel.

All of the following alarms require action by the mail processor. The VERIFIER and OCR alarms may require calling the supervisor if the mail processor's steps are unsuccessful.

1. The EM STOP light indicates that an EMERGENCY STOP switch has been pushed. The system should not be restarted until the cause of the EMERGENCY STOP switch being hit has been determined. The Emergency Stop switch is reset by pulling it straight up.
2. The STACKER FULL light indicates that a stacker has been filled to capacity. The location of the filled stacker is indicated by a light at the front of the appropriate stacker module. During a stacker-full condition, the feeding mechanism is inhibited and no mail can be fed until the condition is corrected by removing some mail from the full stacker, or by moving

the back plate. When the stacker is 3/4 full, an audible alarm will sound and the light at the front of the appropriate stacker module will come on. The STACKER FULL light on the Status Panel will not be lit and letter feeding will continue.

3. The LB light indicates that a light beam is blocked or malfunctioning when the system is started. The light beam test-checks the system for misaligned or burned out sensors. The location of the problem is indicated by a light on the diagram at the bottom of the panel. The transport will not operate until the problem has been corrected.
4. The VERIFIER light indicates that there have been 10 consecutive instances in which the bar code printed on the letter did not match the bar code format sent to the printer. Since verification is performed only when the system is in OCR mode and only when the VERIFIER switch is on, this alarm will light only under those conditions.
5. The OCR light indicates a malfunction in the Logic Section. Call maintenance.
6. The JAM light indicates that a jam has occurred along the transport.

C. Alarm indicators on the right-hand side of the Status Panel. All of these indicators require maintenance assistance before a restart is attempted.

1. The MS light indicates a malfunction in the Main Scanner.
2. The PRT light indicates a malfunction in the Printer.
3. The TEMP light indicates that the temperature inside the DC power supplier or in the Transport Control Unit has gone above a safe level.
4. The AC/DC light indicates a malfunction in the power supply.

D. Other Indicators on the Status Panel.

1. the HOUR meter indicates the number of hours the belts have been running. The meter can not be reset.

2. The transport diagram features lights which indicate the blockage of a light beam along the transport.

3. The alarm annunciator sounds an intermittent "beep" when an alarm is detected. It accompanies a visible indication on the Status Panel and can be silenced by pressing the ALARM STOP switch on (a) the Operation Panel or (b) the Alarm Panel.

### 342.4 Counter Panel

The Counter Panel (Exhibit 342.4) is located behind the third door from the end of the Feeder Module just above the main DC power supply. The panel displays the number of letters accepted and rejected and the total input into the system. The total input will equal the total of accepts plus rejects. Neither the reject counter nor the total input counter include letters sent to the Mechanical Reject stacker through use of the CLEAR switch. The counts for the Counter Panel are unaffected by turning off the main power or stopping and restarting the machine. The counts can only be reset manually. The supervisor can use these counts (and reset them) to help in completing reports on mail processed, as long as the counts are recorded on a regular basis. The Panel may be used as a backup to the report generated at the end of the run.

### 343 INK JET PRINTER UNIT INDICATORS

The operating control indicators for the Ink Jet Printer (IJP) Unit front door are shown in Exhibit 343. A functional description of each indicator follows:

CONTROL INDICATOR	FUNCTION
(1) Power On indicator (white)	Indicates that AC power is being applied.
(2) Service Request Ink Low	A. Steady Light (ink low). Indicates a low ink supply. Approximately 30 minutes of printing time is available. The ink supply should be replenished as soon as possible. If the ink runs out, the system will have to be bled before filling with ink. This would result in unnecessary down time. B. Flashing Light (service request). Signifies an IJP system fault condition. Call maintenance.
(3) Printer Ready indicator (green)	Indicates that the printer is ready to print.

### 344 STACKER UNIT INDICATORS AND ALARM LAMPS

On each module there are two lamps (See Exhibit 344) that, when lit, indicate a problem is present in one or more of the stackers in that particular module.

#### 344.1 Jam Alarm Indicators

The red Jam Alarm Indicator Lamps are mounted on the top cover of each stacker module and indicate the general location of a jam. These lamps aid the sweeper in quickly locating the area in which the jam has occurred. See Exhibit 344.

#### 344.2 Stacker Full Indicators

The Stacker Full lights are located on the front of each Stacker module and light when a stacker in the module is 3/4 full. The light remains lit until the mail is removed from the stacker or the back plate is moved forward. If the stacker is allowed to become full, an alarm condition will occur as follows:

- The Stacker Full Light on the Status Panel will become lit.
- The annunciator on the Status Panel will "beep."
- The Feeder will stop feeding.

Mailpieces that are already in the transport path, including those assigned to the full stacker, will be sorted correctly.

### 345 TRANSPORT CONTROL UNIT

The Transport Control Unit is located behind the doors of the Bar Code Reader module. It contains two switches (a Mode switch and a Verifier switch) which are used to determine how the system will process mail. See Exhibit 345.

#### 345.1 Mode Switch

The Mode Switch is used to select an operation or test mode. The operation modes are selected by the supervisor according to the type of mail which is to be processed. The test modes are selected by the maintenance technician and are used to check the operation of the scanners, the printer, the sorting

system, or the alarm system. The mode selections are:

**A. OPERATION MODES:**

1. **OCR Mode:** Address information is read and a ZIP Code determination is made. If there is already a bar code on the envelope (or noise in the bar code area), no bar code will be sprayed. If the bar code area is clean, the printer sprays a bar code in the lower right corner of the mailpiece. The letter is then sorted in accordance with a supervisor-selected sortation program.

2. **BAR CODE MODE:** The Prescanner, Main Scanner, and IJP do not operate. Letters are sorted on the basis of the bar code printed on the letter. Mail without a preprinted bar code would be sent to the Read Reject Stacker. This mode converts the OCR into a BCS and would not normally be used.

**B. TEST MODES:**

1. **OCR MODE:** This mode is used by technicians to isolate the source of problems in the OCR. Address information is read and a ZIP Code determination is made, but the printer is inhibited. Letters are sorted on the basis of the OCR read results.

**NOTE:** If there are problems during the OCR Test Mode, the problem may be in one of the processing functions (prescanning or main scanning). If there are problems in OCR OPERATION MODE but not in OCR TEST MODE, the printer may be the source of the problem.

2. **TR MODE:** This mode is used by technicians to check the gating action of each stacker. The scanners and the printer do not operate. As the test letters reach the stacker modules, the diverters are activated sequentially, thus sending one letter into each stacker.

3. **PRINTER MODE:** This mode is used by technicians to check the IJP. Internally generated bar codes are printed on test letters. The letters are sorted sequentially in the

stackers. **NOTE:** This mode should not be used with live mail.

4. **ALARM MODE:** This mode is used to check the lights on the Alarm Indicators and the annunciator.

**345.2 Verifier Switch**

The Verifier Switch is a 2-position switch which only affects the processing of mail that has been bar coded during the present run on the OCR of which it is a part. When the Verifier Switch is ON, the printed bar code is read by the Bar Code Reader and checked against the ZIP Code sent to the printer. If the two codes match, the letter is sorted. If the two do not match, the letter is sent to the Read Reject Stacker. When the Verifier Switch is OFF, the letter is simply sorted based on the OCR read, the bar code is not verified. Since a non-verified bar code may become a reject or missort on the BCS, the normal Verifier Switch position is ON.

**346 INTERLOCK SWITCH**

The Interlock Switch Indicator Lamps are mounted on each module to indicate whether or not the guard covers are secure. If not, the yellow lamp will light and the transport will not start until the cover has been completely closed. The Interlock Switch Alarm is the only alarm which does not have a corresponding indicator lamp on the Status Panel. See Exhibit 346.

**347 EMERGENCY STOP SWITCHES**

The Emergency Stop Switches are located at close intervals throughout the entire transport, and are activated by pressing down on the red button. The switches are to be used whenever a problem or potential problem occurs; i.e.:

- a. Danger to a person — either the feeder or the sweeper may activate the switch.
- b. Damage to the mail — the transport has not stopped when a jam has occurred, and letters are being damaged.
- c. Damage to the machine — the machine should be stopped if it is not running in a normal manner.

The Emergency Stop Switches lock automatically, and the machine cannot be restarted until the switches are reset. This is accomplished by determining the cause of the shut down, taking the necessary corrective action, ensuring that all personnel are clear of the equipment, and lifting the red button to reset the Emergency Stop Switches.

### 350 REJECT STACKERS

The Burroughs OCR has two reject stackers which receive mailpieces that have been rejected by the system because of nonreadability of the piece or malfunctions of the equipment. These stackers are commonly referred to as the Read Reject Stacker and the Mechanical Reject Stacker.

#### 351 READ REJECT STACKER (STACKER #1)

This stacker will receive READ REJECTS AND VERIFIER REJECTS. Read Rejects are mailpieces that the OCR cannot read and sort due to misprinted or smeared bar codes and the failure of the system to make a ZIP Code determination. (See section 362 on OCR Readability.) Verifier Rejects are mailpieces on which the bar code did not match the information sent to the printer. The monitoring of mail received in this stacker is a key element of the supervisor's job and must be given the proper attention. High reject rates result in lower accept rates for the equipment and in excessive rehandling of this mail. Mail from Stacker #1 will not be recycled through the OCR in most cases, but will be taken to MPLSM area for processing.

#### 352 MECHANICAL REJECT STACKER (Last Stacker)

This stacker will receive unprogrammed ZIP Codes (if not directed to a residue stacker), jam rejects, and mail which bypasses accept stackers due to malfunctioning diverters and transport belt problems. Mail from the last stacker will be recycled at predetermined intervals or at the end of the run. This mail must be recycled separately from all other mail, and that which is rejected a second time must be taken to MPLSMs for processing.

NOTE: To ensure the proper calculations regarding productivity, throughput, volume, MOD flows, etc.,

for the office, day, hour, and/or operation, it is important to adjust the volume figures associated with the rejected, recycled mailpieces. The MOD Methods Handbook (M-32) should be reviewed and strictly adhered to when formulating the data before and during calculations.

### 360 OCR MACHINABLE AND READABLE MAIL

In order to maximize the use of the automated equipment, it is necessary to understand the various elements which make a mailpiece readable and machinable. The various elements will be discussed in the following paragraphs. For additional information on addressing requirements, refer to:

- a. Publication 25, A Guide to Business Mail Preparation.
- b. Publication 12, Preparing Business and Courtesy Reply Mail.
- c. Notice 221, Addressing for Automation.

### 361 MACHINABLE MAIL

#### 361.1 Dimensions

The Burroughs OCR will accept mail with the following dimensions:

	HEIGHT	LENGTH	THICKNESS
MAXIMUM:	6-1/8"	10-3/8"	1/4"
MINIMUM:	5-1/2"	5-1/2"	0.007"

NOTE: The Letter-Size Mail Dimensional Standards Template, Notice 3A, is available for determining the machinability of mailpieces. Also, mail containing keys, pens, stiff, or other bulky objects should not be fed through the automated equipment.

#### 361.2 Envelope Construction — OCR Machinability

A mailpiece can be a window envelope, a regular envelope, or a postcard. Following are design and construction elements of a mailpiece to be considered with regard to OCR machinability of the piece:

## a. Stock

(1) Envelopes made of materials such as spun olefin and certain recycled paper, at present, cannot be processed on the OCR because the bar codes do not print clearly on these materials.

(2) Textured paper and paper containing dark fibers may cause interference in the optical character reading units of the equipment.

(3) Stiffness of the mailpiece should be such as to allow for reasonable handling. (See Pub. 25.)

(4) Opacity should be such as to make the envelope impervious to the passage of light, especially in the OCR read area of the mailpieces. This would prevent nonaddress printing on envelope inserts and envelopes' inner walls from being read as part of the address information.

b. Window Envelopes. In addition to meeting the standard dimension requirements, the following factors also apply to the acceptability of a window envelope:

(1) The window must be large enough that the address shown on the insert is entirely visible through the window. A clearance of at least 1/8" to 1/4" between the bottom line and sides of the address block and the bottom and side edges of the window must be present, even if the insert shifts position inside the envelope.

(2) The window should not encroach the bar code zone of the envelope.

(3) Envelope windows should be covered with a clear or translucent material which is free of wrinkles, streaks, excessive glare, or other conditions which might obscure the address.

(4) If open windows are used, the opening size should be kept to a minimum. The 1/8" to 1/4" clearance between the window edges and address block must be maintained.

Readability of mailpieces can often be determined, before the mail is loaded into the OCR, by analysis of the pieces to see if any of the following conditions exist. If any one of these conditions is present on the mailpiece, it may not be OCR readable. This same analysis procedure should be used on mailpieces deposited into the Read Reject Stacker. (Reference: Publication 25 and Notice 221.)

- a. Handwritten address present.
- b. Script-like, italic, artistic, or cyrillic fonts are used.
- c. Poor print quality. Print is very light, fuzzy, smudged.
- d. Print color is red or orange or reverse color printing is used (light characters on a dark background).
- e. Very bold, thick, or thin style type used.
- f. Address located outside OCR scan zone.
- g. Mailpiece is misfaced (smiles, frowns, upside downs).
- h. The envelope is dark blue or green in color. This causes lack of contrast between the envelope and the printing on it.
- i. Address is imprinted on safety paper or over ornamental designs.
- j. Logo or other nonaddress information present in the OCR scan zone.
- k. The envelope is a "see-through" type, and information on the envelope contents shows through the face of the envelope.
- l. The address is not properly placed within the window of a window envelope.
- m. The address is misspelled and the local directory has not been updated to accommodate the common spelling errors.
- n. The printed ZIP Code is not a five- or nine-digit ZIP Code.
- o. The printed characters of the city, state, ZIP Code line touch each other or there is an underline that connects the separate characters.
- p. Address line is skewed more than 5 degrees

## 362 OCR READABILITY

clockwise or counterclockwise.

- g. The address line is more than 32 characters.
- r. Large or extra characters exist between the city name and state name or between state name and ZIP Code.
- s. The ZIP Code is located too close to the last character in the state name; two to five character spaces is the acceptable spacing.
- t. The ZIP Code is located too far from the last character in the state name (i.e., greater than five character spaces).
- u. The state name and ZIP Code is located too far from the city name (i.e., greater than two character spaces).
- v. The character height is too small (less than .08 inch) or very large (greater than .2 inch).
- w. The character pitch is outside the range of seven to twelve characters per inch.
- x. The character height-to-width ratio is outside the range 1.1:1 to 1.7:1.
- y. The spacing between the address lines is too small or the number of lines per inch is greater than eight.

### 363 ADDRESS BLOCK — OCR READ AREA (Exhibit 363)

To ensure that the OCR reads the mailing address, and not the return address or information on the mailpiece not pertaining to the mailing address, an OCR Read Area has been identified. The OCR Read Area is an imaginary rectangle on the front of the mailpiece in which the entire mailing address is contained. The boundaries of the OCR Read Area are as follows:

- a. Sides of Rectangle — 1 inch from left and right edges of the mailpiece.
- b. Bottom of Rectangle — 5/8 inch from the bottom edge of the mailpiece.
- c. Top of Rectangle — 2-1/4 inches from bottom edge of the mailpiece.

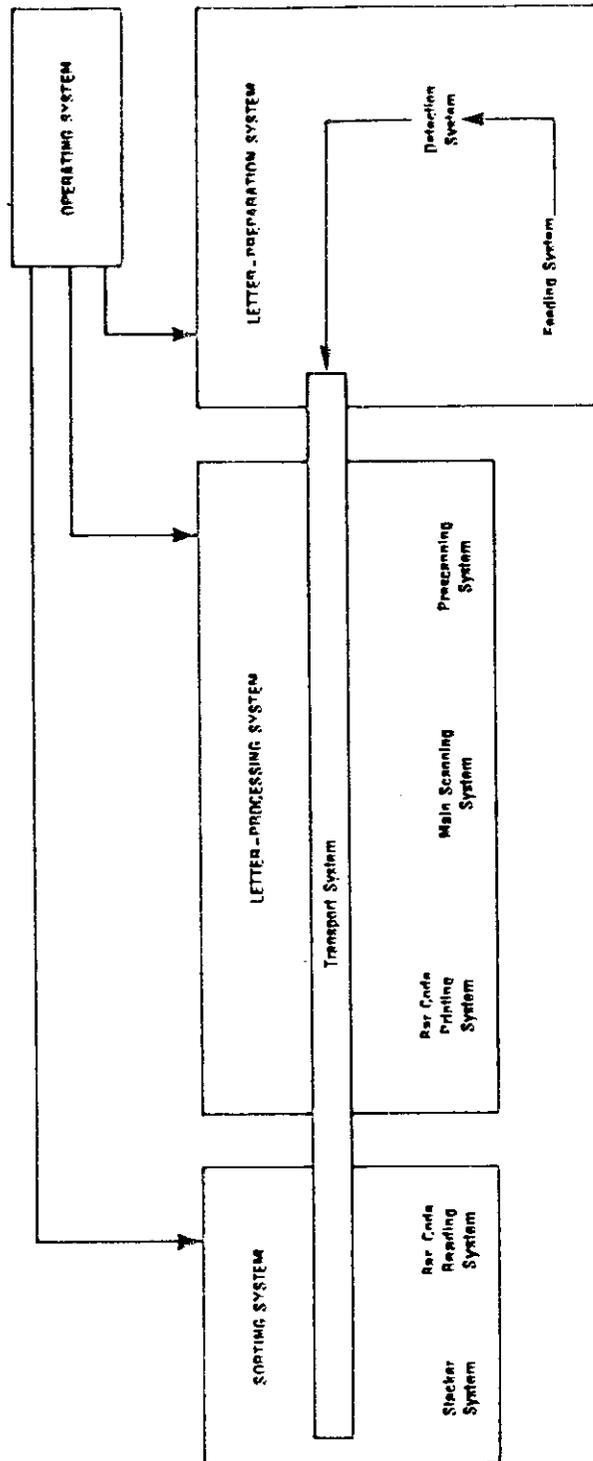


EXHIBIT 320 — FUNCTIONAL BLOCK DIAGRAM OF OCR/CS

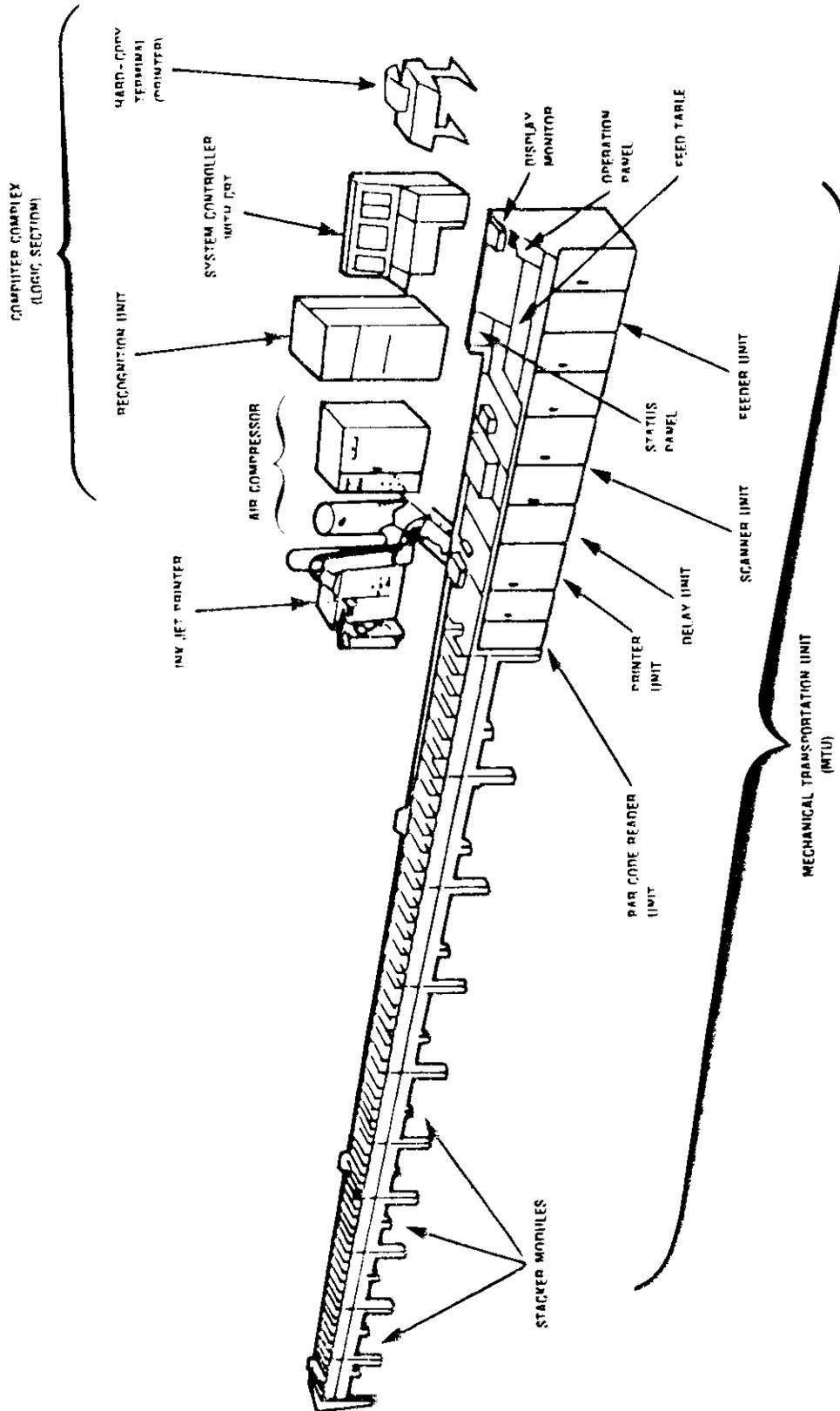


EXHIBIT 330 — BURROUGHS OPTICAL CHARACTER READER (OCR)

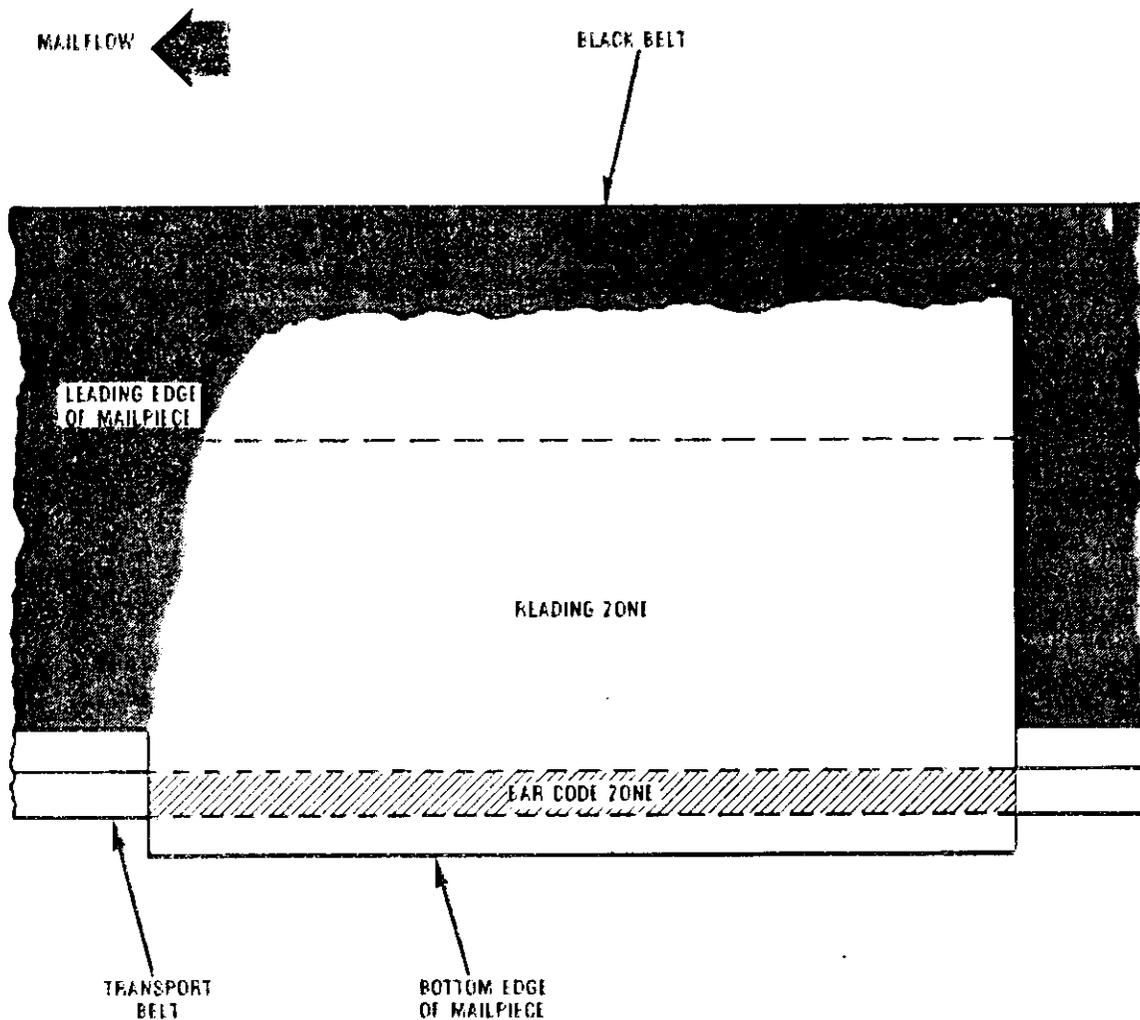


EXHIBIT 332.2 — SCAN ZONE

OCR READS "X" DIGITS OF ZIP	OCR READS CITY/STATE	DIRECTORY LOOK UP AGREES?	IJP ACTION
X = NONE	No	Not Applicable	None
	Yes	Not Applicable	A
X = First 3	No	Not Applicable	None
	Yes	No	A
		Yes	A
X = First 5	No	Not Applicable	B
	Yes	No	A
		Yes (or not found in directory)	B
X = 9	No	Not Applicable	B
	Yes	No	A
		Yes (or not found in directory)	B

A: Use Directory Information to:

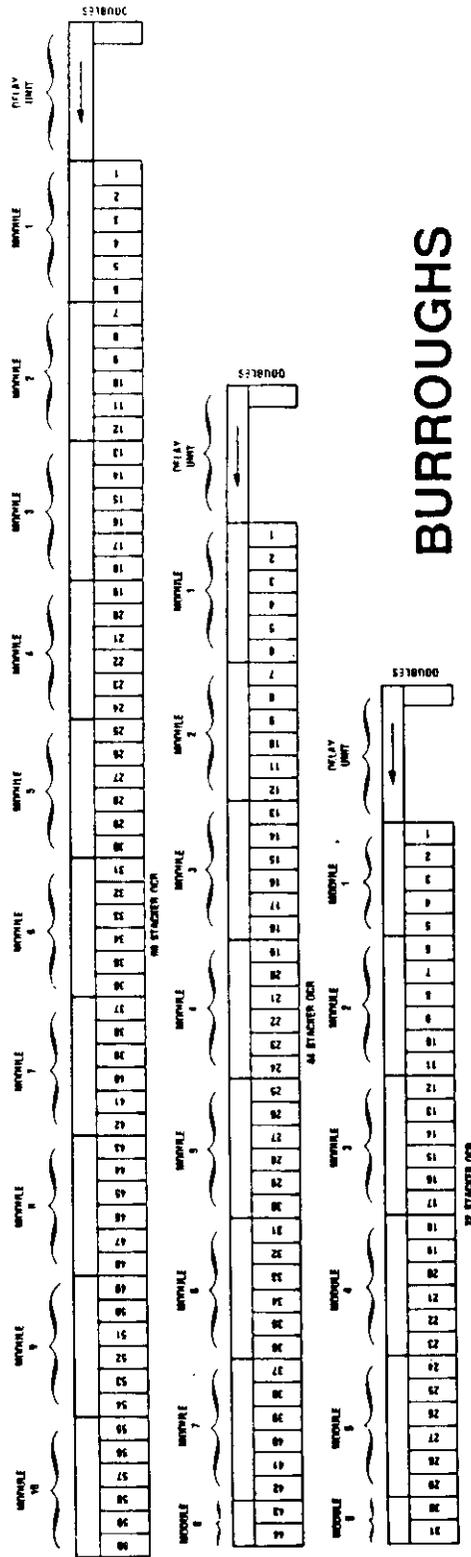
B. Print Numeric Read

Print 5 if SZO  
Print Default if MZO

SZO = Single-ZIP Office  
MZO = Multi-ZIP Office

Default: Print first 3 plus specified last 2 digits — If last 2 digits are not specified, print 00.

EXHIBIT 332.4 — BAR CODE SPRAY DECISION TABLE



# BURROUGHS

EXHIBIT 332.6 — OCR SWEEPSIDE DIAGRAM

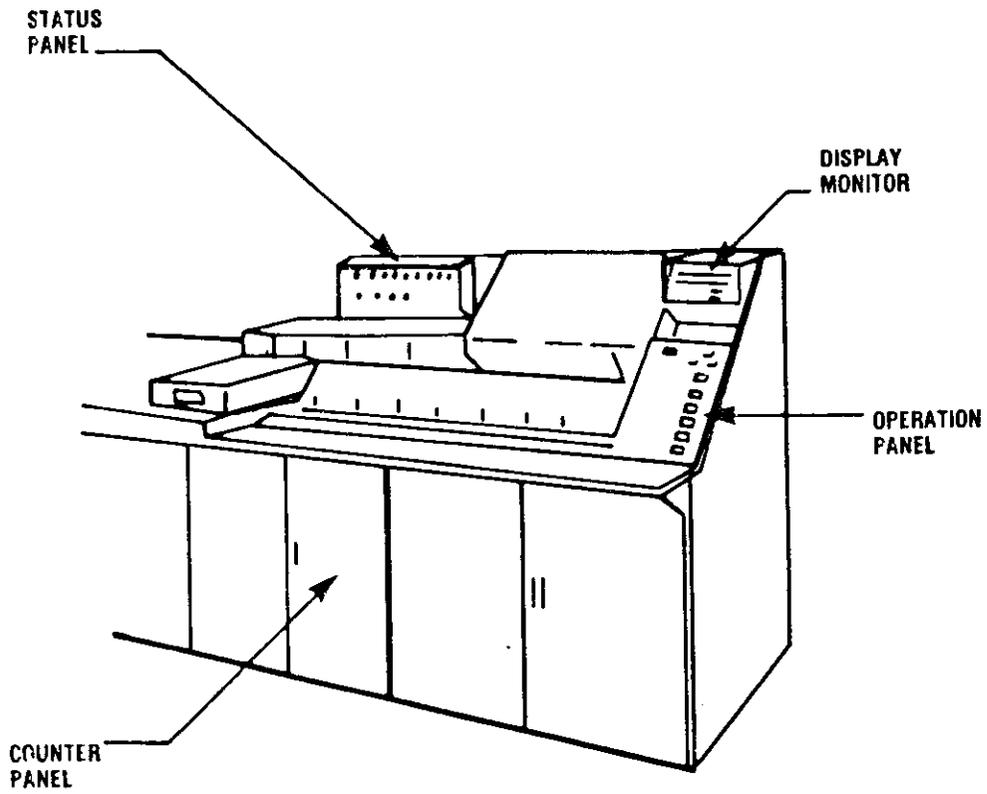


EXHIBIT 342 — FEEDER UNIT CONTROLS AND INDICATORS

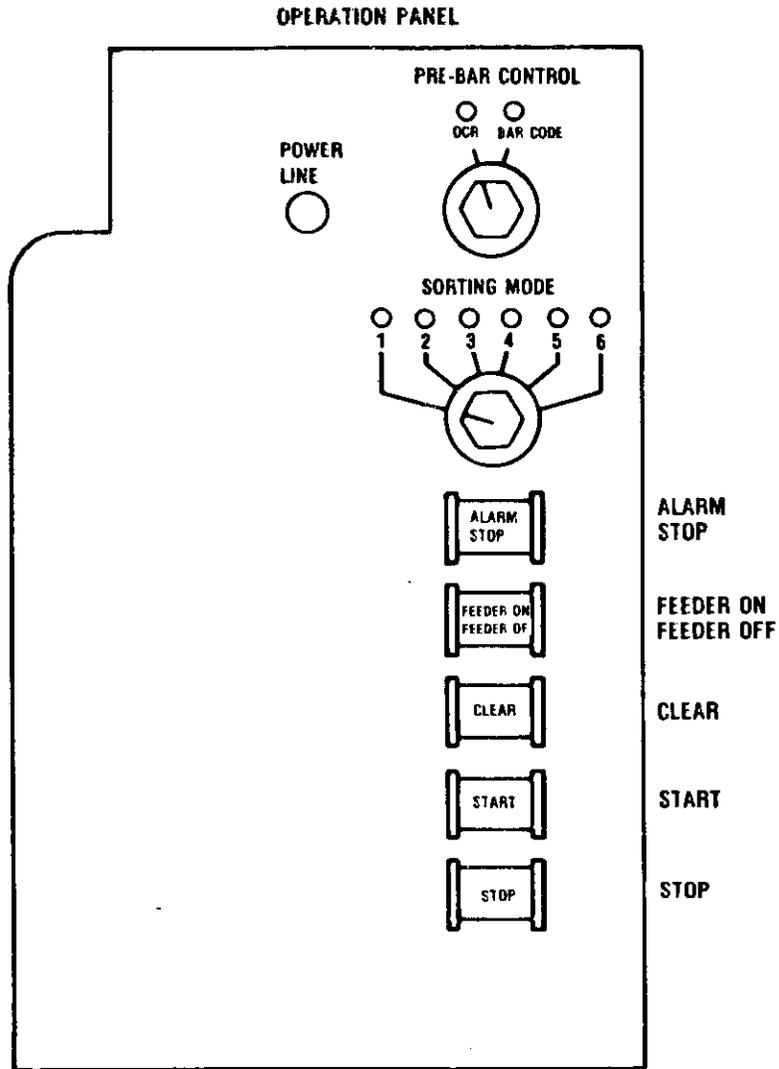


EXHIBIT 342.1 — OPERATION PANEL AND DISPLAY MONITOR

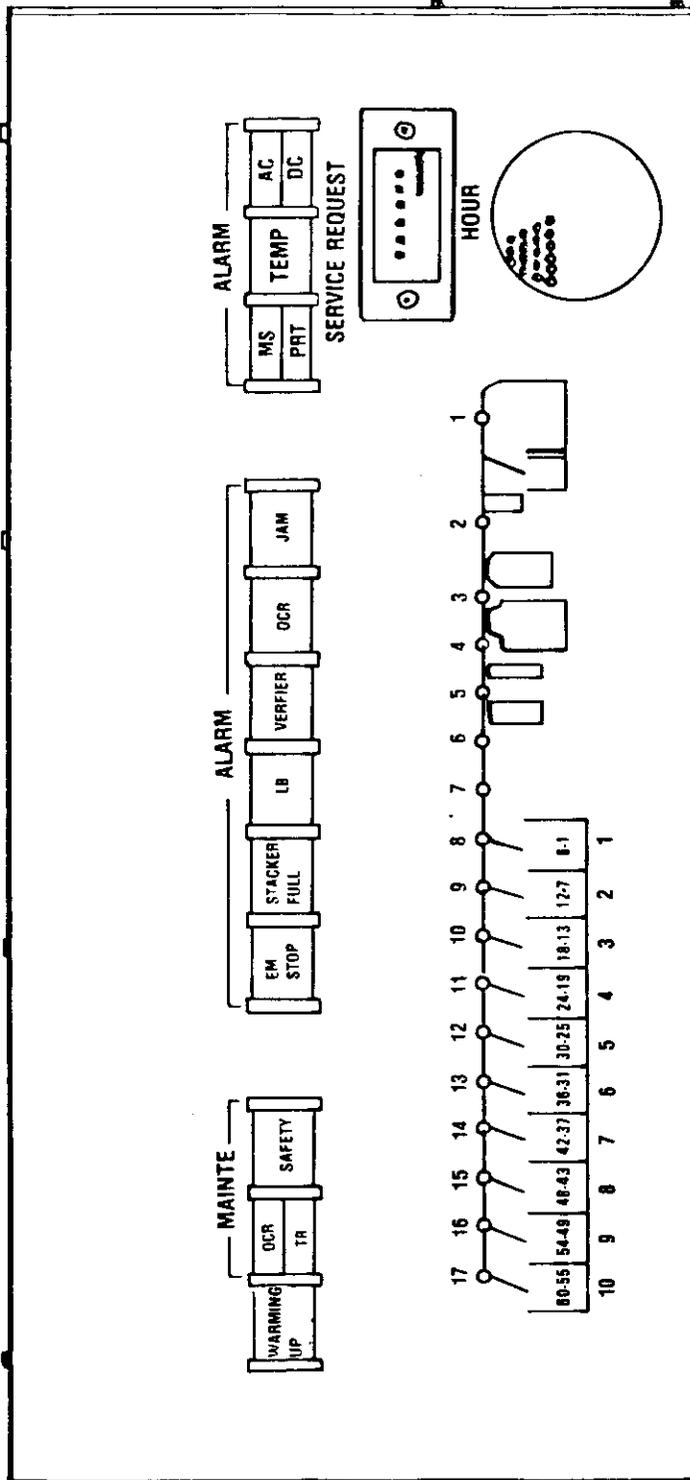


EXHIBIT 342.3 — STATUS PANEL

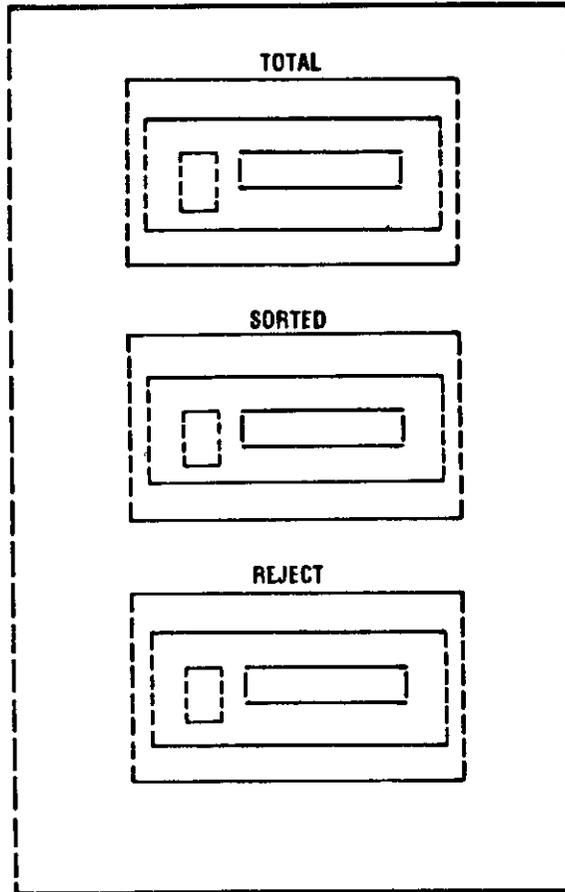


EXHIBIT 342.4 — COUNTER PANEL

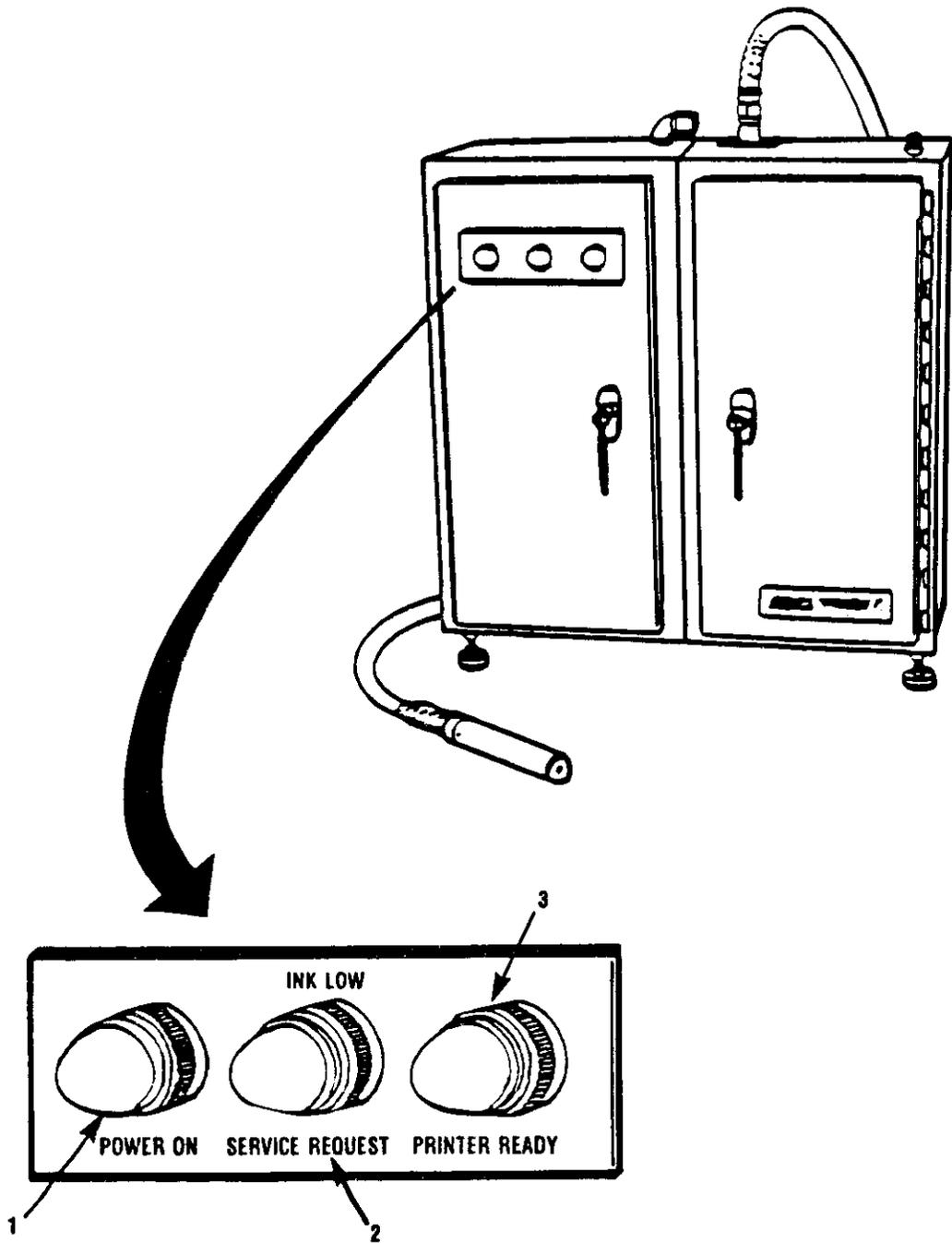


EXHIBIT 343 — INK JET PRINTER FRONT DOOR CONTROL INDICATORS

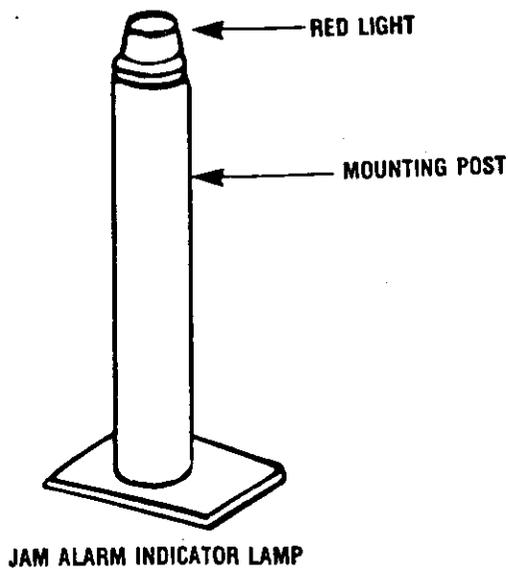
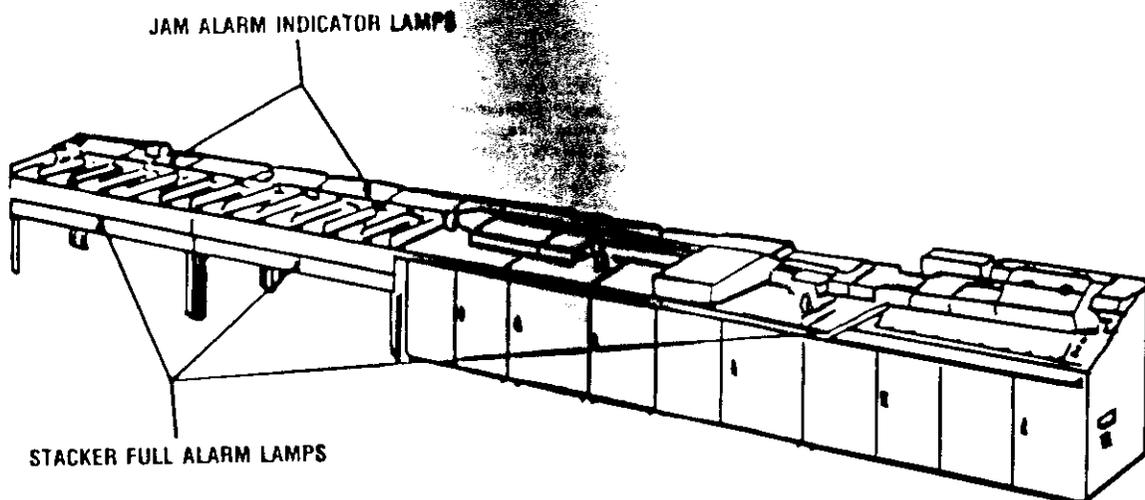
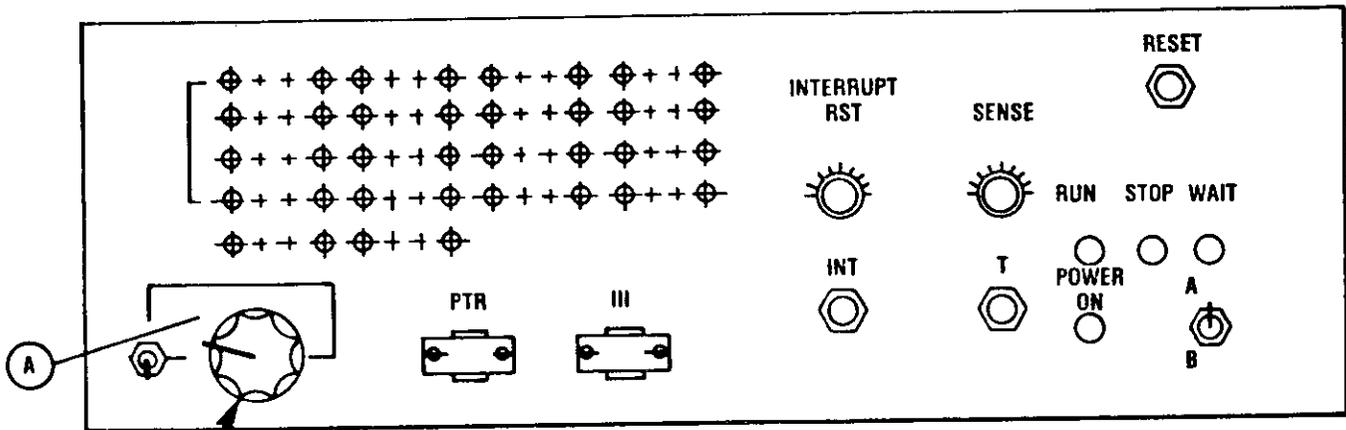
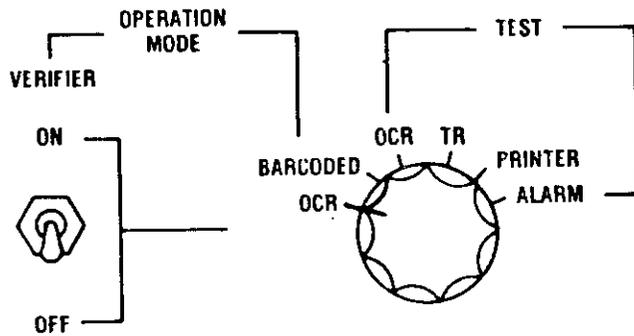


EXHIBIT 344 — STACKER UNIT INDICATORS



Rotary Switch



Detail of (A)

EXHIBIT 345 — TRANSPORT CONTROL UNIT

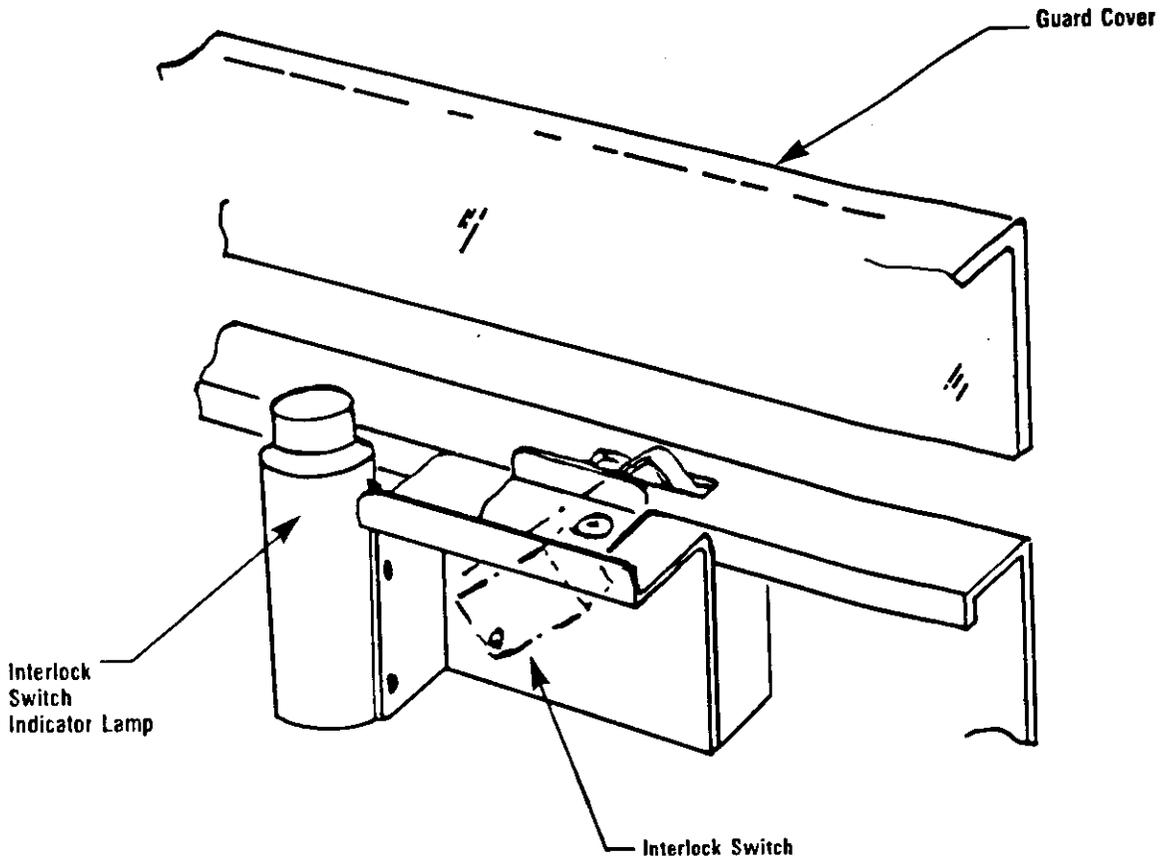
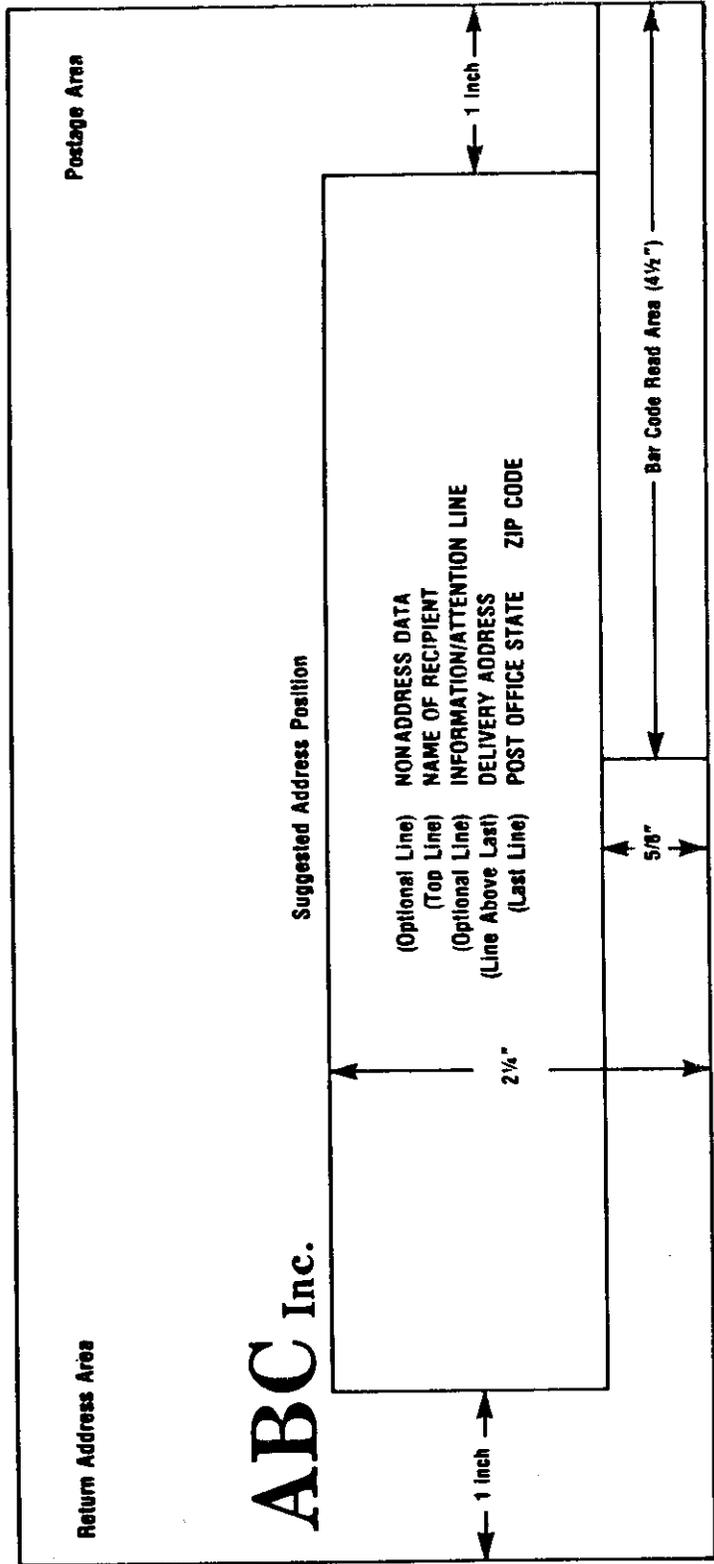


EXHIBIT 346 — INTERLOCK SWITCH



Last Line of Address Must be Completely Within White OCR Read Area

EXHIBIT 363 — ADDRESS BLOCK — OCR READ AREA

## CHAPTER 4

### DUTIES AND RESPONSIBILITIES

#### 410 PROCEDURES

#### 420 SUPERVISOR

Supervisors responsible for the efficient operation of automated equipment will use approved mail-processing criteria and operating procedures to obtain maximum productivity and maximum 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 be run, startup time, etc.).
- e. Check for availability of mail processors and support personnel and issue assignments.
- f. Make certain all necessary forms are completed during equipment operation and reports available from the automation computers are requested at the end of run.
- g. Ensure that necessary support equipment and labels are available at all times.
- h. Maintain a continuous, smooth mailflow into and out of the operation, paying particular attention to make sure that:
  - (1) Mail coming into the automated area is machinable, readable, and correct for the sort program being used.
  - (2) Processed mail going out of the area is properly trayed and labeled.

(3) Machinable rejects are flowed to the LSM area and the nonmachinable culls are continually sent to manual operations.

(4) A continuous flow of OCR-processed mail is maintained to the Bar Code Sorter.

- i. Observe mail processors and support personnel in the performance of their duties, and provide instruction and on-the-job training when needed.
- j. Make periodic stacker checks to ensure that the automated equipment is performing quality sortations and that the bar codes being sprayed on the mailpieces are clear, not smudged, and meet the specifications set forth in Chapter 240.
- k. Analyze computer reports and video screen (CRT) information as required.
- l. Inform maintenance about problem areas on the automated equipment which need diagnostic and corrective action.
- m. Inform immediate supervisor of any unusual situations or difficulties which might occur, and make suggestions for solving these problems.
- n. Use necessary means to analyze mail in the Read Reject Stacker, and complete necessary forms and reports on readability.

#### 430 MAIL PROCESSOR

The mail processor performs a variety of tasks required to process mail using automated equipment. The mail processor will report to the supervisor responsible for the operation and will have the following duties and responsibilities:

- a. Starting and stopping the equipment.
- b. Culling out nonprocessable items.
- c. Loading mail on the transport unit for induction into the distribution system.
- d. Clearing jams not requiring the use of hand tools.

- e. Sweeping mail from stackers, bins, separations, or runouts; rubberbanding or tying bundles as necessary; placing mail into trays, carts, racks, pouches, etc.
- f. Notifying supervisor or maintenance when malfunctions or unsafe conditions occur.
- g. Performing other job-related tasks in support of primary duties.

## CHAPTER 5

# OPERATING INSTRUCTIONS

### 510 INTRODUCTION

There are three basic operational situations which can occur when mail is processed on the automated equipment: (a) Normal Operations, (b) Alarm Conditions, and (c) Abnormal Operations. This chapter will address these three situations, the philosophy and methods necessary to operate the automated equipment effectively, and the necessary information to isolate and react to malfunctions which might occur during operation.

### 520 OPERATING PROCEDURES

#### 521 NORMAL OPERATIONS

The OCR/CS is in normal operation when smooth, problem-free sorting of mail is being accomplished.

#### 522 PRESTARTUP PROCEDURES

Prior to starting the OCR operation, there are various steps that must be taken:

##### 522.1 Supervisor

The supervisor must ensure that:

- a. Sufficient mail volume is available and properly prepared for processing on the automated equipment.
- b. All support equipment such as tray racks, MMP trays, plastic trays, and containers for tie-out bundles are available, in place, and ready for safe use.
- c. Support personnel and adequate space are available to safely stage mail coming into the operation without blocking aisles.
- d. Support equipment and personnel are available to remove processed mail from the automated area to dispatch area or further processing areas.
- e. Maintenance is informed of the startup time, type of mail to be processed, and the sort pro-

gram to be used.

- f. Feeder Unit table and mail transport belts have been checked for mailpieces remaining from previous run.
- g. Mail has been loaded into the Feeder Unit table.
- h. None of the alarm indicators on the Status Panel are lit.
- i. The Operation Mode Switch on the Transport Control Unit is set on OCR or BARCODED depending on the type of mail to be processed. See section 345.1 and Exhibit 345. If the OCR Operation Mode is selected, the Verifier Switch should be in the "ON" position.
- j. The Sorting Mode selector switch on the Operation Panel is set to the proper sort program for the mail being run.
- k. The appropriate position for the PREBAR CONTROL switch on the Operation Panel is selected.
- l. All safety devices are operable and engaged, that the startup alarm is sounded, and all employees are clear of moving machine parts prior to starting.

##### 522.2 Maintenance Personnel

The maintenance personnel should do the following:

- a. Check to ensure the OCR equipment is free of dirt and dust and ready for safe operation.
- b. Check the area surrounding the OCR for safety hazards and cleanliness.
- c. Ensure that all personnel are clear of the equipment, then turn on the Main Power switch located at the rear of the Bar Code Reader Module.

NOTE: When the Main Power Switch is turned on, the POWER LINE indicator and the STOP

switch on the Operation Panel will light. The WARMING UP light on the Status Panel will also light and, after 3 minutes, will go out. There should be no audible alarms. No other lights on the Status Panel or the Interlock switch indicators should be lit.

d. Check the operation of the scanners, IJP, and transport unit. The OCR system should have a 30-minute warming up period prior to operation. The system can operate immediately after the end of the 3-minute warming up period, but an additional 30-minute period will ensure that the IJP has stabilized.

### 523 STARTUP PROCEDURES

During the normal startup process, these steps are to be followed:

- a. Check that all mail transport belt protective covers are closed.
- b. Check all controls and indicators on the Feeder Module (Exhibits 342, 342.1, and 342.3) to ensure there are no alarm lights on.
- c. Check the front door of the IJP (see Exhibit 343) to ensure the green PRINTER READY light is in the "ON" position.
- d. Check to see that the Feed Table (See Exhibit 523) has been properly loaded with mail. This includes:
  - (1) Check orientation of the mail. The mail should be placed between the feeder forks, with the destination address facing away from the suction belt and the stamp end of the envelope resting on the bottom edge of the input stacker. The stamp should be to the outside edge. The return address end of the envelope will enter the belt system first.
  - (2) Check to see that the spaces between each set of forks are not overfilled. This space should be filled to about 80% capacity.
  - (3) Check for letters which are bent, thick, folded, stiff, inclined, lifted, or cross-forked.
- e. Check to see that all personnel are clear of the equipment prior to actual startup.

f. Press the START button on the Operation Panel. The warning alarm will sound for 3 seconds. The STOP switch light will go out. The START switch will light up. The drive motors will start.

g. Press the FEEDER ON Switch on the Operation Panel. Operation of the pickoff device and fork-feed mechanism will be initiated. The switch itself will light up in blue.

h. Monitor the feeding mechanism until a few mailpieces have entered the transport path, to ensure that it is performing smoothly.

### 524 RUN PROCEDURES

The following are the run procedures for the OCR:

- a. Keep Feeder Unit accepting mail in a smooth continuous manner.
- b. The control and indicators on the Feeder Unit must be monitored to ensure awareness of changes in the running status of the equipment.
- c. The Feeder Unit will accept approximately one tray of mail per minute and, therefore, the feed station must be continually monitored.
- d. The stackers must be swept continually to keep the equipment operating smoothly. There are two methods of sweeping:
  - (1) Lift separator plate with left hand while supporting mail with the right hand. Insert separator plate between mailpieces closer to stacker entrance. Remove mail from stacker with both hands. When MTU is running, always leave 2" of mail in the stacker.
  - (2) Remove a handful of mail with the left hand while keeping pressure on the separator with the right hand.

**CAUTION:** Do not allow separator to drop. This may cause injury to hand or fingers. All employees must be properly instructed in the acceptable safe sweeping methods prior to operating this equipment.
- e. Swept mail will be placed into trays.

- f. Place filled trays on dispatch equipment.
- g. Check contents of the Doubles Stacker often to determine if the Detection System is operating properly and if the mail is being culled and loaded efficiently.
- h. Check sort stackers periodically to determine if the proper sortation is taking place and if the bar code sprayed is complete, properly placed, and not smeared.
- i. Monitor transport path to detect the presence of dirt and debris buildup and take appropriate action.

### 525 TURNOFF PROCEDURES

- a. Monitor the mail on the feed table to ensure that the remaining mail is being fed properly.
- b. Press STOP switch on the Operation Panel.
- c. Notify maintenance that turnoff procedures have started.
- d. Request maintenance personnel to obtain the hard copy of the Performance Reports from the computer complex.
- e. Ensure that all mail from the complete run has been swept into the appropriate dispatch equipment.
- f. Check the Feeder Unit and MTU to make sure no mail is left in the OCR after turnoff procedures have been completed.
- g. Complete any necessary paperwork.

### 530 ALARM CONDITIONS

#### 531 DEFINITION

Except in the case of an unsecured belt cover, all alarm conditions will be indicated by an alarm light on the Status Panel, and will result in:

- a. The automatic shutdown of the system.
- b. The sounding of an audible alarm.

To respond to these conditions, first silence the audible alarm by pressing the Alarm Stop switch on the Operation Panel. The audible alarm will stop and the alarm light on the Status Panel will light steadily

rather than blink. If the alarm indicator is in the group of lights on the left, or on the right-hand side of the Status Panel, the problem is one which requires a maintenance technician. For each of these alarms, the mail processor should notify the supervisor immediately. The supervisor should inform the maintenance technician if the warming up light stays on for more than 3-5 minutes, or if any of the following indicator lights are lit:

MAINTO OCR	MAINTO TR	SAFETY
MS	PRT	TEMP
AC/DC		

The supervisor should also inform maintenance if the VERIFIER or OCR alarm occurs more than twice in succession. If the alarm indicator is in the group of lights in the center section of the Status Panel, the problem is one which can be handled by a mail processor. These indicators are discussed in the following sections.

### 532 EMERGENCY STOP ALARM

An Emergency STOP may be defined as those steps taken to prevent injury to personnel or physical damage to the equipment or damage to the mail. Following are instructions concerning OCR shutdown in an emergency and restarting after an emergency shutdown.

#### 532.1 Emergency Shutdown Procedures

Emergency shutdown switches are physically located throughout the MTU. These switches have bright red mushroom-shaped covers which are activated by pushing down on them. At least one emergency shutdown switch is within arm's length anywhere one might stand near the MTU. EMERGENCY switches are located on the Feeder, Scanner, Printer, and Bar Code Reader Units, and there is one (1) switch for each set of six (6) stackers. Pressing an EMERGENCY shutdown switch will immediately shut down the transport path of the MTU. The EM STOP alarm light on the Status Panel will light.

#### 532.2 Restarting After Emergency Shutdown

The following are restart procedures to be used after an emergency shutdown:

- a. Check to ensure that the situation causing need for an emergency shutdown has been cleared and that all personnel are clear of moving parts.
- b. Unlatch any emergency shutdown switch that has been activated. Grasp the switch firmly and pull straight up. This opens the self-locking switch.
- c. Press CLEAR switch on the Operation Panel. This will clear the transport path of mail.
- d. Press START switch on the Operation Panel to restart mail transport system.
- e. Continue to run normally.

### 533 STACKER FULL ALARM

The sweeper will unload some of the mail from the appropriate stacker. Once some of the mail has been removed, the feeder can be signaled to restart the OCR while the sweeper continues to remove the rest of the mail from the stacker.

### 534 LB ALARM

The LB Alarm will occur when the system is being started and will indicate that:

- a. A light beam is blocked.
- b. A light beam is malfunctioning.

Take the following steps to start the system:

- a. Ensure that all personnel are clear of the equipment, and press the CLEAR switch on the Operation Panel to remove any letters remaining in the transport path. All of the lights in the transport diagram at the bottom of the Status Panel should be out. If not, check the area indicated by the light. Remove any item which might be blocking a light beam.
- b. Press the START switch on the Operation Panel. If the system will not start, it may indicate a problem with the light beam unit itself. Notify maintenance personnel.

### 535 VERIFIER ALARM

The feeding mechanism will stop and the FEEDER ON/OFF switch on the Operation Panel will light.

Press this switch twice. Letter feeding should resume. If the alarm occurs again, notify maintenance personnel.

### 536 OCR ALARM

The transport will stop. Ensure that all personnel are clear of the equipment, and press the CLEAR switch to remove any mail remaining in the transport path. Then press the START switch on the Operation Panel. If the transport does not start, or if the same alarm occurs again, notify the supervisor.

### 537 JAM ALARM

The transport will stop and the location of the jam will be indicated by a jam alarm indicator light on the Mechanical Transport Unit (MTU). Engage the Emergency Stop Switch. Carefully remove the jammed mail, readjust the belts if necessary, then signal the feeder to press the CLEAR switch and the START switch on the Operation Panel. The transport will restart.

NOTE: Jams are normally easily recognizable and are easy to clear. Rotate the belts to make removal of jammed mail easier. If any mailpieces are so severely stuck that they may not be easily removed by hand, call maintenance personnel.

### NOTICE

### DO NOT

**FORCIBLY EXTRICATE ANY MAILPIECES**

### 538 INTERLOCK ALARM

This alarm will occur if there are one or more belt covers which are not completely closed. This type of alarm will not be indicated on the Status Panel, but it will prevent starting of the transport. The Interlock Switch light (mounted on each module) will indicate the location of the open belt cover. Once the cover is secured, the indicator light will go out and the transport can be restarted. It is imperative that no safety interlock switch be "tied back" or otherwise disabled for any reason at any time.

## 540 ABNORMAL OPERATIONS

Anytime the flow of mailpieces through the MTU ceases, excluding emergency stops, or the smooth, problem-free sorting of mail is not being accomplished, the OCR is considered to be in the state of Abnormal Operations. These abnormal situations are generally divided into two areas: (1) hardware malfunctions and (2) software stoppages.

### 541 HARDWARE MALFUNCTIONS

Hardware malfunctions are signaled by an illuminated indicator on the Feeder Unit Control Panels, Ink Jet Printer Front Door Control Indicator, or the Stacker Unit Indicators (see Exhibits 342, 343). Also see Chapter 3, section 340, for an explanation of the function of each control and indicator. When the problem causing the malfunction and stoppage of the mail transport belts has been cleared, it will be necessary to follow the instructions in section 543 to restart the run. If it is decided that the run should be discontinued, maintenance personnel should be requested to terminate (exit) the run and generate the end-of-run reports.

### 542 SOFTWARE STOPPAGES

Software stoppages are caused by erroneous information or unexpected data being passed to the Logic Section or too many error situations occurring during the run. They include, but are not limited to, stoppages caused by excessive mail jams, excessive software reloads due to required processing time being too long, photocell signals, and excessive no-sort stacker overflows. Software stoppages will not stop the mail transport belts, but the mailpieces will no longer be fed into the system. If a software stoppage exists, maintenance personnel must be called prior to restarting or resuming the run.

### 543 RESTART

If the mail transport belts have been physically stopped by an abnormal situation, the following sequence of steps should be used to restart the run:

- a. Check to see that the cause of the stoppage has been corrected. Reset Emergency Stop Switch if necessary.

- b. Check to see that all personnel are clear of the equipment prior to startup.

- c. Press the Clear button on the Feeder Unit Operation Panel.

- d. Press the Start button on the Feeder Unit Operation Panel.

- e. Continue to load Feeder Unit feed table.

## 544 OPERATOR MAINTENANCE

Operators should maintain the general cleanliness of the equipment area. Mail jams may be cleared by mail-processing personnel, unless excessive force is required to dislodge mail that is lodged in the transport system or if a hazardous condition would result. If a maintenance procedure requires the opening of the equipment chassis doors (mail transport belt covers excluded) or if tools are required, call maintenance personnel.

## 550 ADDITIONAL OPERATING INSTRUCTIONS

### 551 POLICY GUIDELINES

The following section contains information on policy and areas of concern which must be addressed to ensure that the automated mail-processing system is the priority system for letter mail sortation. Full use of automation can significantly increase mail-processing efficiency and productivity.

### 552 STAFFING

#### 552.1 Supervision

In normal operation and where physical operations permit, a supervisor should be assigned:

1. A maximum of two OCR/CSs.
2. A maximum of three SBSCs, if that is the only equipment assigned.
3. In an installation with one OCR, a supervisor should normally cover one OCR and two SBSCs, if feasible from the standpoint of the equipment arrangement.

### 552.2 Employees

Normal staffing for the Pitney Bowes and Burroughs OCRs (32, 44, and 60 stackers) and the Bell and Howell BCS will be two mail processors to perform the loading, feeding, and sweeping functions. Where limited volume exists for certain sort programs, or during startup or closeout of run, staffing may be reduced. Allied labor assigned to support the OCR/BCS operation will be charged as prescribed in Handbook M-32 (Management Operating Data System).

### 553 MAIL SOURCES

Successful mail-processing operations must fully utilize and exploit the most efficient processing method for the mail type to be processed. This includes automation as a first priority, multiposition letter sorting machines (MPLSM) and other mechanized methods as next priority, and manual methods last. To accomplish this, all mail-processing operations personnel must be trained to identify, select, and prepare the best candidate mail for automated sorting. Opening unit personnel must be instructed in the characteristics of OCR-readable mail so that the best candidate mail is identified and segregated for OCR processing. This identification of OCR-machinable mail applies especially to large-volume mailers. The OCR-machinable identification will ensure this mail is processed in the most efficient method possible. The usual order of priority for mail sources will be:

- a. Large-volume metered mailings (020B).
- b. First-Class permit mailings (not presorted).
- c. First-Class presort mailings residue.
- d. Metered mail from operation 020 (meter belt).
- e. FIM (facing identification mark) tagged mail from appropriate stackers of facer-cancelers (010).
- f. Riffled mail (029).
- g. Trayed managed mail from non-OCR origins (110).
- h. Trayed managed mail from OCR origins identified as OCR candidate mail (110).
- i. Bulk business mail (110)

NOTE: Managed mail (MMP) received in trays with striped labels will be processed on the Bar Code Sorter (BCS). Mail received with dispatch labels with a diagonal red line, extending from one corner to the opposite corner of the label, will be directed to the appropriate LSM operation and will not be processed in the automated operations.

NOTE: Bulk business mail and riffled mail should be planned for and processed on automation as operating windows permit. Automation can usually process this mail more efficiently than a manual operation.

### 554 OPERATION NUMBERS

SERIES	OCR/CS	BCS
Composite	850	860
OGP - OUTGOING PRIMARY	851	861
OGS - OUTGOING SECONDARY	—	862
MMP - MANAGED MAIL ADC/SD	853	863
SCF - SECTIONAL CTR. DIST.	854	—
INP - INCOMING PRIMARY DIST.	855	865
BX - BOX SECTION	—	867

NOTE: Further information regarding operation numbers is available in Handbook M-32 (Management Operating Data System).

### 555 SETTINGS FOR SWITCHES AND DIALS

When the OCR is in normal operation, the following settings must be observed on switches and dials:

- a. Verifier Switch is in the ON position.
- b. Transport Control Unit Mode Switch is turned to OCR MODE.
- c. Operation Panel Switch is set to either OCR position or BAR CODE position, according to type of mail being processed.

### 556 TRAINING

Supervisors, operators, support personnel, and maintenance employees need to be well trained. Employees performing duties must be continually observed to ensure that on-the-job training and instruction can take place when needed and that unsafe acts are prohibited. Under normal circum-

stances, the automated system should not be operated with untrained personnel. As stated in Management Instruction PO-410-83-6, Operation of Automated Mail Processing System, dated 12-15-83, "MSC Managers must ensure that Supervisors, Operators and Maintenance employees are trained, including back-up to cover leave, breaks, attrition, etc., and that the system does not operate with untrained personnel. On-the-job training alone will not suffice."

### 557 MAINTENANCE

To ensure that the automated equipment continually operates efficiently, the following steps are necessary:

- a. Maintenance windows must be established and honored for daily, weekly, and monthly preventive maintenance. A minimum of four hours must be set aside for daily preventive maintenance. This ensures that route sheet items, scheduled corrective maintenance, and problem areas can be corrected. Preventive maintenance windows must be established in compliance with Management Instruction AS-530-84-9, dated 4/6/84.
- b. Adequate spare-parts inventory must be maintained.
- c. Critical spare parts and/or equipment operation problems must be reported through channels for higher level attention.

### 560 IDENTIFICATION AND REACTION TO MALFUNCTIONS

#### 561 PROCEDURES

The identification of problem areas can be accomplished by analyzing all possible information available through:

- a. Visual inspection of the Mail Transport Unit.
- b. Observation of the controls and indicators on the Feeder Unit.
- c. Observation of the indicators on the Ink Jet Printer and the Stacker Units.
- d. Reviewing the Run Performance Reports (see

Chapter 6). The Run Performance Reports can help isolate a problem area, if used along with an analysis of mail in the Read Reject and Mechanical Reject Stackers.

- e. Determining whether Feeder Unit drive belts are operating.

NOTE: Once the malfunction has been reported to the supervisor, the supervisor can identify the problem and determine if maintenance personnel must be called.

### 562 VISUAL INSPECTION

Whenever a failure occurs, the supervisor should visually inspect the OCR/CS system for any obvious problems (e.g., envelopes torn, folded, or jammed; excessive dirt, debris, etc.). If the cause of the malfunction can be corrected without the use of hand tools, it may be corrected. Other types of malfunctions must be reported to maintenance personnel.

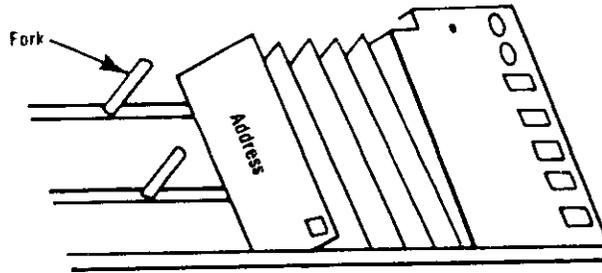
### 563 INK JET PRINTER AND STACKER UNITS

Indicators on these units are discussed in sections 343 and 344.

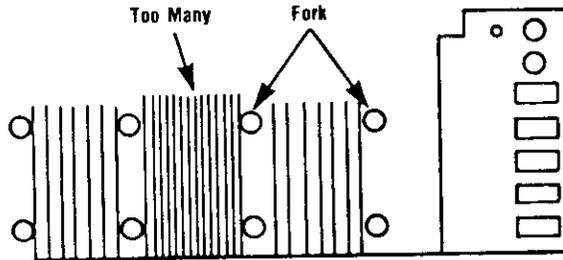
### 564 RUN PERFORMANCE REPORTS

These reports are covered extensively in Chapter 6.

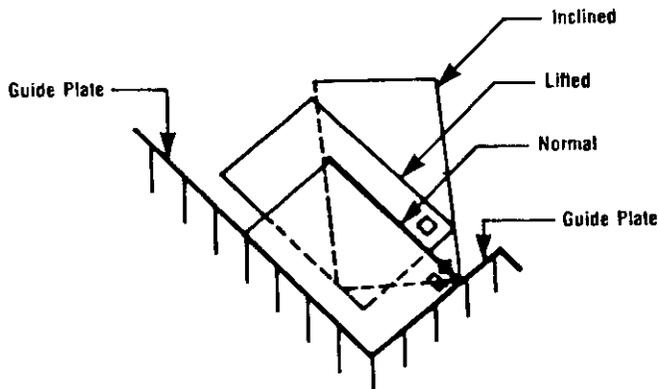
Proper position of letter between forks.



Fill spaces between forks to about 80% capacity. Do not overfill.



Straighten inclined or lifted mailpieces.



Remove bent or folded mailpieces.  
Straighten mailpieces which are caught between the forks.

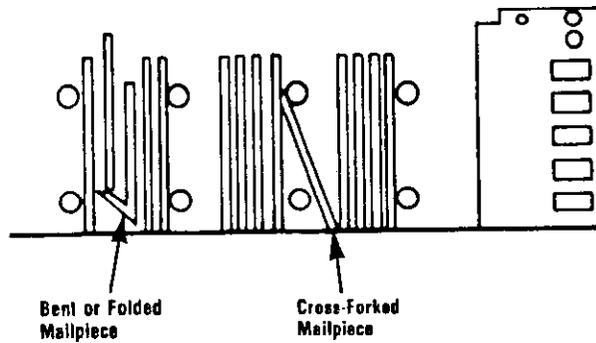


EXHIBIT 523 — FEED TABLE — LOADING MAIL

## CHAPTER 6

### MANAGEMENT INFORMATION

#### 610 INTRODUCTION

Careful analysis of Performance Reports and Readability Assessments, and proper maintenance of the directory, disk, and sort programs can improve OCR productivity and full utilization of automation.

#### 620 PERFORMANCE REPORTS

##### 621 GENERAL INFORMATION

Performance Reports provide a source of information to analyze and evaluate the mail-processing function of the OCR and related systems. In addition, the reports provide data necessary to determine the need for updating and changing sort programs used on the automated equipment. Two types of Performance Reports are produced:

- a. A single-page report known as MAIL PROCESSING DATA.
- b. A single-page report known as OCR DIAGNOSIS DATA.

##### 622 MAIL PROCESSING DATA REPORT

The Mail Processing Data report (see Exhibit 622) provides information about accepts, rejects, and stacker densities obtained during a processing run and must be generated at the end of each run. The Maintenance Technician will use the System Controller keyboard to generate the report and clear the counters by using the following procedure:

- a. Press the MODE key on the keyboard of the system controller. (The CRT will display a menu of the utility programs.)
- b. Press the key which corresponds to MAIL PROCESSING DATA.
- c. Press the HTAB key on the keyboard. (The data will be displayed on the face of the CRT. This information is for all mail processed since the last time the counters were cleared.)
- d. To obtain a hard copy of the report

(1) Turn on the POWER switch on the front of the printer and push the ON LINE switch on the top of the printer. The ON LINE switch will light.

(2) Press the PR key on the keyboard and the printer will print out the information displayed on the CRT.

- e. To clear the counters, hold down the FNC key and press the CLR key.

NOTE: The Mail Processing Data counts are reset when the main power is turned off or when the counts are cleared via the keyboard. The counts begin again with the first letter processed.

The following sections detail the entries on the Mail Processing Data Report.

##### 622.1 Mailpieces

Indicates the total number of mailpieces fed through the processing system (total throughput). Equals the number of accepts plus the number of rejects.

##### 622.2 Accepts

Indicates the total number of mailpieces accepted by the system and assigned to stackers.

##### 622.3 Rejects

Indicates total number of mailpieces rejected by the system during processing. Rejects do not include letters which ended up in the Mechanical Reject Stacker through use of the CLEAR switch.

##### 622.4 Verifier Alarm

Indicates total number of mailpieces for which the bar code read did not correspond to the code sent to the Ink Jet Printer (IJP).

##### 622.5 Prebarcoded

Indicates the number of mailpieces which were prebarcoded.

**622.6 Foreign Mail**

Indicates the number of instances in which the main scanning system found the name of a foreign country in the destination address.

**622.7 GAR**

GROSS ACCEPT RATE is a ratio of the number of letters sorted to the number of letters processed and therefore is expressed as a percent.

**622.8 Stacker**

Indicates the total number of mailpieces assigned to each stacker (stacker counts).

NOTE: The total number of letters in the stackers does not equal the total number of mailpieces fed. This is because the stacker counts are derived from the stacker assignment process, while mailpieces fed (as well as accepts and rejects) are incremented during the OCR process. If a jam occurs after a letter is assigned to a stacker but before it reaches the stacker, the letter may go to the Mechanical Reject Stacker, but the counts will indicate that it was accepted and sorted.

**623 OCR DIAGNOSIS DATA REPORT**

The OCR Diagnosis Data Report (Exhibit 623) is an off-line diagnostic data program which presents detailed information about interrupt and alarm counts which occur during a processing run. This information relates to all major aspects of the Logic Section's hardware and software performance and is used by the maintenance technician to evaluate the system. The maintenance technician obtains the DIAGNOSIS printout by using the System Controller keyboard as follows:

- a. Press the MODE key on the keyboard of the system controller. The CRT will display a menu of the utility programs.
- b. Press the key which corresponds to the DIAGNOSIS DATA.
- c. Press the HTAB key on the keyboard. The diagnosis data will be displayed on the face of the CRT. This information is for all mail processed since the last time the counters were cleared.

- d. To obtain a hard copy of the report:
  - (1) Turn the POWER switch on the front of the printer ON and push the ON LINE switch on the top of the printer. The ON LINE switch will light.
  - (2) Press the PR key on the keyboard. The printer will print out the information displayed on the CRT.

- e. To clear the data counters, hold down the FNC key and press the CLR key.

The following sections will define the entries found on the OCR Diagnosis Data Report.

**623.1 INT (Interrupts)**

The overall flow of Recognition Processing is interrupt driven. These interrupts are generated primarily by hardware events which inform the Sequence Supervisor in the Logic Section that specific processing steps are to be initiated. The Sequence Supervisor not only initiates the appropriate steps, but it also controls and monitors all subsequent processing. Included in this group of counters are:

- a. PSS = The number of Prescan Start Interrupts.
- b. PSE = The number of Prescan End Interrupts.
- c. MSS = The number of Main Scan Start Interrupts.
- d. MSE = The number of Main Scan End Interrupts.
- e. MBE = The number of Memory Buffer Scan End Interrupts.
- f. PRT = The number of Printer Request Timing Interrupts.
- g. MCK = The number of Machine Code Check Interrupts.
- h. NGPSS = The number of Invalid PSS Interrupts.
- i. NGPSE = The number of Invalid PSE Interrupts.
- j. NGPRT = The number of Invalid PRT Interrupts.

- k. NGMCK = The number of Invalid MCK Interrupts.

### 623.2 TR Alarm

Whenever the TR (Transport Unit) stops, a signal is sent to the Logic Section, along with a byte of information which informs the Logic Section the reason for the stop. All stops are recorded according to type. Included in this group of counters are:

- a. JAM = The number of JAM ALARM stops.
- b. PRTAL = The number of Printer Alarm stops.
- c. EMSTP = The number of Emergency stops.
- d. MSALM = The number of Main Scanner Alarm stops.
- e. TRCHK = Twenty (20) consecutive letters have been rejected for prescan, segmentation, and/or sequence alarms, resulting in a software-generated OCR alarm.
- f. OTHER = The number of stops due to other causes.

### 623.3 Accepts

This group of counters indicate how the Logic Section determined the final POSTNET code for the mailpieces processed. Included in this group of counters are:

- a. OCRED

OCR Read Reject. The number of letters on which the output POSTNET code was determined solely on the basis of the ZIP Code read from the mailpiece, without confirmation from the Directory. This is because the city and state were either unreadable or not contained in the Directory.

- b. CRVER

Contextual Recognition Verified. The number of letters on which the ZIP Code read matched the ZIP Code obtained from the Directory during the city/state lookup.

- c. CRRED

Contextual Recognition Read. The number of

letters for which the output POSTNET code was determined solely on the basis of the city/state Directory lookup. This is because either no ZIP Code was on the mailpiece or the ZIP Code on the mailpiece was unreadable.

- d. CRRPL

Contextual Recognition Replacement. The number of letters for which the ZIP Code on the mailpiece did not match the results of the city/state Directory lookup digit for digit, and the Contextual Recognition routine was able to determine legitimate replacement digits. (This does not include instances in which it generated default ZIP Codes.)

- e. CRDEF

Contextual Recognition Default. The number of letters for which the ZIP Code on the mailpiece did not match the results of the city/state Directory lookup digit for digit, and the Contextual Recognition routine replaced the zone digit with the default value. The bar code output for these mailpieces was (SCF) + 00 (two zeros).

- f. FOREN

Foreign. The number of letters which were identified as being destined for foreign countries.

NOTE: ACCEPTS = OCRED + CRVER + CRRED + CRRPL + CRDEF + FOREN

### 623.4 Rejects

This group of counters indicates the mailpieces, in each OCR Read Reject category, for which no ZIP Code could be determined. There are four major categories of OCR Read Reject mail. One major type is mail which has been scanned by the Main Scanner, the data have gone through all steps of Recognition Processing, but a valid ZIP Code could not be determined. These are the OCR Read Rejects (OCRRJ). The second and third major types occur when the quality of the data on the mailpiece is not good enough for one of the primary processing steps. A Prescan Alarm (PSALM) occurs when the prescan data is not good enough for the Address Block Finding routine to produce a valid output. A Segmentation Alarm (SGALM) occurs if

segmented/normalized patterns cannot be determined from the Main Scan data. The fourth major type of reject mail is due to Sequence Alarms (SQALM). These types of alarms are generated by the Sequence Supervisor when it detects that processing requests (either due to hardware or software) are out of proper sequence or processing tasks have not been completed in their allotted time, or due to the fact that too many processing requests have occurred within a certain time frame, and hence the Logic cannot keep up. This group of counters include:

a. OCRRJ

OCR Read Reject. The number of letters rejected by Recognition Processing because a ZIP Code could not be determined from the information read.

b. PSALM

Prescan Alarm. The number of letters rejected by Recognition Processing because the Address Block Finding routine could not determine an address block. Since the Address Block finding routine works with coarse level data representing words and lines on the mailpiece, the most common cause of this alarm is poor or no contrast between the "data" and the background. This alarm is indicated on the Display Monitor by "LLLLL;" on the CRT as PSALM.

c. SGALM

Segmentation Alarm. The number of letters rejected by Recognition Processing because either the Main Scan data cannot be segmented and normalized into characters, or the number of segmented/normalized characters is less than five. This alarm often occurs with handwritten mail, or when the Main Scanner slice level is out of adjustment. This alarm is indicated on the Display Monitor by "PPPPP;" on the CRT as SGALM

d. SQALM

Sequence Alarm. The number of letters rejected by Recognition Processing because the processing tasks have been requested out of proper sequence, or the processing tasks have not been completed in their allotted times, or too many processing requests were received to be completed

in the time available.

### 623.5 Rejects (OCR Read)

OCR Read Rejects occur when Recognition Processing cannot determine a final ZIP Code output. The final stage of processing, which outputs the determined ZIP Code, is Contextual Recognition. Contextual Recognition uses the city/state read to look up in the Directory the appropriate ZIP Code. It compares the directory ZIP Code with the ZIP Code read directly from the mailpiece. It determines the final ZIP Code for output based upon this data. A final ZIP Code is not output whenever the Contextual Recognition process cannot determine an appropriate ZIP Code with high enough reliability. The OCR Read Reject categories are as follows:

a. NOPCD

The number of letters rejected because no ZIP Code was found on the mailpiece and city/state could not be determined.

b. PC1RJ

The number of letters rejected because one digit in the ZIP Code was unreadable and city/state could not be determined.

c. PC2RJ

The number of letters rejected because two digits in the ZIP Code were unreadable and city/state could not be determined.

d. PCNRJ

The number of letters rejected because three or more digits in the ZIP Code were unreadable and city/state could not be determined.

e. PCRRJ

The number of letters rejected because the reliability of the ZIP Code read was too low and city/state could not be determined. In this instance, all ZIP Code digits were readable, but the reliability did not meet an acceptable threshold.

## f. PCCRJ

The number of letters rejected because the ZIP Code read and the city/state read did not match, and a corrected ZIP Code could not be determined with a high enough reliability.

**623.6 MISC (Information Prescan Process)**

Two additional pieces of information recorded on the OCR Diagnosis report refer to counts obtained during the scanning process.

## a. WINDC

Window Detects. This is mail on which a window was detected.

## b. PBDTC

Prebar Detects. This is mail on which a POSTNET code (or something that "looked like" a POSTNET code) was detected during prescan.

**623.7 REJECTS Sequence Alarms (SQALM)**

Sequence Alarms occur whenever processing tasks are being requested out of proper sequence, or processing tasks are not being completed in their allotted times, or too many processing tasks being requested within a given time period, such that the logic section cannot keep up. Whenever a letter is alarmed at some stage of processing, it no longer goes through any further processing and consequently becomes rejected. These counters include:

## a. PSPCH

Prescan Pitch Alarm. This alarm occurs whenever the time from the previous Prescan End interrupt to the next Prescan Start Interrupt is too short for processing. It implies that the distance between two letters is too small. Recognition Processing could not keep up with two such processing task requests within that small time frame. This alarm is indicated on the Display Monitor by "HHHH5," on the CRT as PSFTA.

## b. MSPCH

Main Scan Pitch Alarm. This alarm occurs whenever the Main Scanner is still busy with the previous letter and the distance between two

letters is too small. The Recognition Processing could not keep up with two such processing task requests within that small time frame. This alarm is indicated on the Display Monitor by "HHHH6;" on the CRT as MSPTA.

## c. SQCAL

Sequence Control Alarm. This alarm occurs whenever the processing task requests are out of proper sequence. This alarm is indicated on the Display Monitor by "HHHH1;" on the CRT as SQALM.

## d. SQTME

Sequence Timing Alarm. Each processing step is allotted a specific amount of time for completion. If the allotted time is exceeded, the alarm terminates that processing step and the letter is rejected. This alarm is indicated on the Display Monitor by "HHHH2;" on the CRT as TMALM.

## e. SQQME

Sequence Queue Alarm. The OCR Logic Section is described as a multitask, multiprocessor system. That means that several different and unique tasks can be processed in the different processors at the same time. These task requests are queued when the needed process is still busy with a previous letter (while not yet exceeding its allotted time). Only three task requests may be queued at any one time. If more than that are requested, then the last letter is alarmed and the letter is rejected. This alarm is indicated on the Display Monitor by "HHHH3;" on the CRT as QCALM.

## f. SQLNE

Sequence Letter Number Alarm. At the beginning of the Prescan Process, a tracking number is assigned to the letter which is compared at each process. If the letter numbers do not correspond, the letter number alarm is generated and the letter is rejected. This alarm is indicated on the Display Monitor by "HHHH4;" on the CRT as LCALM.

**623.8 Reject Sequence Alarms (SQOME)**

When an interrupt or processing end notice occurs,

the next processing step is initiated. Since the next processing step may still be busy with the previous letter, each new processing request is queued. This queue is monitored and requests are issued on a first-come, first-served basis. If the queue overflows, the latest requested process is alarmed and the letter is rejected. If the queued task cannot be processed within an allotted amount of time, the oldest requested process is alarmed and the letter is rejected. These counters include:

a. PSQME

Prescan Processing Request Queue Overflows. This occurs when the Address Block Finding request queue has overflowed.

b. SRQME

Scan/Read Queue Overflow. This occurs when the main Scan Processing request queue has overflowed.

c. PPQME

Preprocessing Queue Overflow. This is the number of Normalized Pattern Processing request queue overflows.

d. CRQME

Contextual Recognition Queue Overflow. This occurs when the Contextual Recognition Processing request queue overflows.

e. PSQSE

Prescan Queuing Sequence error. This occurs when the queued Address Block Finding request cannot be executed because the Address Block Finding processing routine is not ready.

f. SRQSE

Scan/Read Queuing Sequence error. This occurs when the queued request cannot be executed because the Main Scanner is not ready or the queued request cannot be executed because the Memory Buffer Scan is not ready.

g. PPQSE

Preprocessing Queuing Sequence error. This occurs when the queued request cannot be executed because the Segmentation, Normalization, or

Determination routines, respectively, are not ready.

h. CRQSE

Contextual Recognition Queuing Sequence error. This occurs when the queued request cannot be executed because the Contextual Recognition routine is not ready.

### 623.9 Reject Sequence Alarms (SQTME)

The amount of time that elapses from the beginning of a given processing request until the next logical processing request must fall within specified time limits. This is to ensure that the overall multitask, multiprocessor system does not get tied up with one letter at the expense of the rest. If the request for the next logical processing step for a given letter does not occur within the specified time limit, then a Sequence Timing (SQTME) Alarm is generated for that letter, and the task is terminated so that it may become ready for the next letter's request.

a. PSETE

Prescan End Timing error. This means too much time has elapsed from the Prescan Start request until the Address Block Finding request.

b. ABFTE

Address Block Finding Timing error. This means too much time has elapsed from the Address Block Finding request until the Address Block Finding End notice.

c. MSSTE

Main Scan Start Timing error. This means too much time has elapsed from the initial Prescan Start request until the Main Scan Start request.

d. MSETTE

Main Scan End Timing error. This means too much time has elapsed from the Main Scan Start request until Main Scan End interrupt.

e. MBETE

Memory Buffer End Timing error. This means too much time has elapsed from the Main Scan End interrupt until the Memory Buffer End interrupt.

## f. SGETE

Segmentation End Timing error. This means too much time has elapsed from the Memory Buffer End interrupt until the Segmentation End notice.

## g. NRETE

Normalization End Timing error. This means too much time has elapsed from the Segmentation End notice until the Normalization End notice.

## h. DTSTE

Determination Start Timing error. This means too much time has elapsed from the Normalization End notice until the Determination Start request.

## i. DTETE

Determination End Timing error. This means too much time has elapsed from the Determination Start request until the Determination End notice.

## j. FDETE

Final Determination End Timing error. This means too much time has elapsed from the Determination End notice until the Final Determination End notice.

## k. CRETE

Contextual Recognition End Timing error. This means too much time has elapsed from the Final Determination End notice until the Contextual Recognition End notice.

## l. PRTTE

Printer Request Timing error. This means too much time has elapsed from the Prescan Start interrupt until the Printer Request.

### 623.10 Reject Sequence Alarms (SQLNE)

The Logic Section monitors the processing of the letters and tracks their movement through the Transport Section in order to ensure that the final POSTNET code output is associated with the correct mailpiece. At Prescan Start, it establishes an entry letter number and transfers it to the Letter Number Start card of the Transport Control. At Main Scan Start and Printer Request, it then rechecks the correspondence of the transport and the Logic Section letter number as it is being

tracked through the system. If the numbers do not agree, Sequence Letter Number errors (SQLNE) are generated.

## a. PCLNE

Prescan End Letter Number shift error. A Prescan End interrupt occurred too soon after Prescan interrupt, or a Prescan End interrupt occurred without a Prescan Start interrupt. In either case, processing is aborted and the letter is alarmed and rejected.

## b. MSLNE

Main Scan Start Letter Number shift error. At Main Scan Start the letter number read from the Letter Number Start card in the Transport Control does not agree with the letter number tracked by the Logic Section.

## c. PRLNE

Printer Request Letter Number shift error. At Printer Request, the letter number read from the Letter Number Start card in the Transport Control does not agree with the letter number tracked by the Logic Section.

## d. LNOVF

Letter Number Buffer overflow. The number of letters entered (at Prescan Start) and being tracked through the Logic Section until Printer Request, exceeds the tracking buffers (16 maximum at any one time). The number shown on the report indicates the number of times the overflow occurred.

### 623.11 Reject Sequence Alarms (SQCAL).

Sequence Control alarms occur whenever it is detected that processing task requests are out of proper logical sequence. As the letter is being tracked through each step of the processing sequence, its present processing state is flagged. Therefore, at each request for the next processing step, it can be determined whether or not the previous step has been properly completed. Whenever a processing request for a given letter is received by the Logic Section, that letter's present processing status (or state) is compared with the next requested process. If the required "state transition" is not logically correct, an SQCAL alarm is generated.

## a. PSSQE

Prescan End State Transition Control error. At Prescan End, the tracked letter does not have the correct previous state; i.e., Prescan Busy.

## b. ABSQE

Address Block Finding End State Transition Control error. At Address Block Finding End, the tracked letter does not have the correct previous state; i.e., Address Finding Block Busy.

## c. MSSQE

Main Scan Start State Transition Control error. At Main Scan Start interrupt, the tracked letter does not have the correct state; i.e., Main Scan Ready.

## d. MESQE

Main Scan End State Transition Control error. At Main Scan End interrupt, the tracked letter does not have the correct previous state; i.e., Main Scan Busy.

## e. MBSQE

Memory Buffer Scan End State Transition Control error. At Memory Buffer Scan End interrupt, the tracked letter does not have the correct previous state; i.e., Scan/Read Busy.

## f. SGSQE

Segmentation End State Transition Control error. At Segmentation End, the tracked letter does not have the correct previous state; i.e., Segmentation Busy.

## g. NRSQE

Normalization End State Transition Control error. At Normalization end, the tracked letter does not have the correct previous state; i.e., Normalization Busy.

## h. DTSQE

Determination Start State Transition Control error. At Determination Start, the tracked letter does not have the correct previous state; i.e., Determination Ready.

## i. DESQE

Determination End State Transition Control error. At Determination End, the tracked letter does not have the correct previous state; i.e., Determination Busy.

## j. FDSQE

Final Determination End State Transition Control error. At Final Determination End, the tracked letter does not have the correct previous state; i.e., Final Determination Busy.

## k. CRSQE

Contextual Recognition End State Transition Control error. At Contextual Recognition End, the tracked letter does not have the correct previous state; i.e., Contextual Recognition Busy.

## l. PRSQE

Printer Request Timing State Transition Control error. At Printer interrupt, the tracked letter does not have the correct previous state; i.e., Printer Ready.

**623.12 OSL -- (Misc Information Main Scan).**

The Optimum Slice Level values indicate the level selected for each mailpiece scanned during the Main Scan Process. The raw seven-level gray data are analyzed to determine the optimum point at which to translate the gray level data into a digital black or white. It permits variable contrasts of background and foreground data to be discriminated into clean black and white data representing the information read from the mailpiece. There are seven possible Optimum Slice levels, one for each of the gray level raw data outputs from the Main Scanner. As a general rule, a light background with light print will drive the OSL up toward level 1, while a dark background with dark print will drive the OSL down toward level 7.

- a. LEV1 = Optimum Slice Level 1
- b. LEV2 = Optimum Slice Level 2
- c. LEV3 = Optimum Slice Level 3
- d. LEV4 = Optimum Slice Level 4
- e. LEV5 = Optimum Slice Level 5
- f. LEV6 = Optimum Slice Level 6
- g. LEV7 = Optimum Slice Level 7

**624 TIMEOUT**

The recognition process consists of the seven subsystems. Each subsystem must perform its task and pass the results to the following subsystem. Each subsystem has a finite amount of time in which to perform its task. If the subsystem cannot perform its task within the allotted time, the information is rejected. This is known as timeout.

REVISION F

\*\*\* MAIL PROCESSING DATA \*\*\*

MAILPIECES =	0	1 =	0	16 =	0	31 =	0	46 =	0
ACCEPTS =	0	2 =	0	17 =	0	32 =	0	47 =	0
REJECTS =	0	3 =	0	18 =	0	33 =	0	48 =	0
VERIFIER ALARM =	0	4 =	0	19 =	0	34 =	0	49 =	0
PREBARCODED =	0	5 =	0	20 =	0	35 =	0	50 =	0
FOREIGN MAIL =	0	6 =	0	21 =	0	36 =	0	51 =	0
		7 =	0	22 =	0	37 =	0	52 =	0
		8 =	0	23 =	0	38 =	0	53 =	0
		9 =	0	24 =	0	39 =	0	54 =	0
		10 =	0	25 =	0	40 =	0	55 =	0
		11 =	0	26 =	0	41 =	0	56 =	0
		12 =	0	27 =	0	42 =	0	57 =	0
		13 =	0	28 =	0	43 =	0	58 =	0
		14 =	0	29 =	0	44 =	0	59 =	0
		15 =	0	30 =	0	45 =	0	60 =	0

G.A.R. = 00.0%

EXHIBIT 622 — MAIL PROCESSING DATA REPORT

## 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'S RESPONSIBILITIES

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

- a. Enforcement of all current safety rules and regulations and local policies to ensure the use of safe operating procedures.
- b. Observing employees and immediately correcting unsafe acts, practices, operational errors, and poor work habits noted.
- c. Ensuring that all personnel are aware of the need for proper and safe use, maintenance, and protection of Postal Service equipment.
- d. Investigation of all accidents occurring within the area of responsibility to determine the cause and the corrective action to be taken.
- e. Using the proper method of summoning medical aid in case of an emergency.
- f. Ensuring that the equipment is not operated by personnel without proper authority or proper training.
- g. 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.
- h. Maintaining a clean and safe work area by enforcing good housekeeping practices.

#### 730 EMPLOYEE'S RESPONSIBILITIES

All craft employees have the responsibility to protect themselves, their fellow employees, the mail, and U.S. Postal Service equipment and property. This can only be accomplished by every individual accepting the responsibility of understanding and observing safety standards and procedures at all times. Following are some of the commonsense safety precautions which 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. Know the proper type of fire extinguisher to use on an electrical fire. 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.

## GLOSSARY OF TERMS

**Accepts** — Total number of mailpieces accepted by the system and assigned to other than the first and last stackers.

**Accept Throughput** — Indicates the throughput for accepted mail items as measured in mailpieces per hour. Total number of accepted pieces are divided by elapsed time.

**Alarm Annunciator** — An electrical signaling device that sounds when an alarm is detected, and displays a visual indication on the control panel.

**Bar Code Sorter (BCS)** — A computer-controlled, high-speed machine which sorts letters, based upon a bar code. Consists of a mail feed and transport unit, stacker modules, and associated electronic equipment (computer, video/monitor display, and floppy disk).

**Black Colored Belt** — Transports mail past the read head in the reader unit. Establishes an optical background reference due to its dark color as compared to typical mailpieces.

**"Booting Up the Computer"** — Starting up the computer.

**Bar Code Characters** — Within the POSTNET system a combination of 5 bars (2 full bars and 3 half bars) is used to represent a numeric character code (0 through 9).

**Decoding Template** — A template designed by the Postal Service to assist in the decoding and verifying of bar codes.

**Disk** — A flat circular material used to accept, store, and release magnetically encoded information. Disks are of two types, hard and floppy.

**Disk Drive** — A device which sends and receives information between a disk and the computer.

**Down Time** — Time that an OCR or BCS system is needed for mail processing but was not able to function due to operational or maintenance problems.

**Elapsed Time Clock** — Indicates machine run time in hours and tenths of an hour.

**Feeder Unit** — That portion of a machine upon which mail is loaded. It accepts unsorted, preoriented mail and converts it into a flow of mailpieces equally spaced as they enter the transport system.

**File** — Group of reference data describing one type of information. For this purpose, the data are stored in some form of computer memory.

**Gross Acceptance Rate (GAR)** — Ratio of number of letters sorted to number of letters processed.

**Hard-Copy Terminal (Printer)** — Permits the users to have a printed hard copy of video displayed information and reports.

**Ink Jet Printer (IJP)** — Mechanical unit in the printer unit which electrostatically atomizes a liquid ink in the shape of a bar code on an envelope that corresponds to the ZIP Code of that mailpiece.

**Jam Detection System** — A safety mechanism which stops the transport system whenever an envelope blocks a photocell for longer than one-tenth of a second.

**Loader** — The employee assigned loading duties of placing unsorted mail onto the feed unit.

**Mail Jogging** — The function of bumping handsfull of letters against a hard surface in order to create a uniform edge of all pieces.

**Mail Tracking Subsystem** — That portion of all sorters which accounts for the physical location of each mailpiece in the mail transport subsystem.

**Mechanical Rejects** — Mailpieces the sorters cannot sort due to some physical reason; either a machine transport malfunction, out-of-sort program, or loss of assignment due to jams, etc., must always be the last stacker.

**Mechanical Throughput** — Indicates the mechanical throughput rate for the mail processed during the report period and is measured in mailpieces per hour. Throughput is calculated by determining the number of mechanically accepted pieces during the elapsed time of the report (accepted pieces are the total number of pieces of mail

fed into the system less the number of pieces that were mechanical rejects).

**National ZIP Code Directory Files** — Contains listings of ZIP Codes arranged by states and, within the state listings, by cities.

**OCR Directory** — A disk file which contains certain city, state, and ZIP Code listings used by the Computer Complex of the OCR to compare information found in the address block on the mailpieces, to determine the correct bar code to be applied to the mailpiece.

**OCR Readability Program** — Any program designed to upgrade address characteristics of First-Class letter mail to achieve a readability range for Optical Character Reader Equipment.

**Optical Character Reader (OCR)** — A computer controlled, high-speed, mail-sorting system. Consists of a mail feed and transport unit, stacker modules, and associated electronic equipment (computer, system control, address directory, video monitor/display, and live printer).

**POSTNET (Postal Numeric Encoding Technique)** — A bar code system for encoding ZIP Codes on letter mail. It consists of bars and half bars which are assigned values and represents digits.

**"Powering Down the Sorter"** — The procedure for turning off the sorter after the mail run has been completed.

**Printer/Verifier Unit** — Prints a bar code on the envelope face and verifies that it corresponds to actual ZIP Code information supplied to the printer.

**Read Rejects** — Mailpieces for which no ZIP Code can be determined. May be due to nonread or non-recognition of a valid city, state, and ZIP Code. Read Rejects are normally assigned to Stacker #1.

**Reader Unit** — Optically scans each mailpiece, passed in front of its lens, and sends the information on to the computer system for analysis.

**Rejects** — Mailpieces rejected by an OCR or BCS during operations. See Read Rejects and Mechanical Rejects.

**Routine** — A sequence of instructions that directs a computer to perform a specific operation or sequence of operations.

**Scan Zone** — The area, 1 inch from each end and up to 2-1/4 inches from the bottom on a mailpiece, containing address and bar code information which is scanned by the reader unit.

**Sortation Program** — File containing ZIP Code assignment information used to direct mailpieces to specific stackers on OCRs and BCSs.

**Spelling Variation Files** — Lists of spelling variations for those city names contained in the National ZIP Code Directory which may be included in an OCR Directory.

**Stacker Report** — Indicates the number of mailpieces distributed to each stacker during the report period. Read reject and mechanical reject volumes are not included in this report.

**Startup Alarm** — Whenever transport belts are started up, a startup alarm sounds for three to five seconds prior to any belt movement to alert employees in the area.

**Stackers** — Those bins or channels into which mailpieces are sorted by the machine. Stacker modules may consist of a combination of six or two individual stackers.

**Stacker Counts** — Total number of mailpieces assigned to each stacker. See stacker report.

**Sweeper** — The mail processor responsible for removing the mail from the stackers and placing it into the takeaway equipment.

**Sweeping Efficiency** — The designing of stacker assignments to reduce sweeper effort.

**Terminal** — Data entry or exit point in a computer or communication network.

**Transport Section** — The portion of the system consisting of belts, pulleys, monitors, and diverters responsible for the movement of mail past the various processing stages and into stackers.

**Type 1 Record** — Is provided with every entry in

the State and City Directories. It contains the information that identifies the name of the state or city using the preferred spelling. Also identifies the range of ZIP Code values assigned to that state or city.

**Type 2 Record** — Used to indicate individual ZIP Code ranges for states and cities that have more than one range assigned.

**Type 3 Record** — Used to enter variations to the state and city name spelling listed in the preceding Type 1 record.

**Verifier Alarm** — A signal which activates when a predetermined number of mailpieces are bar coded and the bar code does not match the original address information sent to the Ink Jet Printer.

**Video Monitor** — Black and white Cathode Ray Tube (CRT) which displays information about the system. Also used as a diagnostic tool.

## INITIALS, ABBREVIATIONS, AND ACRONYMS

**ADAPT** — Automatic Density Analysis Profile Techniques

**ASRMS** — Annual Staffing and Resource Management Simulator

**AUX** — Auxiliary

**BBM** — Bulk Business Mail, previously known as Circular Mail

**BCR** — Bar Code Reader

**BCS** — Bar Code Sorter

**CIR** — Circular Mail now known as Bulk Business Mail

**COL** — Collection Mail

**CPU** — Central Processing Unit

**CRT** — Cathode Ray Tube/Video Monitor

**EMG** — Emergency

**FDR** — Feeder Unit

**GAR** — Gross Acceptance Rate

**IJP** — Ink Jet Printer

**INTK** — Interlock

**LVM** — Large-Volume Mailer

**MB** — Meter Belt Mail

**MMP** — Managed Mail Program

**MPM** — Mail Processing Monitor

**MS** — Main Scanner

**MTU** — Mechanical Transport Unit

**OCR** — Optical Character Reader

**OCR/CS** — Optical Character Reader/Channel Sorter

**POSTNET** — Postal Numeric Encoding Technique

**PRT** — Printer

**PRV** — Print/Verify

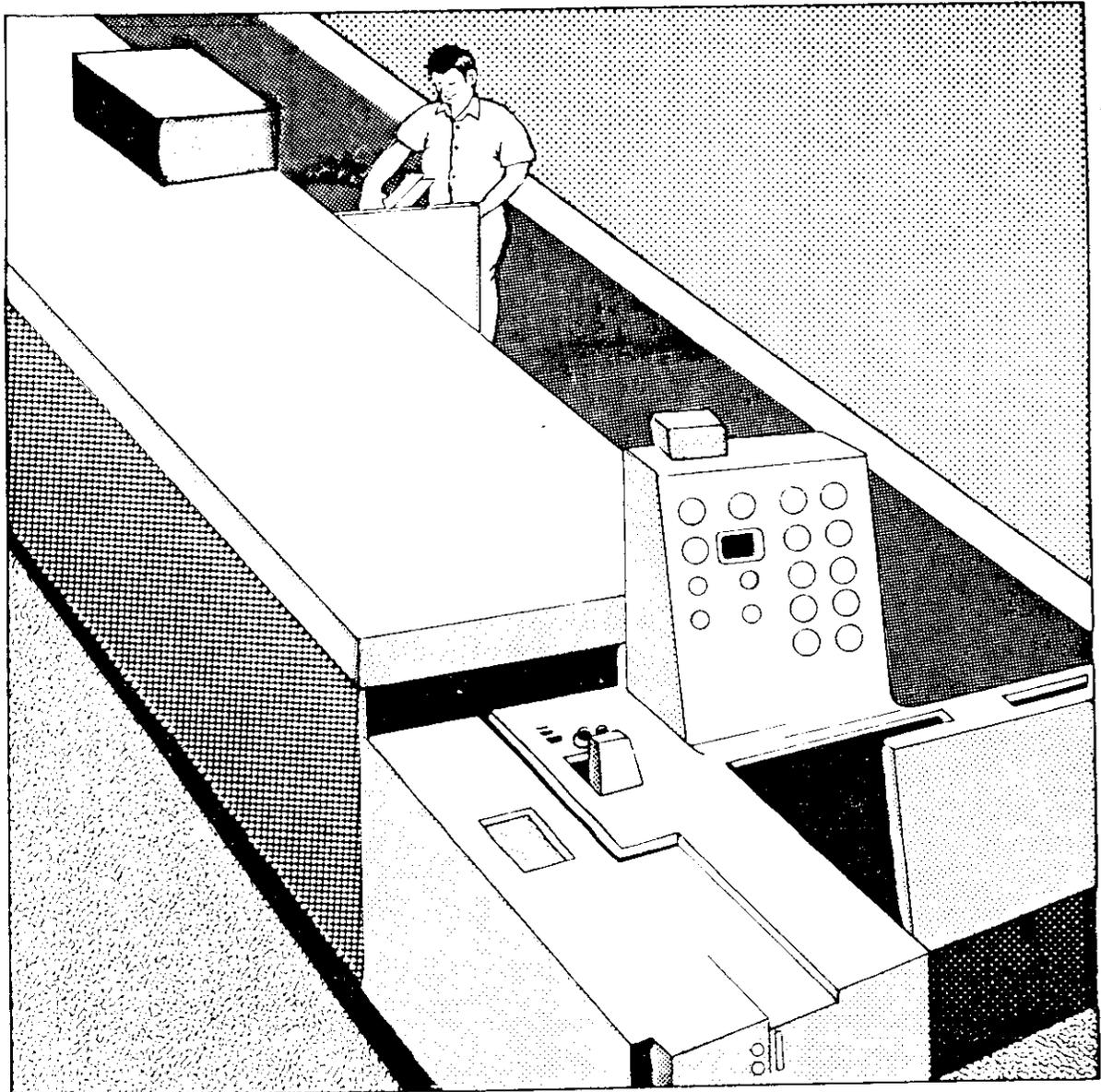
**ROU** — Reader Optical Unit

**STn** — Stacker Unit (n-Represents Number)

**TEMP** — Temperature



# Bell and Howell Bar Code Sorter Operating Guidelines



Handbook PO-412  
February 1, 1988

**Bell and Howell  
Bar Code Sorter  
Operating Guidelines**

This manual is a management guideline. No FLSA nonexempt employee may remove this text or reproduce copies of any section thereof for use off postal premises or off-the-clock.

U.S. Postal Service  
Washington, DC 20260-7110

Handbook PO-412  
Bell and Howell Bar Code Sorter  
Operating Guidelines

February 1, 1988

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**A. Explanation**

Handbook PO-412, *Bell and Howell Bar Code Sorter Operating Guidelines*, is a new handbook which establishes guidelines and procedures for operating Bell and Howell bar code sorter equipment. This handbook applies to all facilities with Bell and Howell bar code sorter equipment.

**B. Initial Distribution**

This handbook is being distributed directly to all regional mail processing offices, divisions, and Management Sectional Centers.

**C. Additional Copies**

Order any necessary additional copies from your area supply center on Form 7380, *Supply Center Requisition*.

**D. Comments**

1. **Content.** Address any comments or questions regarding the content of this directive to:

Director, Office of Mail Processing Operations  
U.S. Postal Service Headquarters  
475 L'Enfant Plaza, SW  
Washington, DC 20260-7140

2. **Clarity.** Address any comments, questions, or suggestions regarding the organization or language of this directive to:

Document Control Division  
U.S. Postal Service Headquarters  
475 L'Enfant Plaza, SW  
Washington, DC 20260-1571

**E. Issuances Rescinded**

None.

**F. Effective Date**

These instructions are effective upon receipt.



*Allen R. Kane  
Assistant Postmaster General  
Mail Processing Department*

## Table of Contents

### Chapter 1—Introduction

110 Purpose

120 General Information

### Chapter 2—Postal Numeric Encoding Technique

210 Introduction

#### 220 POSTNET Code Structure

- 221 Bars and Half Bars
- 222 Code Characters
- 223 Position Weights
- 224 Correction Digit
- 225 Standard Formats
  - 225.1 General
  - 225.2 Types of Standard Formats
    - 225.21 Nine-Digit Format
    - 225.22 Five-Digit Format
- 226 Error Detection and Recovery
  - 226.1 Substitution Errors
  - 226.2 Detection of Substitution Errors
  - 226.3 Substitution Errors Affecting Only a Single Code Character
  - 226.4 Failure to Satisfy "Multiple-of-Ten" Requirement
  - 226.5 Other Substitution Errors

230 Decoding Template

#### 240 Bar Code Specifications

- 241 Bar Code Shape
- 242 Bar Code Height
- 243 Bar Code Width
- 244 Bar Code Spacing (Pitch)
- 245 Bar Code Location
- 246 Bar Code Skew
- 247 Baseline Shift

### Chapter 3—BCS System Orientation

#### 310 Physical Description

- 311 General
- 312 Feed Table (Magazine Section)

- 313 Feed Unit (Operator Section)
  - 313.1 General
  - 313.2 Vacuum Picker/Stripper Assembly
  - 313.3 Reader/Transport Assembly
  - 313.4 Bar Code Reader (BCR)
- 314 Mail Transport Unit (Conveyor Unit)
- 315 Work Table
  - 315.1 General
  - 315.2 Printer
  - 315.3 Computer
  - 315.4 Disk Drive
  - 315.5 Floppy Disk
    - 315.51 General
    - 315.52 Precautions When Using the Floppy Disk
    - 315.53 Proper Insertion of Disk into Disk Drive
    - 315.54 Proper Removal of Disk from Disk Drive
- 316 Video Monitor (CRT)

### 320 BCS Controls, Indicators, and Alarms

- 321 General
- 322 Main Power Panel
  - 322.1 General
  - 322.2 Sorter Electrical Power Switches
  - 322.3 Elapsed Time Indicator
- 323 Operator Control Panel
- 324 Magazine Control Panel
  - 324.1 General
  - 324.2 Fuse Holder
  - 324.3 Power On Light
  - 324.4 On/Off Switch
  - 324.5 Speed Control Knob
- 325 Video Monitor (CRT) Controls
- 326 Computer Controls
  - 326.1 General
  - 326.2 Control (CTRL) Key
  - 326.3 Reset Key
  - 326.4 Return Key
  - 326.5 Escape (ESC) Key
- 327 Printer Controls
  - 327.1 Rear Panel Controls
  - 327.2 Front Panel Controls and Indicators

- 327.21 General
- 327.22 Control Switches
  - 327.221 Form Length Rotary Switch
  - 327.222 Top of Form Set Switch (TOF)
  - 327.223 Select Switch (SEL)
  - 327.224 Form Feed Switch
  - 327.225 Line Feed Switch
- 327.23 Indicator Lights
  - 327.231 Select (SEL) Indicator Light
  - 327.232 Paper Indicator Light
  - 327.233 Power Indicator Light
- 327.3 Printer Control Levers
  - 327.31 General
  - 327.32 Paper Lock Release Lever
  - 327.33 Head Gap Adjustment Lever
- 328 System Controls and Alarms
  - 328.1 Start-Up Alarm
  - 328.2 Emergency Stop Switch
  - 328.3 Stacker Full Switch
  - 328.4 Jam Detection System
- 330 Reject Stackers**
  - 331 General
  - 332 Read Reject Stacker
  - 333 Mechanical Reject Stacker (END BIN)
- Chapter 4—Duties and Responsibilities**
- 410 Automation Readability Specialist**
- 420 Supervisor**
- 430 Mail Processor**
- Chapter 5—Operating Procedures**
- 510 Introduction**
- 520 Normal Operations**
  - 521 Definition
  - 522 Prestart-Up Procedures
    - 522.1 Supervisor
    - 522.2 Maintenance Personnel
  - 523 Start-up Procedures
  - 524 Run Procedures
    - 524.1 General
    - 524.2 Sweeping Mail
    - 524.3 Clearing Jams
  - 525 Shutdown Procedures
    - 525.1 General
    - 525.2 Normal Shutdown Procedure
    - 525.3 Emergency Shutdown Procedure
- 526 Restarting After an Emergency Shutdown
- 530 Abnormal Operations**
  - 531 Definition
  - 532 Printer Failure
  - 533 Jam Detection Circuitry Failure
  - 534 Stacker Full Switch Failure
  - 535 Magazine Motor Failure
  - 536 Single Stacker Gate Failure
  - 537 Last Conveyor Module Failure
  - 538 Power Failure (Interruption)
- 540 Troubleshooting Guide**
  - 541 General
  - 542 Printer Not Printing
  - 543 Computer Will Not Boot Up
  - 544 Inappropriate Response from Main Power Switch
  - 545 No Computer Response to Keyboard Entries
- 550 Operational Policies**
  - 551 Guidelines
  - 552 Staffing
    - 552.1 Supervision
    - 552.2 Employees
  - 553 Mail Sources
  - 554 Operation Numbers
  - 555 Training
  - 556 Maintenance
  - 557 Visual Inspection
- Chapter 6—Management Information**
- 610 Introduction**
- 620 Main Menu Options**
  - 621 General
  - 622 Sort Option
  - 623 Report Options
    - 623.1 General
    - 623.2 Current Report
      - 623.21 Description
      - 623.22 Generating Report
      - 623.23 Report Entries
        - 623.231 Scheme Name
        - 623.232 Date
        - 623.233 Fed
        - 623.234 Sorted
        - 623.235 Rejected
      - 623.256 Non-read
      - 623.237 No-Code
      - 623.238 Out-of-Scheme

- 623.239 Accept Rate
- 623.3 End of Run Report
- 623.31 Description
- 623.32 Generating Report
- 623.33 Report Entries (Bin Totals)
- 624 Inquiry Option
  - 624.1 Description
  - 624.2 Generating Inquiry
- 625 Test Option
  - 625.1 Description
  - 625.2 Generating Test
    - 625.21 Echo
    - 625.22 Single Bin
    - 625.23 Sequence

**Chapter 7—Safety**

**710 Introduction**

**720 Supervisor's Responsibilities**

**730 Employee's Responsibilities**

**740 Operational Safety Summary**

**Appendix A—List of Exhibits**

**Appendix B—Glossary of Terms**

**Index**

## Chapter 1 Introduction

### 110 Purpose

This handbook establishes the methods and techniques needed to maximize use of automated mail processing systems. It provides operating guidelines for all levels of management.

### 120 General Information

The Postal Service has a system which automates letter mail distribution which results in significant productivity improvements. The heart of this system consists of the

representation of the ZIP Code by a bar code on the mail-piece utilizing the Postal Numeric Encoding Technique (POSTNET), the Optical Character Reader/Channel Sorter (OCR/CS), and the Bar Code Sorter (BCS). With this new equipment and the concept of bar coding, the Postal Service automates the process of reading addresses and sorting letters into stackers according to destination. The OCR sprays a bar code representation of the destinating address ZIP Code on each mail piece. This reduces the need for reading the address portion of the envelope in the subsequent distribution steps and allows for BCS distribution.

## Chapter 2

### Postal Numeric Encoding Technique

#### 210 Introduction

The POSTNET bar code system was developed by the USPS for encoding ZIP Codes on letter mail. This encoded information is then read by the bar code reading equipment which will perform sortations. POSTNET accommodates both 5-digit and the expanded 9-digit ZIP Codes (ZIP + 4). To fully understand the automation concept, it is imperative to understand the design of the POSTNET bar code.

#### 220 POSTNET Code Structure

##### 221 Bars and Half Bars

As shown in the following example, the basic elements of a POSTNET code are bars and half bars:



##### 222 Code Characters

A combination of 5 bars is used to represent each digit. Each 5-bar combination consists of 2 full bars and 3 half bars. Ones (1's) are full bars and zeros are half bars. Thus, the digits of zero (0) through nine (9) have been assigned the following codes:

0	11000	5	01010
1	00011	6	01100
2	00101	7	10001
3	00110	8	10010
4	01001	9	10100

Only these ten combinations of bars and half bars are valid and represent all possible combinations. The two-full-bars and three-half-bars convention for representing a number is important to the POSTNET concept because of the error-recovery feature of the system (see section

226). A combination other than two full bars and three half bars will be interpreted by the system as an error.

##### 223 Position Weights

Each code character is fully defined by the combination of bars which are assigned mathematically. Within each 5-bar combination, each position has been assigned a specified **weight**. With the exception of 0 (zero), the numerical value of each valid combination may be determined by summing the "weights" of the two positions which are occupied by the 1's (full bars). From left to right, the positions are weighted 7,4,2,1, and 0. Thus, for example, the combination (01010) has 2 full bars in the second (weight 4) and fourth (weight 1) positions. Summing 4 and 1 yields 5, which is the assigned value of 01010. The combination (11000) has a total weight of 11. This combination has been assigned the value of 0 (zero) and is the only exception to the summing of weights rule.

##### 224 Correction Digit

Each time a bar code field is printed, one additional digit is encoded along with the ZIP Code digits. This digit, known as the correction digit, is used as part of the error-recovery system. It is represented by 2 full bars and 3 half bars, as is each digit of the ZIP Code. The correction digit selected brings the sum of all the digits in the bar code field to the next higher multiple of 10. Examples:

a. The 9-digit ZIP 12345-6789 is to be encoded in POSTNET format. Summing the 9 digits yields 45. A correction digit "5" will result in the sum of the 10 digits being an integral multiple of 10.

b. The 9-digit ZIP 20036-5993 is to be encoded in POSTNET format. Summing the 9 digits yields 37. A correction digit "3" will result in the sum of the 10 digits being an integral multiple of 10.

c. The 5-digit ZIP 14609 is to be encoded in POSTNET format. Summing the 5 digits yields 20. A correction digit "0" will result in the sum of the six digits being an integral multiple of 10.

## 225 Standard Formats

### 225.1 General

The POSTNET System uses only two standard formats containing 52 and 32 bars, respectively. Reading of any number of bars other than these two formats will be interpreted by the system as an error.

### 225.2 Types of Standard Formats

#### 225.21 Nine-Digit Format

The standard 52-bar, 9-digit ZIP format is the basic configuration for encoding the full 9-digit ZIP Code. It is printed as a single 52-bar field, all bars uniformly spaced:

F	SCF	Zone (Delivery Unit)	Sector/Segment	C.D.	F
1	2-16	17-26	27-46	47-51	52

- a. Bar 1 is a frame bar and will always be a full bar called a frame bit.
- b. Bars 2-16 represent the 3 digits of the sectional center facility (SCF), each digit expressed by 5 bars.
- c. Bars 17-26 represent the 2 digits of the zone (delivery unit), each digit expressed by 5 bars.
- d. Bars 27-46 represent the 4 digits of the sector/segment number, each digit expressed by 5 bars.
- e. Bars 47-51 represent the correction digit.
- f. Bar 52 is a frame bit and will always be a full bar.

#### 225.22 Five-Digit Format

The standard 32-bar, 5-digit ZIP format is used for the initial coding of a mailpiece on which there is not enough information available to determine the full 9-digit ZIP Code. It is printed as a single 32-bar field with all bars uniformly spaced. It may represent either the 5-digit ZIP (SCF plus zone or delivery unit) or the 3 digits of the SCF plus a zero representing each of the last two digits of the zone numbers. The latter situation is known as a DEFAULT CODE.

F	SCF	Zone (Delivery Unit)	C.D.	F
1	2-16	17-26	27-31	32

- a. Bar 1 is a frame bar and will always be a full bar called a frame bit.
- b. Bars 2-16 represent the 3 digits of the SCF, each digit expressed by 5 bars.
- c. Bars 17-26 represent the 2 digits of the zone (delivery unit) number (or default code 00 if the zone number is unknown or indeterminate). The 2 digits are each expressed by 5 bars.
- d. Bars 27-31 represent the correction digit.
- e. Bar 32 is a frame bit and will always be a full bar.

## 226 Error Detection and Recovery

### 226.1 Substitution Errors

A substitution error is the reading or printing of a short bar as a long bar or vice versa. POSTNET has been specifically designed to detect substitution errors and provide a means of recovering from the error to the greatest extent practical. The following information applies to both the 32- and the 52-bar code field. The term "correctable" does not mean the physical modification of the bar code; rather, the ability to determine the correct value of the affected character, and to sort accordingly, rather than reject the mailpiece.

### 226.2 Detection of Substitution Errors

A substitution error is detected when a coded digit (a sequence of 5 bars) has other than 2 full bars and 3 half bars. All substitution errors are detectable, with the exception of "offsetting" errors in which either 1 or 2 full bars are misprinted or misread along with an equal number of half bars. Experience has shown that this type of error seldom occurs.

### 226.3 Substitution Errors Affecting Only a Single Code Character

An error which affects only one digit is always correctable. The digit is identified by its failure to meet the test of having exactly 2 full bars and 3 half bars. The correct value of the single affected character is determined by subtracting the sum of the 9 (or 5) valid characters from the next higher multiple of 10. If the sum of 9 (or 5) valid characters is itself a multiple of 10, the affected character is 0.

#### 226.4 Failure to Satisfy "Multiple-of-Ten" Requirement

If a complete bar code is read in which no substitution errors are detected, but in which the sum of the individual characters is not a multiple of 10, the mailpiece must be rejected. This is an indication of offsetting substitution errors and will probably result in a missort, if not rejected.

#### 226.5 Other Substitution Errors

Substitution errors affecting more than one digit cannot be corrected. The mailpiece will be sorted to the "Read Reject" stacker.

### 230 Decoding Template

A POSTNET Code Decoding Template has been designed by the Postal Service to assist in the decoding and verifying of bar codes. See Exhibit 230. This transparent template may be used to segment the individual code characters of the bar code into the numeric digits of the ZIP Code. The chart in the upper right corner of the template has been provided as a code reference. As stated before, 1 (one) represents a full bar and 0 (zero) represents a half bar. The large shaded area located near the right of the ZIP + 4 and 5-digit overlays indicates the correction digit area. The smaller hashed areas at the extreme ends of the two overlays indicate the location of the full bar frame bits. The POSTNET Code Decoding Template may be ordered from the area supply centers (supply number Item 04).

### 240 Bar Code Specifications

#### 241 Bar Code Shape

The shape of each bar must conform to the minimum and maximum bar characteristics, as shown in Exhibit 240. Each full bar must completely cover the minimum requirements for a full bar, but not exceed the maximum requirements shown in the exhibit. Each half bar must completely cover the minimum half bar requirements, as outlined in Exhibit 240, but must not exceed the maximum requirements depicted for the half bar.

#### 242 Bar Code Height

The height of the bar will be 0.125 inches (plus or minus 0.010) for a full bar and 0.050 inches (plus or minus 0.010) for a half bar.

#### 243 Bar Code Width

The width of the full bar and half bar is the same. In no instance will the bars be less than 0.015 or more than 0.025 inches wide.

#### 244 Bar Code Spacing (Pitch)

The horizontal spacing must be 21 bars per inch (plus or minus 1) (one pitch = 0.0475 plus or minus 0.0025 inches from centerline).

#### 245 Bar Code Location

The location of the bar code on the mailpiece has been chosen to ensure code readability by the letter-sorting equipment. Also considered was the area on the face of the mailpiece which would most likely be clear of extraneous information. Excluding vertical misalignment of the mailpiece due to transport considerations, the baseline of the bar code must be 0.245 inches (plus or minus 0.025) from the bottom edge of the mailpiece. The start position (left-most bar) of either the 52-bar code or the 32-bar code must be no greater than 4 inches or less than 3.875 inches from the right-hand edge of the mailpiece. The final (right-most bar) of the 32-bar code must terminate not less than 2.300 inches from the right-hand edge of the mailpiece.

#### 246 Bar Code Skew

Two types of skew may occur in the printing of bar codes on envelopes:

- a. *Positional.* The entire position may be skewed with respect to the bottom edge of the mailpiece.
- b. *Rotational.* The individual bars may be skewed with respect to the baseline of the pattern.

*Note:* It is possible for both types of skew to be present. The combined effects of positional and rotational skews must be limited to a maximum rotation of the bars (as they appear on the envelope) of plus or minus five degrees from a perpendicular to the bottom edge of the envelope.

#### 247 Baseline Shift

The vertical position of adjacent bars must not vary more than 0.005 inches as measured at the bottom of the bars.



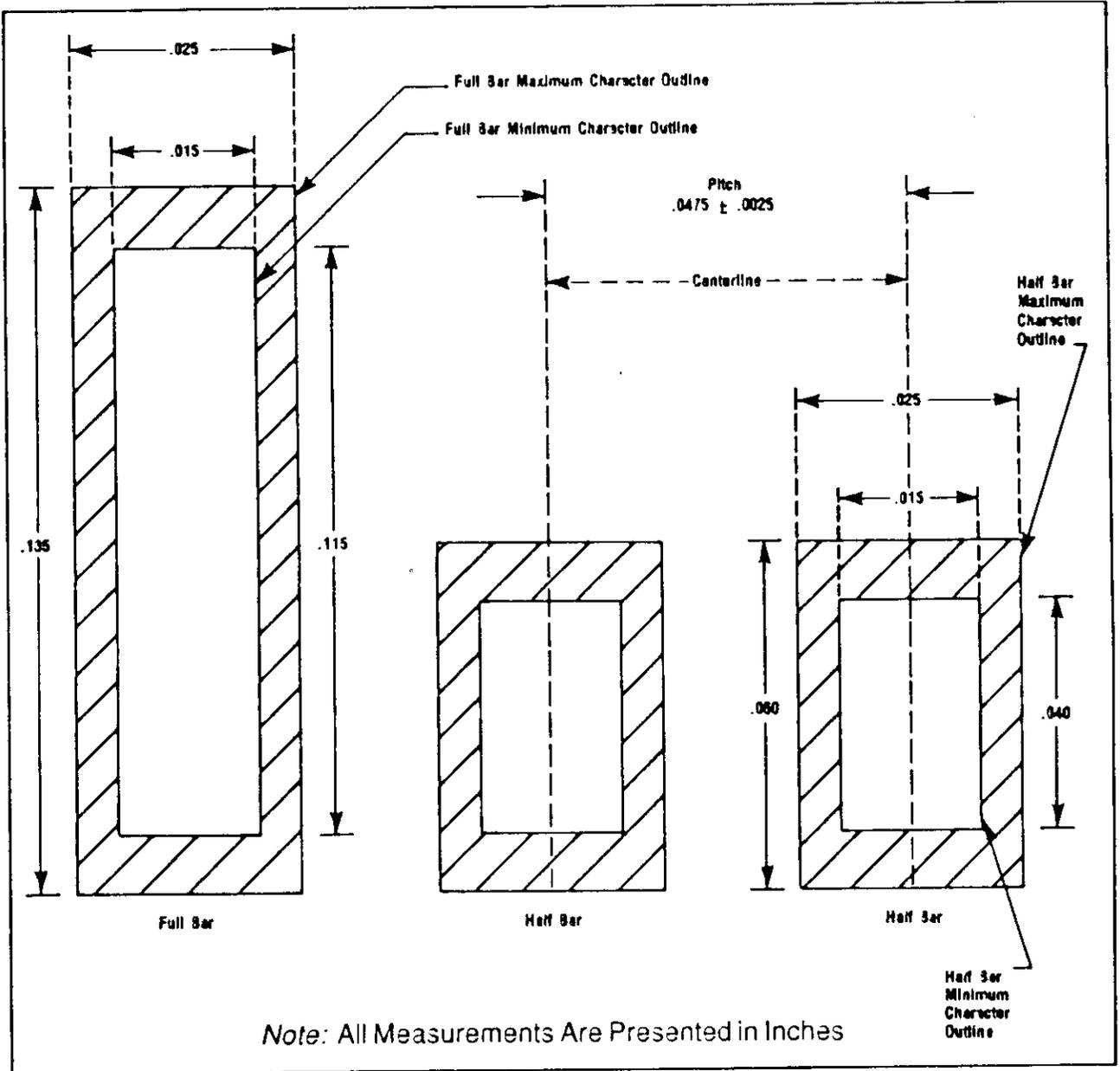


Exhibit 240 Bar Code Specifications

## Chapter 3 BCS System Orientation

### 310 Physical Description

#### 311 General

The Bell and Howell Bar Code Sorter (BCS) is a computer controlled, high-speed, mail sorting system which is capable of reading and interpreting bar code representations of address information (POSTNET), which have been placed on mailpieces by an Optical Character Reader (OCR) or by a large volume mailer (see Exhibit 311). The BCS sorts mail, by a predetermined program, at a rate of approximately nine pieces per second and will accept mail with the following dimensions:

	Height	Length	Thickness
Maximum:	6-1/8"	11-1/2"	1/4"
Minimum:	3-1/2"	5"	0.007"

As illustrated in Exhibit 311, the Bell and Howell BCS system comprises five major components:

- a. Feed Table or Magazine Section.
- b. Feed Unit or Operator Section.
- c. Mail Transport Unit (MTU) consisting of six stacker modules.
- d. Work table on which the computer, disk drive, and printer are placed.
- e. Video Monitor (CRT) located on top of the Operator Section.

*Note:* Mail containing keys, pens, or other stiff or bulky objects should not be fed through the OCR or BCS.

#### 312 Feed Table (Magazine Section)

The Feed Table (Magazine Section) is where bar coded mail is hand loaded and introduced into the system. The mail is transported, from right to left on the feed table, by three augers (screws) to the Vacuum Picker/Stripper area in the Feed Unit.

### 313 Feed Unit (Operator Section)

#### 313.1 General

The Feed Unit consists of the Vacuum Picker/Stripper and Reader/Transport assemblies and the Bar Code Reader (BCR) which consists of a Reader Optical Unit (ROU) and a Central Processing Unit (CPU).

#### 313.2 Vacuum Picker/Stripper Assembly

This assembly contains a number of micro switches, belts, springs, and fingers which work together to allow one letter at a time to enter the Reader/Transport Assembly. The Picker selects one mailpiece at a time while the Suction Stripper, which is opposite the Picker, prevents more than one mailpiece from entering the transport area. The Suction Stripper has two stainless steel leaf springs to hold the mailpieces in place.

#### 313.3 Reader/Transport Assembly

The Reader/Transport Assembly contains belts and springs which work together to transport the mail smoothly past the Bar Code Reader (BCR) to the first Conveyor Section.

#### 313.4 Bar Code Reader (BCR)

The Bar Code Reader consists of a Reader Optical Unit (ROU) and a Central Processing Unit (CPU). The ROU reads the POSTNET Code and transmits the information to the CPU. The CPU processes this information and sends it to the computer. The computer assigns the mailpiece to a stacker and issues that number to the tracking electronic circuitry. The mailpiece now travels down the Mail Transport Unit (Conveyor Unit) until it reaches its assigned stacker.

### 314 Mail Transport Unit (Conveyor Unit)

The Mail Transport Unit (MTU), also known as the Conveyor Unit, consists of six Stacker Modules. Each

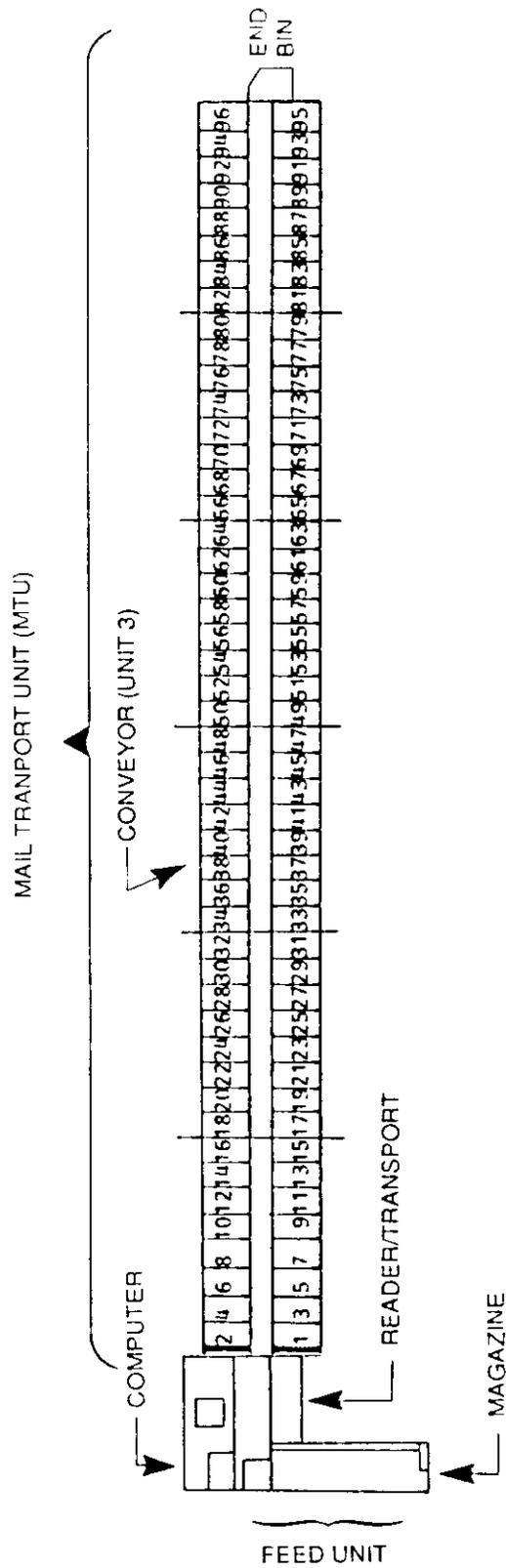


Exhibit 311 Bell and Howell Bar Code Sorter (BCS)

module contains sixteen stackers, eight on each side of the unit for a total of 96 stackers. The stackers contain gates which open to receive assigned mailpieces. The gate closes after the mailpiece has entered. A mailpiece, on which the bar code cannot be read, or there is no bar code, is sent to the Read Reject Stacker. The Read Reject Stacker and the Mechanical Reject Stacker are discussed in section 330.

## 315 Work Table

### 315.1 General

The Work Table is located to the left of the Operator Section. The printer, computer, disk drive, and floppy disk are on the work table.

### 315.2 Printer

The Printer is an alphanumeric, bi-directional line printer which is connected to the computer through a ribbon cable connection in the center of the rear panel of the printer. It is capable of printing 120 characters per second and provides a communication link with the computer to produce hard copies of the Current Report and End of Run Report.

### 315.3 Computer

The Microcomputer has a capacity of 64k bytes of memory with a built-in, typewriter-style keyboard. The keyboard has four special keys that are used in the daily operation of the Bar Code Sorter. These keys and other features of the computer are covered in section 326. Mail sorting is accomplished by means of a computer program which is loaded into the computer from a small disk inserted into the disk drive. Communication from the computer to the user is displayed on the CRT screen. Responses are made by the user on the computer keyboard.

### 315.4 Disk Drive

The Disk Drive, which is relatively delicate, is a small mechanical device made up of motors and other moving parts. Rough handling, such as dropping it or dropping things on it, can cause the disk drive to malfunction. Following is information and precautions which are necessary to know before using the disk drive:

a. The Disk Drive is used to send and receive information between the disk and the computer.

b. The door on the front of the disk drive serves to hold the disk in place and to lower the read head and drive wheel when the door is closed. The drive wheel makes contact with the hole in the center of the disk and turns it inside of the sleeve.

c. The small red "In Use" light on the front of the disk drive will be lit when the computer and disk drive are communicating. Never remove a disk while this light is on.

## 315.5 Floppy Disk

### 315.51 General

The Floppy Disk is a 5-1/4-inch-diameter, plastic disk coated with a material that allows information to be stored or erased from its surface. The coating is similar to the magnetic surface of a recording tape. The disk has been permanently sealed inside a square cover which contains both a cleaning and a lubricating agent. The cover serves to protect the disk, keep it clean, and allow it to spin freely. Although it is slightly flexible, actual bending of the disk can cause permanent damage.

### 315.52 Precautions When Using the Floppy Disk

Observe the following precautions when using Floppy Disks:

a. The disk is permanently enclosed in a protective cover. When handling the disk nothing should touch the part of the disk that is exposed through the cover. A dust particle, fingerprint, or even a small scratch on the disk itself can cause a loss of information which could result in an error.

b. When they are not in use, keep the disks in the paper jackets they come in. These jackets have been specially treated to minimize static electricity build-up, which attracts dust particles.

c. Store the disks in a vertical position. A storage box is provided at the Operator's Station for this purpose.

d. Once a disk label has been applied to the protective cover, never write on the label with a pencil or ball point pen. Excessive pressure on the disk's protective cover can damage the disk. If the label needs to be changed, write on a new label and stick it over the old one, or use a felt pen and light pressure to change the old one.

e. Keep disks away from magnetic fields. Also, keep disks out of the sun and away from sources of heat and moisture which can cause them to warp or lose data.

f. Create back-up copies of all computer disks and keep them in a secure place. This will provide a ready source of programs if something should happen to the original disks.

### 315.53 Proper Insertion of Disk into Disk Drive

To insert the disk properly into the disk drive, perform the following steps:

- a. Open the disk drive door by pulling outward on the bottom edge.
- b. Handling the disk carefully, insert it into the slot with the label upward. The end of the disk with the oval cutout goes into the slot first and the edge with the label goes in last. If the disk is held with the right thumb over the label it should be correctly oriented.
- c. Push the disk gently into the disk drive. Do not bend or push it too hard as this can cause permanent damage.
- d. Close the door by pushing it down until it latches.

### 315.54 Proper Removal of Disk from Disk Drive

Perform the following steps to properly remove the disk from the disk drive:

- a. Never remove the disk while the red "In Use" light is on.
- b. Open the disk door by pulling outward on the bottom edge. Opening the door lifts the read head off of the disk.
- c. Pull the disk carefully out of the disk drive.
- d. Hold the disk by its permanent cover, replace it in the paper jacket, and return it to the storage container.

## 316 Video Monitor (CRT)

The Video Monitor is located on top of the Reader/Transport unit of the Operator Section and is the visual communication link between the operator and the computer. The computer displays system status, requests responses, and directs input via prompts on the monitor screen. The computer's keyboard is used to answer these prompts and the monitor screen shows data regarding the inputs. The monitor controls are discussed in section 325.

## 320 BCS Controls, Indicators, and Alarms

### 321 General

There are operating controls, indicators, and alarms located throughout the BCS system that provide for the safe and efficient operation of the equipment. The following paragraphs describe their location and physical properties. Controls, indicators, switches, circuit breakers, or adjustment areas used exclusively for preventive or corrective maintenance are not included.

### 322 Main Power Panel (Exhibit 322)

#### 322.1 General

The Main Power Panel is located on the Operator Section, just below and to the right of the CRT. The panel is protected by a hinged metal door which is opened by pressing the knob to the right and pulling. The main power panel contains four electrical power switches for the sorter and an Elapsed Time Indicator. (See Exhibit 322.)

#### 322.2 Sorter Electrical Power Switches

These four switches are of the switch-breaker type also known as circuit breakers. They not only turn the electrical power on and off but they also protect the electrical circuit by shutting the power off when an overload is detected. The switches (circuit breakers) are labeled:

MOTOR CONTROL AUXILIARY  
OPERATOR STATION MOTOR VACUUM  
MAIN  
COMPUTER

#### 322.3 Elapsed Time Indicator

The Elapsed Time Indicator is mounted on the right-hand side of the main power panel between the main circuit breaker and the computer circuit breaker. The indicator shows the time in hours and tenths of an hour. It can be reset to zero as required and runs only when the vacuum motor and main circuit breakers are turned on.

### 323 Operator Control Panel (Exhibit 323)

The Operator Control Panel is located on the Feed Unit (Operator Section), immediately below the Video

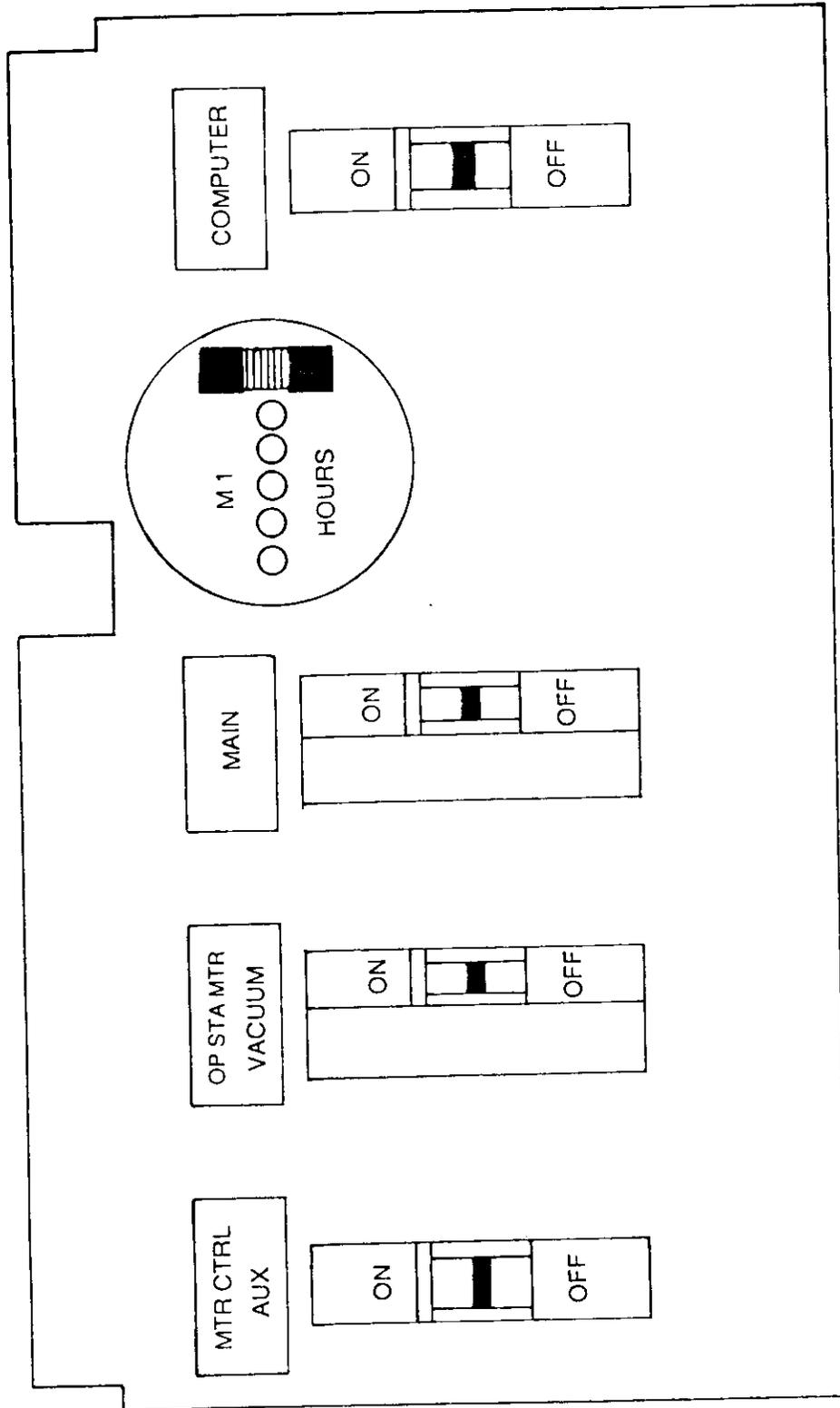


Exhibit 322 Main Power Panel

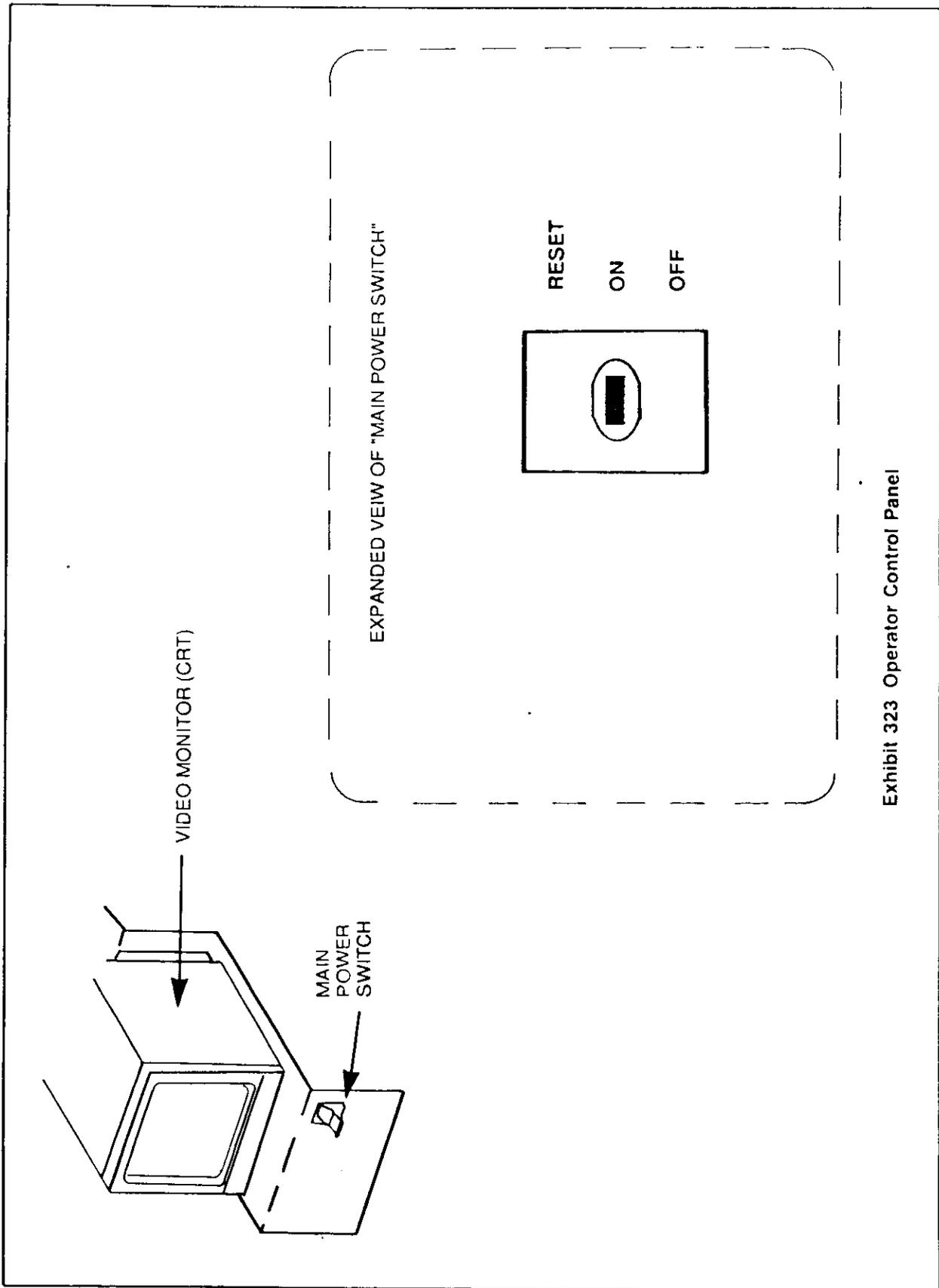


Exhibit 323 Operator Control Panel

Monitor (see Exhibit 323). This panel contains the three position Main Power switch which controls the operation of the sorter. The three positions are:

- a. **RESET** - This position is used to restart the sorter after a machine stop caused by a jam detector, a stacker-full switch, or an Emergency Stop switch being activated.
- b. **ON** - This position is used to turn on the power to the Mail Guide Drive Belts in each Stacker Module. The last Stacker Module starts first, then the remaining modules start sequentially (for example: Module 6, then 5, then 4).
- c. **OFF** - This position is used to turn off the power to the Mail Guide Drive Belts in each Stacker Module and the Feed Unit. The Feed Unit Stops first then the Stacker Modules stop sequentially starting with Module 1 (for example: Feed Unit, then Module 1, then 2, then 3).

## 324 Magazine Control Panel (Exhibit 324)

### 324.1 General

The Magazine Control Panel is located on the front right-hand end of the Magazine Section just below the Feed Table (see Exhibit 324). This panel contains a fuse holder, power on lamp, on/off switch, and a speed control knob.

### 324.2 Fuse Holder

The Fuse Holder contains a fuse which protects the Magazine Section motor from an electrical overload.

### 324.3 Power On Light

The Power On Light indicates whether or not there is power to the Magazine Motor Controller. When the Magazine Control Panel switch is in the "ON" position, the red power light should be lit.

### 324.4 On/Off Switch

The On/Off Switch is located in the center of the Magazine Control Panel. This is a three position switch which turns the power to the Magazine Section "ON" and "OFF." The "OFF" position allows the motor to coast to a stop when the power is turned off. The "BRAKE" position provides for dynamic braking which stops the augers instantly.

### 324.5 Speed Control Knob

The Speed Control Knob is located on the right-hand side of the panel and controls the speed of the magazine motor which controls the speed of the feed table augers. Maintenance personnel will adjust the Speed Control Knob to ensure smooth feeding of mailpieces. The normal setting used is usually between 70 and 80 RPMS. Varying the speed depending on thickness/thinness of the mailpiece in a run can affect the GAR (Gross Acceptance Rate).

## 325 Video Monitor (CRT) Controls

All controls for the monitor are located behind the hinged protective panel, directly below the screen. These control knobs include the Horizontal Hold, Vertical Hold, Brightness, and Contrast adjustments for the screen presentation and the power On/Off switch. All adjustment control knobs will be operated by maintenance personnel. The power On/Off switch should be left in the ON position at all times. The power for the monitor is controlled by the switch on the Main Power Panel. When the monitor is receiving power, the power ON light below the screen, and the right-hand side of the panel, will be lit.

## 326 Computer Controls

### 326.1 General

There is an On/Off switch on the rear panel of the computer next to the electric plug. Leave this switch in the "ON" position at all times. The computer switch on the main power panel will normally be used to turn the computer on and off. When power is applied, the computer will "beep" and a white "POWER ON" indicator, located on the lower left-hand side of the keyboard, will light. The POWER ON light is not a key and cannot be depressed. Its only function is to indicate that the power to the computer is on. There are 52 keys on the computer.

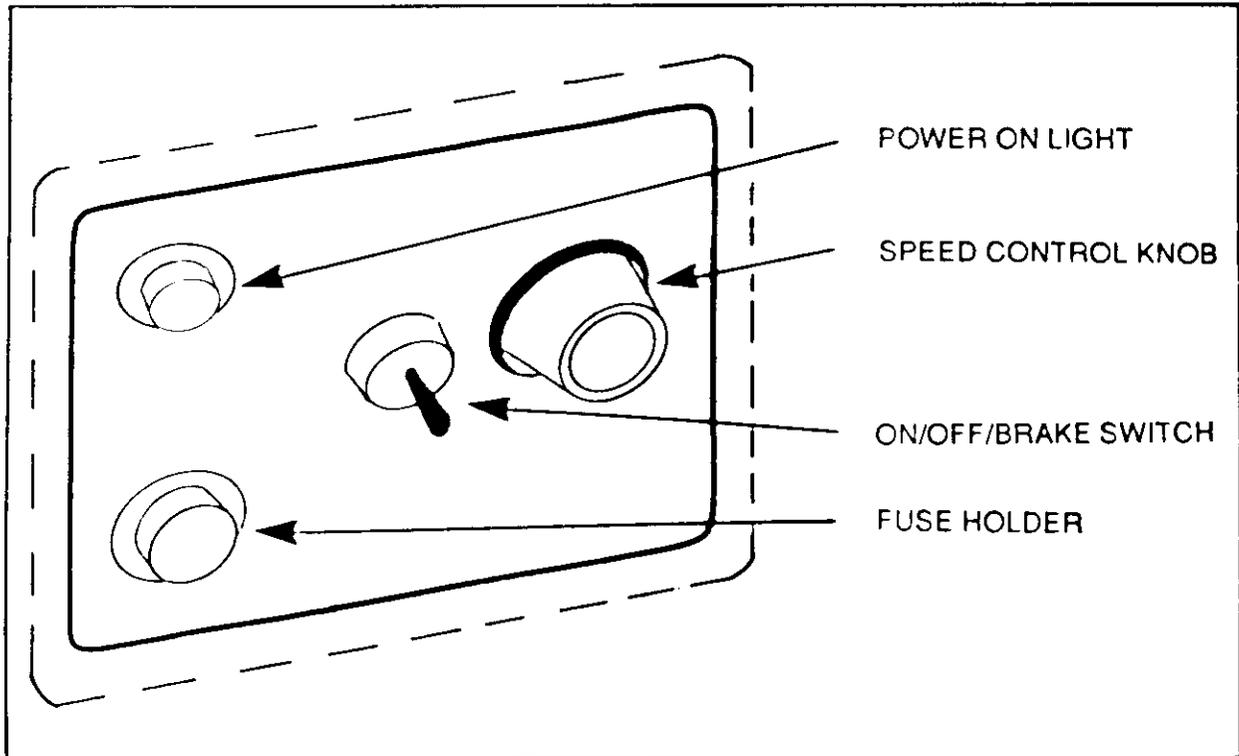


Exhibit 324 Magazine Control Panel

keyboard; four of which are special keys used in the daily operation of the Bar Code Sorter. They are the CONTROL (CTRL) key, RESET key, RETURN key, and ESCAPE (ESC) key.

### 326.2 Control (CTRL) Key

The CONTROL key is always used along with another key and serves to give the other key a special function. It acts something like the shift key on a regular typewriter. In a set of instructions a hyphen is used between two keys to show that they are to be used together. For instance, the instruction "CONTROL-P" means press the control key down first and hold it while the "P" key is pressed. Release both keys at the same time.

### 326.3 Reset Key

When used along with the CONTROL key, the RESET key will serve to start a program. The command is written as "CONTROL-RESET" and when used an asterisk (\*) will appear in the lower left-hand corner of the Monitor screen, followed by a blinking square called a cursor.

### 326.4 Return Key

The RETURN key is the ENTRY key and is pressed after each appropriate informational entry has been made on the keyboard. Pressing the RETURN key inputs the information or command to the computer.

### 326.5 Escape (ESC) Key

The ESCAPE key is used when directions to do so appear on the monitor screen. Depressing this key cancels one operation and enables the selection of a different operation.

## 327 Printer Controls

### 327.1 Rear Panel Control

The Printer has an AC power On/Off switch on the right-hand side of the rear panel just above the electric power cord. This switch is left in the "ON" position all the time and the power is controlled from the Main Power Panel.

## 327.2 Front Panel Controls and Indicators

### 327.21 General

The printer controls and indicators are located on the left-hand side of the front panel. There are five control switches and three light indicators. The printer controls are set by maintenance personnel.

### 327.22 Control Switches

#### 327.221 Form Length Rotary Switch

The Form Length Rotary Switch is a selection dial which is used to set the length of the page when the printer is used to print on forms.

#### 327.222 Top of Form Set Switch (TOF)

The TOF Set switch is used to tell the printer where the first line is located on the form. This switch is functional only when the printer is off-line and the SEL light is OFF.

#### 327.223 Select Switch (SEL)

The SEL Switch is used to connect or disconnect the printer to the computer. When the SEL switch is pressed and the SEL light goes out, the printer is disconnected from the computer and is said to be off-line and the TOF Set, Form Feed, and Line Feed switches become operable. When the SEL Switch is pressed and the SEL light goes on, the printer is connected to the computer and is said to be on-line. When the printer is on-line, it is controlled by the computer.

#### 327.224 Form Feed Switch

Depressing the Form Feed Switch causes the printer to advance the paper one sheet to the next top of form position. The Form Feed Switch is functional only when the printer is off-line and the SEL light is off.

#### 327.225 Line Feed Switch

Depressing the Line Feed Switch causes the printer to advance the paper the distance of one line. This switch is functional only when the printer is off-line and the SEL light is off.

## 327.23 Indicator Lights

### 327.231 Select (SEL) Indicator Light

The SEL Indicator Light shows the communication status between the printer and the computer. When the light is off the printer is off-line and cannot receive data from the computer. When the light is on, the printer is on-line and can receive data from the computer. If the printer runs out of paper the SEL indicator light automatically goes off and the printer goes off-line. After the paper supply has been replenished, the SEL switch must be pressed to put the printer back on-line with the computer; the SEL indicator light will come on.

### 327.232 Paper Indicator Light

The Paper Indicator Light comes on only when the printer is out of paper.

### 327.233 Power Indicator Light

The Power Indicator Light comes on when electric power is applied to the printer.

## 327.3 Printer Control Levers

### 327.31 General

The two control levers are on the right-hand side of the printer. The Paper Lock Release Lever is behind the platen (roller) and the Head Gap adjustment lever is in front of the platen.

### 327.32 Paper Lock Release Lever

The Paper Lock Release Lever is pushed toward the back of the printer when using roll paper and pulled toward the front when using sprocket paper.

### 327.33 Head Gap Adjustment Lever

The Head Gap Adjustment Lever is used to adjust the gap between the platen and the print head. When the lever is pushed toward the back of the printer, the gap adjustment is set for one or two thicknesses of paper. When the lever is pulled toward the front of the printer, the gap adjustment is set for three or four thicknesses of paper.

## 328 System Controls and Alarms

### 328.1 Start-Up Alarm

The Start-Up Alarm, which is a warning horn, is activated when the main power switch on the Operator Control Panel is placed in the reset position. One alarm horn is located in the feeder module, and the second is located in the last conveyor module. The alarm horn alerts all personnel that the sorter is about to start and they should stand clear of the machine. The alarm will continue to sound until the last Conveyor Module starts to run.

### 328.2 Emergency Stop Switch

There are Emergency Stop Switches located every eight feet along both sides of the conveyor modules, plus one at the end of the Magazine Section. These red, mushroom shaped switches are activated by pushing down and deactivated by pulling up. Engaging an Emergency Stop Switch stops the Bar Code Sorter immediately. It cannot be restarted until the problem is cleared and the stop switch is reset. Always use the Emergency Stop Switch when clearing a jam.

### 328.3 Stacker Full Switch

Stacker Full Switches are mounted on the inside wall of each stacker. Allowing the stacker to fill to capacity with mail will cause the stacker backplate to press against the Stacker Full Switch and trip it. This will shut down the entire machine immediately. In an emergency, if an Emergency Stop Switch cannot be reached, use any one of the Stacker Full Switches to stop the machine. The machine can be restarted as soon as the Stacker Full Switch is released so use this method of stopping the machine only in an extreme emergency and then activate an Emergency Stop Switch immediately.

### 328.4 Jam Detection System

The Jam Detection System will turn off the sorter whenever an envelope blocks a photocell for longer than one tenth of a second. This indicates that a jam has occurred. Activate the Emergency Stop Switch before attempting to clear the jam.

## 330 Reject Stackers

### 331 General

The Bell and Howell Bar Code Sorter has two reject stackers which receive mailpieces that have been rejected by the system because of nonreadability of the mailpiece or a malfunction of the equipment. These stackers are the Read Reject Stacker and the Mechanical Reject Stacker.

### 332 Read Reject Stacker

The Read Reject Stacker receives mailpieces that the sorter was unable to process due to misprinted or smeared bar codes, bar codes that have not been assigned to a stacker in the scheme being used (out of scheme mail), misfaced mail being fed, or mail being fed in a skewed position. Accumulate mail in the Read Reject Stacker and recycle it through the Bar Code Sorter a

second time at predetermined intervals or at the end of run. The mail which is rejected a second time should be a small percentage and should be taken to the MPLSM area for processing.

*Note:* Recycle rejected mail selectively, since it could be in the Read Reject Stacker due to poorly sprayed or missing bar codes.

### 333 Mechanical Reject Stacker (End Bin)

The Mechanical Reject Stacker on the BCS is referred to as the End Bin and accepts mailpieces which did not enter the proper stacker because of a mechanical/electrical problem. For example: a stacker gate was activated for a mailpiece but it could not enter because a machine stoppage occurred at the same time. Recycle all good, undamaged mail in the End Bin through the BCS since it was successfully read the first time but did not reach a sort stacker due to a mechanical problem.

## Chapter 4 Duties and Responsibilities

### 410 Automation Readability Specialist

Automation Readability Specialists (ARS) coordinate and support activities related to BCS (and OCR) processing. The duties and responsibilities of the ARS include, but are not limited to, the following:

- a. Promote and maintain high acceptance rates for letter mail processed on automated equipment.
- b. Ensure that the Automation Readability Enhancement Program is a success at the local level.
- c. Serve as a technical information clearinghouse on automation readability matters.
- d. Identify and resolve problem areas related to automation readability.
- e. Isolate, identify, test, and evaluate letter mail for processing on automated equipment.
- f. Establish and coordinate procedures for exchanging information concerning address format changes which affect the readability of local originating mail.
- g. Identify mail which yields the highest Gross Accept Rate (GAR).
- h. Periodically examine Reject and Accept Stacker contents and review data from quality control.
- i. Provide feedback to the Field Division General Manager/Postmaster or designee on major problems affecting automation readability.
- j. Interface with the Marketing Account Representative to provide postal customers information and assistance in solving specific problems.

### 420 Supervisor

Supervisors responsible for the efficient operation of automated 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 (sort program to be run and start-up time).

- e. Check for availability of mail processors and support personnel.

- f. Issue work assignments.

- g. Make certain all necessary forms are completed during equipment operation and reports available from the automation computers are requested by the end of run.

- h. Provide back-up personnel as needed for relief and lunch coverage.

- i. Ensure that necessary support equipment and labels are available at all times.

- j. Maintain a continuous, smooth mail flow into and out of the operation paying particular attention to ensure:
  - (1) Mail coming into the automated area is machinable, readable, and correct for the sort program being used.
  - (2) Processed mail going out of the area is properly trayed and labeled.
  - (3) Machinable rejects are recycled through the BCS and those mailpieces that are rejected a second time are flowed to the MPLSM area and any nonmachinable culls are continually sent to manual operations.

- k. Observe mail processors and support personnel in the performance of their duties and provide instruction and on-the-job training when needed.

- l. Make periodic stacker checks to ensure that the automated equipment is performing quality sortations.

- m. Analyze mail in the Read Reject Stacker to determine the cause for rejection. If the bar code on this mail is smeared or poorly printed, inform maintenance personnel to check the OCR printing system from which this mail was received, providing the mail was bar coded by an OCR in the same office.

- n. Inform maintenance about problem areas on the automated equipment which need diagnostic and corrective action.

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

*p.* In offices that have an Automation Readability Specialist (ARS), notify the ARS of problems encountered because of nonreadable, mailer prepared mail-pieces.

### **430 Mail Processor**

The mail processor performs a variety of tasks required to process mail using automated equipment. The mail processor will report to the supervisor responsible for the operation and will have the following duties and responsibilities:

- a.* Starting and stopping the equipment.
- b.* Culling nonprocessable items.
- c.* Loading mail onto the feed table for induction into the distribution system.
- d.* Clearing jams not requiring the use of hand tools.
- e.* Sweeping mail from stackers, bins, separations, or runouts; rubber banding or tying bundles as necessary; and placing mail into trays, carts, racks, and pouches.
- f.* Notifying supervisor or maintenance personnel when malfunctions or unsafe conditions occur.
- g.* Performing other job-related tasks in support of primary duties.

## Chapter 5 Operating Procedures

### 510 Introduction

This chapter addresses the philosophy and methods necessary to operate automated equipment effectively, and provides the information necessary to isolate and react to malfunctions that occur during operation.

### 520 Normal Operations

#### 521 Definition

The Bar Code Sorter (BCS) is in normal operation when efficient and accurate sortation of mail is being accomplished.

#### 522 Prestart-Up Procedures

##### 522.1 Supervisor

Prior to starting the BCS operation, the supervisor must ensure that:

- a. Sufficient mail volume is available and properly prepared for processing on the automated equipment.
- b. Support equipment, such as tray racks, MM trays, plastic trays, and containers for tie-out bundles is available, in place, and ready for safe use.
- c. Both support personnel and adequate space are available to safely stage mail coming into the operation without blocking aiseways.
- d. Support equipment and personnel are available to remove processed mail from the automated area to dispatch areas or further processing areas.
- e. Maintenance is informed of the start-up time and type of mail to be processed.
- f. All units of the BCS are checked for mailpieces remaining from previous run.
- g. All switches and controls on the equipment are in the proper settings prior to actual start-up. A detailed explanation of this procedure is given in section 523.
- h. All safety devices are operable and engaged.
- i. All employees are clear of moving machine parts prior to start-up.
- j. Mail processors are scheduled in a timely manner to maintain optimum operation of the equipment.

##### 522.2 Maintenance Personnel

Prior to starting the BCS operation, maintenance personnel must:

- a. Check to ensure the BCS equipment is free of dirt and dust and ready for safe operation.
- b. Check the area surrounding the BCS for safety hazards and cleanliness.
- c. Perform all other duties as set forth by local management policy.

#### 523 Start-Up Procedures

*Note:* With the increasing changes in software, not all menu's will be represented in the same appearance. Therefore, keep in mind that menus may vary in each office. The following is just one example of start-up procedures:

During the normal start-up process, perform the following procedures:

- a. Open the Main Power Panel door.
- b. Push the Computer circuit breaker switch up to the "ON" position. Listen for the "beep" tone from the computer as power is first applied to it.
- c. Check that the Power On Light on the computer is lit.
- d. Push the Main circuit breaker switch up to the "ON" position.
- e. Push the Motor Control Auxiliary circuit breaker switch up to the "ON" position.
- f. Check that the Power On Light is lit on the monitor.
- g. Check that the Power On and SEL Lights on the printer are lit. When the SEL Light is "ON" the printer is on-line and controlled by the computer. When the SEL Light is "OFF" the printer is off-line.
- h. Load the sort program into the computer as follows (referred to as "booting"):
  - (1) Insert a disk containing the selected sort program to be run into the disk drive and close the door.

(2) Enter the start-up command into the computer by depressing the following keys in order:

CONTROL-RESET  
7  
CONTROL-P  
RETURN

(3) Check that the red "IN USE" light on the disk drive is on. If it is "ON," the sort program is being transferred from the disk to the computer. If it is "OFF," the computer did not receive the start-up command and it will be necessary to re-enter it.

*Note:* The "IN USE" light will go off when the sort program loading to the computer is completed. If the light does not go out in a short time, press the CONTROL-RESET keys. This command will end the computer's processing procedure. Check to see if a disk is in the drive and if it is oriented and seated properly. Execute steps 1, 2, and 3 again. If the light still remains on follow steps 1, 2, and 3 using a new disk. If this does not work, notify maintenance personnel. When the "IN USE" light goes off, the "Headline," which gives the sort program name on the disk, will briefly appear on monitor screen. It will be replaced with the following request:

ENTER TODAY'S DATE (MM/DD/YY)  
--()

(4) Enter 2 digits each for the month, day, and year on the keyboard being careful to include the slash marks. Example: 05/29/88

*Note:* Always use the numeric zero key for numbers. The alpha key "O" on a computer keyboard is different from the numeric zero key.

(5) Type in any additional heading information required in your facility. Examples: supervisor's name, MODS operation number, type of mail, tour.

(6) Press the RETURN key. This will enter the information into the computer and normal sorting operations can begin when the following display appears on the monitor screen:

### MONITOR OPTIONS

SCHEME NAME: XXX (Sample Name)  
S - SORT  
R - REPORT  
I - INQUIRY  
T - TEST  
E - END OF RUN  
PLEASE SELECT OPTION—()

This is called the "Monitor" position in the program.

(7) Press the "S" (To Sort) key and then the Return Key. This enters the selected option into the computer. The following display will appear on the monitor screen:

SORT  
SCHEME NAME: TXXX (Sample Name)  
PRESS 169ESC" TO RETURN TO MONITOR  
TOTAL = 000000

The computer is ready to sort mail according to the sort program which was loaded from the disk.

(8) Press the ESCAPE (ESC) key to return to the "Monitor" position in the program when the sorting operation is completed. Another option may then be selected.

i. Ensure the Feed Table is loaded with mail.  
j. Open Main Power Panel door and push the OPERATOR STATION MOTOR VACUUM circuit breaker switch up to the "ON" position. Listen for the vacuum motor to start.

k. Ensure that all personnel are clear of the machine and move the Main Power Switch on the Operator Control Panel from the "OFF" position to the "RESET" position. The start-up alarms will sound for 2.5 seconds. The conveyor motors in each module will start sequentially, with module 6 being first and the Feed Unit being last.

l. Push the Magazine (Feed Table) motor switch on the Magazine Control Panel to the "ON" position and check the red light next to the switch. If the light is "ON" there is power to the controller.

m. Ensure that the Magazine motor speed has been properly adjusted by maintenance personnel. This is necessary to ensure a smooth, steady, continuous flow of mail is being introduced into the system.

## 524 Run Procedures

### 524.1 General

Following are the run procedures for the Bell and Howell BCS:

*a.* Keep the feed table of the Magazine Section properly loaded with mail to ensure a smooth continuous flow.

*Note:* It is essential that the mailpieces be jogged to line up the leading and bottom edges before loading them onto the feed table.

*b.* Monitor controls and indicators to ensure awareness of changes in the running status of the equipment.

*c.* The Feed Unit will accept approximately one tray of mail per minute; therefore continually monitor the feed station.

*d.* Sweep the stackers continually to keep the equipment operating smoothly.

*e.* Place swept mail into trays, where volume warrants and bundle it where volumes do not warrant tray-ing.

*f.* Place filled trays on dispatch equipment and replace tray. Place bundles in an appropriate container to accommodate pouching operations.

*g.* Check all stackers, including the Read Reject Stacker and the End Bin (Mechanical Reject Stacker), often to determine if the equipment is operating properly.

*h.* If the mailpieces were bar coded (sprayed) within the facility, notify the OCR supervisor when bar codes are incomplete, improperly placed, or smeared. These situations indicate a problem exists with the facility OCR which must be corrected as soon as possible.

*i.* Monitor the mail transport path to detect the presence of dirt and debris buildup and take appropriate action.

### 524.2 Sweeping Mail

There are two methods of sweeping:

*a.* Lift the Stacker Backplate (also known as separator plate) with the left hand while supporting the mail with the right hand. Insert the backplate next to the

Beater Wheel at the stacker entrance. Remove mail from stacker with both hands.

*b.* Grasp the mail a handful at a time and let the backplate spring toward the stacker entrance to hold up the remaining mail. Always grasp the mail in the clear area between the side of the stacker and the end of the backplate to prevent contact with the Beater Wheel. When the conveyors are running and this method is used, always leave 2 inches of mail in the stacker.

**CAUTION:** Never reach behind the stacker backplate to grab mail as the Beater Wheels may grab the knuckles.

### 524.3 Clearing Jams

If a mailpiece blocks a photocell for longer than one tenth of a second, the Jam Detection Circuitry indicates that a jam has occurred and shuts the Bar Code Sorter down. To clear a jam, use the following procedures:

*a.* Activate the Emergency Stop Switch to prevent the BCS from accidentally being restarted while a jam is being cleared.

*b.* Carefully remove the jammed mail. If mailpieces are so severely stuck that they cannot be easily removed by hand, call maintenance personnel. The mail processor may only clear jams which do not require the use of hand tools.

**CAUTION: DO NOT FORCIBLY REMOVE ANY MAILPIECES.**

*c.* Reset the Emergency Stop Switch.

*d.* Ensure that all personnel are clear of the machine and move the Main Power Switch to the reset position to restart the BCS.

*Note:* If a jam occurs in the vicinity of a gate, removal of the mailpieces may cause the gate to move vertically on its shaft. Always check for this occurrence. To reset the gate, press down on it before resetting the Emergency Stop Switch.

## 525 Shutdown Procedures

### 525.1 General

The BCS can be stopped by a normal shutdown procedure or by an emergency shutdown procedure.

## 525.2 Normal Shutdown Procedure

This procedure begins at the completion of the mail run and proceeds as follows:

- a. Ensure all mail has cleared the Feed Unit and turn off the Magazine motor.
- b. Ensure all mail has cleared the Conveyor Sections and turn off the Main Power switch on the Operator Control Panel.
- c. Turn off the vacuum circuit breaker.
- d. Press the ESCAPE (ESC) key on the computer keyboard.
- e. Press the letter "E" on the computer keyboard and then press the RETURN key. This will select the End of Job option on the monitor menu.
- f. Press the letter "Y" (Yes) on the computer keyboard to start the End of Job Report printing.
- g. Remove the disk from the disk drive after the End of Job Report has been printed.
- h. Close the disk drive door.
- i. Replace the disk into its protective cover and place in the disk storage container.
- j. Open the cover on the Main Power Panel and turn off the circuit breakers in the following order:
  - (1) Motor Control Auxiliary
  - (2) Main
  - (3) Computer
- k. Close and latch the cover on the Main Power Panel.
- l. Ensure that all mail from the completed run has been swept into the appropriate dispatch equipment.
- m. Check the BCS for stray mailpieces.
- n. Complete any necessary paperwork.

## 525.3 Emergency Shutdown Procedure

This procedure is used when immediate action is necessary to prevent injury to personnel or damage to the equipment or mail. The BCS can be stopped by depressing an Emergency Stop Switch or a Stacker Full Switch. Emergency Stop switches are located every eight feet on both sides of the conveyor sections and on the right-hand end, top cover of the Magazine Unit. The Stacker Full Switches are located on the end of the stacker closest to the operator. If the Stacker Full switch is used, engage the Emergency Stop Switch to prevent accidental restart.

*Note:* All electrical power to the BCS and all its components can be quickly removed by opening the cover on the Main Power Panel and turning off the Main and Computer circuit breakers.

## 526 Restarting After an Emergency Shutdown

Use the following procedures to restart the system after an emergency shutdown has occurred:

- a. Check to ensure that the situation causing the need for an emergency shutdown has been cleared and that all personnel are clear of moving parts.
- b. Unlatch any emergency shutdown switch that has been activated by grasping the switch firmly and pulling straight up. This opens the self-locking switch.
- c. If the Main Power Switch on the Operator Panel is in the "ON" position and there is no mail in the transport path from the Magazine Section to the End Bin, restart the BCS by momentarily holding the Main Power Switch in the "RESET" position and then releasing it.
- d. If the power has been turned off to the BCS it may be necessary to follow the start-up procedures in section 523.
- e. Continue to run normally.

**CAUTION: HOLDING THE MAIN POWER SWITCH IN THE "RESET" POSITION OVERRIDES THE JAM DETECTION CIRCUITRY.**

## 530 Abnormal Operations

### 531 Definition

Anytime the flow of mailpieces through the BCS ceases, or the smooth, problem-free sorting of mail is not being accomplished, the BCS is considered to be in the state of Abnormal Operations. This can be caused by mail jams or component malfunctions. The mail jam situation is discussed in section 524.3. The possible component failures which would allow the BCS to still be operated, but at a reduced efficiency, follow.

### 532 Printer Failure

The printer must be turned on and must be on-line when the computer is initially booted up; however, the printer could fail at a later time during operation. The failure of the printer does not affect the sorting operation once it has begun. When the printer fails, it is not possible to run the Current Report or the End of Run Report. If an attempt is made to select and run either of these reports, the computer will lock up while waiting for the "Printer Ready" signal from the printer. Rebooting the computer will not be possible since this procedure requires an "On Line" signal from the printer to the computer. Rebooting would result in a loss of all the counts in memory which are necessary to produce the reports. To recover

from a printer failure, without a loss of memory counts, perform one of the following steps:

- a. Temporarily replace the defective printer with one from another sorter and run the End of Job Report.
- b. Return to the monitor mode by depressing CTRL-RESET, CTRL-Y, and RETURN. Continue sorting by selecting the "S" option on the menu.
- c. Process the next sortation program without receiving an End of Job Report:
  - (1) Record the pieces fed data from the Monitor screen.
  - (2) Place the new sort program disk into the disk drive.
  - (3) Enter the following commands on the computer keyboard; CTRL-RESET, 7, CTRL-P, and RETURN.
  - (4) Continue sorting with the new sort program.

### 533 Jam Detection Circuitry Failure

A Jam Detection Circuitry failure would not be evident until a jam condition occurs and the BCS does not shut down automatically. To recover and continue sortation perform the following steps:

- a. Stop the BCS by activating an Emergency Stop switch or by pushing the Main Power Switch to "OFF."
- b. Clear the jam and, following proper procedure, restart the BCS.

*NOTE:* It is *not recommended* that the BCS be operated if the Jam Detection circuitry is not fully operational. This will prevent damage to the equipment.

### 534 Stacker Full Switch Failure

A Stacker Full Switch failure will not be evident until a jam occurs at the gate of a stacker which cannot receive additional mailpieces because of its full condition. To continue sorting operations:

- a. Follow proper procedures to clear the jam.
- b. Partially or completely empty the stacker of mailpieces.
- c. Restart the BCS and continue sortation.

*NOTE:* Monitor the stacker with the defective switch closely to prevent future jams during the run. Since a stacker should normally not be allowed to fill beyond the halfway point before being emptied, the jam situation should not be a problem.

### 535 Magazine Motor Failure

The Magazine Motor failure becomes apparent when the augers on the feed table fail to turn. This interrupts the feeding of mailpieces to the Picker Assembly. Hand-feeding can be used to accomplish sortation while maintenance personnel are making repairs. To hand-feed, simply hold a handful of mail up against the Picker and allow it to pick off one mailpiece at a time. This will reduce the rate at which the mail is fed, but will allow for sortation and the completion of a run.

### 536 Single Stacker Gate Failure

A failure of one Stacker Gate will become apparent when the sortation of mailpieces to that stacker ceases and those mailpieces are deposited into the End Bin. The mail sorting process can continue while maintenance personnel are effecting repairs.

*NOTE:* Hand verify or re-sort mailpieces deposited in the End Bin during a stacker gate failure before the mail is dispatched.

### 537 Last Conveyor Module Failure

If a failure of the Last Conveyor Module occurs, no mail will be accepted in any of its stackers. To enable the five remaining Conveyor Modules to function normally, it is necessary to secure one of the stacker gates in the Last Conveyor Module in an open position. As a result, all of the mail for the Last Conveyor Module will be deposited in the secured stacker while repairs are being made. After the repairs are completed, the mail from the isolated stacker can be correctly sorted.

### 538 Power Failure (Interruption)

An interruption of power to the sorter will stop all mail sortation. A battery provides uninterrupted power to the computer during this situation. This ensures the computer's memory will retain the record of mailpieces processed before the power failure. When a power failure occurs, perform the following procedures to protect the BCS or the computer from a power surge when the power is restored.

- a. Depress the ESCAPE (ESC) key on the keyboard. This will return the computer program to the monitor mode.

b. Turn off all circuit breakers on the BCS except for the Computer circuit breaker. The Computer Power Light on the keyboard will indicate there is still power to the computer.

## 540 Troubleshooting Guide

### 541 General

There are common problems that can occur during normal operations which are within the capability of the supervisor to diagnose and resolve. The purpose of this guide is to highlight these problems and suggest possible solutions. Refer problems of a more serious nature to maintenance personnel.

### 542 Printer Not Printing

At the beginning of, or during, the printing process, the printer may fail to operate. If this occurs, the following check list is offered as a means of identifying a possible solution to the problem.

a. Check the Paper Indicator Light. This light should be "OFF." If it is "ON," the usual indication is the printer is out of paper. Check the quantity of paper in the printer and take appropriate action.

b. Check the SEL Indicator Light. This light must be "ON" for the printer to be online and to communicate with the computer. If it is "OFF," press the SEL switch to establish communication between the printer and the computer.

c. Check the Power Indicator Light. If this light is "ON," electric power is being applied to the printer. If it is "OFF," check the power On/Off switch and take appropriate action.

### 543 Computer Will Not Boot Up

If the computer fails to boot up, a problem may exist with the disk. Check this situation by performing the following procedures:

a. Remove and reinsert the disk into the disk drive. If the disk did not seat properly when first inserted this will solve the problem.

b. Reenter the boot up commands as stated in section 523. If the disk is properly seated this should ensure that the computer receives the start-up command.

c. Try another disk if steps a and b fail. After insertion of the new disk, enter the start-up commands again.

d. Check all power switches to ensure they are in the "ON" position.

### 544 Inappropriate Response from Main Power Switch

If the Main Power Switch on the Operator Control Panel has to be held in the "RESET" position to keep the BCS running or if there is no response when the switch is pressed, check the following.

- a. Check for obstructed photocells.
- b. Check for a jam.
- c. Check all Stacker Full Switches to determine that none have been activated.
- d. Check to determine that all Stacker Full Switch plastic connectors are secure.
- e. Ensure that no Emergency Stop Switch is depressed.

### 545 No Computer Response to Keyboard Entries

Entering commands on the keyboard should generate a response from the computer. If there is no response, the following steps may solve the problem.

- a. Ensure all power switches are on.
- b. Ensure that the power light on the lower left side of the computer keyboard is "ON."
- c. Check the power On/Off switch on the rear of the computer next to the electric power cord plug to ensure it is in the "ON" position.
- d. Ensure the electric power cord next to the On/Off switch on the rear of the computer is securely in place.

## 550 Operational Policies

### 551 Guidelines

Full use of the automation can significantly increase mail processing efficiency and productivity. The following section contains information on policy and areas of concern which must be addressed to ensure that the automated mail processing system is the priority system for letter mail sortation.

## 552 Staffing

### 552.1 Supervision

In normal operation and where physical operations permit, a supervisor should be assigned:

- a. A maximum of two OCR/CSs.
- b. A maximum of three BCSs, if that is the only equipment assigned.
- c. In an installation with one OCR, a supervisor should normally cover one OCR and two BCSs, if feasible from the standpoint of the equipment arrangement.

### 552.2 Employees

Normal staffing for the Pitney Bowes, Burroughs, and ECA OCRs (32, 44, and 60 stackers) and the Bell & Howell and ECA BCSs will be two mail processors to perform the loading, feeding, and sweeping functions. Where limited volume exists for certain sort programs, or during startup or closeout of run, staffing may be reduced. All labor assigned to support the OCR/BCS operation will be charged as prescribed in Handbook M-32, *Management Operating Data System for MOD 1 Offices*.

## 553 Mail Sources

Successful mail-processing operations must fully utilize and exploit the most efficient processing method for the

mail type being processed. This includes automation as a first priority, multiposition letter sorting machines

(MPLSM) and other mechanized methods as next priority, and manual methods last. To accomplish this, train all mail processing operations personnel to identify, select, and prepare the best candidate mail for automated sorting. Maintain a smooth continuous flow of bar coded mail from the facility OCR to the BCS. Identify and process incoming bar coded mail from OCR origins on the BCS.

**NOTE:** Process mail from the Managed Mail Program (MMP) received in trays with striped labels on the Bar Code Sorter. Mail received with dispatch labels with a diagonal red line, extending from one corner to the opposite corner of the label, designate mail which has already been processed on an originating OCR or is non-OCR readable for some reason. This mail normally will be directed to the appropriate MPLSM operation and will not be processed in the automated operations.

## 554 Operation Numbers

Operation numbers and series for the OCR/CS and BCS are given in the chart below.

**NOTE:** Operations 856 and 866 are incoming secondary operations on the OCR and BCS, respectively, with sortation primarily to carrier routing. Operations 857 and 867 are box section or firm sortations. Use operations

**OCR and BCS Operation Numbers**

SERIES	OCR/CS		BCS	
	Pitney Bowes Burroughs	ECA	B & H	ECA
Composite:	850	840	860	870
OGP - Outgoing Primary	851	841	861	871
OGS - Outgoing Secondary	852	842	862	872
MMP - Managed Mail ADC/SC	853	843	863	873
SCF - Sectional Ctr. Dist.	854	844	864	874
INP - Incoming Primary Dist.	855	845	865	875
INS - Incoming Secondary Dist.	856	846	866	876
BS - Box Section	857	847	867	877

856 and 857 for the defined processes whether based upon address read or bar code reading. In other words, the operation number series is determined by the type of machine employed not by the recognition method.

### 555 Training

Supervisors, operators, support personnel, and maintenance employees must be trained. Continually observe assigned employees to ensure that they are performing their duties correctly. If they are not, provide on-the-job training and instruction when needed. Employees must realize that unsafe acts will not be tolerated. Never operate the automated system with untrained personnel. As stated in Management Instruction PO-410-83-6, *Operation of Automated Mail Processing System*, dated 12-15-83, "MSC Managers must ensure that Supervisors, Operators, and Maintenance employees, including backup, are trained, and that the system does not operate with untrained personnel. On-the-job training alone will not suffice."

### 556 Maintenance

To ensure that the automated equipment continually operates efficiently, perform the following steps:

a. Establish and honor maintenance windows for daily, weekly, and monthly preventive maintenance. Set aside a minimum of four work hours for daily preventive maintenance per machine. This ensures that route sheet items, scheduled corrective maintenance, and other problem areas can be corrected. Establish preventive maintenance windows in compliance with Management Instruction AS-530-84-9, *Preventive Maintenance for Mail Processing Equipment*, dated 4/6/84.

b. Maintain adequate spare parts inventory.

c. Report critical spare parts or equipment operation problems through channels for higher level attention.

### 557 Visual Inspection

Whenever a failure occurs, the supervisor should visually inspect the BSC system for any obvious problems (for example, conditions as stated in section 530; envelopes torn, folded, or jammed; diverter gate out of position; and excessive dirt, debris). If the cause of the malfunction can be corrected without the use of hand tools, it may be corrected by the mail processor or supervisor. Report malfunctions that require the use of handtools to maintenance personnel.

## Chapter 6 Management Information

### 610 Introduction

Careful analysis of main menu options, including performance reports, proper maintenance of the disks and sort programs, and the continual monitoring of mail flow can improve BCS productivity and full utilization of automation.

*NOTE:* Since software is continually being improved and updated, the menu options and messages that appear on the monitor screen may differ slightly from examples in this handbook.

### 620 Main Menu Options

#### 621 General

The main menu contains four options which are SORT, REPORT, INQUIRY, and TEST. Any option may be selected by depressing the first letter of the option and then depressing the return key on the computer keyboard after completing the steps outlined in the following sections.

#### 622 Sort Option

The sort option is used during normal operations and enables the BCS to start processing mailpieces according to the sort program, which has been loaded into the computer from the disk. Refer to section 523 for the steps needed to accomplish this function.

#### 623 Report Options

##### 623.1 General

Performance Reports provide information to analyze and evaluate the mail processing function of the BCS and related systems. In addition, the reports provide data necessary to determine the need for updating and changing sort programs used on the automated equipment. There are two types of Performance Reports Options:

- a. Current Report
- b. End of Run Report

##### 623.2 Current Report (Exhibit 623.2)

###### 623.21 Description

The current report is a one page report that may be requested at any point during the sorting process.

###### 623.22 Generating Report

To generate the current report proceed as follows:

- a. Turn off the Magazine Motor switch on the Magazine Control Panel.
- b. Ensure all Conveyor Module tracks are clear of mail.
- c. Turn off the Mail Power Switch on the Operator Control Panel.
- d. Ensure that the printer is on-line.
- e. Press the ESCAPE (ESC) key on the computer keyboard to return the computer to the monitor mode known as the Main Menu.
- f. Press the "R" key and then the RETURN key on the computer keyboard. This selects the Current Report which will immediately start printing.

###### 623.23 Report Entries

The entries which appear on the Current Report also appear on the End of Run Report, with additional information. The End of Run Report is discussed in section 623.3. The common entries on the Current Report are discussed in the following sections.

###### 623.231 Scheme Name

This entry shows the name of the sort program on which the mailpieces were processed and the data was collected.

CURRENT REPORT

-----  
-----

SCHEME NAME: 863

DATE: 11/08/88

GRAND TOTALS

-----  
-----

FED	1724
SORTED	1455
REJECTED	269
NON-READ	231
NO-CODE	38
OUT-OF-SCHEME	00
ACCEPT RATE	86.60%

## END-OF-RUN REPORT (PCD SOFTWARE VERSION 2.0)

SCHEME NAME: 862

DATE: 11/08/88 BCS 2 RUN 2 TOUR 2 OLIVER

BIN TOTALS

<u>Bin Count</u>		<u>Bin Count</u>		<u>Bin Count</u>		<u>Bin Count</u>	
01	1495	25	750	49	0	73	51
02	0	26	1	50	1	74	2
03	0	27	2	51	1	75	35
04	7	28	9	52	1	76	1
05	3	29	421	53	23	77	168
06	33	30	139	54	1	78	34
07	0	31	179	55	314	79	45
08	177	32	553	56	1	80	325
09	0	33	357	57	3	81	45
10	10	34	289	58	8	82	331
11	0	35	1607	59	3	83	83
12	7	36	3	60	3	84	267
13	591	37	110	61	24	85	81
14	44	38	1	62	226	86	610
15	0	39	0	63	1	87	37
16	96	40	0	64	143	88	5
17	0	41	0	65	149	89	0
18	60	42	3	66	436	90	0
19	729	43	322	67	74	91	23
20	30	44	1	68	5	92	3
21	0	45	3	69	150	99	72
22	0	46	2	70	1	94	5
23	37	47	10	71	217	95	1
24	7	48	0	72	1	96	7

GRAND TOTALS

FED	12105
SORTED	10610
REJECTED	1495
NON-READ	728
NO-CODE	548
OUT-OF-SCHEME	219
ACCEPT RATE	93.98%

**623.232 Date**

This entry can contain up to 255 characters and can include month, day, and year of the run, the BCS identification number, the tour number, and the name of the supervisor or crew.

**623.233 Fed**

This entry is the number of mailpieces which the Reader observed.

**623.234 Sorted**

This is the number of mailpieces which were successfully sorted to stackers 2 through 96.

**623.235 Rejected**

This entry is a total of the non-read, no-code, and out-of-scheme entries and shows the number of mailpieces that were directed to stacker #1 (Read Reject Stacker).

**623.236 Non-read**

This entry indicates the number of mailpieces that were directed to Stacker #1 because, although a bar code was present, the bar code was not read.

**623.237 No-Code**

This entry shows the number of mailpieces, directed to stacker #1, which had no bar code visible to the Reader because the mailpieces were misfaced or non-bar coded.

**623.238 Out-of-Scheme**

This entry shows the number of mailpieces, directed to stacker #1 because the bar codes representing the ZIP Codes had no stacker assignment in the computer sort program being run.

**623.239 Accept Rate**

This entry is a ratio between mailpieces fed and mailpieces non-read and is expressed as a percent. There are two formulas that can be used to find the Accept Rate:

$$a. \text{ ACCEPT RATE} = \left( 1 - \frac{\text{NON READ}}{\text{FED}} \right) \times 100$$

$$b. \text{ ACCEPT RATE} = \left( \frac{\text{FED} - \text{NON READ}}{\text{FED}} \right) \times 100$$

**623.3 End of Run Report (Exhibit 623.3)****623.31 Description**

The End of Run Report is a one page report that has all the entries that appear on the Current Report plus the entries described in the following sections. Request this report when the mail sortation run is complete and final data is desired.

**623.32 Generating Report**

To generate the End of Run Report proceed as follows:

- a. Turn off the Magazine Motor switch on the Magazine Motor Control Panel.
- b. Ensure all Conveyor Module tracks are clear of mail.
- c. Turn off the Main Power switch on the Operator Control Panel.
- d. Turn off the Vacuum circuit breaker on the Main Power Panel.
- e. Ensure that the printer is on-line.
- f. Press the ESCAPE (ESC) key on the computer keyboard to return the computer to the monitor mode known as the Main Menu. The screen will display the following error message which must be answered:

TRANSMITTING SCHEME DATA  
PLEASE WAIT  
TRANSMISSION ERROR  
RETRANSMIT SCHEME? (Y/N):

*NOTE:* If there is no host computer, answer the above error message with an "N" (No). The "N" answer will cause the monitor to display the Menu Options. When a host computer is attached and working properly, the error message will not appear.

- g. Press the "E" key and then the RETURN key on the computer keyboard to select the End of Run option in the computer program. The monitor screen will display the question "End of Run? (Y/N)." If the End of Run Report is desired, press "Y" (Yes) on the keyboard. If "N" (No) is pressed, the monitor screen will return to the menu.

*h.* Select the number of copies to be printed by answering the question, "How many copies? (1-9)," which will appear on the monitor screen. The following error message will appear which must be answered.

TRANSMITTING PRODUCTION DATA  
PLEASE WAIT  
TRANSMISSION ERROR  
RETRANSMIT PRODUCTION DATA? (Y/N)

*NOTE:* If a host computer is connected to the system, the production data will be transmitted to the host computer when "Y" is selected. If a host computer is not connected, the monitor will display the above message again when "Y" is selected. The selection of "N" will activate the printer, and the report will start printing. The screen will display "REPORTS(S) NOW PRINTING." "END-OF-RUN COMPLETE" will appear on the screen when all the requested copies of the report have been printed.

*i.* Continue sortation by accomplishing the steps in the following message, which will appear on the monitor screen:

TO BEGIN NEXT RUN, INSERT NEXT RUN DISK  
AND PRESS RETURN

### 623.33 Report Entries (Bin Totals)

The entries common to the End of Run Report and the Current Report are defined in section 623.23. The only additional entries which appear on the End of Run Report are called Bin Totals. These entries show the individual stacker numbers and the total number of mailpieces sorted to each stacker during the run.

## 624 Inquiry Option

### 624.1 Description

The Inquiry Option displays all ZIP Codes associated with a particular stacker number or the stacker number associated with a particular ZIP Code.

### 624.2 Generating Inquiry

To obtain the inquiry option from the computer program proceed as follows:

*a.* Depress the "ESC" key to display the main menu on the CRT.

*b.* Depress the "I" key and then the return key. The following will be displayed on the CRT screen.

### INQUIRY

SCHEME NAME:  
PRESS ESC TO RETURN TO MENU  
(1) ZIP CODE  
(2) BIN CODE  
SELECT OPTION:

*c.* Depress the number "1" key to select the option which determines what stacker a particular ZIP Code or ZIP Code range is assigned in the selected sort program.

*d.* Depress the number "2" key to select the option which determines what ZIP Codes are assigned to a particular stacker in the selected sort program.

*e.* If the CRT screen fills during the inquiry in step *c* and *d*, depress the space bar to advance the screen.

## 625 Test Option

### 625.1 Description

The test option is a diagnostic tool which is selected from the Main Menu by pressing the "T" key on the computer keyboard and then pressing the RETURN key.

### 625.2 Generating Test

The CRT screen will display the following test options:

### TEST

1 - ECHO  
2 - SINGLE BIN  
3 - SEQUENCE  
PLEASE SELECT TEST OPTION

### 625.21 Echo

The Echo option is used to test the readability of the POSTNET Bar Code on mailpieces. To enter this option, press the number "1" key and then the return key on the computer keyboard. Feed mailpieces, one at a time, into the BCS. The CRT will display the Reader Unit interpretation of the bar code. Full bars will be dis-

played as ones and half bars will be displayed as zeros. The numeric ZIP Code will also be displayed. If no bar code was read for the mailpiece, "ERROR" will be displayed on the CRT screen.

### 625.22 Single Bin

The Single Bin option is used by maintenance personnel to check gates at the entrances of the stackers. To select this option, press the number two key and then the return key. The CRT will ask for the stacker number to be tested. Enter the stacker number on the keyboard and then press the RETURN key. All the mailpieces fed will now go to the selected stacker.

### 625.23 Sequence

The Sequence option is used by maintenance personnel to check all gates on the BCS. Mail processing person-

nel may use this option to feed separator cards into the system to divide the mailpieces run on one sort program from those run on the next sort program. This enables sort programs to be run back to back without waiting to sweep all the stackers between sort program changes. To select this option, press the number "3" key and then the RETURN key. The CRT will ask for starting and ending stacker numbers. Use the following procedure.

- a. Enter the starting stacker number and press the return key on the keyboard.
- b. Enter the ending stacker number and press the return key on the keyboard.
- c. Feed separator cards into the BCS.
- d. Observe that, as the cards feed, one piece will enter each stacker sequentially between the selected stacker range. This will continue until all cards have been run.

## 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's Responsibilities

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

- a. Enforcement of all current safety rules and regulations and local policies to ensure the use of safe operating procedures.
- b. Observing employees and immediately correcting unsafe acts, practices, operational errors, and poor work habits noted.
- c. Ensuring that all personnel are aware of the need for proper and safe use, maintenance, and protection of Postal Service equipment.
- d. Investigation of all accidents occurring within the area of responsibility to determine the cause and the corrective action to be taken.
- e. Using the proper method of summoning medical aid in case of an emergency.
- f. Ensuring that the equipment is not operated by personnel without proper authority or proper training.
- g. 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.
- h. Maintaining a clean and safe work area by enforcing good housekeeping practices.

### 730 Employee's Responsibilities

All craft employees have the responsibility to protect themselves, their fellow employees, the mail, and U.S. Postal Service equipment and property. This can only be accomplished by every individual accepting the respon-

sibility of understanding and observing safety standards and procedures at all times. Following are some of the commonsense safety precautions which 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. Know the proper type of fire extinguisher to use on an electrical fire. 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 reaching 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 Operational Safety Summary

- a. All 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 stop the equipment 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 the Emergency Stop Switch before clearing jams.

i. Keep all access doors closed during mail-processing operation 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 (e.g., "Walk Man Radios,") in the automated equipment area.

l. No seats or restbars are to be used in the operation of the equipment or in the work area. The constant reaching involved in the operation of this equipment makes the use of seats or restbars unsafe.

m. Keep aisles and work areas neat and free of all extraneous materials (i.e., empty trays, string, rubberbands, paper, labels, etc.).

n. Always be alert when the Startup Alarm sounds.

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

## Appendix A List of Exhibits

<u>Exhibit No.</u>	<u>Description</u>
<b>Chapter 2</b>	
230	Decoding Template
240	Bar Code Specifications
<b>Chapter 3</b>	
311	Bell and Howell Bar Code Sorter (BCS)
322	Main Power Panel
323	Operator Control Panel
324	Magazine Control Panel
<b>Chapter 6</b>	
623.2	Current Report
623.3	End of Run Report

## Appendix B Glossary of Terms

**Accepts.** Total number of mailpieces accepted by the system and assigned to other than the first and last stackers.

**Accept Throughput.** Indicates the throughput for accepted mail items as measured in mailpieces per hour. Total number of accepted pieces are divided by elapsed time.

**Alarm Annunciator.** An electrical signaling device that sounds when an alarm is detected, and displays a visual indication on the control panel.

**Bar Code Sorter (BCS).** A computer-controlled, high-speed machine which sorts letters, based upon a bar code. Consists of a mail feed and transport unit, stacker modules, and associated electronic equipment (computer, video/monitor display, and floppy disk).

**Booting Up the Computer.** Starting up the computer.

**Bar Code Characters.** Within the POSTNET system a combination of 5 bars (2 full bars and 3 half bars) is used to represent a numeric character code (0 through 9).

**Computer Complex.** A unit which houses the system software and microprocessors necessary to operate the equipment.

**Decoding Template.** A template designed by the Postal Service to assist in the decoding and verifying of bar codes.

**Disk.** A flat circular material used to accept, store, and release magnetically encoded information. Disks are of two types, hard and floppy.

**Disk Drive.** A device which sends and receives information between a disk and the computer.

**Downtime.** Time that an OCR or BCS system is needed for mail processing but was not able to function due to operational or maintenance problems.

**Elapsed Time Clock.** Indicates machine run time in hours and tenths of an hour.

**Feed Unit.** That portion of a machine upon which mail is loaded. It accepts unsorted, preoriented mail and converts it into a flow of mailpieces equally spaced as they enter the transport system.

**File.** Group of reference data describing one type of information. For this purpose, the data are stored in some form of computer memory.

**Gross Acceptance Rate (GAR).** Ratio of number of letters sorted to number of letters processed.

**Hard-Copy Terminal (Printer).** Permits the users to have a printed hard copy of video displayed information and reports.

**Ink Jet Printer (IJP).** Mechanical unit in the printer unit which electrostatically atomizes a liquid ink in the shape of a bar code on an envelope that corresponds to the ZIP Code of that mailpiece.

**Jam Detection System.** A safety mechanism which stops the transport system whenever an envelope blocks a photocell for longer than one-tenth of a second.

**Loader.** The employee assigned loading duties of placing unsorted mail onto the feed unit.

**Mail Jogging.** The function of bumping handfull of letters against a hard surface in order to create a uniform edge of all pieces.

**Mail Tracking Subsystem.** That portion of all sorters which accounts for the physical location of each mailpiece in the mail transport subsystem.

**Mechanical Rejects.** Mailpieces the sorters cannot sort due to some physical reason; either a machine transport malfunction, out-of-sort program, or loss of assignment due to jams, etc. Mechanical rejects must always accumulate in the last stacker.

**Mechanical Throughput.** Indicates the mechanical throughput rate for the mail processed during the report period and is measured in mailpieces per hour. Throughput is calculated by determining the number of mechanically accepted pieces during the elapsed time of the report (accepted pieces are the total number of pieces of mail fed into the system less the number of pieces that were mechanical rejects).

**National ZIP Code Directory Files.** Contains listings of ZIP Codes arranged by states and, within the state listings, by cities.

**OCR Directory.** A disk file which contains certain city, state, and ZIP Code listings used by the Computer Complex of the OCR to compare information found in the address block on the mailpieces, to determine the correct bar code to be applied to the mailpiece.

**OCR Readability Program.** Any program designed to upgrade address characteristics of First-Class letter mail to achieve a readability range for Optical Character Reader equipment.

**Optical Character Reader (OCR).** A computer controlled, high-speed, mail-sorting system. Consists of a mail feed and transport unit, stacker modules, and associated electronic equipment (computer, system control, address directory, video monitor/display, and live printer).

**POSTNET (Postal Numeric Encoding Technique).** A bar code system for encoding ZIP Codes on letter mail. It consists of bars and half bars which are assigned values and represent digits.

**Powering Down the Sorter.** The procedures for turning off the sorter after the mail run has been completed.

**Printer/Verifier Unit.** Prints a bar code on the envelope face and verifies that it corresponds to actual ZIP Code information supplied to the printer.

**Read Rejects.** Mailpieces for which no ZIP Code can be determined. May be due to nonread or nonrecognition of a valid bar code. Read Rejects are normally assigned to Stacker #1.

**Reader Unit.** Optically scans each mailpiece, passed in front of its lens, and sends the information on to the computer system for analysis.

**Rejects.** Mailpieces rejected by an OCR or BCS during operations. See Read Rejects and Mechanical Rejects.

**Routine.** A sequence of instructions that directs a computer to perform a specific operation or sequence of operations.

**Scan Zone.** The area, 1 inch from each end and up to 2-1/4 inches from the bottom of a mailpiece, containing address and bar code information which is scanned by the reader unit.

**Sortation Program.** File containing ZIP Code assignment information used to direct mailpieces to specific stackers on OCRs and BCSs.

**Spelling Variation Files.** Lists of spelling variations for those city names contained in the National ZIP Code Directory which may be included in an OCR Directory.

**Startup Alarm.** Whenever transport belts are started up, a startup alarm sounds for three to five seconds prior to any belt movement to alert employees in the area.

**Stackers.** Those bins or channels into which mailpieces are sorted by the machine.

**Stacker Counts.** Total number of mailpieces assigned to each stacker.

**Sweeper.** The mail processor responsible for removing the mail from the stackers and placing it into the takeaway equipment.

**Sweeping Efficiency.** The designing of stacker assignments to reduce sweeper effort.

for the movement of mail past the various processing stages and into stackers.

**Terminal.** Data entry or exit point in a computer or communication network.

**Video Monitor.** Black and white Cathode Ray Tube (CRT) which displays information about the system. Also used as a diagnostic tool.

**Transport Section.** The portion of the system consisting of belts, pulleys, monitors, and diverters responsible

## Index

<b>A</b>		Proper insertion	315.53
		Proper removal	315.54
		Disk drive	315.4
Abnormal operations		<b>E</b>	
Jam detection failure	533	Elapsed time indicator	322.3
Last conveyor module failure	537	Emergency shutdown procedure	525.3
Magazine motor failure	535	Emergency stop switch	328.2
Power failure	538	End of run report	623.3
Printer failure	532, 542		
Single stacker gate failure	536		
Stacker full switch failure	534		
<b>B</b>		<b>F</b>	
Bar code reader (BCR)	313.4	Feed table (magazine section)	312
Bar code sorter (BCS)		Feed unit (operator section)	313
Controls		Floppy Disk	
Elapsed time indicator	322.3	Description	315.51
Electrical power switches	322.2	Precautions	315.52
Emergency stop switch	328.2	Proper insertion	315.53
Form feed switch	327.224	Proper removal	315.54
Front panel	327.2		
Line feed switch	327.225	<b>I</b>	
Magazine control panel	324	Indicator lights	327.23
Main power panel	322	Inquiry option	624
Operator control panel	323	Inspection	557
Speed control knob	324.5		
Description	311	<b>M</b>	
Bar code (see POSTNET)		Magazine control panel	324
Description	221	Magazine section (feed table)	312
Specifications	240	Mail sources	553
<b>C</b>		Mail transport unit (conveyor unit)	314
Clearing jams	524	Main menu options	
Computer		Inquiry	624
Controls	326	Report	
Description	315.3	Current report	623.2
Conveyor unit (mail transport unit)	314	End of run report	623.3
CRT (video monitor)	316	Sort	622
Current report	623.2	Test	625
<b>D</b>		Main power panel	322
Decoding template	230	Maintenance	556
Disk (floppy)		Managed mail program	553
Description	315.51		
Precautions	315.52	<b>O</b>	
		Operation numbers	554

