American Postal Workers Union, AFL-CIO

November 9, 2004

TO: Local Presidents

RE: Methods Guide for Automated Package Processing System (APPS)

Enclosed you will find a copy of a letter dated 11/1/04 for the Postal Service regarding the above referenced matter and a copy of the newly-released Methods Guide for APPS.

Please feel free to contact me if you have any questions or concerns.

Yours in Union Solidarity,

Jim

James 'Jim' P. McCarthy
Director, Clerk Division

JPM/ema
opeiu #2
afl-cio

Enclosures: Methods Guide

American Postal Workers Union, AFL-CIO

(202) 842-4246 Office
(202) 842-4297 Fax

From the Office of CLIFF "C.J." GUFFEY
Executive Vice President

1300 L Street, NW
Washington, DC 20005

Memorandum

November 8, 2004

TO: James P. McCarthy

SUBJECT: **Methods Guide for Automated Package Processing System**

(Notification No. GCCC200466)

Please find attached a copy of a letter dated 11/1/2004 from Patricia A, Heath, regarding the above reference matter. The following is a description of the issues involved in this notification:

> **Enclosed copy of newly-released Methods Guide for the Automated Package Processing System (APPS).**

You are designated as the APWU contact person in this matter. Contact the USPS representative as soon as possible for discussion, if appropriate. Please provide notification of your review to me by 12/8/2004, providing a copy to President Burrus. Your secretary should update the Notification Tracking Module in Step 4 CAS as necessary.

Attachment
CJG:ha
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NOV 9 2004
AMERICAN POSTAL WORKERS UNION
CLERK DIVISION

LABOR RELATIONS

UNITED STATES
POSTAL SERVICE

NOV 2004
Received
Presidents Office

November 1, 2004

Mr. William Burrus
President
American Postal Workers
Union, AFL-CIO
1300 L Street NW
Washington, DC 20005-4128

Certified Mail Number
7099 3400 0009 5114 5003

Dear Bill:

Enclosed is a copy of the newly-released Methods Guide for the Automated Package Processing System (APPS).

Please feel free to contact Patricia Heath at 202-268-3813 if you have questions or concerns regarding this matter.

Sincerely,

John W. Dockins
Manager
Contract Administration (APWU)

Enclosure

475 L'ENFANT PLAZA SW
WASHINGTON DC 20260-4100
WWW.USPS.COM

UNITED STATES
POSTAL SERVICE

Automated Package Processing System (APPS)

Methods Guide

Engineering, Systems/Process Integration

Release: 1.0

August 2004

A P P S M E T H O D S G U I D E

Release 1.0
August 2004

UNITED STATES POSTAL SERVICE

Engineering, SPI

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1.0 Introduction

1.1 Purpose

This guide provides United States Postal Service® (USPS®) managers and supervisors with the methods, procedures, and guidelines for use with the Automated Package Processing System (APPS). Integration of the key mail processing concepts and practices, contained within this guide, and the APPS hardware and software create a highly effective and productive operational system for parcel and bundle processing. With an *APPS Methods Guide*, the APPS management team is able to create the effective and efficient APPS operating environment to achieve the required system productivity.

> ***Methods:*** elements of a strategy, based on defined procedures; a combination of various instruments/tools applied by various process stakeholders to achieve defined objectives and set targets.

The general methods provide the tools and information necessary to attain an effective system of production and, at a minimum, sustain a level of 5,500 pieces per hour for a single induction machine, or 9,500 pieces per hour for a dual induction machine. These methods have been developed in a modular format and apply to single and dual induction machines in all configurations.

The Decision Analysis Report (DAR) used a conservative throughput estimate of 9,500 pieces per hour, which has been surpassed with the demonstrated First Article Test (FAT) performance. Initial standardization certification throughput requirements exceed the DAR estimates. As the operation of the system improves, machine throughput and performance will continue to increase and will be reflected in future productivity targets.

The information provided in this guide focuses on the basic operational and support techniques necessary for efficient system operation. It is presented in sections, giving the user an introduction to APPS, a general overview, detailed information on each subsystem, operational methods for each major subsystem, instructions on how to develop and create a sort program, staffing assessment/assignment, and assessing operational training needs.

The guide provides general information on APPS, but is ***NOT intended as a replacement for formal training or other standardized operator instruction.*** APPS Methods Guide *users include in-plant support personnel, mail processing managers and supervisors.*

1.2 Background

The APPS combines state-of-the-art mail sorting technology with proven mechanical subsystems to produce an automated parcel and bundle sorting system. The equipment includes automatic package singulation, parcel address recognition, and online remote video coding. Each system is configured to meet site-specific processing requirements and building structures. APPS is designed to handle packages and bundles in a wider range of shapes and sizes than those that are processed on current Small Parcel Bundle Sorters (SPBS). In addition, APPS is able to sort to the same USPS® containers currently used for SPBS sorting (with the exception of the SPBS 1265-T tray).

1.2.1 Mechanized/Manual Package and Bundle Processing

Before the introduction of the APPS, mail processing operations supported the handling of packages and bundles with mechanized processing equipment and manual operations. The major mechanical systems used included the SPBS and Linear Integrated Parcel Sorter (LIPS). Both of these mechanical systems and manual operations will continue to be used to process excess volumes in automated sites, and will continue to be used in smaller facilities with low volumes that cannot support the APPS.

Small Parcel and Bundle Sorter (SPBS). The SPBS is an operator-assisted/paced mechanical system that sorts small parcels and bundles of flats and letters. It is configurable from four to six induction stations and has from 100 to 132 outputs.

The SPBS inducts small parcels and bundles via container unloaders; four to six operators singulate the mail-pieces and key the ZIP code information via keypads located at operator keying stations; the system transports and sorts the mail-pieces to a maximum of 132 separate outputs and into mail transport equipment such as pallet-boxes, hampers, or sacks.

The theoretical maximum mechanical capacity of the SPBS is approximately 11,000 pieces per hour. However, the actual throughput is considerably less than the maximum mechanical capacity, and is limited by the performance of the operators. The SPBS can accept and process parcels and bundles that weigh from 3 ounces to 20 pounds and are sized between 3.5" x 5" x 0.010" and 12" x 15.5" x 12".

Linear Integrated Parcel Sorter (LIPS). The LIPS sorts small parcels and flat bundles of mail into mail transport equipment. It is a low-cost alternative to the SPBS that is suitable for low volumes and sites with space constraints. This system can be configured into a two-tiered or dual induction system and can deliver up to 38 outputs per sorter. The LIPS is an operator-paced machine that works similar to the SPBS but is more limited with respect to package size and throughput capacity.

The LIPS inducts small parcels and bundles via container unloaders. An operator singulates the mail-pieces, then manually keys the ZIP code information on a keypad located at the operator keying station. The system transports and sorts the mail-pieces to an output, then to the mail transport equipment.

Manual Distribution. Mechanized and manual distribution is dependent on the performance of the operator. Because of the varied requirements in sort depths, volumes, and container availability, standardizing these operations has been very difficult.

The most common processes use a number of mail transport equipment containers arranged around a single work station and are referred to as a "bullpen." The configurations can be arranged in a parallel tier, "L-shaped" or "U-shaped," with up to 60 destinations to a section. Using large containers (or more than 60 small containers) should be avoided because of the excessive walking distances, lower distribution rates, and accuracy.

1.3 General Support Information

The USPS®'s schedule for APPS deployment calls for 74 systems to be installed during calendar years 2004 and 2005. The APPS increases the USPS® package-sorting, system-wide capacity and is the first step in replacing the fleet of SPBS equipment. A single APPS, with dual feed modules, is as productive as two or more SPBSs. Table 1-1 lists the APPS mail processing characteristics.

Table 1–1: APPS Specifications

		Single Induction	Dual Induction
Baseline Operational Throughput		5,500 pieces/hour	9,500 pieces/hour
Theoretical Maximum Mechanical Throughput		9,310 pieces/hour	14,900 pieces/hour
Acceptable Package Size	Length	3.5 inches to 22 inches	
	Width	3.0 inches to 18 inches	
	Height	0.05 inches to 15 inches	
	Weight	0.1 pounds to 25 pounds	

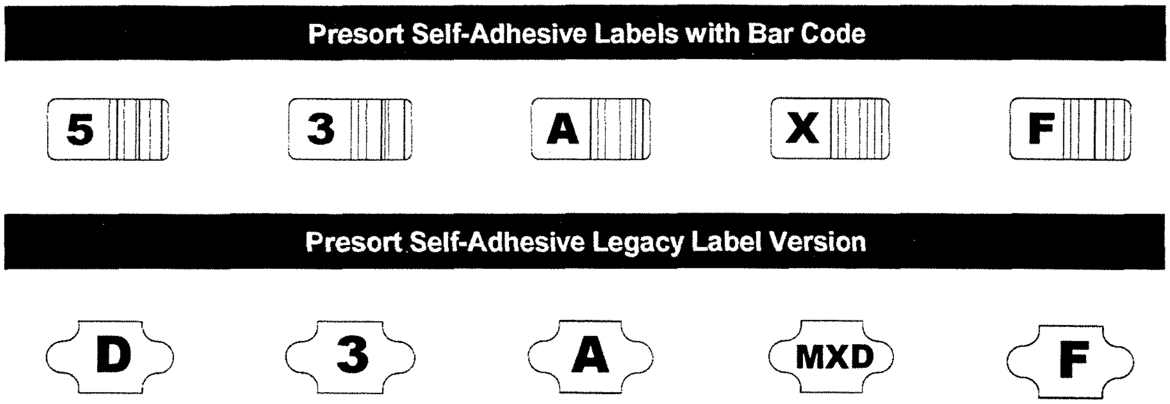
The APPS incorporates new technology that leverages many key support systems within the USPS®. The APPS provides the ability to sort mail based on presort level as well as ZIP code, type, size, and weight.

Mail presorted by mailers can be grouped to various levels of distribution or ZIP code. The level of distribution for each bundle of mail can be identified by one of two existing presort identification systems. Mailers apply either a "Self-Adhesive Presort Label" or a textual "Optional Endorsement Line" (OEL) information field in the address block. APPS is capable of identifying and sorting mail-pieces with either of these presort identifiers.

1.3.1 Presort Self-Adhesive Labels

The first method of presort mail identification is the pressure-sensitive, self-adhesive label. The labels with bar codes were recently designed to enhance the automated sorting of flat bundles. Figure 1-1 shows the differences in the bar coded version introduced in October 2003, and the legacy label version. Table 1-2 describes the labels and their uses.

Figure 1-1: Presort Self-Adhesive Label Identifiers



NOTE: Labels not to scale.

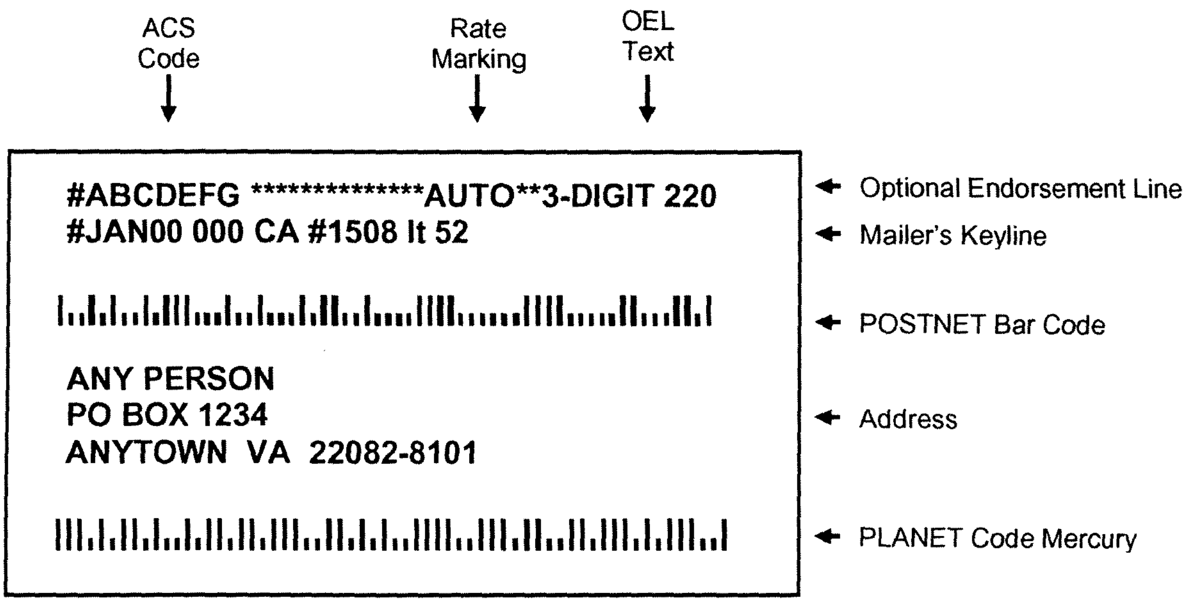
Table 1-2: Presort Self-Adhesive Label Descriptions

Presort Label	Presort Level	Label Color	Description and Uses
5 or D	5-Digit or Direct	Red	Bundle presorted to the same five-digit or direct ZIP code.
3	3-Digit	Green	Bundle presorted to the same three-digits of a ZIP code.
A	ADC	Pink	Bundle presorted to the same area distribution center (ADC).
X or MXD	Mixed	Tan	Bundle presorted to a mixed working level for two or more ADCs.
F	Firm	Blue	Bundle presorted to a firm that is two or more copies for the same address.

1.3.2 Optional Endorsement Line (OEL)

The printing of an OEL is a method that mailers use to identify the presort level of flat bundles. The OEL is printed above the address block. USPS® regulations specify the type font, style, and abbreviations used in OELs. Except when an address block bar code is placed above the OEL, the appropriate presort identification must be the first line at the top of the address block or label. A mailer receiving address corrections through the address change service (ACS) may use the first eight positions on the left side of the OEL for the ACS participant code. The information in the OEL must be in capital letters. The letter size and line spacing must not be less than the size and line spacing of the largest letters or characters in the address block, or any other part of the address label. Letters in the endorsement line must be the same type font as those in the address block. Only capital letters of the alphabet, Arabic numerals, or asterisks may be used in the OEL. Figure 1-2 presents an example OEL flat mail label with corresponding field descriptions.

Figure 1-2: Optional Endorsement Line Address Sample



If an ACS participant code is used in an OEL on a label or in an address block, the delimiter symbol (#) must be in the first position at the left margin of the OEL, followed by the seven-character USPS®-assigned ACS participant code, then one blank space. (If an ACS code is not used, the format spaces are filled with asterisks.) Any blank format spaces between the left-justified delimiter and the first character of the right-justified mail sorting information of the OEL must be filled with asterisks. Table 1-3 shows OEL sorting levels and their corresponding text.

Table 1–3: OEL Sorting Level and Text

Sorting Level	OEL Text (Excluding Asterisks)
Firm—Periodicals	FIRM 12345
Carrier Route—Periodicals	CAR-RT LOT**C-001
Basic	CR LOT 1234A**C-001
Carrier Route—Periodicals High Density	CAR-RT WSH**C-001
Carrier Route—Periodicals Saturation	CAR-RT WSS**C-001
ECR—Standard Mail	ECRLOT**C-001
Basic	ECRLOT 1234A**C-001
ECR—Standard Mail	ECRWSH**C-001
ECR—Standard Mail Saturation	ECRWSS**C-001
Carrier Route—Automation (First Class and Std Mail)	AUTOCR**C-001
Carrier Route—Bound Printed Matter	CAR-RT SORT**C-001
5-Digit	5-DIGIT 12345
5-Digit Scheme (AFSM 100 Compatible Flats)	SCH 5-DIGIT 12345
3-Digit	3-DIGIT 771
ADC (3-digit ZIP Code Prefix)	ALL FOR ADC 105
ADC (5-digit ZIP Code)	ALL FOR ADC 90197
Mixed ADC (3-digit ZIP Code)	MIXED ADC 640
Mixed ADC (5-digit ZIP Code)	MIXED ADC 60821

1.4 Information Resources

A great deal of information and resources are available to those involved in the APPS operation, including multiple user and training manuals, instructional videos, and various USPS® intranet sites that describe APPS operations.

1.4.1 User and Training Manuals

The National Center for Employee Development (NCED) has developed training classes for personnel involved in APPS operations, including mail processing, electronic technicians, and operators and supervisors. User guides and instructional manuals that work with the training courses include:

- *APPS Supervisor/In-Plant User's Guide*
- *APPS VCS Supervisor User's Guide*
- *APPS Keyer User's Guide, and*
- *APPS VCS Quality Assurance User's Guide*
- *WebAPPS User Guide*, and the
- *WebAPPS Training Guide*.

Under a separate initiative, the *APPS Standardization Guide* provides a step-by-step process and the required productivity targets for certification, as well as the procedures for process certification. Section 7 of this manual describes in detail the course offerings and the user guides, manuals, and materials used with the courses.

1.4.2 Intranet Resources

Additional resources are located on the following USPS® Headquarters intranet pages.

Engineering: http://56.72.6.112/apps/
Maintenance: http://www.mtsc.usps.gov/equipment/APPS/index.htm
Processing Operations: http://blue.usps.gov/procops/apps/apps.htm
Program Management: http://web.eng.usps.gov/enggroup/acqmgmt/packsort/projects/robmatapps.htm
Site Preparation: http://56.72.6.112/apps/DeploymentSitePrep.htm
Training: http://nced.usps.gov/apps/

1.4.3 Informational Videos

The USPS® Engineering, Systems/Process Integration department has produced and distributed an informational video that introduces the APPS to the world of mail processing. The video is an introduction that describes each of the machine's subsystems and its various components, and the processes that take place during a live mail operation. The video shows the operation of the system from the time the mail is unloaded into the system, right through the scanning, sorting, and dispatching of the mail.

A methods video is currently being produced by the Engineering department and will explain the various techniques and practices used to operate the APPS. The methods video will explain in great detail proper loading, induction, and output operations. The video will also describe the methods for proper staging, both for working mail and mail transport equipment, that will be used to assist the site in planning for their machine's implementation. In addition, the methods video will analyze in detail the APPS machine's sort program optimization to operate the machine to its maximum capacity. This methods video is expected to be released late in 2004.

2.0 System Overview

The System Overview section of this manual provides USPS® managers and supervisors with general information about the APPS's system configuration, detailed information about its major subsystems, and overall system operation.

This guide is intended to provide the reader with a general understanding of the system and its major components. ***It is NOT intended as a replacement for formal training or other standardized operator instruction.***

2.1 Standard Configurations

The APPS design offers a total of 10 basic machine configurations. The configurations are classified by the following criteria:

- Open- or closed-loop (sorter backbone);
- Single or dual induction; and
- 100, 150, or 200 sort destinations.

The specific number of sort destinations on each basic configuration may be modified to better accommodate the floor plan of the site and depth of distribution needs (see Table 2-1).

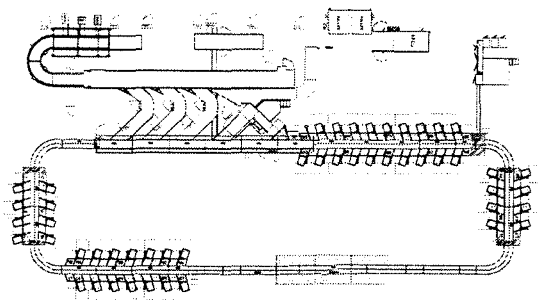
Table 2–1: Basic APPS Configurations

APPS Configuration				Work Space Area		
Configuration	Type	Number of Inductions	Number of Outputs	Length Dimension FT	Width Dimension FT	Approximate Area FT^2
1	Open	2	100	210	162	34,000
2	Open	2	150	246	162	39,900
3	Open	2	200	278	162	45,000
4	Open	1	100	189	120	22,700
5	Open	1	150	224	120	26,900
6	Closed	2	100	257	121	31,100
7	Closed	2	150	323	121	39,100
8	Closed	2	200	389	121	47,100
9	Closed	1	100	226	86	19,400
10	Closed	1	150	292	86	25,100

2.1.1 Open/Closed Sorter Backbone

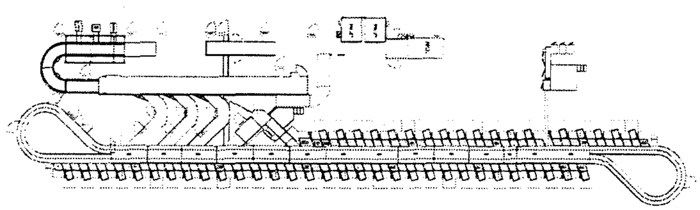
The sorter design includes two variants. First is the "open" design (see Figure 2-1), which has a unidirectional single track section that discharges mail-pieces on both the left and right sides of the line of travel. The open systems are oval-shaped and have either a single or double elevated section that permits operators and mail containers access to the center sections of the machine.

Figure 2–1: Open-Loop (Type 4: Single Induction, 100 Output)



The "closed" design does not have an accessible center section (see Figure 2-2). The sorter track sections are placed back-to-back to create a double transport lane. The carrier cells travel in one direction on the one side of the track, loop around at each end, then travel back on the adjacent track. This design permits mail-pieces to discharge only on one side of the track, which is the right side with respect to the line of travel. Since both track systems create a "looping" path, the terms "open-loop" and "closed-loop" systems have been adopted.

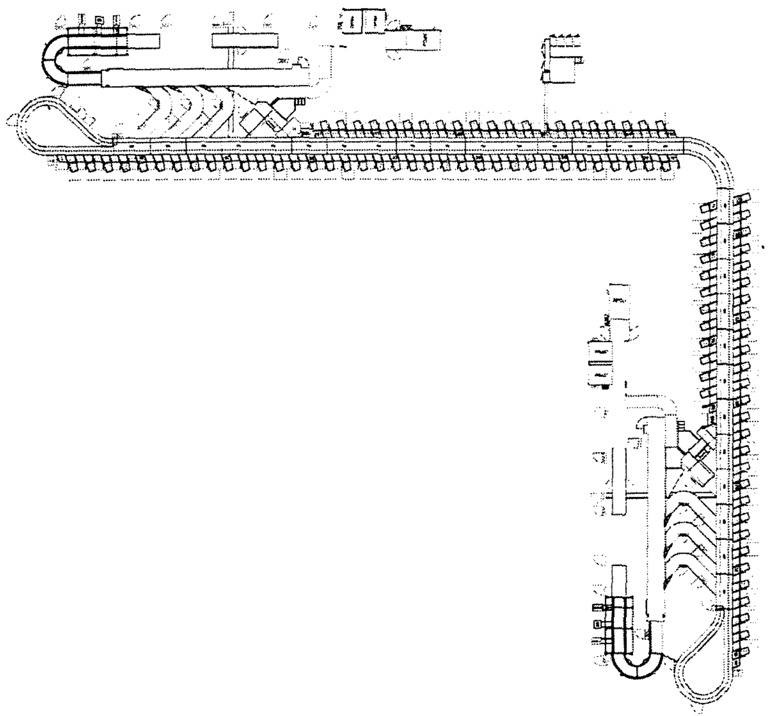
Figure 2–2: Closed-Loop (Type 9: Single Induction, 100 Output)



Space utilization for both systems is similar, with the open systems requiring space configured with greater width, and the closed systems requiring a longer, narrower work space area. Open systems require additional overhead clearance to accommodate the overhead track sections. The specific physical requirements of the facility are the primary drivers in the configuration assignment.

The closed design also allows the use of an optional "L" or 90° turn module (see Figure 2-3). This module is used when facility constraints do not permit the accommodation of a long system.

Figure 2–3: Closed-Loop with 90° Turn (Type 8-L: Dual Induction, 200 Output)

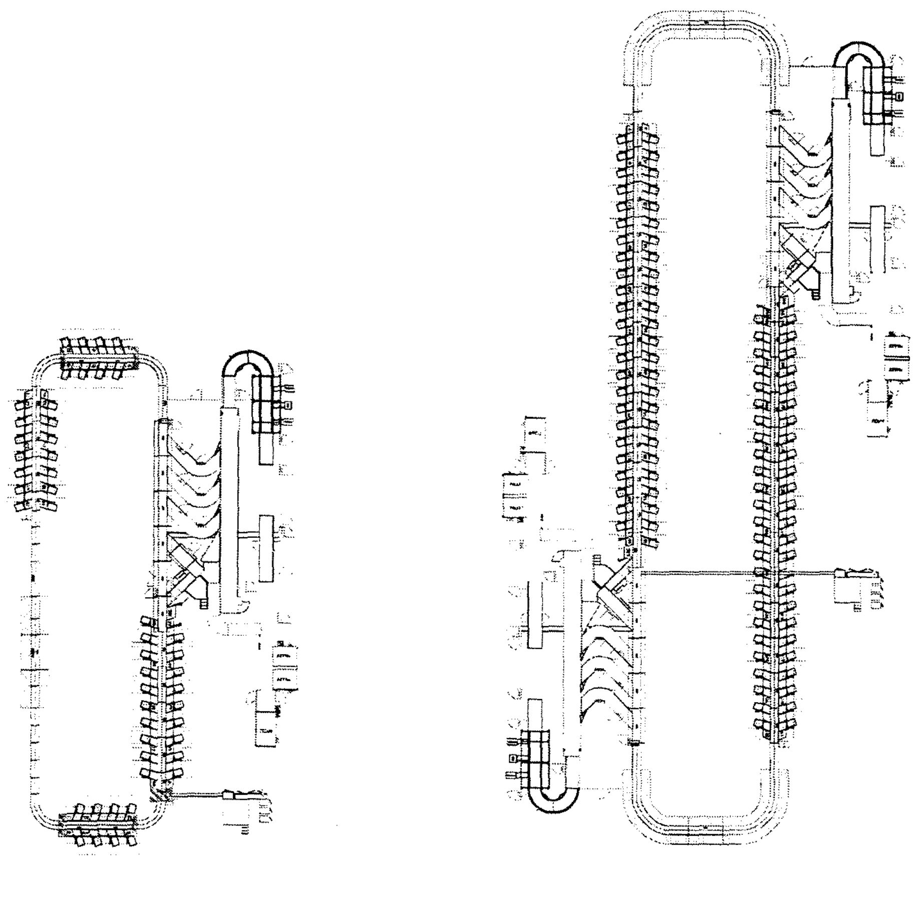


2.1.2 Single/Dual Induction

The induction area of the APPS performs the load, buffering, singulation, and induction to the sorter. Each APPS is configured with either one or two induction areas. The induction areas are similar in capability, although the specific container unloader equipment can be custom-configured to site requirements. Dual induction systems can be operated as two separate sorting systems, sharing a common sorter mechanism.

System throughput for a single induction system is rated at approximately 5,500 pieces per hour, and a dual induction system is rated at approximately 9,500 pieces per hour (see Figure 2-4). Dual induction systems require significantly more available space, and are more difficult to configure to physical requirements of the facility than a single induction system.

Figure 2–4: Single Induction/Dual Induction



Single Induction
(Type 4: Single Induction, 100 Output)

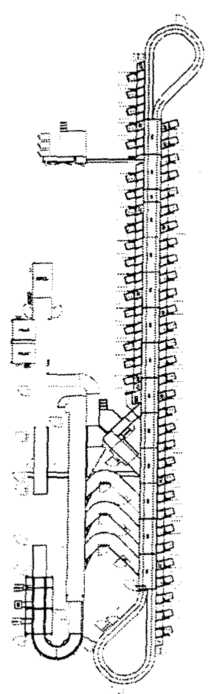
Dual Induction
(Type 3: Dual Induction, 200 Output)

2.1.3 100/150/200 Sort Destinations

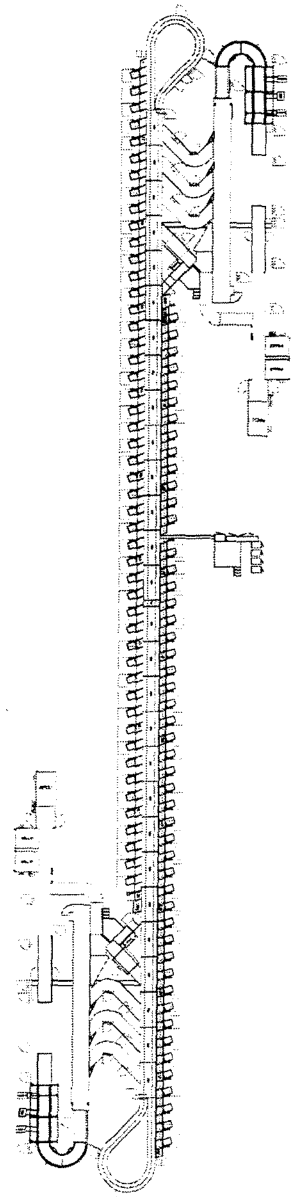
The sorter destinations (or outputs) are modular and can be configured prior to installation. The single induction systems are available in configurations with 100 to 150 outputs; the dual induction systems are available in 100 to 200 outputs (see Figure 2-5).

Outputs can be added and subtracted to a configuration as required by the specific physical requirements of the facility and the required depth of distribution. Depth of distribution requirements are the primary driver for total number of outputs, but space is the limiting factor. Each site is custom-configured prior to installation.

Figure 2–5: 100-200 Sort Destinations (Outputs)



100 Sort Destinations
(Type 9: Single Induction, 100 Output)



200 Sort Destinations
(Type 8: Dual Induction, 200 Output)

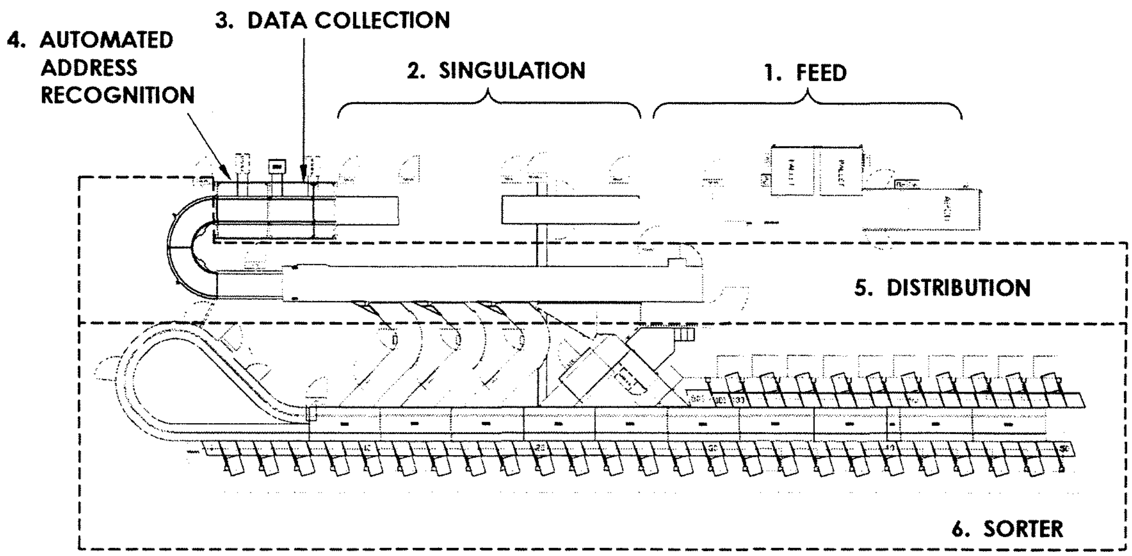
2.2 APPS Subsystems

The APPS consists of six major subsystems or modules.

1. Feed Subsystem
2. Singulation Subsystem
3. Data Collection Subsystem (DCS)
4. Automatic Address Recognition Subsystem (AARS)
5. Distribution Subsystem
6. Sorter Subsystem

Figure 2-6 shows where each subsystem is located on the APPS.

Figure 2–6: APPS Subsystems Diagram



The subsystems in this section are defined by mechanical attributes. Each mechanical subsystem performs a step in the automated mail processing activity. The mechanical subsystems are identical in open/closed, single/dual, and 100 to 200 output configured systems.

The subsystems are described in detail in the following sections of this manual. In particular, in sections 3 and 4, the subsystems will be grouped with respect to the operation of the APPS.

2.2.1 APPS Mail-Piece/Subsystem Processing Flow

Mail-pieces that are processed by the APPS are transported automatically through the subsystems as follows:

- Starting with the ***Feed Subsystem***, mail is fed via pallet-unloader or all purpose container unloaders onto a load conveyor module. The operator inspects the mail-stream, removes any out-of-specification mail-pieces, loose mail, or packaging material, and performs limited repairs of broken bundles.
- The mail is then transported through the ***Singulation Subsystem***, where it is automatically converted into a single-high, single-wide mail-stream.
- The mail-stream then enters the ***Data Collection Subsystem***, which weighs the package, determines package type and dimensions, performs singulation verification, and assigns a virtual package tracking identification.
- Adjacent to the ***Data Collection Subsystem***, the ***Automatic Address Recognition Subsystem*** performs an image lift, bar code reading, and optical character recognition to determine the destination information. If the bar code reader and optical character reader cannot decode the address, then the images are sent to the video coding system to be keyed at a remote encoding center. Package information is sent from the ***Automatic Address Recognition Subsystem*** through the system controller to the ***Sorter Subsystem***.
- Mail-pieces then pass through the ***Distribution Subsystem***, where it is either transferred to one of four induction stations (three automatic, one semi-automatic) or sent back to the ***Feed Subsystem*** via a recirculation conveyor.
- Mail that is transferred onto one of the three automatic induction stations is automatically synchronized, oriented, and inducted onto the ***Sorter Subsystem***.
- If the automatic induction systems are not available, or if the item requires operator intervention, the mail-pieces are diverted to the semi-automatic induction station. At this station, items are manually handled by an operator who properly orients the package onto a conveyor. The package is then scanned by the overhead ***Automatic Address Recognition Subsystem*** camera. Packages are automatically dimensioned, weighed, and loaded onto the ***Sorter Subsystem***. If the operator finds a mail-piece that is unsuitable for further APPS processing, the operator can remove it at this station.
- Once on the sorter, a mail-piece can remain on the ***Sorter Subsystem*** for a specified time while the address information is resolved. If the destination is determined in the allotted time, then the mail-piece is transported to its appropriate destination and discharged to the destination container. If the destination cannot be determined in the allotted time (automatic induction only), then the mail-piece is sent to the semi-automatic induction station for rework.
- The ***Sorter Subsystem*** is populated with mail transport equipment containers. Operators monitor and sweep the output bins and containers. When containers are unavailable, the mail-pieces recirculate until the output is reactivated or the preset time limit is reached. If the preset time limit is exceeded, then the mail-pieces are then directed to the semi-automatic rework roller conveyor.

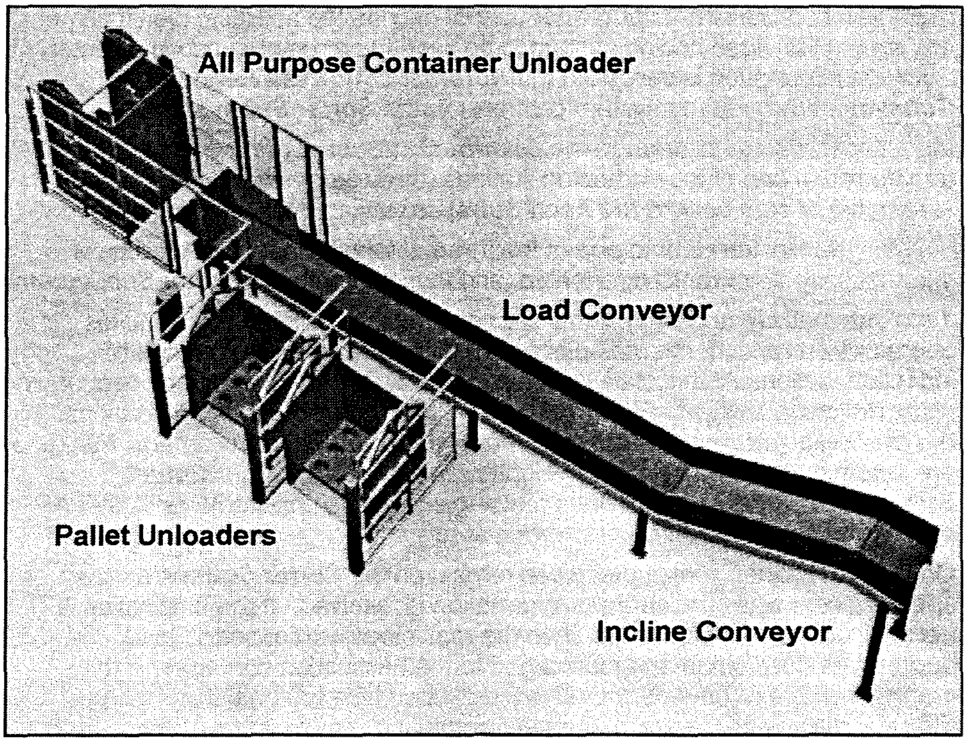
2.2.2 Feed Subsystem

The Feed Subsystem is the entry point for mail-pieces processed on the APPS. The Feed Subsystem consists of a high volume load area with two types of automated container unloaders: pallet-unloaders that shingle layers of bundled magazines and letters, and all purpose container unloaders that rapidly unload standard USPS® mail transport equipment.

Although the APPS Feed Subsystem is similar in appearance to the legacy SPBS Feed System (see Figure 2-7), the APPS Feed Subsystem incorporates significant enhancements. They are:

- Cushioned belts on the load module that minimize mail-piece impact damage;
- Fully automatic unload cycle operation that is controlled by sensors in the load conveyor; and
- Improved hydraulics that decrease unloader cycle time.

Figure 2–7: APPS Feed Subsystem



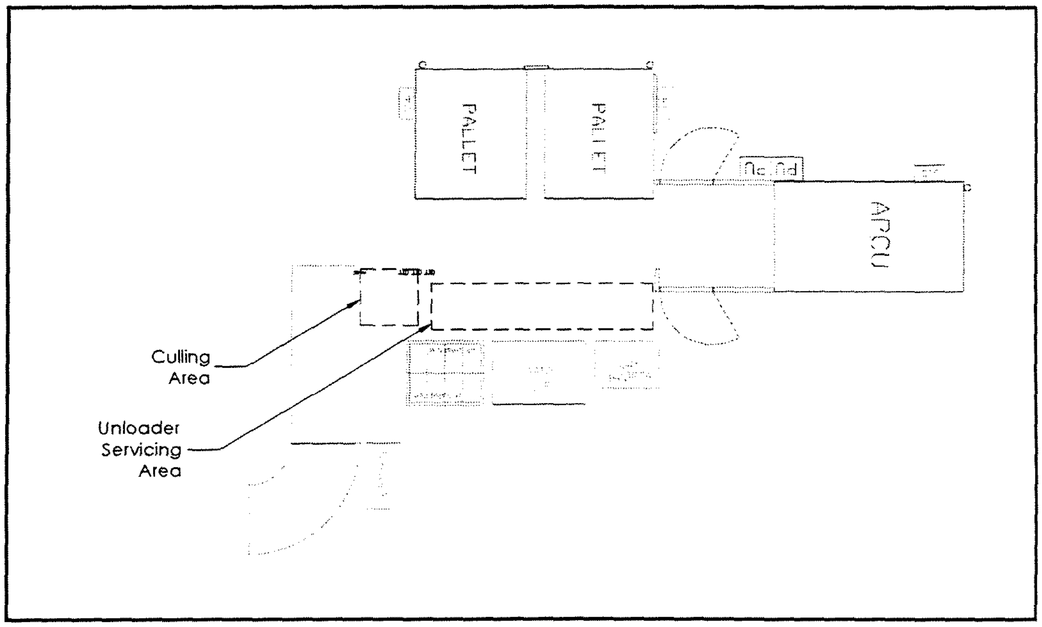
Mail-pieces enter the Feed Subsystem via container unloading operations. Palletized loads are presented to the pallet-unloader for destacking or "shingling." Standard mail transport equipment containers such as hampers, wiretainers, eastern regional mail containers (ERMCs), or over the road containers (OTRs) are unloaded in the all purpose container unloader. The operator servicing the unloaders activates the control system when a container is placed in the unloader.

Each unloader can be placed individually in either automatic mode or manual mode. In the automatic mode, which is the recommended mode, sensors in the load conveyor control the unloader to deposit the optimal amount of mail onto the load conveyor. The automatic mode synchronizes the functions of all three unloaders. While in this mode, the culling operator has the ability to pause the load module as needed for manual intervention.

The manual mode provides full control to both the unloader operator and the culling operator. The culling operator is responsible for the operation of the unloaders once the containers are loaded and the unit is activated. The culling operator manages the unloading of mail into the system with the "up" and "down" buttons located on the load conveyor on the control panel, as well as the load conveyor pause controls.

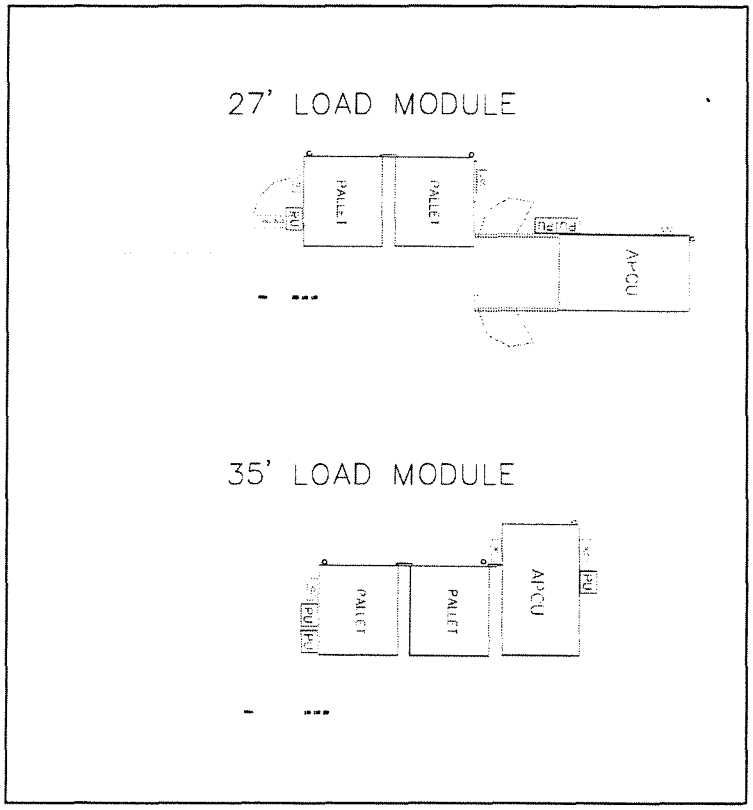
At the end of the load conveyor next to the incline conveyor, the operator has access to the culling area (see Figure 2-8). In the culling area, the operator inspects the mail-stream, removes any out-of-specification mail-pieces, loose mail or packaging material, and performs limited repairs of broken bundles.

Figure 2–8: Culling Work Area



The load modules (see Figure 2-9) can be configured in various combinations, depending on the mail mix that is typical for a specific USPS® facility. This subsystem may also include transport (straight) and turn (curved) conveyor modules as needed to accommodate site-specific requirements.

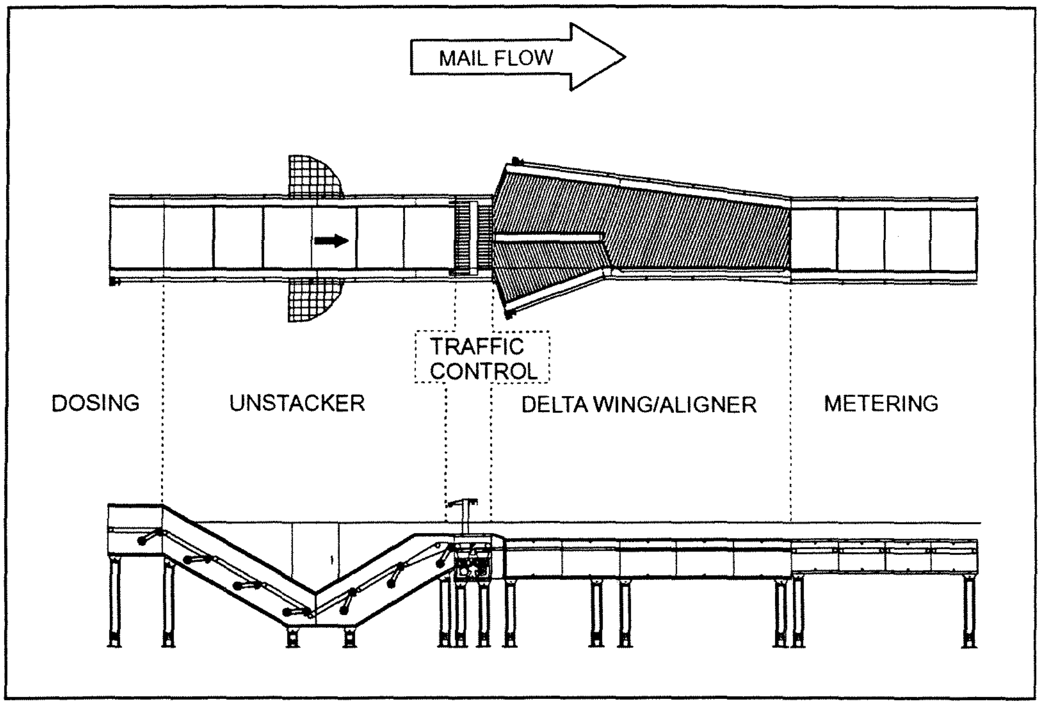
Figure 2–9: 27′ and 35′ Load Modules



2.2.3 Singulation Subsystem

The Singulation Subsystem accepts the conveyor load mail from the Feed Subsystem and converts it into a single-high, single-wide mail-stream for subsequent processing and sorting operations. It has four main conveyor modules: (1) unstacker, (2) traffic control, (3) delta-wing/aligner, and (4) metering (see Figure 2-10).

Figure 2–10: Singulation Subsystem



The Singulation Subsystem unstacks mail-pieces through a series of decline and incline belts. Side-by-side mail-pieces are eliminated using a traffic control module that staggers the mail-stream. The aligner module arranges the mail into a single file, justified in the direction of travel. Proper spacing is obtained with the metering conveyor.

Mail-pieces in the Singulation Subsystem are processed as follows:

- The first section of the ***unstacker*** is a ***dosing conveyor***, which regulates the flow of conveyor load mail into the system.
- Next, a series of three ***decline conveyors*** with high friction belts induce a "bumping," which causes packages to slide off one another as they move downward through the module.
- Three ***incline conveyors*** follow, each with a progressively faster belt speed to further spread out the packages.
- The mail then passes through the ***traffic control module***, which senses side-by-side packages and pulls one ahead of the other by varying the speed on individual sections of a series of strip belts.

- The ***delta wing conveyor*** moves the packages into a single file line using a combination of herringbone rollers with a narrow belt conveyor running down the center.
- The ***aligner*** then positions the mail-stream flush against one side of the conveyor to facilitate data collection and induction into the Sorter Subsystem. Typically the mail is aligned so that the smallest two of the six sides are to the front and rear of the line of travel.
- Finally, the ***four metering conveyors*** adjust the gap between mail-pieces to provide the desired mail-stream flow rate and spacing necessary for the Data Collection Subsystem.

2.2.4 Data Collection Subsystem

The Data Collection Subsystem (DCS) assigns a unique virtual identifier to each mail-piece within the system so that detailed information can be captured and carried with the item throughout the sortation process.

The subsystem includes:

- ***Singulation Verification*** to confirm the presence of properly singulated mail-pieces;
- ***Package Typing*** to determine an item as a package, a bundle of flats, or a bundle of letters; and
- ***Inmotion Weighing and Mail-Piece Dimensioning*** to provide the length, width, and height for every mail-piece.

During data collection, the mail-piece dimensions (length, width, and height), glossiness, and roughness are used to determine package type as a parcel, a bundle of letters, or a bundle of flats. The DCS also detects "doubles" (stacked side-by-side or on top) and incorrectly spaced parcels. The DCS provides this information to the APPS system manager so that critical processing information on each mail-piece can be shared with other subsystems.

This information collected by the DCS is also used to determine induction and discharge profiles for each item, and to determine when the sorter output bins are full.

NOTE: Doubles cannot be automatically loaded onto the cross-belt sorter and are sent to the semi-automatic induction station for rework. Incorrect spacing between parcels is corrected by the synchronizing conveyors on the Distribution Subsystem.

The DCS conveyor section is enclosed in a canvas "tunnel," which also contains the automatic address recognition subsystem. The DCS consists of three conveyors and contains an inmotion scale and a package typing singulation verification (PTSV) module. The PTSV has three main components: a top laser dimensioning instrumentation (TLDI) assembly, a side laser dimensioning instrumentation (SLDI) assembly, and an electronics/computer rack. An integrated debris collection system keeps the module clear of loose labels, banding, and other nonmail items.

2.2.5 Automatic Address Recognition Subsystem

The Automatic Address Recognition Subsystem (AARS) incorporates image capture hardware, bar code reader and optical character recognition systems, and a remote video coding system. High-speed cameras capture images from four sides of the package: top, bottom, and both sides (the lead and trail sides are not captured). The AARS provides the functions necessary to detect and process address and presort information from a mail-piece and forwards that information to the Sorter Subsystem so the mail-piece can be discharged at the appropriate point.

The image information is managed by the image collection server. The system bar code reader is capable of deciphering many of the USPS®-approved package bar codes. The optical character reader interprets addresses from handwritten and machine printed mailing labels. The recognition system is also used to identify the optional endorsement line (OEL), which provides bundle presort information for finer separation options.

If an image cannot be resolved by the bar code or OCR functions, a near-real time remote video coding system is integrated with the existing USPS® remote encoding centers (REC). The images are sent to and displayed on REC video display terminals. Operators decode the address data and input the address information (5-digit ZIP code plus 4, or OEL if required) to the system. Mail-piece address information is then sent back to the system manager where it is used to direct the mail-piece to the proper output destination.

AARS components include an image capture "tent" (a covered section of the conveyor) enclosing four cameras and several light sources. An image server and a bank of image processors are located next to the system manager subsystem (SMS) platform.

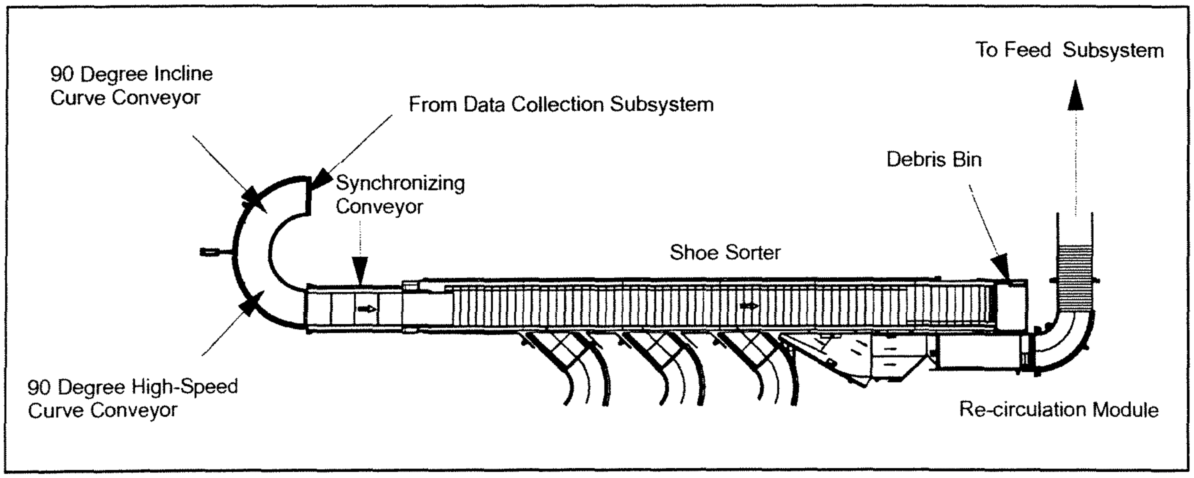
2.2.6 Distribution Subsystem

Once singulated and imaged, the mail-piece then travels to the Distribution Subsystem where the mail-piece is oriented and diverted to one of the automated induction stations. The induction station synchronizes the mail-piece for transition onto the cross-belt sorter.

The Distribution Subsystem transports mail from the Data Collection Subsystem/Automatic Address Recognition Subsystem and delivers it to the Sorter Subsystem. It is typically comprised of the following modules (refer to Figure 2-11):

- 90-degree curve transport conveyors (one incline, one high-speed);
- Synchronizing module (set of four belt conveyors);
- Shoe sorter, the main transport and distribution module;
- Recirculation module (gravity chute and power roller conveyors); and a
- Debris collection bin.

Figure 2–11: Distribution Subsystem

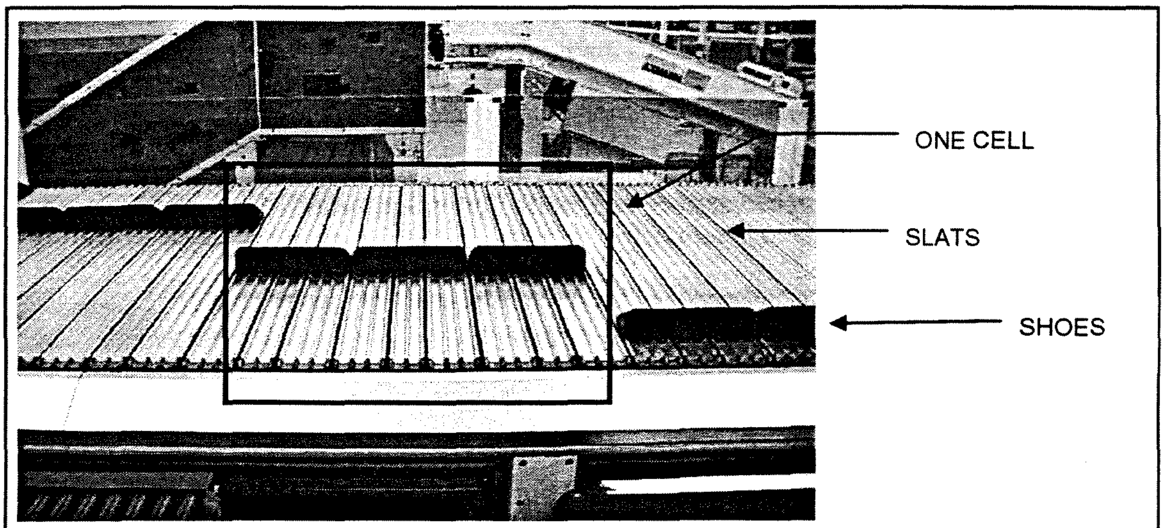


If all automated induction stations are busy, then the overflow volume is sent to the semi-automatic induction station or recirculation module. Mail-pieces requiring manual intervention prior to processing are diverted and processed at the semi-automatic Induction station. Mail-pieces that the DCS determines to be oversized or overweight bypass all of the induction stations and are sent to the recirculation module of the Feed Subsystem for manual removal from the system by the culling station operator.

The synchronizing module uses variable speed conveyors to coordinate the delivery of each mail-piece onto a specific shoe sorter cell. The shoe sorter, based on information received from the AARS, systematically distributes mail to each Sorter Subsystem induction station, or returns it via the recirculation module to the Feed Subsystem load conveyor for rework.

The shoe sorter is comprised of a series of rolling slats with sliding shoes on top (see Figure 2-12). The slats operate in groups of three to form a cell, and their accompanying shoes work together to offload packages in a horizontal fashion.

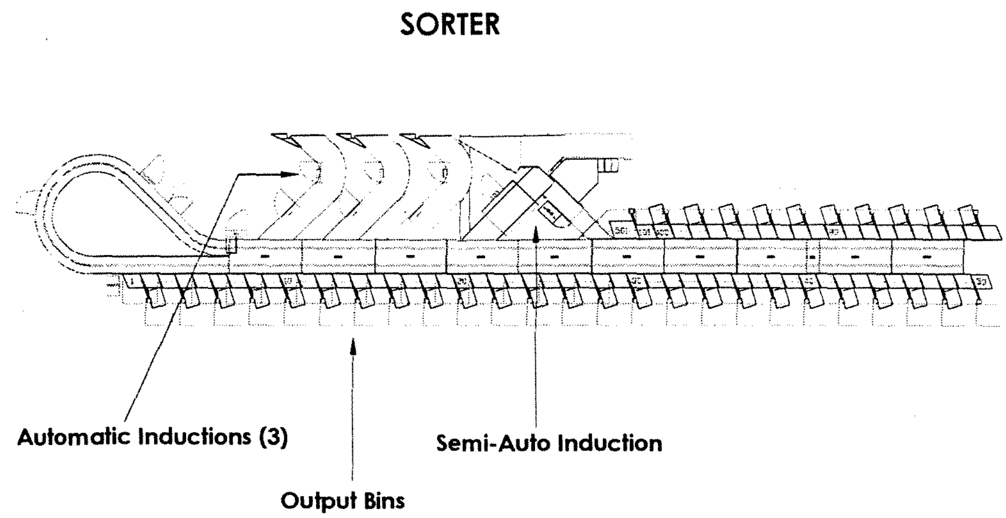
Figure 2–12: Shoe Sorter



2.2.7 Sorter Subsystem

The Sorter Subsystem accepts packages from the distribution system, orients and queues the packages for induction to the sorter, transports and discharges them at designated outputs based on information received from the DCS and AARS. The subsystem consists of automatic and semi-automatic induction stations, a cross-belt sorter, and multiple discharge chutes. (See Figure 2-13.)

Figure 2–13: Sorter Subsystem

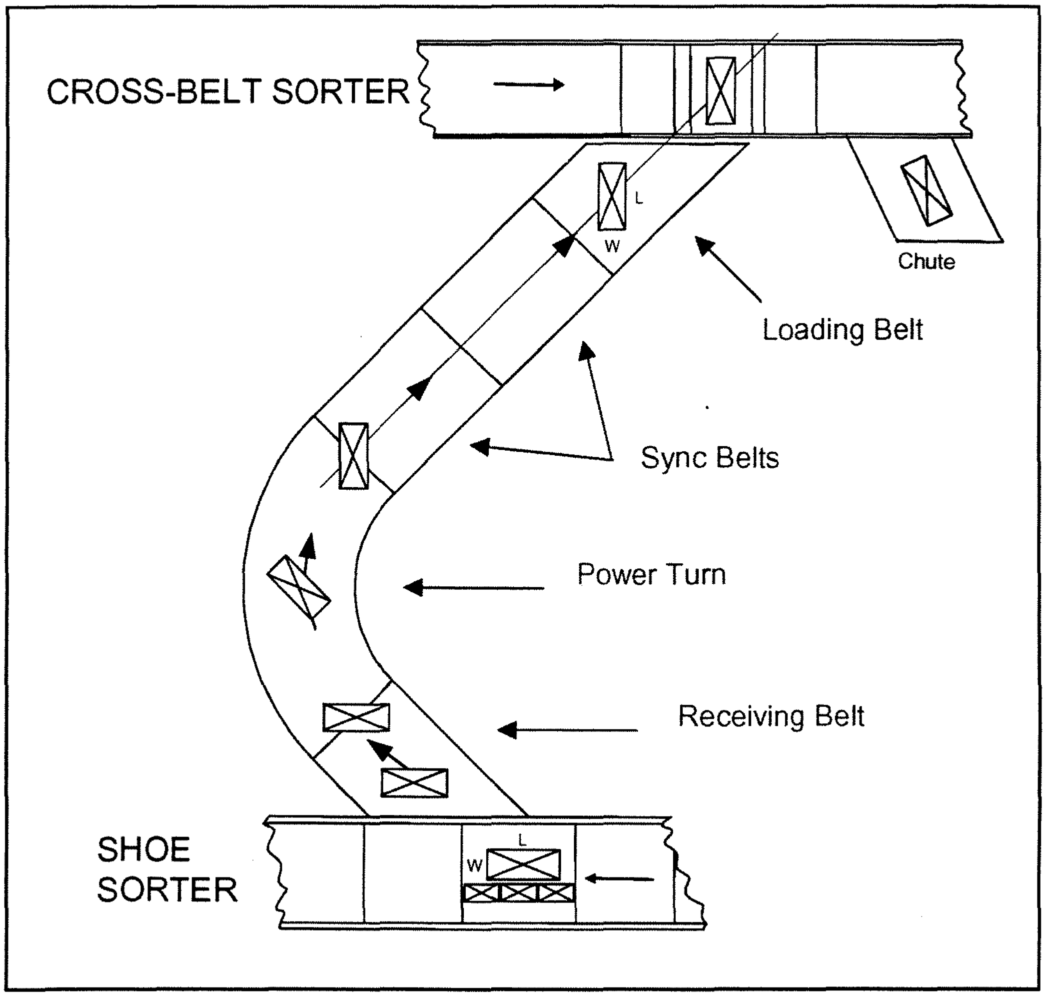


Automatic Induction. Three automatic induction stations are located between the shoe sorter and the cross-belt sorter. (See Figure 2-14.) As a mail-piece travels through the automatic induction conveyors, it is positioned lengthwise to be loaded on the cross-belt sorter. Mail-pieces entering any automatic induction station are tracked and placed on a cell of the cross-belt sorter with no manual intervention.

Each automatic induction station is made up of five belt conveyors:

- Receiving (45-degree)—accepts parcels from the shoe sorter;
- Power-turn (90-degree);
- Two synchronizing—coordinates placement of parcels onto the cross-belt sorter;
- Loading (45-degree)—places parcels onto the open sorter cell.

Figure 2–14: Automatic Induction Station



Semi-Automatic Induction. One semi-automatic induction station is located next to the three automatic induction stations. Mail-pieces that have not been properly singulated enter this semi-automatic induction station from the shoe sorter. Additional mail volume is diverted to the semi-automatic station from the shoe sorter if the automatic stations are unavailable.

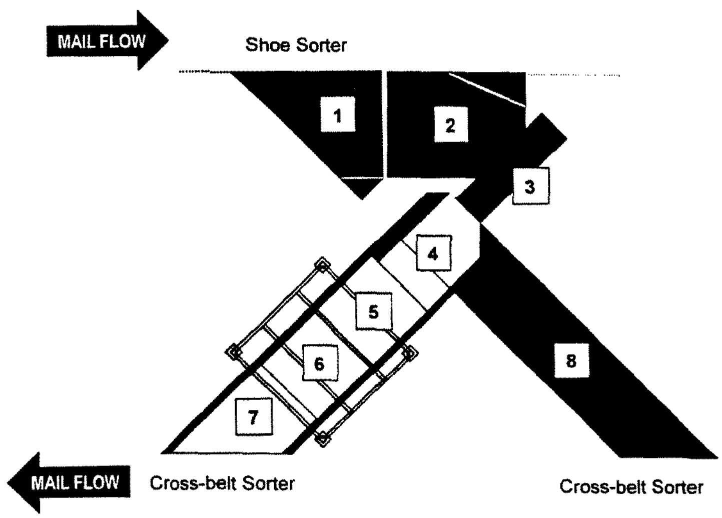
The semi-automatic station also incorporates a rework roller conveyor that receives VCS time-out and VCS reject mail-pieces from the automatic induction stations via the sorter backbone.

Once received at the semi-automatic station, mail-pieces are positioned with the address block on top and moved one at a time onto the coding belt conveyor. (See Figure 2-15). Each package is automatically dimensioned (length, width, height), weighed, and the top side is imaged. While image data are being sent to the AARS for processing, the package is automatically conveyed onto an available carrier cell of the cross-belt sorter.

The semi-automatic induction station is comprised of eight integrated roller and belt conveyors:

1-2. Two roller load tables—accepts mail from the shoe sorter, acts as a buffer zone;
3. Operator roller table—positions the mail-pieces;
4. Coding belt—packages queue here while awaiting entry to the AARS;
5. Sync belt—coordinates the placement of mail-pieces onto the cross-belt sorter;
6. Weigh belt—weighs the mail-piece;
7. Load belt (45-degree)—places the parcel onto the open sorter cell;
8. Rework roller table—accepts the mail from the cross-belt sorter, acts as a buffer zone.

Figure 2–15: Semi-Auto Induction Station



The semi-automatic induction station is configured with the following equipment:

- AARS camera mounted above the weigh belt;
- Dimensioning hardware located between the coding belt and the sync belt;
- Text Display to provide status messages to the operator;
- Control Panel to select mode and reset errors;
- All working surfaces incorporate powered roller conveyors.

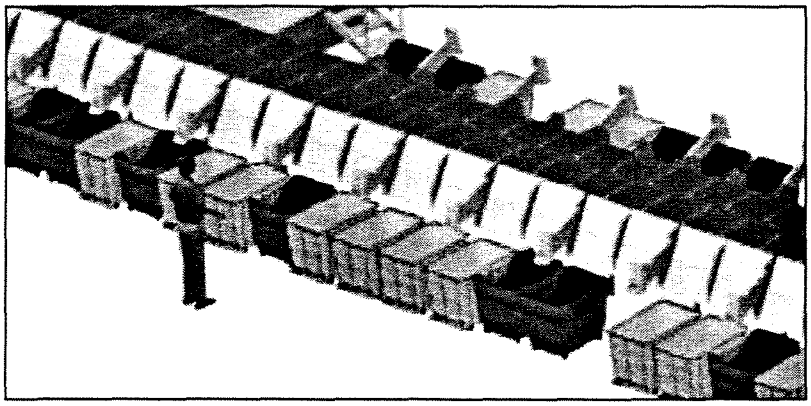
Cross-Belt Sorter. The backbone of the sorter is based on cross-belt technology, similar to the function of the SPBS, but far superior in design and performance. The sorter drive system incorporates distributed drive motor propulsion, which allows for a carousel-type configuration, no chain, low noise levels, and less maintenance. The sorter can sustain high-speed processing, while accurately discharging products to selected output locations.

Sorter operation is enhanced through the intelligent use of information from the data subsystems. Weight and dimension information determine the optimum discharge profile for each mail-piece sorted. This feature enables the sorter to discharge the product with customized control and high accuracy into the output bins. (See Figure 2-16.)

Each output location on the sorter can accommodate many different types of standard USPS® mail transport equipment such as:

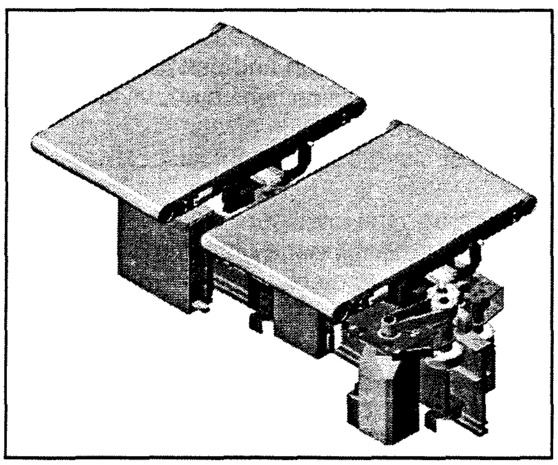
- 1046 Hampers;
- Wiretainers;
- Half-height cardboard pallet-boxes;
- Utility carts; and
- Sacks/pouches.

Figure 2–16: Sorter Backbone



Carrier Cells. The cross-belt sorter is comprised of a train of motorized carrier cells moving on a monorail system. Each carrier cell has its own motor-driven conveyor belt, mounted perpendicular to the direction of travel, for the loading and unloading of mail-pieces. (See Figure 2-17.)

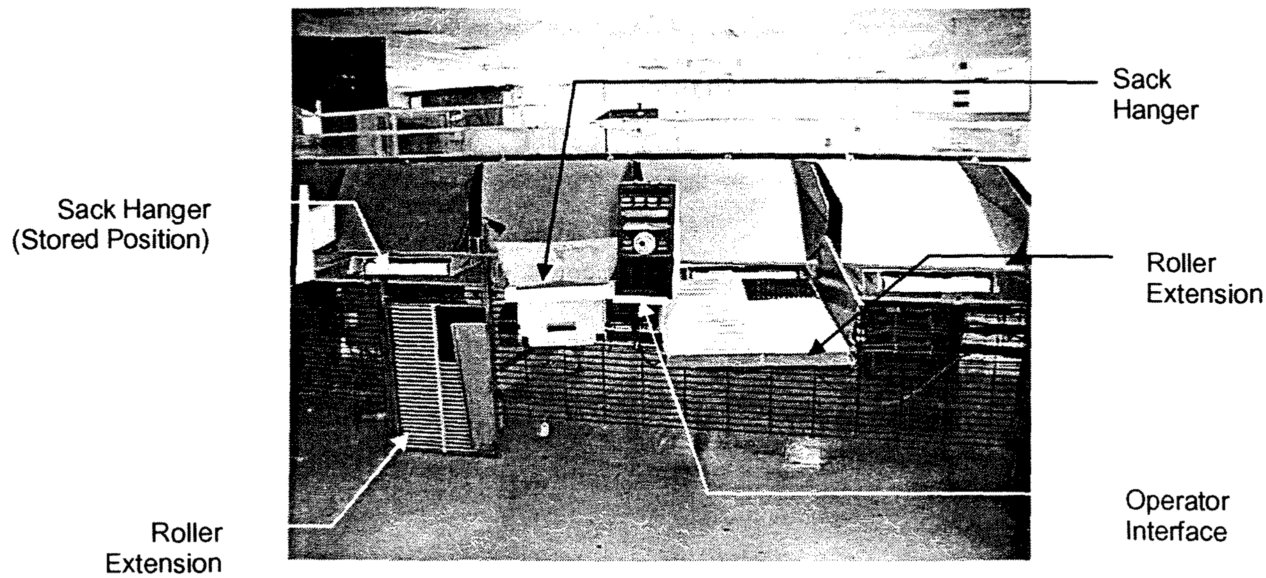
Figure 2–17: Sorter Carrier Cells



Each carrier cell receives mail-pieces from the induction stations, then transports and discharges the mail-pieces at the designated output points based on data received from the AARS. The loop design of the cross-belt sorter allows mail-pieces to recirculate, thereby allowing the AARS time to resolve the address and sort destination for each mail-piece. Once a sort destination is determined, the cross-belt conveyor on the carrier cell is activated and the mail-piece is discharged into the appropriate output chute. If the address is not resolved after a designated time, the carrier cell offloads the mail-piece at the semi-automatic induction station for rework. Packages with out-of-sort program destinations are sorted to a reject output bin.

Output Chutes. The Sorter Subsystem output chutes are mounted on the side of the cross-belt sorter. (See Figure 2-18.) The chutes are angled in the direction of mail-piece travel to reduce noise and mail damage, and are designed to accommodate a variety of mail transport containers. Each chute has a stowable sack hanger assembly, for use with sacks and pouches. Every other chute is equipped with a foldaway roller extension conveyor to permit larger containers to be set up in a staggered inside/outside configuration, and so that any combination of different-sized containers can be used without sacrifice to an adjacent output destination.

Figure 2–18: Output Chutes

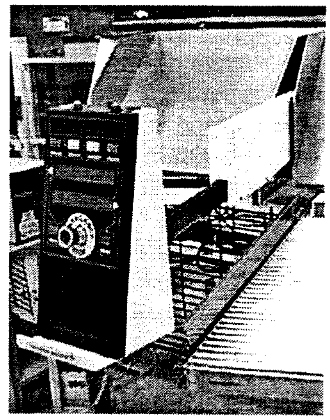


The standard APPS configurations allow sortation into the following USPS® containers:

- 1046 Hampers
- Wiretainers
- Utility carts
- Sacks/pouches
- Half-height cardboard pallet-boxes

One output control arm or operator interface terminal (OIT) is provided for every two chutes. The control arm is extendable and contains push-button controls that allow an operator to pause the output to a bin for sweep activities and print container dispatch labels. (See Figure 2-19.) The OITs also display bin information and have signal lights to indicate when the bins are ready to be swept. Operators monitor and sweep the output bins.

Figure 2–19: OIT



Label Printers. Two Microcom 466 label printers are located in the sorter output area, one on each end of the sorter loop. See Figures 2-20 and 2-21. Each printer sits on its own table. The label printers have an attached stacker assembly and are provided for operators to print dispatch labels prior to or during a run. A third printer (laser) for 8.5" x 11" placard labels is located on the SMS platform. These printers are available to the operators so that they are able to prepare labels as they are needed. Operators can also prepare labels in collated sets before operating the machine.

Figure 2–20: Microcom Printer

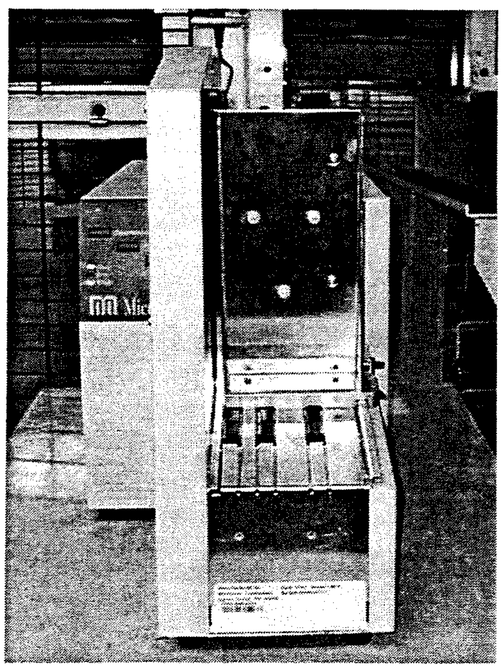
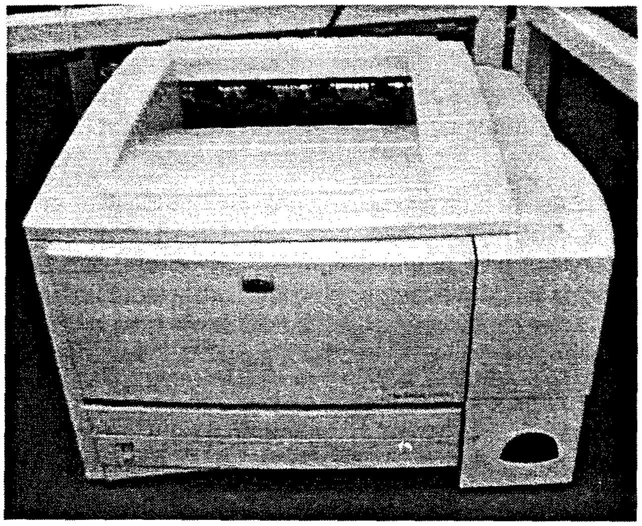


Figure 2–21: Placard Printer



3.0 Staging

3.1 Introduction

This section provides USPS® managers and supervisors with methods, procedures, and guidelines to use when allocating space for the operational support of the APPS in the mail processing environment.

The general staging methods for mail processing provide the location and size of the work space necessary for sufficient staging of containers and mail. These staging methods will help to attain an effective system throughput and, at a minimum, sustain a level of 5,500 pieces per hour for a single induction machine, or 9,500 pieces per hour for a dual induction machine. These methods have been developed in a modular format and are applicable to single and dual induction machines in all configurations.

The information provided in this section focuses on two basic operational and support subject areas: feed, and sorter operations. Although the information is arranged in two subject areas, the work duties are not segregated. An operator is expected to service the APPS as a whole system.

3.2 General Information

The operational and space requirements of the APPS include mail transport equipment staging to provide a self-contained working environment, or work space unit. In general, work space units contain the required space for standard USPS® automated, mechanized, and manual systems with support equipment to efficiently perform designated mail processing activities.

This section provides standard guidelines to create mail transport equipment staging areas within the work space units that are optimized for throughput, labor, and mail-flow.

3.2.1 General Assumptions

The size and location of mail transport equipment staging areas within the work space unit are based on numerical models using various standard containers and mail types for feed and sweep operations.

The model assumed the following:

- The APPS is operating at a feed and throughput rate of 5,500 mail-pieces/hour/induction.
- Input and output staging is sized to one hour of system run time, in a steady operational state.
- The operator's utilization is at 80 percent efficiency.
- All square-feet area values are presented as "per induction." On a dual induction system, the values require multiplication by a factor of two.
- The container types for the system outputs are defined by the sort program.

3.2.2 Container Assumptions

The standard APPS configurations provide for staging of the following USPS® containers:

- Wiretainers;
- BMC/OTRs;
- 1046 Hampers;
- ERMC/GPMCs; and
- Pallets/Half-height cardboard pallet-boxes.

The staging areas on the APPS depend on the mail type and containers used for each sort program. In addition to the actual dimensions of the container, a factor of 20 percent was added to the required base area for work space and access. See Table 3-1 for container dimension and stacking information.

Table 3–1: Container Dimension Information

Container	Length (inch)	Width (inch)	Height (inch)	Tare Weight (lbs.)	Capacity (lbs.)	Stacking Information (empty)
BMC	64	43	70	475	2000	Not stackable
GPMC/APC	42	29	69	134	1200	Not stackable
Pallet	48	40	Vary	Vary	Vary	Stackable/foldable
Wiretainer	48	40	42	320	2000	Not stackable (manually)
Hamper (S/P)	48	31	38	75/100	800	Stackable 3 high
U-carts	35	21.5	40	80	120	Inserted 20 in row
Sack/Pouch	Vary	Vary	Vary	Vary	Vary	Stackable in other container

Containers full of mail cannot be stacked or nested, and require a larger staging area. Some empty containers can be stacked or nested; thus, the staging areas for these empty containers are smaller. See Table 3-2 for information about the various containers, and the size of the work space area required whether empty or full.

Table 3–2: Container Work Space

Container	Length (inch)	Width (inch)	Stackable (empty/full)	Footprint Area (ft^2)	Workspace Area (ft^2)
BMC	64	43	No/No	19	23
GPMC/APC	42	29	No/No	8	10
Pallet	48	40	Yes/No	80 (13)	97 (16)
Wiretainer	48	40	No/No	13	16
Hamper (S/P)	48	31	Yes/No	10	12
U-carts	35	22	Yes/No	5	6
Sack/Pouch	48	31	Yes/Yes	10	14

NOTE: Pallet-box space requirements are listed as unassembled and (assembled).

Table 3-3 provides information about container piece conversion rates. This information will help in determining the required staging areas for mail volume for one hour of machine run time.

Table 3–3: Container/Mail-Piece Conversion Rates

Container	Priority Mail	LTR Bundles	FLT Bundles	SPRS	Stacking Information (filled)
BMC	170	377	288	409	Not stackable
GPMC/APC	85	214	163	232	Not stackable
Half Gaylord	170	188	193	288	Not stackable
Wiretainer	86	187	178	288	Not stackable
Hamper	43	95	122	210	Not stackable
U-carts	11	91	36	101	Not stackable
Sack/Pouch	11	17	10	30	Stackable in other container

NOTE: Source Mail Condition Reporting System

3.2.3 Analysis

The staging areas for the APPS are classified by function and vary by size and location. The four APPS staging areas are:

a. ***Pre-Induction*** - filled containers pending induction/unloaders;
b. ***Post-Induction*** - empty containers from the induction/unloaders;
c. ***Sorter*** - empty containers for placement/replacement on the sorter;
d. ***Dispatch*** - filled containers removed from the sorter pending dispatch from the operation.

The ***induction staging areas*** depend on the type of containers that the network uses to transport mail to the APPS. It is also assumed that filled containers pending induction are not stackable or nestable. *Management of the upstream operations and selective use of containers (i.e. large-wheeled containers) can increase the efficiency of the APPS induction operations and minimize the required staging areas.* The location of the staging area is a critical factor in the efficiency of the overall system, so the operator servicing the unloader can minimize the container transport time and unloader cycle time. These methods will be described in detail in the following sections.

For each container type and mail type, the number of filled containers required to be unloaded per hour was determined by using the following formula:

$$\text{Containers unloaded (/hr)} = \frac{\text{throughput rate (pcs/hr)}}{\text{container-mail type conversion rate (pcs/container)}}$$

The filled container pre-induction staging area was determined by the following formula:

Filled container staging area (ft^2) = containers unloaded (/hr) x container work space (ft^2)

As containers are inducted on the APPS, the resulting empty mail transport equipment is then placed in an interim staging area near the unloaders (***post-induction***). These empty containers can be stacked, nested, and not stacked; therefore, this post-induction staging area can be smaller than the pre-induction staging area for the same number of containers. Containers from this area can be used on the sorter (internal to the work space unit) or transported to upstream operations (external to the work space unit).

The container staging for the ***sorter*** operational areas of APPS depends on the type of containers assigned by the site for each output by sort program. As with the induction areas, large-wheeled containers provide certain operational advantages that will be discussed in detail further in this section. *Management of the container flow to downstream operations and selective use of containers can increase the efficiency of the APPS sorter operation and minimize required staging areas.*

The location of the staging area is a critical factor in the efficiency of the overall system. Staging areas near the work location can minimize the container transport time and output-out-of-service time. Depending on the configuration of the APPS, multiple sorter staging areas may be designated. Empty containers staged for use on the sorter can be stacked, nested, and not stacked; therefore, this ***sorter*** staging area can be smaller than the ***dispatch*** staging area for the same number of containers.

These staging areas are explained in the following sections, 3.3 and 3.4.

3.3 Feed Subsystem Staging

The Feed Subsystem is the entry point for mail-pieces processed on the APPS. The Feed Subsystem consists of a high volume load area with two types of automated container unloaders: pallet-unloaders that shingle layers of bundled flats and letters, and all purpose container unloaders (APCUs) that rapidly unload standard USPS® mail transport equipment.

Sufficient quantities of working mail must be available to ensure that the Feed Subsystem has the ability to maintain peak productivity. The staging area is sized to account for the 5,500 mail-piece per hour system throughput, the varied sizes of mail-pieces per mail type, and the capacity of individual container types.

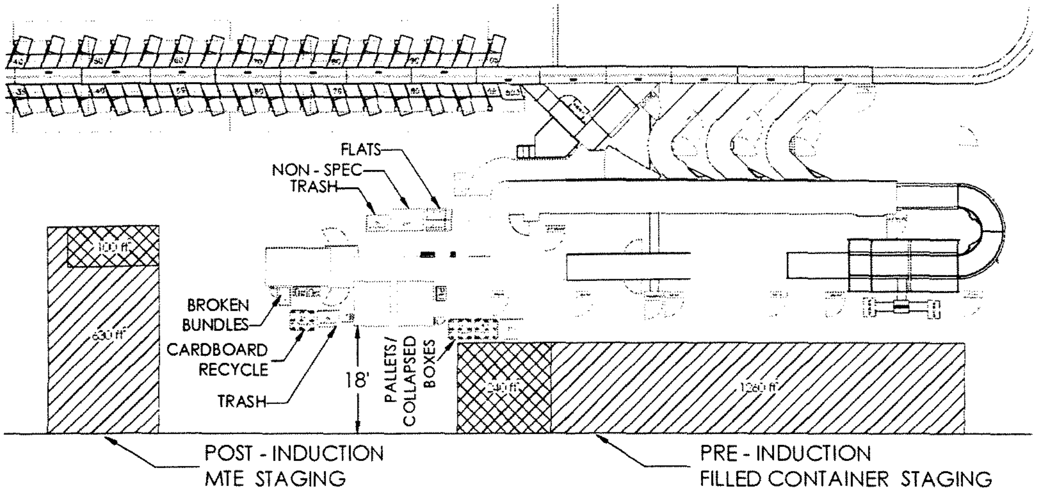
Two types of staging are in this area: working mail in the ***pre-induction*** area and mail transport equipment (or empty equipment) in the ***post-induction*** area. The area required has a range between 240 and 1,260 square feet for pre-induction, and 100 and 630 square feet for post-induction staging. Table 3-4 provides an estimated area required using an average mix of equipment per mail type. The information can be used as a minimum recommendation and adjusted for site-specific factors.

Table 3–4: Typical Induction Staging Area

Typical Induction Staging Area		
Mail Type	**Pre-Induction Filled Containers (ft^2)**	**Post-Induction Empty Containers (nested) (ft^2)**
FCM	400	200
Priority	500	450
STD	650	150

The location of the staging area within the work space unit is critical to achieving productive operations. Figure 3-1, "Feed Subsystem Staging Areas," identifies the recommended locations of the pre- and post-induction staging areas to minimize travel distances within the work space unit. Site-specific facility structures and nonstandard system configurations may require deviation from the recommended layout.

Figure 3–1: Feed Subsystem Staging Areas



NOTE: Single hatch marked areas are average maximum, double hatch areas are average minimum.

3.3.1 Feed Subsystem Staging Area Requirements/Checklist

- Establish an efficient retrieval method that can be repeated to move the mail from the staging area to the unloaders. Forklifts, electric pallet-jacks, or manual pallet-jacks can be used.
- Establish specific locations for stacking of plastic pallets and wooden pallets. Fold and place cardboard pallet-boxes inside an empty pallet-box, or lay them flat in a stack. (See Figure 3-1 and section 4 of this manual.)
- Prepare three separate containers: one for cardboard that can be recycled, one for trash, and one for cardboard that cannot be recycled.
- Whenever possible, re-use or recycle the equipment being unloaded:
  - Hampers or wiretainers can be staged and re-used within a short time period.
  - If ERMC/GPMC, or OTR/BMC containers cannot be re-used on the sorter, a process must be identified to have them removed periodically from the post-induction staging area.
- The post-induction staging area must be easily accessible from ***both*** the unloaders and the sorter, so that the mail transport equipment can be re-used on the sorter or removed from the work space.

3.4 Sorter Subsystem Staging

The sorter subsystem discharge chutes are mounted along the side of the cross-belt sorter. The chutes are designed to accommodate a variety of mail transport containers. Each chute has a stowable sack hanger assembly, to use with sacks and pouches. Every other chute is equipped with a foldaway roller extension conveyor to permit larger containers to be set up in a staggered inside/outside configuration, and so that any combination of different sized containers can be used without impact to an adjacent output destination.

As with the feed subsystem, a sufficient quantity of mail transport equipment must be available to ensure that the sorter subsystem has the ability to maintain peak productivity. The staging area is sized to account for the 5,500 mail-piece per hour system throughput, the varied sizes of mail-pieces per mail type, and the capacity of individual container types.

Two types of staging are in this area: empty mail transport equipment in the ***sorter*** area, and filled mail transport equipment from the sorter in the ***dispatch*** area. The staging area required ranges between 100 and 650 square feet for sorter, and 150 and 1,250 square feet for dispatch staging. Table 3-5 below provides an estimated typical area required using an average mix of typical equipment per mail type. The information can be used as a minimum recommendation and adjusted for site-specific factors.

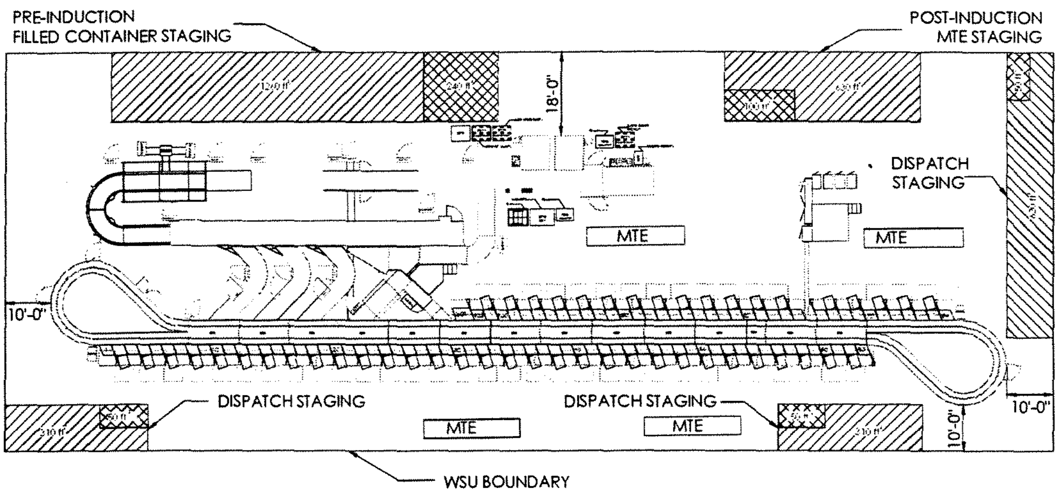
NOTE: All information is based on a "per feed subsystem" basis.

Table 3–5: Sorter Subsystem Staging Area

Mail Type	Sorter Empty Containers (nested) (ft^2)	Dispatch Filled Containers (ft^2)
IC FCM	350	400
IC Priority	250	750
IC STD	450	1100
OG FCM	300	200
OG Priority	125	250
OG STD	200	450

The location of the staging area within the work space unit is critical to achieving productive operations. The "Sorter Subsystem Staging Areas," as shown in Figure 3-2, identifies the recommended locations of the sorter/dispatch staging areas on a closed-loop configuration to minimize travel distances within the work space unit. Site-specific facility structures and nonstandard system configurations may require deviation from the recommended layout.

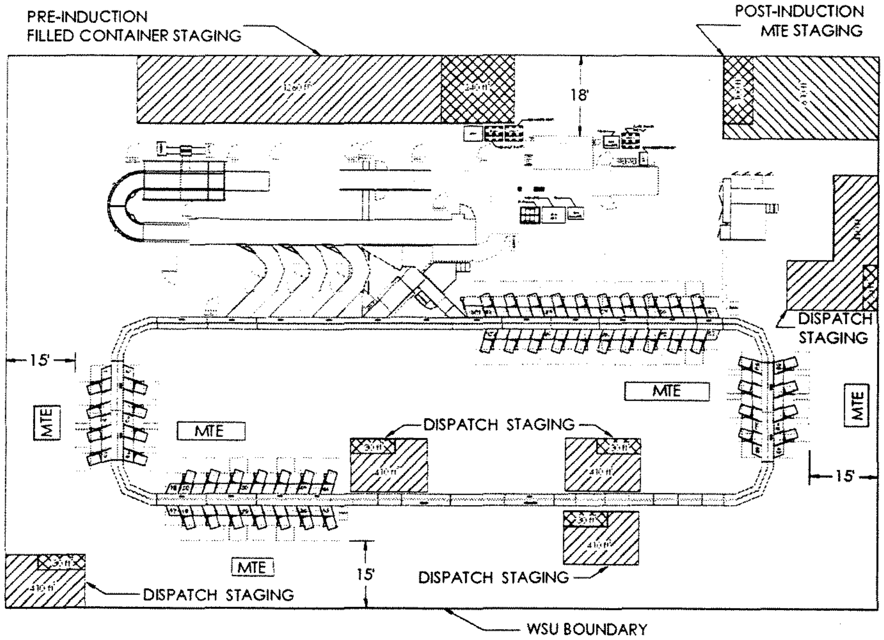
Figure 3–2: Sorter Staging Areas, Closed-Loop Configuration



NOTE: Areas designated by "MTE" are reserved for empty mail transport equipment.

The "Sorter Subsystem Staging Areas," as shown in Figure 3-3, identifies the recommended locations of the sorter/dispatch staging areas on an open-loop configuration to minimize travel distances within the work space unit. Site-specific facility structures and nonstandard system configurations may require deviation from the recommended layout.

Figure 3–3: Sorter Staging Areas, Open-Loop Configuration



3.4.1 Sorter Subsystem Staging Area Requirements/Checklist

- Establish an efficient retrieval method that can be repeated to move the mail from the sorter to the dispatch staging area. Manual pallet-jacks can be used.
- Designate sorter staging areas in close proximity to the outputs.
- Assign dispatch staging areas next to motorized equipment aisles, for ease in moving mail transport equipment to dock operations.
- Whenever possible, re-use or recycle the equipment from the Feed Subsystem unloader operation:
  - Hampers or wiretainers can be staged and re-used within a short time period.
  - ERMC/GPMC OTR/BMC containers can be re-used on the sorter for consolidation of sacks and those items that won't fit inside a sack (i.e., outsides).
- When using pallet-boxes, preassemble at least three pallet-boxes per sorter area for quick replacement when filled.
- Mail transport equipment can be obtained and re-used on the sorter from the post-induction staging area.
- Each sorter staging area contains specific sort program containers for the outputs in that general area. That is, pallet-boxes and wheeled equipment should be grouped in the areas where they are being used.

3.5 Transport Equipment

In addition to providing effective staging areas, proper equipment must be available to transport the containers to and from the staging areas. Internal to the work space unit, transportation from pre-induction staging to the unloaders, and from the unloaders and to post-induction staging is required. External to the work space unit, transportion from dock or upstream operations to the pre-induction staging area, and from the dispatch area to downstream and dock operations, is required. This equipment may include forklifts, manual and electric pallet-jacks, as well as powered towing equipment.

The operator transporting mail to the pre-induction area should remove full dispatch containers or mail transport equipment from the APPS post-induction or dispatch areas on the return trip. A constant flow of containers of mail to the induction, and mail transport equipment from the sorter, must be maintained to keep the APPS productive.

3.5.1 General Assumptions

These assumptions are used as a basis to determine the number of transport equipment units. The size and location of mail transport equipment staging areas within the work space unit are based on numerical models using various standard containers and mail types for feed and sweep operations.

The models assume the following:

- The APPS is operating at a feed and throughput rate of 5,500 mail-pieces/hour/induction.
- The average travel distance to the dock from APPS dispatch staging area is 500 feet.
- Vendor-listed equipment speeds are capped at 70 percent of maximum.
- Unique tables are presented for dual induction systems.
  - Single induction values ***cannot*** be multiplied by a factor of two for dual induction.

3.5.2 Analysis

The number of transport equipment units required to support an APPS is estimated per operation by using the number of containers to be unloaded or swept, the travel distances, and the transport equipment speed.

External Work Space Unit Support. For each sort program and mail type, the number of transport equipment units required was determined by the following formula:

$$\text{Number of Transport Equipment Units} = \frac{\text{containers unloaded/swept (/hr) x travel distance (ft)}}{\text{equipment speed (feet/ hour)}}$$

When the container type is capable of being towed, the tables include a factor on tuggers to adjust for the efficiencies of towing three containers at once.

Internal Work Space Unit Support. Table 3-6 shows the number of pallet-jacks required to support internal APPS operations by using the number of containers to be unloaded or swept, the travel distances, and transport equipment speed.

To determine the service time, refer to the table in Appendix C of this manual, "Estimated Sorter Output Servicing Times."

Number of pallet-jacks = servicing time (sweep/unload) x number of containers swept/unloaded (operational-hour)

Table 3–6: Common Transport Equipment Speeds

Transport Equipment Speed			
Transport Equipment	**Speed (miles/hour)**	**Speed (feet/second)**	**Speed (feet/hour)**
Pallet Jack, Manual	2.1	3.1	11,088
Pallet Jack, Riding	4.8	7.0	25,133
Tugger/Tow Motor	4.3	6.3	22,546
Forklift	6.6	9.6	34,595

3.5.3 Recommended Quantities of Transport Equipment Units

For single and dual induction systems, Tables 3-7 and 3-8 provide the recommended quantities of transport equipment units to service the APPS external to the work space unit.

Table 3–7: External—Single Induction

Recommended Quantity of Transport Equipment, External WSU Single Feed Subsystem		
Sort Program/Mail Class	**Riding Pallet-Jack/Forklift**	**Tugger**
IC First Class	1	1
IC Priority	0	2
IC Standard	2	2
IC Standard (hampers)	2	2
OG First Class	1	1
OG Priority	1	1
OG Standard	2	1

Table 3–8: External—Dual Induction

Recommended Quantity of Transport Equipment, External WSU Dual Feed Subsystem		
Sort Program/Mail Class	Riding Pallet-Jack/Forklift	Tugger
IC First Class	1	2
IC Priority	0	3
IC Standard	4	3
IC Standard (hampers)	3	4
OG First Class	1	2
OG Priority	1	2
OG Standard	3	2

For single and dual induction systems, Tables 3-9 and 3-10 provide the recommended quantities of transport equipment units to service the APPS internal to the work space unit.

Table 3–9: Internal—Single Induction

Recommended Quantity of Transport Equipment, Internal WSU Single Feed Subsystem		
Sort Program/Mail Class	Feed Subsystem Powered Pallet-Jack	Sorter Subsystem Manual Pallet-Jack
IC First Class	1	2
IC Priority	0	0
IC Standard	1	2
IC Standard (hampers)	1	0
OG First Class	0	2
OG Priority	1	0
OG Standard	1	0

Table 3–10: Internal—Dual Induction

Recommended Quantity of Transport Equipment, Internal WSU Dual Feed Subsystem		
Sort Program/Mail Class	Feed Subsystem Powered Pallet-Jack	Sorter Subsystem Manual Pallet-Jack
IC First Class	2	3
IC Priority	0	0
IC Standard	2	4
IC Standard (hampers)	2	0
OG First Class	0	3
OG Priority	2	0
OG Standard	2	0

4.0 Operations Methods

This section provides United States Postal Service® (USPS®) managers and supervisors with methods, procedures, and guidelines for use with the Automated Package Processing System (APPS) in the mail processing environment. It is intended to provide the integration of the key mail processing concepts and practices with the physical attributes of the mechanical systems and major components of APPS.

> ***Methods:*** elements of a strategy, based on defined procedures; a combination of various instruments and tools applied by various process stakeholders to achieve defined objectives and set targets.

The general methods for mail processing, or *process methods*, provide the tools and information necessary to attain an effective system throughput and, at a minimum, sustain a level of 5,500 pieces per hour for a single induction machine, or 9,500 pieces per hour for a dual induction machine. These methods have been developed in a modular format and are applicable to single and dual induction machines in all configurations.

The information provided in this section focuses on three basic operational and support subject areas: feed, semi-automatic induction, and sorter operations. Although the information is grouped into three subject areas for discussion, the work duties are not segregated. An operator is expected to service the APPS as a whole system.

*This guide provides general information on APPS, but is **NOT intended as a replacement for formal training or other standardized operator instruction.***

4.1 Feed Subsystem

The Feed Subsystem is the entry point for mail-pieces processed on the APPS. The Feed Subsystem consists of a high-volume load area with two types of automated container unloaders: pallet-unloaders that shingle layers of bundled magazines and letters, and all purpose container unloaders that rapidly unload standard USPS® mail transport equipment.

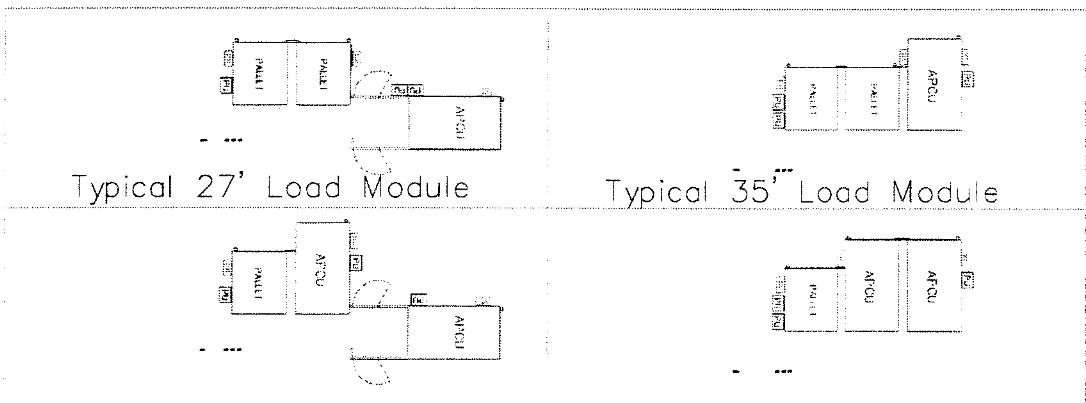
Starting with the Feed Subsystem, mail is fed via pallet-unloader or all purpose container unloaders onto a load conveyor module. The operator inspects the mail-stream, removes any out-of-specification mail-pieces, loose mail, or packaging material, and performs limited repairs of broken bundles. The mail is then transported through the Singulation Subsystem, where it is automatically converted into a single-high, single-wide mail-stream. Nonsingulated mail-pieces are sent back to the Feed Subsystem via the recirculation conveyor.

Although the APPS Feed Subsystem is similar in appearance to the legacy SPBS Feed System, the APPS Feed Subsystem incorporates multiple significant enhancements and requires a different operating method. Effective operation of the feed area includes continuity of tasks and operations whenever mail is available at both the culling and unloader stations. Operators are expected to attend to both the unloader side and the culling side of the feed area continuously.

4.1.1 Load Module Configurations

The load module can be configured in two basic lengths with one or two pallet or all purpose container unloaders. In Figure 4-1 below, the 27′ load module is shown on the left, and the 35′ load module is shown on the right.

Figure 4–1: 27′ and 35′ Load Modules



The 35′ load module provides an area to manually load containers. A typical configuration on the 27′ load module (Figure 4-1) consists of the 27′ load conveyor, one pallet-unloader, one all purpose container unloader (APCU) on the side of the belt, and one APCU at the end of the belt. There is no designated place to manually unload containers on the 27′ unit. A typical configuration of the 35′ load module consists of a 35′ load conveyor, one pallet-unloader, and two APCUs located on the side of the belt. The end of the belt is designated for manually unloading the occasional container.

4.1.2 Unloaders

There are two basic types of unloaders: pallet and APCU. Both types have two operational modes: auto and manual. In almost all instances, the auto mode is used.

In the auto mode system, photo-eyes control the unloaders and the flow of mail. The load area operator is required only to activate the "up" control to start the system. In the manual mode, the load area operator activates the system, but the culling area operator controls the unload process.

When processing bundles of flats and letters on the APCU, the correct mode is determined by the bundle characteristics. Poly-wrapped bundles, loose bundles, rubberband bundles, and bundles less than 2" thick should be unloaded with the APCU controls set in manual mode.

Pallet-Unloaders. The pallet-unloader accepts only pallets of stacked or layered mail-pieces. The pallet-unloader ***cannot*** accommodate pallet-boxes or Gaylords. The unloader raises and shingles off layers of mail-pieces automatically.

All Purpose Container Unloaders (APCUs). The APCU can unload various types of mail transport equipment: pallet-boxes, wiretainers, hampers, Eastern Regional Mail Containers (ERMC) or General Purpose Mail Containers (GPMC), and Over the Road (OTR) containers. Although APCUs can physically accommodate pallets, it is recommended that they only be used for pallets as a last option. The APCU dumps a pallet, while pallet-unloaders shingle the mail-pieces off.

4.1.3 Material Handling Equipment

Material handling equipment to support the Feed Subsystem includes forklifts, powered pallet-jacks, and manual pallet-jacks. This equipment is required to perform the basic mail transport function from the staging areas into and out of the unloaders. Operators are required to be trained and qualified to use all the referenced material handling equipment. The training includes powered equipment training classes and license testing.

The preferred material handling equipment for moving pallets in the feed area is the powered pallet-jack. Pallets should be unstacked at the time of delivery to the staging area; if they are not, a forklift will be required for use inside the APPS work space area. Operators ***must NOT*** load stacked pallets into the unloaders. Ride-on electric pallet-jacks are the best option, and are very efficient in a one-person operation where one operator performs unloader duties and the staging area is within the work space unit.

Manual pallet-jacks can be used to move equipment and mail around the unloader area. However, it may be difficult to load a pallet into an unloader with a nonpowered pallet-jack because of the lip on the unloader bottom plate. All wheeled containers should be manually placed into the unloaders. A forklift, electric pallet-jack, or a manual pallet-jack should be used to insert pallets and pallet-boxes into the unloaders.

When one person is assigned to the load function, the operator is required to remove any plastic and/or banding on the pallet, transport the pallet into the unloader, and set the controls.

When two people are assigned to the load function, the operator working the material handling equipment (MHE) places the pallet in front of an unloader, while the other operator cuts the plastic and/or banding. The MHE operator pauses during the pallet preparation, then moves the pallet into the unloader for processing.

When a significant quantity of mail on pallets is available for unloading, a process should be established where the MHE operator places a pallet at one unloader and retrieves another pallet for the second unloader, while the first pallet is prepared for the first unloader. After the MHE operator places the second pallet, the operator moves the first (now prepared) pallet into the unloader, and retrieves another pallet from the staging area and continues the sequence. This ensures a constant mail-flow into the system and minimizes operator downtime.

4.1.4 Support Equipment and Set-up

In order to perform operations in an effective and efficient manner, it is recommended that the operator prepare the work area with the required support equipment, arrange the equipment in a manner that minimizes distances, and is advantageous for opportunities to prepare culled mail for the next operation.

Table 4-1 describes the staged containers recommended for the feed area.

Table 4–1: Staged Containers for the Feed Area

Mail Transport Equipment Type	Proposed Use
OTR, ERMC/GPMC, platform truck	Non-machineable, out of specification
Flat Mail Cart (FMC) or Flat Mail Tray stacked in ERMC/GPMC	Loose Flats
Pallet	Empty, folded pallet-boxes
Pallet-box, recycling hamper	Pallet-tops, dividers and other cardboard that can be recycled
ERMC/GPMC, hamper	Loose empty sacks and pouches
Waste hamper	Waste, plastic wrap, banding, etc.

It is recommended that out of specification mail-pieces that are culled from staged mail or the Feed Subsystem be placed in a wheeled MTE container that is suitable for the next processing operation. The container type used for non-machinable mail-pieces is site-specific, based on the downstream operations. Typically, the container will be an APC, hamper, or OTR container. Safety is always a consideration when selecting this container as some mail-pieces might be heavy and difficult to lift from a hamper or an OTR.

A Flat Mail Cart (FMC) is recommended for any loose flats that can be recovered before the induction of the mail into the Feed Subsystem. For AFSM 100 processing, loose flats from broken bundles can be placed in a flat mail cart with the address facing up and the binding to the right. This reduces the mail preparation time in an 035 operation.

If the pallet-boxes are not needed for immediate re-use, they can be folded and placed in one central location. The operator should provide an empty pallet so that flattened boxes can be stacked, or folded and placed in a half pallet-box.

It is recommended that operators use a pallet-box or recycling hamper for cardboard that can be recycled such as pallet-tops or layer dividers. Local policy will dictate the type of container for cardboard that can be recycled, whether it will go to a compactor, or will be on a truck at the dock. Reusable containers do not go in the same container as cardboard that cannot be recycled.

ERMC/GPMC or hampers can be used for empty sacks and pouches. If the equipment is to be sent to the Mail Transport Equipment Service Center (MTESC) for processing, it is recommended that an ERMC/GPMC be used. If the equipment is to be used again within the facility, local policy should be followed.

A waste container is required for paper that cannot be recycled, poly-wrap, and banding. The unloader operation generates a large quantity of waste. Plants typically use a large trash hamper to discard material that cannot be recycled such as poly-wrap from the pallets, and cardboard from the pallet-tops that cannot be recycled. Plastic and metal banding removed from the pallets require disposal. Unless local policy prohibits combining these materials in one trash hamper, poly-wrap, banding, paper that cannot be recycled, cardboard, and wooden pallet-tops can be placed in the trash hamper. Depending on local waste disposal policies, creating a separate stack for wooden pallets and pallet-tops may be required.

The diagrams in Figures 4-2 and 4-3 depict the recommended locations for support equipment placement around the two standard load modules.

Figure 4–2: 27' Load Module Support Equipment Layout

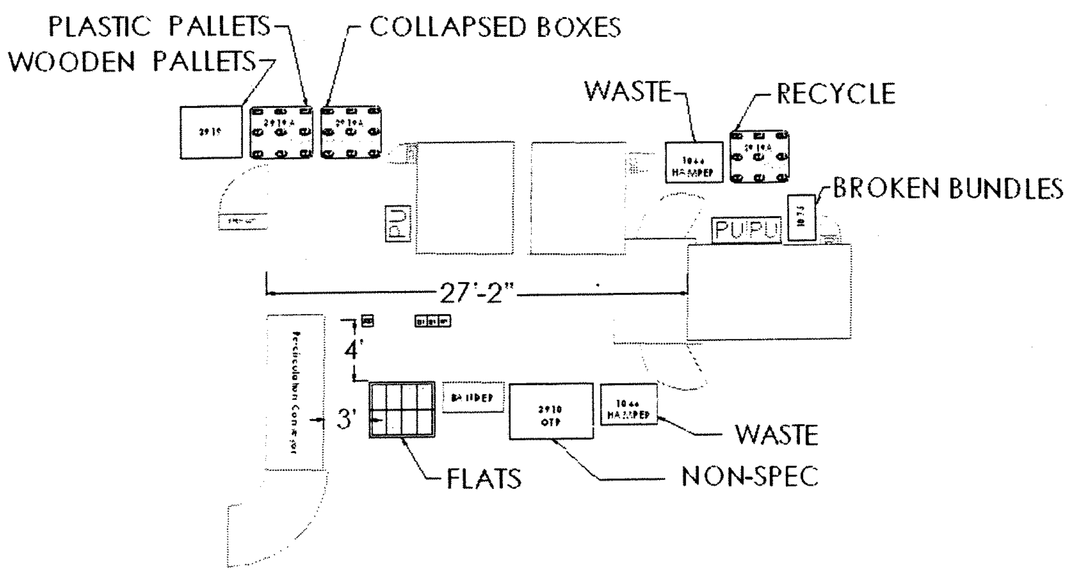
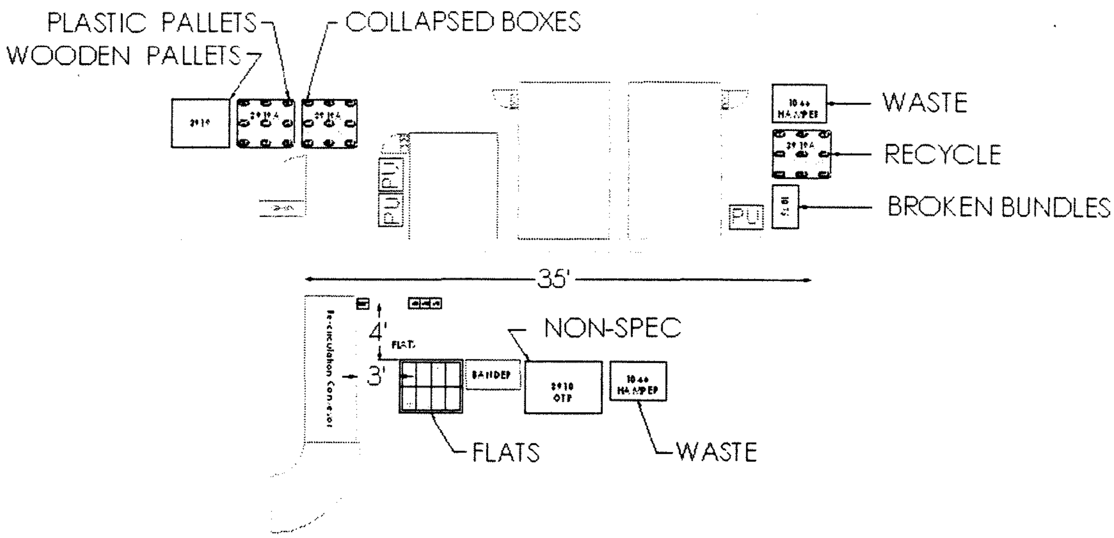


Figure 4–3: 35′ Load Module Support Equipment Layout



4.1.5 Support Equipment and Set-Up for Culling Area

Standard and special equipment is recommended for use by the culling area operator. This equipment is listed in the tables below.

Table 4–2: Standard Equipment and Use for Culling

Mail Transport Equipment Type	Proposed Use
Waste hamper	Waste, plastic wrap, banding, etc.
OTR, ERMC/GPMC, platform truck	Non-machineable, out of specification
Flat Mail Cart (FMC) or Flat Mail Tray stacked in ERMC/GPMC	Loose Flats

Table 4–3: Special Equipment and Use for Culling

Special Tools and Equipment	Proposed Use
"Shepherd's Hook"	Dislodging jammed or stuck mail-pieces
Bander	Repairing loose and broken bundles

The "Shepherd's Hook" is a long pole with a hook on the end used to remove lodged mail-pieces from the hampers and other containers in the unloaders. There should also be a bander located in the area to repair loose bundles. The repaired bundles then can be placed on the load conveyor for direct processing on the APPS.

Out of specification mail-pieces that are culled from staged mail or the Feed Subsystem should be placed in a wheeled MTE container that is suitable for the next processing operation. The container type used for non-machineable mail-pieces is site-specific, based on the downstream operations. Typically, the container will be an ERMC, hamper, or OTR container. Safety is always a consideration when selecting this container as some mail-pieces might be heavy and difficult to lift from a hamper or an OTR.

Loose flats or unrecoverable broken bundles should be placed in a Flat Mail Cart (FMC) with the address facing up and the binding to the right for AFSM 100 processing. This reduces the mail preparation time in an 035 operation.

A waste container is required for paper that cannot be recycled, poly-wrap, and banding. The unloader operation generates a large quantity of waste. Plants typically use a large trash hamper to discard material that cannot be recycled, such as poly-wrap from the pallets, and cardboard from the pallet-tops that cannot be recycled. Plastic and metal banding removed from the pallets requires disposal. Unless local policy prohibits combining these materials in one trash hamper, poly-wrap, banding, paper that cannot be recycled, cardboard, and wooden pallet-tops can be placed in the trash hamper. Depending on local waste disposal policies, creation of a separate stack for wooden pallets and pallet-tops may be required.

Unloader Modes. The unloaders have two mode settings, auto and manual. In most cases the mode will be set to auto. The activities of the operator on the culling side will differ depending on the mode required, which is based on mail type and containers.

Auto Mode. In the auto mode system, photo-eyes control the unloaders and the flow of mail. The load area operator activates the system, and the unloaders will continue to unload mail automatically as controlled by the photo-eye in load conveyor. The operator on the culling side of the load conveyor monitors and adjusts the mail in the load conveyor and presses the "down" button when the container/pallet is empty.

The auto mode is the preferred mode for parcels and for pallet-unloaders during bundle operations. When in the auto mode, the operator must allow the photo-eyes to control the unloader cycle. If the operator pulls mail-pieces out of the loader prematurely, the photo-eyes will not be able to correctly control the unloader, resulting in a less efficient operation.

Manual Mode. In the manual mode the load area operator activates the system, but the culling area operator takes control of the unload process. Once activated, the unloader in manual mode will automatically rise to a mid-height position and stop, until the culling side operator reactivates the motion by pressing the "up" button. The operator controls the dumping of mail onto the load conveyor by pressing and holding the "up" button; releasing the button stops the motion.

After the unloaders have reached the full extent of travel, the culling operator must check to ensure that they are empty. If mail-pieces are lodged in the container, the operator should use the "Shepherd's Hook" to dislodge the mail-pieces. Any mail-pieces that cannot be dislodged can be removed by the feed area operator when the unloader is returned to the load position. The culling operator presses the "down" button to lower the unloader. Pressing and releasing the "down" button returns the unloader to the load position.

4.1.6 Feed Area Operator Activities

The feed operator is primarily responsible for loading containers into the APPS Feed Subsystem, and for keeping a constant flow of mail to the system. All mail for induction should be available in the pre-induction staging area, and empty MTE should placed in the post-induction staging area.

Operators are expected to assist each other and perform all duties supporting the work area and the entire system. Effective operation of the feed area includes continuity of tasks and operations whenever mail is available at the station. Both the unloader side and the culling side of the feed area should be attended to by the same operator in a continuous manner, over a continuous block of time. Under certain circumstances when the mix of induction containers is predominantly pallets or hampers, and when the staffing tool recommends additional staffing for the feed area, the focus of the additional operator should be on servicing the unloader side of the feed area.

Operator activities vary slightly by the type of mail and the MTE container type. All operators in the Feed Subsystem area are responsible for system operation.

Package Type/Wheeled Container Processing. When loading OTR/BMC type containers, the container must be pushed into the unloader until it makes a positive stop. The operator must then ensure that the top retention bar is in the correct position for an OTR container and the mode switch is set to "auto." To activate the unloader, the operator must first press the "reset" button, then the "up" button. After the container is emptied, the culling area operator activates the "down" controls, and the system will return to the load position. When the operator lowers the unloader, the container is pulled out of the unloader until it can be pushed. At this time, the OTR must be moved to the MTE/post-induction staging area. The operation being worked dictates whether it can be re-used for a pouch dispatch container on the APPS, or be removed from the operation, such as in a standard mail operation where OTRs are rarely used.

It is recommended that the operator:

- Push, not pull, the ERMC/GPMC into the APCU.
- Make certain that the top retaining bar is in the correct position to hold the container in the unloader.
- For ERMCs, turn the container so the webbed side is facing out. The smooth plastic side provides a flatter surface for the mail to slide down and minimizes jams. If the weight of the container will not let it be safely turned sideways, push it straight into the unloader.
- Again, ensure that the retaining bar is in the correct position to hold the container in the unloader.
- First press "reset," then press "up."
- After the unloader is lowered and the container is empty, pull the empty container from the unloader and push it to the proper staging area, either for re-use or removal.
- When unloading a wiretainer or 1046 hamper, use the removable retaining bar located on a hook on the side of the unloader.
- Insert the hamper or wiretainer into the unloader, ensure that the front-top edge is under the fixed retaining mechanism mounted in the back of the unloader.
- Place the removable retaining bar in the slots on both sides of the unloader at the correct height for hampers and wiretainers.
- First press "reset," then press "up" in order to activate the unloader.
- After the container is empty and has been lowered by the culling area operator, remove the container and stage it for re-use or removal.

Bundle Type/Pallet Processing. Bundle loads on pallets should be processed on the pallet-unloader.

When one person is assigned to the load function, the operator is required to prepare any plastic and/or banding on the pallet, transport the pallet into the unloader and set the controls.

When two people are assigned to the load function, the operator working the material handling equipment (MHE) places the pallet in front of an unloader, while the other operator cuts the plastic and/or banding. The MHE operator pauses during the pallet preparation, then moves the pallet into the unloader for processing.

When a significant quantity of mail on pallets is available for unloading, a process should be established where the MHE operator places a pallet at one unloader and retrieves another pallet for the second unloader, while the first pallet is prepared for the first unloader. After the MHE operator places the second pallet, the operator moves the first (now prepared) pallet into the unloader, retrieves another pallet from the staging area, and continues the sequence. This ensures a constant mail-flow into the system and minimizes operator downtime.

If the pallet does not look stable, the operator can remove as much of the wrapping material as possible without destabilizing the load before placing the pallet into the unloader, and remove the remaining wrapping material once it is inside the unloader. Another option is to slice the bottom three-quarters of the wrap, leaving a band around the top, insert the pallet, then finish cutting and removing the wrap. This stabilizes an otherwise problematic pallet.

If any partially broken bundles can be made whole by banding, these can be placed in a utility cart and, during slacktime, and the bundles can be taken to the bander for repairing.

Once the pallet is in the unloader, set the mode switch to auto or manual, depending on the type of mail. The load area operator first presses the "reset" button, then the "up" button. This raises the unloader and starts the unload cycle. After the pallet-unloader has been emptied and lowered, the operator removes the empty pallet and moves it to the MTE staging area. The operator then obtains the next pallet for processing.

One-inch thick poly-wrapped flat bundles stacked higher than two or three bundles do not singulate effectively and can cause double feeds. The APCU may be a better alternative as the dumping action tends to effectively singulate this type of mail.

When processing pallets in the APCU, the removable retaining bar must be placed in the lower position to keep the pallet from falling out of the unloader when the APCU is fully raised.

Pallet-Boxes. The pallet-box is loaded into the APCU via a pallet-jack or forklift. Once it is loaded, the removable retention bar is placed in the proper location. The operator sets the mode switch to the proper setting for the mail being unloaded, presses the "reset" button, then the "up" button. When the pallet-box is empty and the unloader is lowered, the pallet-box and pallet are removed and staged for re-use or stacking, and the pallet-box is folded and placed on the appropriate stack for removal.

Sack/Pouch. Sack unloading at the APPS cannot provide sufficient mail-piece volume to maintain the required throughput. There is not sufficient space around the load module to unload sacks on the 27′ version, and only a small area on the 35′ version. The occasional sack should be unloaded in conjunction with pallet and container unloading.

An alternative to unloading sacks on the load module belt is to unload them in a separate operation from the APPS. This preparation operation requires the use of a container unloader, a Model 89 belt, and wiretainers. The mail is unloaded from the sacks onto the belt, the trash and debris removed, and the bundles are allowed to fall off the end into a wiretainer for transport and unloading on the APPS. Broken or loose bundles can also be removed or repaired prior to APPS induction.

4.1.7 Culling Area Operator Activities

The operator on the culling side of the load module monitors and adjusts the volume of mail flowing through the Feed Subsystem from the unloaders, so that there is a smooth, consistent flow of mail into the system. When the unloaders are in the manual mode, the unloaders automatically rise to a mid-height position. The culling area operator controls the unload process with a series of buttons located on the load conveyor.

The primary responsibility of the culling area operator is to ensure that the unloading process does not diminish bundle integrity and to provide a sufficient supply of mail to the system. The operator performs culling operations in situations where mail condition is poor.

Proper depth of mail on the load conveyor is critical to system performance. The operator must ensure that the load conveyor is not overloaded. (Recommended procedures are provided in this section.)

General duties:

- Repair miscellaneous mail, collect or remove trash, etc.;
- Clear any unloader jams;
- Cull and dress the mail on the load belt;
- Operate the load conveyor controls;
- Monitor the recirculation conveyor;
- Remove out-of-specification mail-pieces;
- Loosen and prepare bundled mail;
- Set-up and tie-out activities; and
- Observe system operation and communicate with co-workers and supervisors.

Correct Loading of Conveyor. A smooth consistent mail-flow is required for the APPS to achieve the required throughput and productivity goals. To do this, it is the responsibility of the operators to place the correct amount of mail on the load module. The recommended volume is approximately 15 mail-pieces for every five-foot length of load conveyor. This will allow the belt to keep moving with only occasional pauses, yet allow sufficient quantities of mail to flow into the singulation module to keep the sorter at peak throughput.

When loading bundles on the load conveyor, the operator must ensure that overloading or excessive piling of mail-pieces does not occur. Mail-pieces that are densely packed on the conveyor are more difficult for the system to automatically destack and singulate.

When loading larger packages, such as Priority Mail, the packages must be stacked higher on the conveyor to achieve the target 15 pieces per five feet of belt.

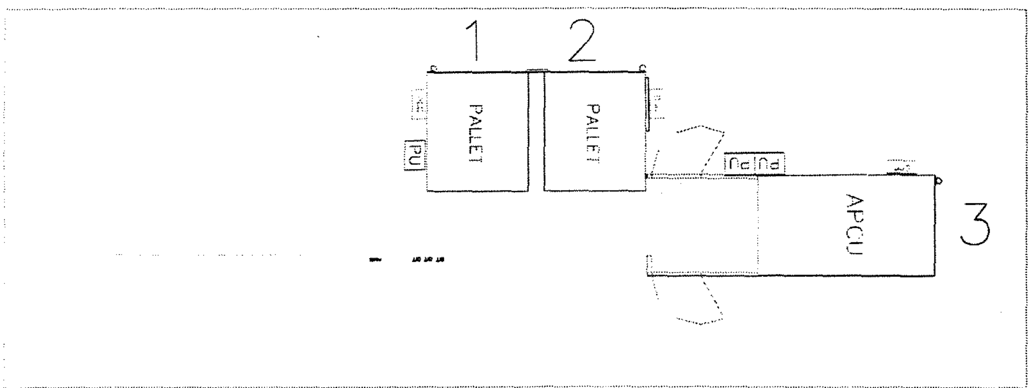
Unloader Use Precedence. The system requires a smooth, consistent flow of mail in order to achieve the throughput targets. One way to ensure a consistent flow of mail, as well as to eliminate empty sections of belt or gaps on the load conveyor, is to prioritize the order in which the unloaders are emptied while set in the auto mode. Establishing this priority is not a setting, nor is it software; it is a method. The sequence will vary depending on the site's unloader configuration, and the type of mail being processed.

The recommended methods for each of the four general types of load modules is provided below, and can be adjusted for site-specific mail conditions.

General precedence:

- Pallet-unloaders take precedence over APCUs when unloading pallets of bundles because they shingle off the bundles, thus reducing bundle damage.
- On the 27' load module, the APCU at the end of the belt should be used as the primary unloader, before another APCU located on the side of the load module. The end unloader places mail on the load conveyor in the direction of the belt, thus reducing damage.

Figure 4–4: 27' Load Module with Two Pallet-Unloaders and One APCU



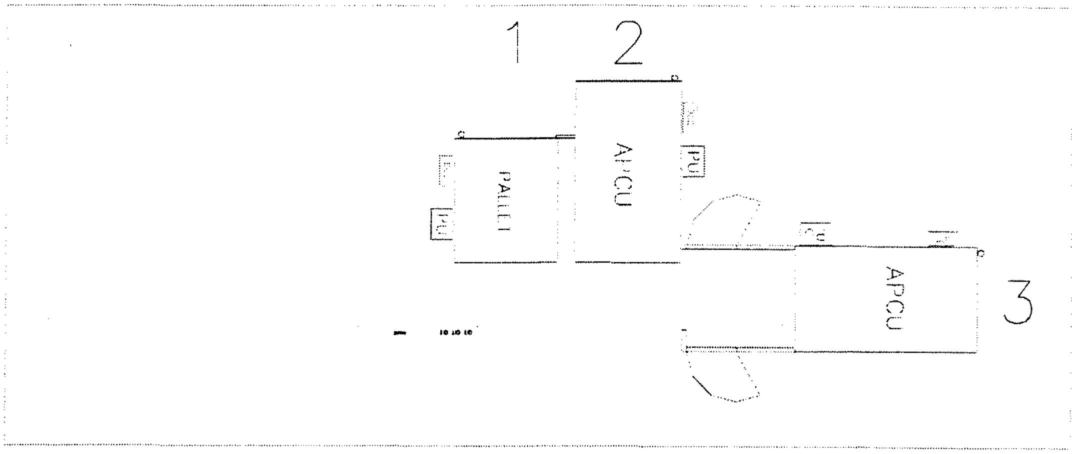
Sequence Precedence for *Bundle* Operations

- Set the pallet-unloaders to the auto mode, and the APCU to the manual mode.
- At the start of processing, place a pallet of bundles in each of the unloaders. Pallet-boxes, or other containers are unloaded in the APCU. If any are available, place them in the APCU; if not, place a pallet in the APCU.
- The primary unloader will be #2 with #1 being the backup to fill the gaps on the load conveyor, while the #2 unloader is being resupplied with another pallet of mail. If the pallet-unloaders cannot provide sufficient volume, the operator manually cycles unloader #3.

Sequence Precedence for *Package* Operations

- Set the pallet-unloaders to the auto mode, and the APCU to the auto mode.
- The primary unloader will be #3 with the other unloaders used when possible.

Figure 4–5: 27′ Load Module with Two APCUs and One Pallet-Unloader



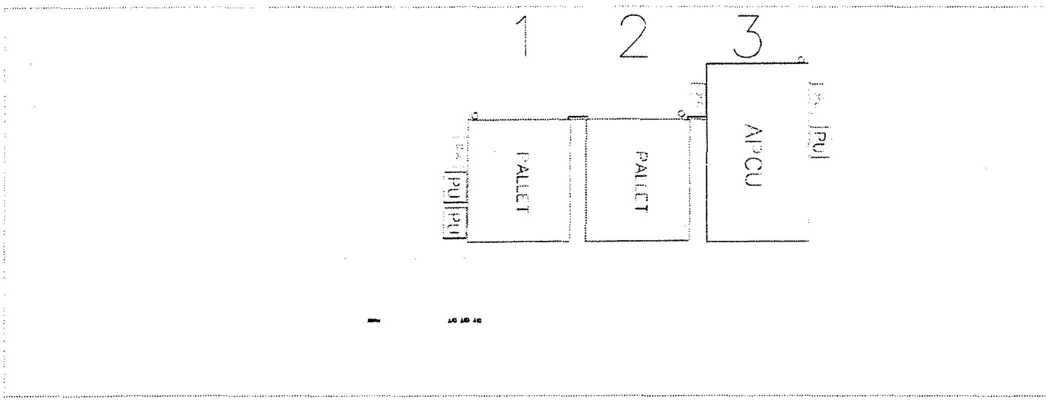
<u>Sequence Precedence for *Bundle* Operations</u>

- Set the pallet-unloader to the auto mode, and the APCUs to the manual mode.
- At the start of processing, place a pallet of bundles in unloader #1. Pallet-boxes, or other containers are unloaded in the APCUs. If any are available, place them in the APCUs; if not, place a pallet in each of the APCUs.
- If the pallet-unloaders cannot provide sufficient volume, the primary unloader will be #1, with #2 and #3 manually cycled by the operator.

<u>Sequence Precedence for *Package* Operations</u>

- Set all unloaders to the auto mode.
- At the start of processing, containers are to be placed in unloaders #2 and #3, and if palletized loads are available, place them in unloader #1.
- The primary unloader will be #3. Use unloaders #1 and #2 as needed.
- The end unloader, #3, interfaces with the load conveyor in the direction of travel, thus reducing the risk of damage to the mail. Unloader #2 will cycle while #3 is being reloaded with another container.
- The area around unloaders #3 and #2 must be kept free and clear of equipment so that the feed area operator can walk between the units quickly and safely.

Figure 4–6: 35' Load Module with Two Pallet-Unloaders and One APCU



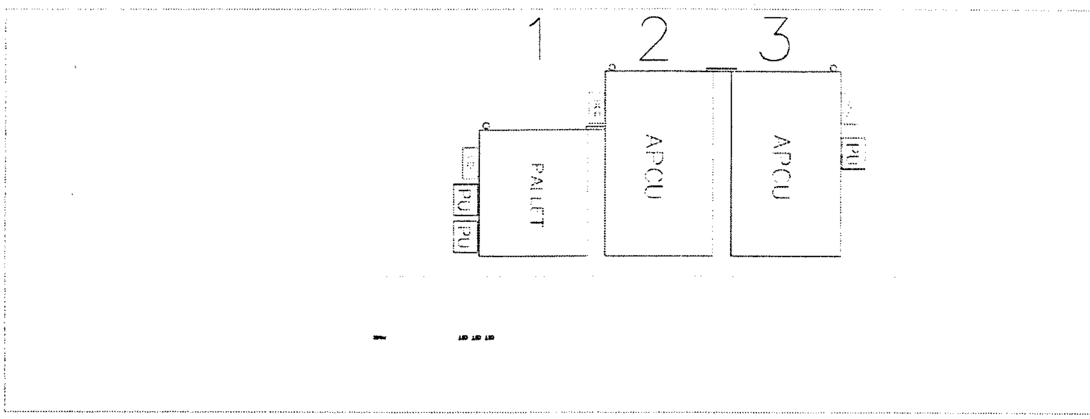
Sequence Precedence for *Bundle* Operations

- Set the pallet-unloaders to the auto mode, and the APCU to the manual mode.
- At the start of processing, place a pallet of bundles in each of the unloaders. Pallet-boxes, or other containers are unloaded in the APCU. If any are available, place them in the APCU; if not, place a pallet in the APCU.
- The primary unloader will be #2 with #1 being the backup to fill the gaps on the load conveyor, while #2 unloader is being resupplied with another pallet of mail. The operator manually cycles unloader #3, if the pallet-unloaders cannot provide sufficient volume.

Sequence Precedence for *Package* Operations

- Set the pallet-unloaders to the auto mode, and the APCU to the auto mode.
- The primary unloader will be #3. Use the other unloaders when possible.

Figure 4–7: 35′ Load Module with Two APCUs and One Pallet-Unloader



Sequence Precedence for *Bundle* Operations

- Set the pallet-unloader to the auto mode, and the APCUs to the manual mode.
- At the start of processing, place a pallet of bundles in unloader #1. Pallet-boxes, or other containers are unloaded in the APCUs. If any are available, place them in the APCUs; if not, place a pallet in each of the APCUs.
- If the pallet-unloaders cannot provide sufficient volume, the primary unloader will be #1, with #2 and #3 manually cycled by the operator.

Sequence Precedence for *Package* Operations

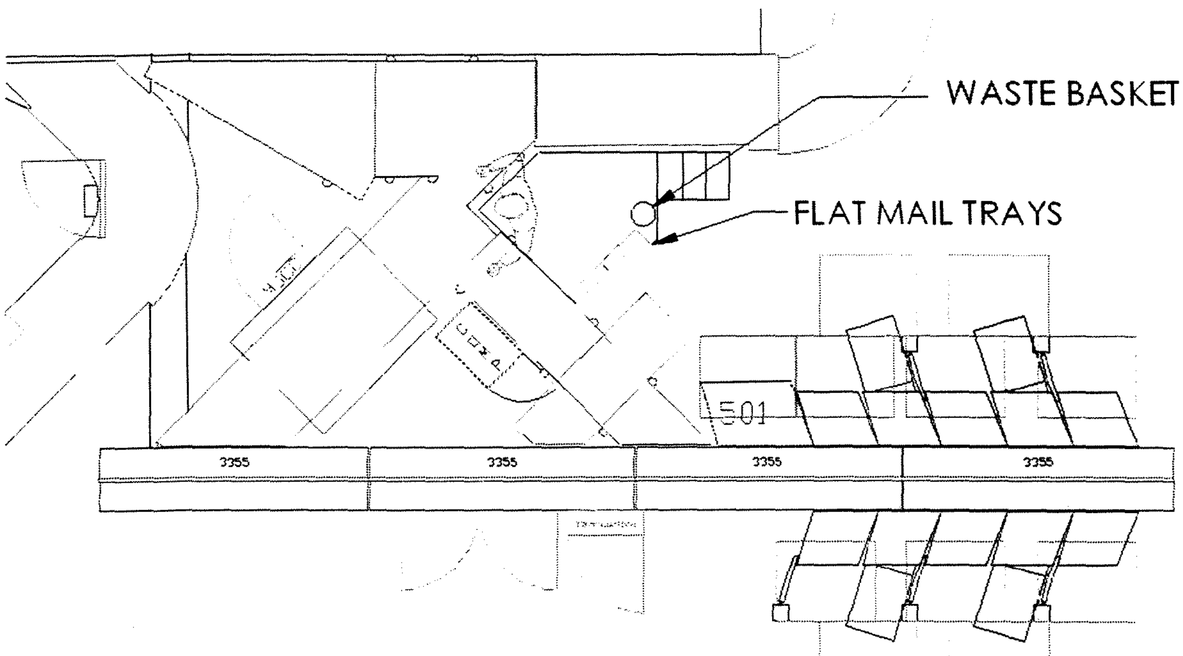
- Set all unloaders to the auto mode.
- At the start of processing, containers are to be placed in unloaders #2 and #3. If palletized loads are available, place them in unloader #1.
- The primary unloader will be #3. Use unloaders #1 and #2 as needed.
- The end unloader, #3, interfaces with the load conveyor in the direction of travel, thus reducing the risk of damage to the mail. Unloader #2 will cycle while #3 is being reloaded with another container.
- The area around unloaders #3 and #2 must be kept free and clear of equipment so that the feed area operator can walk between the units quickly and safely.

4.2 Semi-Automatic Induction Station

Mail that is transferred onto one of the three automatic induction stations is automatically synchronized, oriented, and inducted onto the ***Sorter Subsystem***. If the automatic induction systems are not available, or if the item requires operator intervention, then the mail-pieces are diverted to the semi-automatic induction station. At this station, items are manually handled by an operator who properly orients the package on a conveyor. The package will then be scanned by the overhead ***Automatic Address Recognition Subsystem*** camera. Each package is then automatically dimensioned, weighed, and loaded onto the ***Sorter Subsystem***. If the operator finds a mail-piece that is unsuitable for further APPS processing, then the operator can remove it at this station.

4.2.1 Support Equipment and Set-Up for the Semi-Automatic Induction Station

Figure 4–8: Semi-Automatic Station Set-Up



Standard and special equipment is recommended for use by the culling area operator. This equipment is listed in the table below.

Table 4–4: Standard and Special Equipment and their Use for Culling

Mail Transport Equipment Type	Proposed Use
Waste basket, tall	Waste, plastic wrap, banding, etc.
Flat Mail Tray (1257)	Loose Flats

Loose flats or unrecoverable broken bundles should be faced and placed in one of the two flat mail trays, with the address up and binding to the right for AFSM 100 processing.

Use the second flat mail tray for non-machineable flats and letters culled from the semi-automatic induction station.

A waste container is required for any loose paper, poly-wrap, and banding.

4.2.2 Semi-Automatic Operator Activities

The Semi-Automatic Induction Station receives mail-pieces from two different systems. The Sorter Subsystem presents mail-pieces via the rework roller conveyor. These mail-pieces have been rejected by the VCS or have exceeded the recirclation time limit for the system. The shoe sorter roller table presents mail-pieces that have failed to singulate or did not have the opportunity for induction on the automatic stations.

The rework roller conveyor activity takes precedence over the shoe sorter. Failure to clear the rework roller conveyor contributes to induction blocking and reduces overall system thoughput. The operator should make every effort to keep the rework conveyor clear.

At the semi-automatic induction station, the operator is required to:

- Singulate and face mail-pieces from the shoe sorter;
- Singulate and face mail-pieces from the rework conveyor;
- Inspect, evaluate, and correct obstructions to address block readability;
- Remove broken bundles and trash;
- Operate the conveyor controls;
- Clear any jams; and
- Remove out-of-specification mail-pieces.

The primary function of the semi-automatic induction operator is to singulate, correct address obstructions and face mail-pieces for induction onto the sorter. If the mail-piece is rectangular, place it lengthwise (in the direction of travel) on the synchronizing belt conveyor.

If a jam occurs in the synchronizing conveyor system, the operator clears it by turning both conveyor reverse controls at the same time in a clockwise motion on the operator interface terminal. This reverses the belts and backs the mail-piece out of the induction tunnel onto the roller table. The operator then resets the system and continues to process mail.

4.3 Sorter Subsystem

Once on the sorter, a mail-piece can remain on the ***Sorter Subsystem*** for a specified time while the address information is resolved. If the destination is determined in the allotted time, then the mail-piece is transported to its appropriate destination and discharged to the destination container. If the destination cannot be determined in the allotted time (automatic induction only), then the mail-piece is sent to the semi-automatic induction station for rework. The ***Sorter Subsystem*** is populated with mail transport equipment containers. Operators monitor and sweep the output bins/containers. When containers are unavailable, the mail-pieces recirculate until the output is reactivated or the preset time limit is reached. The mail-pieces are then directed to the semi-automatic rework conveyor.

The sorter design includes two variants. First is the "open" design (see Figure 2-1), which has a unidirectional single track section that discharges mail-pieces on both the left and right sides of the line of travel. The open systems are oval-shaped and have either a single or double elevated section that permits operators and mail containers access to the center sections of the machine. ***Forklifts are not permitted in the center of an "open" system.*** Manual operations may be perfomed inside the center of the "open" systems.

The "closed" design does not have an accessible center section. (See Figure 2-2). The sorter track sections are placed back-to-back to create a double transport lane. The carrier cells travel in one direction on the one side of the track, loop around at each end, then travel back on the adjacent track. This design permits mail-pieces to discharge only on one side of the track, which is the right side with respect to the line of travel. Since both track systems create a "looping" path, the terms "open-loop" and "closed-loop" systems have been adopted.

The closed design also allows the use of an optional "L" or 90° turn module. (See Figure 2-3). This module is used when facility constraints do not permit the accommodation of an elongated system.

4.3.1 Support Equipment and Set-up

Standard and special equipment is recommended for use by the culling area operator. This equipment is listed in the table below.

Table 4–5: Standard and Special Equipment and their Use for Culling

Equipment Type	Proposed Use
Manual Pallet-jacks	Moving filled MTE from the sorter
MTE, Various	Replace filled containers on the sorter, and provide consolidation containers for filled sacks
Labels	Routing labels for MTE

Material Handling Equipment. The only material handling equipment which is permitted to interface directly with the sorter section of the machine is nonpowered mail handling equipment. Only manual pallet-jacks can be used to pull the pallet-boxes away from the machine to minimize the risk of powered equipment accidentally damaging the machine. Once the pallet, or other MTE, is pulled away from the machine to one of the dispatch staging areas, powered equipment can be used.

Mail Transport Equipment. Requirements for empty MTE will vary according to the sort program. The recommended initial quantity of staged MTE is 10 percent per container type for the active sort program. For example if 50 pallet-boxes are in a section of the system, place five empty pallet-boxes on pallets in the immediate area of the pallet-boxes in the outputs on the machine. Do the same for other types of equipment.

Containers from the Feed Subsystem can augment the staged empty MTE during processing. Additional quantities or alternate sources and staging are required for high volume operations.

Sort programs that use sacks and pouches require dispatch containers for consolidation prior to transport. Local transportation requirements will dictate the container, which will generally be OTR/BMCs, or ERMC/GPMCs. These containers are placed next to the operator servicing aisle, along the outputs of the system.

The Sorter Subsystem must have containers in place at each output prior to the start of mail processing. The required container type is shown on the display of the output OIT. Placard labeling can take place after the operation has started on nonsack type containers.

Labels. Every container on the APPS must be marked to identify the contents either for transport to downstream operations within the facility, or for dispatch. The type of MTE used on the outputs determines the labeling requirement.

Sack and pouch labels require 1" or 2" labels. Wheeled MTE requires placards. Placards are usually preprinted on a half sheet of 8.5" x 11" paper. Label holders are located on the operator interface terminals at each set of outputs. ***Do not hang any rolls of tape on the Emergency Stop buttons on the OITs.***

Sack labels can be bulk-ordered from Topeka, KS, via the Passport System. When ordering, specify the number of labels per output for each sort program. Keep bulk-ordered labels in a central location on each side of the APPS. If preprinted labels are depleted, the APPS label printers are provided for replenishment printing. The APPS label printers with the stacker attached will print only 2" labels. Changing this to a 1" label requires the removal of the stacker and changing the print requirement through the SMS computer, which is located on the supervisor's platform. Select MTE capable of using 2" labels. Sacks and pouches should be labeled before the sack is hung on the output.

Placard labels are required for wiretainers, hampers, and pallet-boxes. If preprinted quantities of placards are insufficient, the laser printer on the supervisor platform is available to print additional placards via the OIT. When labeling hampers, wiretainers, and pallet-boxes, place the placard on the front of the container with a piece of tape.

4.3.2 Sorter Subsystem Activities

The initial equipment set-up for the machine depends on the sort program. Once the sort program is loaded on the system, the container required for each output is displayed on the OIT. The operator is required to configure the output for the container type. Sacks and pouches require the use of the retractable sack hanger and deflector. Large, staggered containers require the use of the hinged roller extension.

After the initial set-up of the sorter area, the primary function of the sorter area operator is to monitor the output chutes, dress the mail in the containers, and replace filled containers with empty MTE. The operator monitors the outputs for any jammed pieces and, if found, frees them. This can usually be performed without tools. If a tool is needed to clear a jammed piece, the operator is required to notify a supervisor and call a maintenance personnel.

As containers fill with mail, LED lights on the OIT indicate the outputs that require a container change-out. The sort program identifies a container type for each output, including the weight and volume limit of the container to determine when a container is full. When 75 percent of this limit is reached, a solid amber light on top of the OIT is illuminated, which signals the operators to perform sweep duties, and to change-out a particular output. If the output reaches 98 percent capacity, the indicator light flashes and no additional mail will be discharged to the output until the container is changed-out and the output control is reset. When additional mail-pieces are on the sorter for an output that is full, the indicator light flashes at a higher frequency indicating to the operator to "sweep me first." The mail-pieces destined for unavailable output recirculate on the sorter until the output is reset or the mail-piece times out. Both conditions decrease system throughput.

Output controls are located on the OIT. The "sweep" and "pause" buttons on the OIT are the primary controls and must be used when servicing the outputs. The sweep button stops the flow of mail and resets the counters that keep track of how full the container is. Press the sweep button when changing the container in that output. Press the pause button to stop the flow of mail temporarily to that output. The pause does not reset the counter for that output.

Sacks and Pouches. Sacks and pouches should be labeled prior to hanging. High-density sack type outputs should have a second sack labeled and placed on the front hook of the hanger. When a change-out is required, the output can be placed back in service quickly. When changing-out a sack/pouch, remove the full sack/pouch and set it on the floor. Do not close the sack/pouch until the replacement is rehung and the output returned to service. Close the full sack/pouch and place it in or on the dispatch container. Hang and relabel another empty sack or pouch on the front hooks of the output hanger.

NOTE: The hanging metal plates must be attached to the hooks that are inside the sack to ensure mail falls into the sack.

Pallet-Boxes and Wheeled MTE. For containers assigned to high-density outputs, place two placards on the front of the container. The second placard will be for the replacement container, and will save time during the change out process, thus reducing output downtime. After the filled container has been moved away, take one of the two placards and place it on the new empty container, and relocate the other container to the inside edge of the filled container. Placing the placard on the inside will allow the placard to be read when the containers are placed up against each other in the dispatch area.

When changing-out an internal container on a staggered set-up, the pause button is used on the external containers that are temporarily moved to gain access to the filled container.

Move the outside container to the side. Press the sweep button for the internal row container that is full and move out of the output. Replace the container. Press the sweep button to start the flow of mail into the internal container. Move the front container back into position and press the pause button on the front OIT for the front container, then move the full container to the dispatch staging area.

If a manual pallet-jack was used, return it by placing it under the pallet that will most likely fill up next. This way, the pallet-jack is not in the way, and it is most likely placed in the location where it will be needed next.

End of Run Close-Out/Change-Over. At the end of a mail processing run, ensure that all mail has been discharged from the sorter before removing the containers.

Group pallets separately from wheeled MTE in the dispatch staging area, so that material handling equipment operators can gain quick access to containers that are suitable to their equipment. Wheeled containers that are similar should also be grouped together.

5.0 Sort Programs

5.1 Introduction

This section provides USPS® managers and supervisors with information about APPS sort programs, their design, development, and operation. It is intended to make efficient and productive use of the robust features of the APPS through the sort program.

Sort program development is a function of the In-Plant Support staff. When planning and creating sort programs, it is critical that the person responsible for APPS sort program development solicit input from several sources, including mail processing, transportation, and in the case of secondary distribution, customer service.

This guide is intended to provide the reader with a general understanding of the system's sort program development function and its major components. ***It is NOT intended as a replacement for formal training or other standardized operator instruction.***

5.2 Sort Program Development Process

The following outline identifies the major steps in designing, developing, and refining APPS sort programs.

1. Gain a general understanding of the overall operation of APPS.
   - Complete or review available training. For more specific information about training, see section 7 of this manual.
   - Observe an APPS in operation.
   - Become familiar with the APPS functions as they specifically relate to sort program development.
2. Review site-specific system configuration and layout.
   - Identify the staging and dispatch areas within the APPS work space unit.
   - Review site survey drawings. The APPS site coordinator will have the survey drawings available that indicate output numbering, restricted outputs, or those blocked by obstructions.
   - Identify those outputs that have roller extensions available for staggering containers.
   - Identify site-specific or layout issues, aisle access, and facility mail-flow.
   - Identify areas on the APPS that can be used for "high-density" and "chaining" use, access, staging, VCS resolve time, etc.
3. Research the operational requirements for processing.
   - Determine the required depth of distribution.
     i. For outgoing mail, use the current ADC labeling list available from your area office or USPS® Headquarters.
     ii. For incoming mail, use the city/state listing provided within the WebAPPS application.

- Identify groups of destinations by location, combined dispatch times, shared transportation routings, and mail transport equipment.
- Select containers for maximization and dispatching requirements.
- Analyze density information to identify opportunities for specialized outputs.

4. Develop a sort program worksheet.
   - Highlight blocked, obstructed outputs and any special handling or sorting requirements.
   - Develop the naming convention.
   - Use the MS-Excel® USPS® Headquarters template to develop the sort program with designated output assignments.
   - Review with mail processing operations representatives.

5. Create the sort program with the WebAPPS sort program system.
   - Attend WebAPPS training.
   - Create the loadable sort program.

6. Test and review.
   - Test the sort program on APPS.
   - Observe operations; perform output verification.
   - Analyze Sort Program Summary and Density Analysis reports generated from the System Management Subsystem. Review with mail processing operations representatives.
   - Adjust chaining, output assignments, induction load balancing, and other modifications as necessary.

7. Update the sort program.
   - Revise the sort program in WebAPPS.
   - Test and validate.
   - Perform periodic reviews.

5.3 APPS Functions and Operations

In order to begin the APPS sort program development process, it is necessary to become familiar with a few of the APPS basic characteristics, its functions, and how they relate specifically to developing sort programs, which will be described in this section.

5.3.1 What is WebAPPS?

WebAPPS is the Sort Program System Application that is used to create and maintain sort programs for the APPS. WebAPPS is a web-based application that is different from the sort program system currently being used for other mail processing equipment.

Before beginning sort program development, the sort program developer must attend the required training course to become proficient in the WebAPPS application. The WebAPPS training course instructs participants in the development and maintenance of sort programs for the APPS, as well as how to develop sort programs to ensure maximum optimal use of the APPS machine. More information about training for WebAPPS sort program developers is located in section 5.7, and section 7 of this manual.

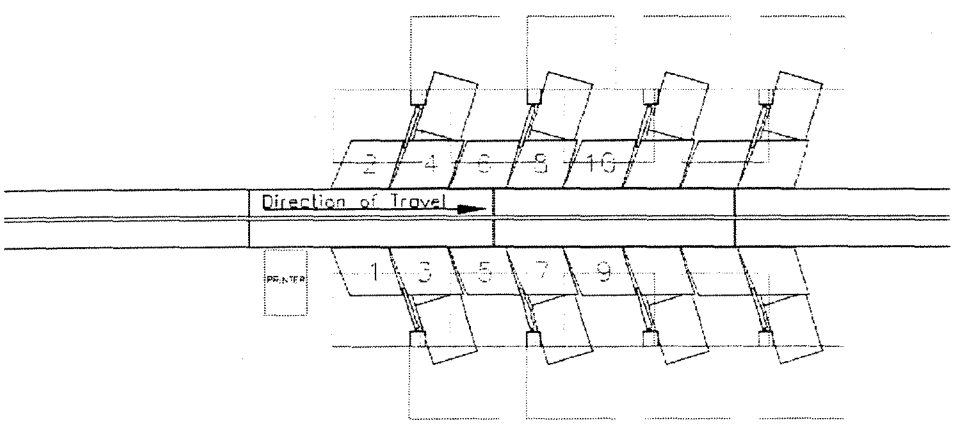
5.3.2 Observe an APPS in Operation

In order to gain a better understanding of the machine, it is recommended that USPS® managers and supervisors who will be working on the APPS view the APPS in operation. The site or area APPS coordinator can provide information about the nearest APPS site location for touring availability and viewing information.

5.3.3 Open-Loop Configurations

On an open-loop APPS machine, outputs are numbered sequentially in increments of 2, starting with outputs #1 and #2, and continue in the direction of travel of the sorter. Odd-numbered outputs are located on the outside of the loop and even-numbered outputs are located on the inside of the loop. Output #1 is the first output located on the outside of the sorter loop in the direction of travel from the Side 1 induction area. See Figure 5-1.

Figure 5–1: Output Sequence on an Open-Loop Configuration

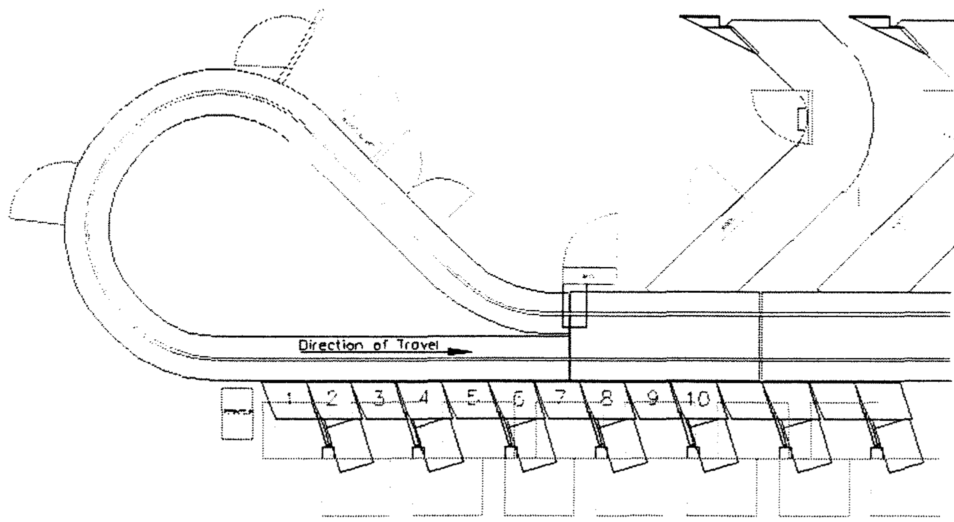


For open-loop configurations, outputs #1 and #2 will not have roller extensions, but outputs #3 and #4 will. In general, the first output in any continuous grouping of chutes will not have a roller extension, while the second output will. Wherever a gap occurs in the placement of output chutes (such as configurations that have outputs on the ends of the sorter loop), the roller extension sequence will restart.

5.3.4 Closed-Loop Configurations

On a closed-loop APPS machine, outputs are numbered sequentially in increments of 1, starting with output #1, and continue in the direction of travel of the sorter. All possible output locations are assigned output numbers, even if they are configured as "not available" because of blocking columns or other obstructions. Roller extensions are installed on even-numbered output chutes starting with output #2, and continue in the direction of travel from the Side 1 induction area. See Figure 5-2.

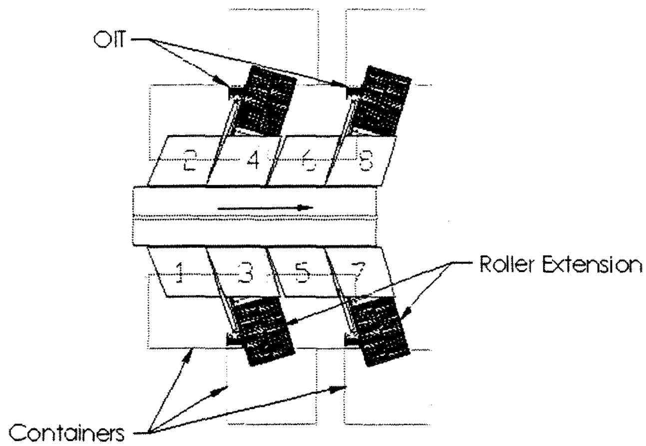
Figure 5–2: Output Sequence on a Closed-Loop Configuration



5.3.5 Staggered Outputs

When large mail transport equipment containers are used (i.e., pallet-boxes, wiretainers, or hampers), the container dimensions exceed the width of the output chute and must be placed in a staggered pattern next to each other and against the sorter. See Figure 5-3.

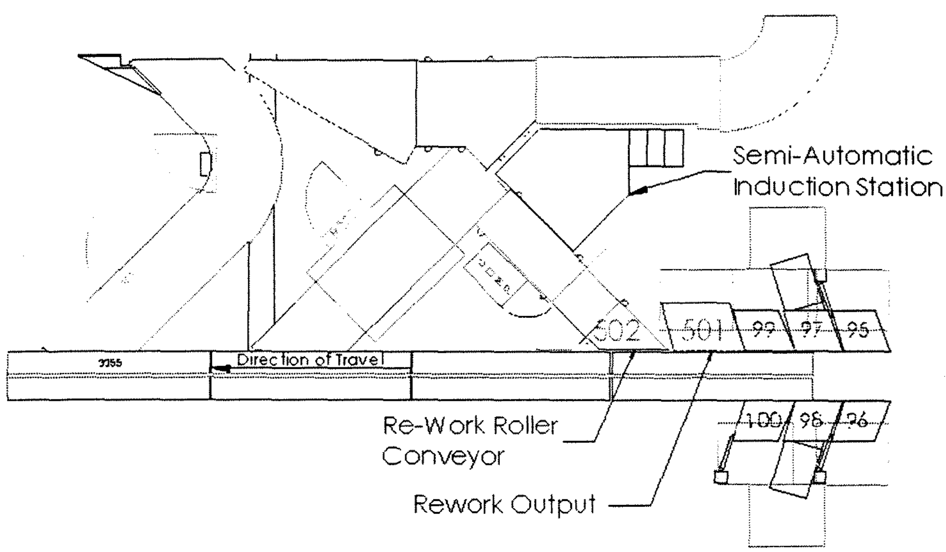
Figure 5–3: Staggered Outputs



5.3.6 Sorter Rework Function

Sorter rework is mail coming from the sorter module that either has been rejected from the video coding system operation, or has exceeded the time in the video coding system process. The sorter rework output receives mail when outputs are not available because of sweeping or because the output is full. Figure 5-4 depicts the sorter rework locations.

Figure 5–4: Sorter Rework Locations



Mail-pieces are diverted to rework when:

- Mail-pieces have been rejected from the video coding system operation;
- Mail-pieces on the sorter have exceeded the time in the video coding system process;
- Outputs are not available because of sweeping; or
- Outputs are not available because the outputs are full.

Each induction area (Side 1/Side 2) has one rework roller conveyor that extends from the sorter to the semi-automatic station, and one fixed rework output, which is the last output before the semi-automatic station. These locations/outputs cannot be edited within the sort program. These outputs are numbered as follows:

- Output #501 - the last output before the Side 1 semi-automatic station;
- Output #502 - the roller conveyor leading to the Side 1 semi-automatic station;
- Output #503 - the last output before the Side 2 semi-automatic station;
- Output #504 - the roller conveyor leading to the Side 2 semi-automatic station.

NOTE: Single-sided APPS configurations will only have outputs #501 and #502.

If no mechanical reject output is specified in the sort program, then appropriate mail-pieces will be sorted to the nearest rework output (either output #501 or #503). The reject output will receive mail-pieces that were inducted at a semi-automatic station and rejected by a video coding system keyer.

Sort programs for single-induction APPS configurations ***must*** be designated as "Single Side/Side 1" in order for the System Management Subsystem (SMS) to recognize the sort program. Sort programs designated as "single-sided" can assign a chained rework overflow output. This output is assigned by entering an available output number in the appropriate field on the WebAPPS application.

For a dual induction machine running two sort programs, the rework overflow output for each sort program should be assigned on the opposite side for the induction area that introduced the mail, as follows:

- The rework overflow output for the Side 1 induction sort program should be the last assignable output before the Side 2 semi-automatic induction station.
- The rework overflow output for the Side 2 induction sort program should be the last assignable output before the Side 1 semi-automatic induction station.

5.3.7 Sorter Rework Flow

Mail destined for the rework output is re-processed depending on the machine configuration and the type of sort program(s) being run.

Double-Sided Configuration Running One Sort Program

Mail-pieces inducted on Side 1 that are identified for rework ***before*** they reach the Side 2 induction area are handled as follows:

1. The mail-piece is discharged to the Side 2 rework roller conveyor (#504).
2. If the Side 2 rework roller conveyor is not available, then the mail-piece is discharged to the Side 2 rework output (#503).
3. If the Side 2 rework output is not available, then the mail-piece is discharged to the Side 1 rework roller conveyor (#502).
4. If the Side 1 rework roller conveyor is not available, then the mail-piece is discharged to the Side 1 rework output (#501).

5. If the Side 1 rework output (#501) is not available, the mail-piece will recirculate until a rework roller conveyor or output is available.

Mail-pieces inducted on Side 1 that are identified for rework ***after*** they pass the Side 2 induction area are handled as follows:

1. The mail-piece is discharged to the Side 1 rework roller conveyor (#502).
2. If the Side 1 rework roller conveyor is not available, then the mail-piece is discharged to the Side 1 rework output (#501).
3. If the Side 1 rework output is not available, then the mail-piece is discharged to the Side 2 rework conveyor (#504).
4. If the Side 2 rework roller conveyor is not available, then the mail-piece is discharged to the Side 2 rework output (#503).
5. If the Side 2 rework output (#503) is not available, the mail-piece will recirculate until a rework roller conveyor or output is available.

Double-Sided Configuration Running Two Sort Programs at the Same Time

The recommended processing sequence in this subsection is valid, assuming that the rework overflow output for each sort program has been assigned on the opposite side of the machine from where mail is inducted for that sort program.

Mail-pieces inducted on Side 1 that are identified for rework ***before*** they reach the Side 2 induction area are handled as follows:

1. The mail-piece is discharged to the rework overflow output for the Side 1 sort program (output should be located on Side 2).
2. If the rework overflow output is not available, then the mail-piece is discharged to the Side 1 rework roller conveyor (#502).
3. If the Side 1 rework roller conveyor is not available, then the mail-piece is discharged to the Side 1 rework output (#501).
4. If the Side 1 rework output (#501) is not available, the mail-piece will recirculate until a rework roller conveyor or output is available.

Mail-pieces inducted on Side 1 that are identified for rework ***after*** they pass Side 2 induction area are handled as follows:

1. The mail-piece is discharged to the Side 1 rework roller conveyor (#502).
2. If the Side 1 rework roller conveyor is not available, then the mail-piece is discharged to the Side 1 rework output (#501).
3. If the Side 1 rework output is not available, then the mail-piece is discharged to the rework overflow output for the Side 1 sort program (output should be located on Side 2).
4. If the Side 1 rework overflow output is not available, the mail-piece will recirculate until a rework roller conveyor or output is available.

Single-Sided Configurations

If a rework overflow output has not been assigned, then the mail-pieces that are identified for rework are handled as follows:

1. The mail-piece is discharged to the rework roller conveyor (#502).
2. If the rework roller conveyor is not available, then the mail-piece is discharged to the rework output (#501).
3. This process continues until a rework roller conveyor or output is available.

If a rework overflow output has been assigned, then the mail-pieces that are identified for rework are sent to either the rework overflow output or the rework roller conveyor (#502), whichever is nearer to the mail-piece at the time of assignment. If the assigned output is not available, then the mail-piece recirculates through the three rework locations in the order specified below.

1. The mail-piece is discharged to the rework roller conveyor (#502).
2. If the rework roller conveyor is not available, then the mail-piece is discharged to the rework output (#501).
3. If both the rework roller conveyor (#502) and the rework output (#501) are not available, then the mail-piece is discharged to the rework overflow output assigned in the sort program.
4. The process continues until a rework roller conveyor or output is available.

5.3.8 Output Chaining Characteristics and Requirements

High-Density: The WebAPPS application designates high-density outputs with "Mode X" in the chaining mode field. In this mode, the mail-piece always proceeds to the nearest output or to the nearest output that is not full. If both outputs are full, then the items recirculate until one of the outputs is available, or the recirculation counter is exceeded. As soon as either output is empty, output resumes to the nearest output that is not full.

Momentary: The WebAPPS application designates alternating outputs with "Mode Y" in the chaining mode field. In this mode, when the primary output is full, mail-piece output will switch to the secondary output. When the primary output has been swept and is ready, output immediately switches back to the primary output. The process repeats. If both outputs are full, the items recirculate until one of the outputs is available or the recirculation counter is exceeded. As soon as either output (primary or secondary) is empty, output resumes to that output.

Alternating Outputs: The WebAPPS application designates alternating outputs with "Mode Z" in the chaining mode field. In this mode, when the primary output is full, mail-piece output will switch to the secondary output. When the secondary output is full, mail-piece output will switch back to the primary output, and continue alternating in this manner. If both outputs are full, the items recirculate until one of the outputs is available or the recirculation counter is exceeded. As soon as either output (primary or secondary) is empty, output resumes to that output.

5.3.9 Alternate Output

An alternate output is used when a mail-piece cannot be discharged to its assigned output because of opening size restrictions on the container assigned to the output.

When using an alternate output, the alternate container type must be less restrictive (larger) than the container assigned to the original output. The alternate output is normally configured as a 'jackpot' for multiple destinations and a manual sortation is performed.

An example, multiple outputs configured with Priority Pouches and mail-pieces assigned to those outputs with dimensions that exceed the sack hangar opening, but would be able to be placed in the pouch manually. These items would be diverted by the system to the alternate output for manual placement to the assigned container.

5.3.10 Container Types and Descriptions

Outputs on the APPS use a variety of mail transport equipment containers. Table 5-1 shows a list of compatible container types and their descriptions. In addition, the table shows the three-character designation of each container that is used to identify containers in the WebAPPS application.

Table 5–1: Container Types and Descriptions

Container Type ID	Weight Limit (lbs)	Volume Limit (cu.in)	Fill Factor (%)	Max. Item Weight (lbs)	Max. Item Dimension (in)	Package Type	Label Type	Description
A1C	1,200	75,516	70	50	-1	P	3	General Purpose Container
A1P	1,200	57,600	70	50	-1	P	3	Universal Mail Container
B1H	2,000	119,016	70	50	-1	P	3	BMC/OTR HD
B1L	1,500	119,016	70	50	-1	P	3	BMC/OTR LD
B1P	750	109,980	70	50	-1	P	3	Full-Gaylord
B2P	2,000	132,480	70	50	-1	P	3	Postal Pak - w/pallet
C1B	-1	-1	100	-1	-1	PFL	3	Conveyor Belt
E1C	1,200	74,298	70	50	-1	P	3	Eastern Region Container
G1H	750	54,990	50	-1	-1	PFL	3	Half-Gaylord
H1C	800	42,240	45	-1	-1	PFL	3	Hamper
H1P	800	42,523	45	-1	-1	PFL	3	Hamper Plastic
P1E	70	7,616	60	-1	21	PFL	2	Pouch Express
P1G	70	4,340	60	-1	17	PFL	2	Pouch No. 1 Green
P1P	70	8,330	60	-1	22	PFL	2	Pouch Priority
P2P	70	6,944	60	-1	21	PFL	2	Pouch Priority Plastic
S1W	70	8,330	60	-1	22	PFL	2	Sack No. 1 White
S2W	70	5,040	60	-1	17	PFL	2	Sack No. 2 White
S3G	70	2,240	60	-1	16	PFL	2	Sack No. 3 Green
S3W	70	3,500	60	-1	17	PFL	2	Sack No. 3 White
U1C	120	12,920	55	-1	-1	PFL	3	Utility Cart
W1P	800	61,440	70	-1	-1	PFL	3	WestPak
W1R	2,000	65,280	50	-1	-1	PFL	3	Wiretainer

NOTE: Unlimited/Exceeds Machine Outputs = -1

5.4 Site-Specific Configurations

APPS is one of the largest nonfixed mechanization systems to be implemented in the USPS® processing environment. Because of its size, special consideration for walking and towing distances, both inside and outside of the work space unit, is required in the sort program development process.

The APPS is deployed in many configurations and in many different types of facilities. The sort program developer must evaluate many general rules to ensure that site-specific configurations and obstructions do not hamper or interfere with the maximum efficient use of the APPS.

When evaluating site-specific issues for the APPS, the sort program developer will need to consider the following issues and recommendations. Doing so will minimize any negative impact to the operation, and will maximize the system's productivity.

5.4.1 Staging Location of Mail Transport Equipment

The sort program developer must determine the staging requirements within the APPS work space unit based on the type of mail and containers used. The sort program developer can use information from existing SPBS operations as a starting point for determining container selection. For more detailed information about Sort Subsystem Staging recommendations, please see section 3.

5.4.2 Obstructions

Certain outputs may be obstructed by columns, staging areas, and unloader operations. The sort program developer must identify these obstructed outputs and assign mail transport equipment (containers) that are compatible. For example, one way to overcome the challenge of an obstruction is to hang a sack behind a column where a larger piece of equipment (such as a pallet-box) will not fit.

5.4.3 Blocked Outputs

A blocked output is unusable. It can be obstructed by a column or a wire chase. Blocked outputs noted in the configuration file cannot be used when assigning outputs in the sort program.

5.4.4 Roller Extensions

The sort program developer must identify roller extensions based on the site's machine configuration drawing. Once these roller extension locations are identified, it is recommended that they be used for high-density separations.

5.4.5 High-Density/Chained Outputs

A high-density output is defined as an output that receives one percent or greater of the total distribution on the sorter.

The sort program developer must place high-density separations in areas that are free of obstructions and easily accessible to aisles and staging areas. It is recommended that the sort program developer assign high-density separations to outputs that have roller extensions so that they are on the outside and can be easily swept.

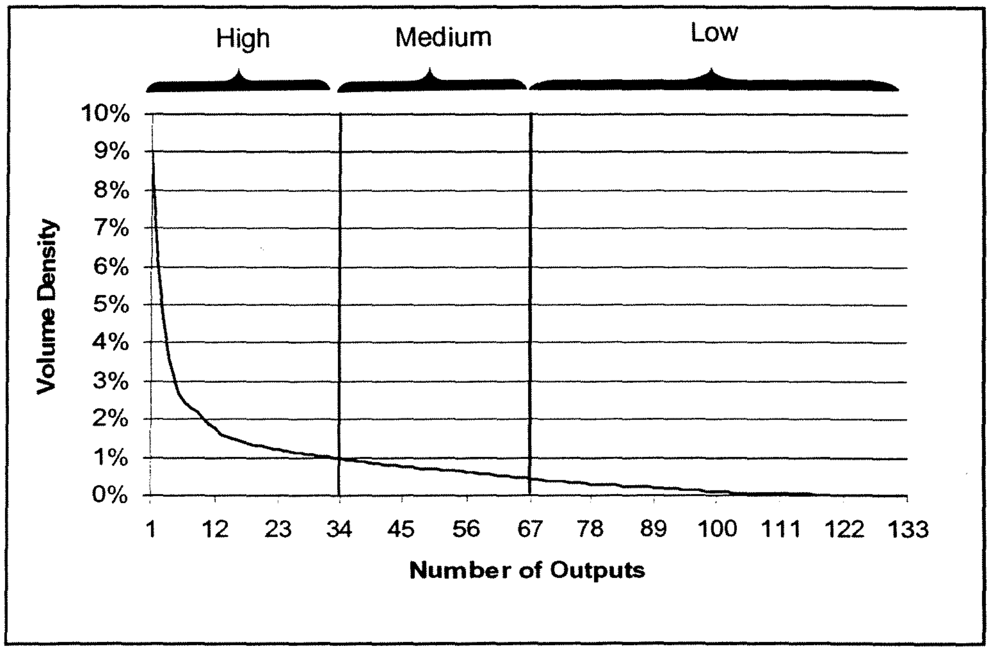
The following table is a guide to help determine the densities that are considered high, medium, and low-density outputs.

Table 5–2: Output Density

Density (Volume)	Density Description
0.0 - 0.5%	Low Density
0.5 – 1.0%	Medium Density
1.0 % and up	High-Density

Figure 5-5 shows a typical density profile for an APPS sort program and the volume density categories.

Figure 5–5: Typical Density Profile for an APPS Sort Program



5.4.6 Chaining Modes

High-Density Chaining—Chained outputs are typically located on the opposite sides of the machine on a dual induction configuration. This mode helps reduce the amount of induction blocking and increases the sorter throughput.

Alternating Chaining—When chained outputs are assigned near their primary outputs, a chaining mode of "alternating" is recommended. This mode would be typically be used for sites that restrict various mail separations to specific areas of the machine.

Momentary Chaining—A chaining mode of "momentary" is recommended for use when a high-density destination is determined and the secondary output cannot be located on the opposite side of the machine.

5.4.7 Balance and Video Coding System Delay Time

Sort programs for a dual-sided configuration should be balanced so that about 50 percent of the mail density is sorted on each side of the machine.

In order to finalize as many mail-pieces as possible before reaching the next induction area, high-density outputs should be assigned from the furthest assignable output, in descending density order. This allows more space for new mail to be inducted on the sorter.

- A single sort program for a dual-induction configuration with 200 outputs might follow a 15/35 split on each side. This means that approximately 15 percent of the total mail sorted on the machine would go to outputs #1 – #50, and 35 percent would go to outputs #51 – #100. Similarly, outputs #101 – #150 would receive about 15 percent of the total mail sorted, and outputs #151 – #200 would receive 35 percent.
- A dual-sided configuration running two single-side sort programs simultaneously might follow a similar technique. With this technique, about 30 percent of the total mail for each sort program sorts to the first half of the outputs, and about 70 percent of the total mail for that sort program sorts to the second half of the outputs.
- A sort program for a single-sided configuration with 150 outputs designed with a 35/65 split would mean that outputs #1 – #75 would receive about 35 percent of the total mail volume, and outputs #76 – #150 would receive about 65 percent of the total mail sorted.

NOTE: The percentages proposed above are initial recommendations only. Evaluating site-specific requirements and distribution density is essential for creating optimized sort programs.

5.4.8 Induction Blocking

Induction blocking occurs when mail-pieces on the sorter carrier cells are recirculating and pass in front of the induction stations. If a mail-piece is available for induction, the recirculating mail-piece renders the carrier cell unavailable and the induction must pause. Sort programs that induce induction blocking are the greatest contributor to poor throughput and productivity of the APPS machine. Single-sided sort programs should be designed so that all mail is discharged before it reaches the second induct.

Figure 5-6 shows the effect of sort program induction blocking on the throughput of a dual induction, 200 output, closed-loop APPS machine. As shown, the percent throughput will decease by about 18 percent when 50 percent of the mail blocks the opposite induction.

Figure 5–6: Percent Decrease in Throughput on a 200 Output Closed-Loop

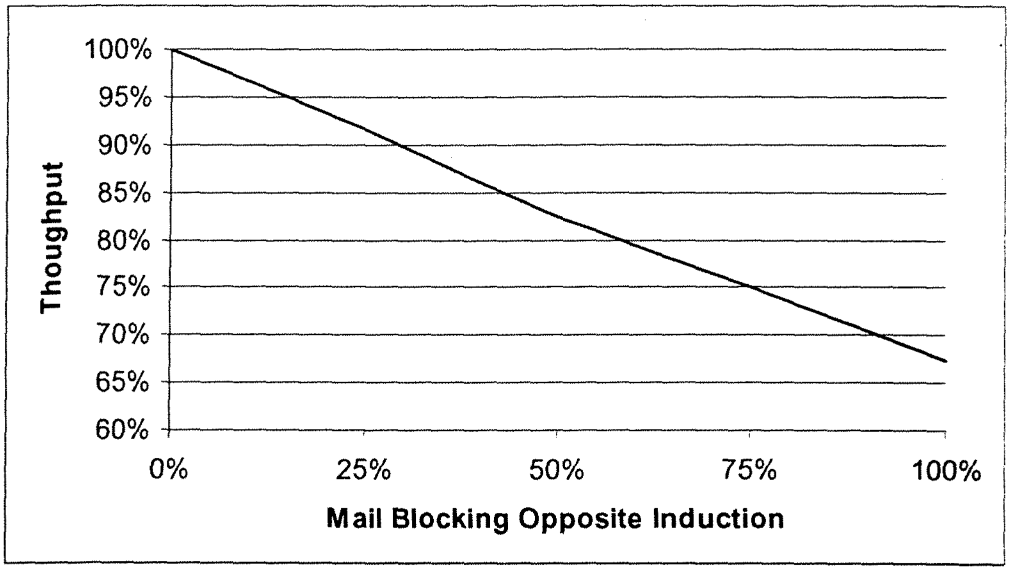
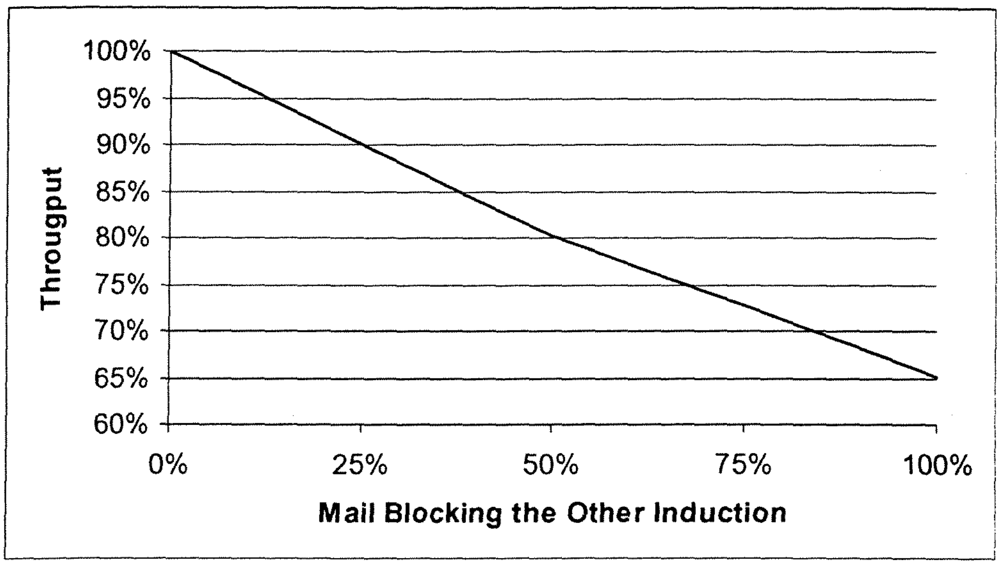


Figure 5-7 shows the effect of sort program induction blocking on the throughput of a dual induction, 200 output, open-loop APPS machine.

Figure 5–7: Percent Decrease in Throughput on a 200 Output Open-Loop



As shown, the percent throughput of a 200 output, open-loop APPS machine will decrease by 20 percent when 50 percent of the mail blocks the other induction, which goes up to over 35 percent when 100 percent of the mail blocks the other induction.

The main factor that will affect a single induction machine throughput will be recirculation as a result of the video coding system and outputs being unavailable because of sweeping or full output occurrences.

5.4.9 Video Coding System Resolution Time

On an average of 15 seconds, the video coding system resolves a mail-piece that cannot be read by the automatic address recognition system. Within this timeframe, if a mail-piece passes its output, it then has to recirculate, which causes induction blocking.

5.4.10 The Effect of Output Chaining

Using output chaining on high-density locations eliminates the possibility of mail-pieces that are missing output designations. Because these output designations may be missing (for example, because of sweeping), another output location will be available. Whenever possible, output chaining should be used on locations that are swept frequently, which would most likely be the very high-density locations on the high-density category.

5.5 Operational Requirements

5.5.1 Outgoing Sort Programs

Outgoing sort programs must use the current ADC labeling list. The ADC labeling list separations can be accessed within the WebAPPS application. This labeling list determines the specific site's required separation holdouts, and can be used as a guide when planning sort program layout. In some machine configurations, separations will need to be combined. If a particular configuration does not allow all the required ADC holdouts to be separated in a single pass, then the sort program developer must determine which separations can be combined to be sorted in a downstream operation. Machine configurations with a high number of outputs or outputs that exceed the minimum ADC separation requirements can consider using the additional outputs for:

- High-density output chaining;
- Local holdout; and/or
- Finer breakdown of the ADC list.

The sort program developer must ensure that all outputs are used for maximum depth of distribution.

5.5.2 Incoming Sort Programs

The local city/state service area determines the required number of separations, which is found on the WebAPPS application. In cases where the machine configuration limits the number of separations, the sort program developer determines which outputs can be combined and sorted in a downstream operation. Machine configurations with a high number of outputs or outputs that exceed the minimum local city/state separation requirements can consider using the additional outputs for high-density output chaining.

5.5.3 Output Groupings

It is recommended that, when possible, the output containers be grouped in a way that aids the operator in smooth and efficient dispatching. It will only be necessary to stage one type of mail transport equipment for each grouping. Grouping sacks and pouches in the same area allows the operator to use a common dispatch container, such as an over the road container or an air cargo container used for airline scanning, or containers for a certain HUB destination.

5.5.4 Effect of Container Types

Container selection has a direct impact on machine throughput. Because smaller containers need to be swept more often, and will be unavailable during sweeping, there is a greater chance of a mail-piece bypassing its designated output. Larger containers are swept less often, but can require more sweep time. In addition, larger containers can block other containers that are located on the inside of a staggered set-up. Sweeping containers on the inside of a staggered set-up requires the disabling of more than one output during the sweep process, and can result in a longer sweep time.

Table 5-3 shows the types of output containers and how they are used based on their volume densities.

Table 5–3: Output Containers

High-Density	Medium Density	Low Density
Wire (unblocked)	Wire	U-Cart
Pallet (unblocked)	Pallet	Sack/pouch
Hamper (unblocked)	Hamper	Obstructed*

* Obstructed outputs are blocked by facility structures and should only be used for low-density separations.

Blocked: In a staggered set-up, the interior containers are considered blocked.

5.5.5 Analyzing an Existing Sort Program

SPBS PC104 distribution information is useful in providing existing depth of distribution and density when beginning to develop an APPS sort program, and allows the sort program developer to review and analyze the effectiveness of a proposed sort program.

5.5.6 General Support Information

Output density data determines the best methods for a sort program design or for mail-flow diagnostics. Output densities by individual sort program can be obtained in WebEOR by using the End of Run Bin Analysis Report. This report provides information about volume densities, as well as volume percentages. This report can be exported to MS-Excel® and sorted by output density to determine the highest and lowest output densities of a particular sort program. These densities will assist the sort programmer in planning and evaluating sort programs for the APPS.

5.5.7 Service Standard Tables

The service standard is the number of days by which a mail-piece should arrive at its destination. Service standards are automatically populated in the label editor depending on the class of service selected when the sort programs are created. There are different service standards based on First-Class, Standard, Priority, and Periodicals.

5.5.8 Content Identifier Numbers (CINs)

CINs are a three-digit numeric code specifying mail characteristics, such as mail class, shape, sort level, and bar code status. All labels and placards must contain CIN information for downflow operations. The table in Appendix B of this manual shows the available CIN values and label text in WebAPPS. The CIN data field is populated automatically by WebAPPS in most circumstances.

5.5.9 Mail Processing Code

The mail processing code is a one-digit numeric that represents the type of process used for mail sorting. When selecting a CIN value in the WebAPPS application, the default value can be modified as required in some circumstances. However, not all mail processing codes are available with all CINs. The mail processing code values are defined in Table 5-4.

Table 5–4: Mail Processing Code Matrix

Mail Processing Code	Description
MPC 1	Automation Flow
MPC 2	Mechanized Flow
MPC 4	Manual Flow
MPC 5	Intrafacility Flow
MPC 6	Intrafacility RBCS Image Lift Flow
MPC 7	For Mailers Use Only
MPC 9	Intrafacility Flow

Generally, mail processing codes 1, 2, and 4 are defined as interfacility. Mail processing codes 5, 6, and 9 are defined as intrafacility mail-flows. The intrafacility codes populate the label text with the identifier “IN-HOUSE” in large, bold text at the bottom of the label where the day of delivery is normally located.

5.5.10 Day of Delivery

Labels contain both a human-readable and bar code day of delivery information. The day of delivery is the day the mail is scheduled to be delivered to the addressee. The day of delivery appears in the human-readable text form at the bottom center of the label. However, if the mail processing code has an intrafacility value, the identifier “IN-HOUSE” will print rather than the day of delivery.

5.5.11 Management Operating Data System (MODS) Operation Numbers

MODS functional operation numbers are used to identify the mail processing equipment type and sortation level. Table 5-5 lists the APPS MODS operation numbers for functional areas of APPS processing.

Table 5–5: MODS Operations Numbers

LDC	Induction Type		
Non-Supervisory	Single	Dual	Description
13	152	242	APPS International-Export
13	153	243	APPS International-Import
13	154	244	APPS Outgoing Pref
13	155	245	APPS Outgoing Std
13	156	246	APPS Incoming Pref
13	157	247	APPS Incoming STD
13	158	248	APPS Priority Outgoing
13	159	249	APPS Priority Incoming
13	159C	249C	APPS Composite

5.5.12 Labels and Placards

Labels and placards are used to identify mail destinations and mail-flow within mail processing facilities. The APPS has the capability to print labels in 1 and 2 inch formats and full sheet placards. Appendix E shows an example of each type of label and placard.

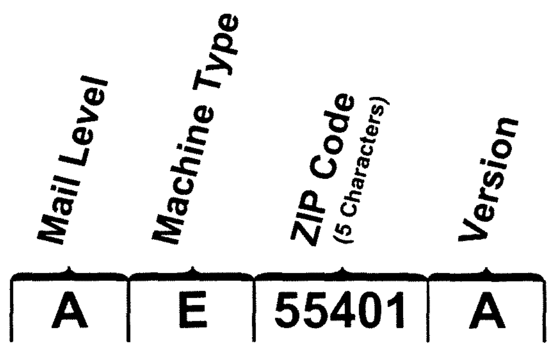
5.6 Sort Program Development

Described below are factors to consider when developing sort programs for the APPS. These include developing the sort program system names, completing the sort program worksheet, generating and updating the sort programs, reviewing the special handling descriptions, and other recommendations to help the sort program developer prepare an efficient sort program.

5.6.1 Sort Program Name

To name the sort program, follow the standard sort program system naming convention. Figure 5-8 shows an example of a sort program name along with its format descriptions. The sort program name consists of eight characters expressed in this way:

Figure 5–8: Sort Program Name



The mail level component of the sort program name is defined in Table 5-6 below. The mail level indicates the level, or depth, to which mail is sorted and is represented by a letter.

Table 5–6: Mail Levels and Descriptions

Mail Level	Description
A	Outgoing Primary (OGP)
B	Outgoing Secondary (OGS)
C	Managed Mail (MMP)
D	Sectional Center Facility (SCF)
E	Incoming Primary (INP)
F	Incoming Secondary (INS)

- The machine type, which is the second character in the sort program name, designates the mail processing equipment on which the sort program will run and is also represented by a letter. The letter "E" has been designated for the APPS and will be used for all sort programs developed for the APPS.
- The local five-digit ZIP Code serves as the zone. **The sort program name should contain only a local ZIP Code.** This is important because service standard information and valid local ZIP Codes are pulled from the system database for use when sort programs are created.
- The version is a letter from A–Z; multiple versions can be created for the same sort program.

For example, if the user creates an outgoing primary sort program for the APPS, and designates 55401 as the five-digit ZIP code with version A, the sort program name would look like this:

AE55401A

Selecting ZIP codes for a Sort Program: After determining a sort program name, the user should list all of the ZIP codes that will be used in the sort program. ZIP codes provide important information for creating APPS sort programs.

- ZIP codes for outgoing primary and outgoing secondary sort programs determine the contents of the area distribution center (ADC) Tables.
- ZIP codes for managed mail processing (MMP), sectional center facility, and incoming primary sort programs determine the contents of the five-digit city/state tables.
- ZIP codes for incoming secondary sort programs determine which firm/building entries appear in the firm/building tables.

5.6.2 Sort Program Worksheet

To aid in the development of the sort program, an MS-Excel® format worksheet template is available at:

http://blue.usps.gov/procops/apps/apps.htm

Figure 5-9 shows an example of the worksheet.

Figure 5–9: Worksheet Template

APPS Sort Program Worksheet

SORT PROGRAM NAME: ______________________

Date:

Created:	Max Outputs/Bins:		Mail Type:	Mail Shape:
Modified:	Outputs/Bins Used:	Outputs/Bins Unused:		

(1) Output/Bin	(2) CNT	(3) Display/Print Line 1	(4) Display Line 2	(5) ZIP Code	(6) Mail Shape	(7) OEL	(8) Height	(9) Weight	(10) Special Handling
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Column 1, Output/BIN

Enter output numbers based on the site-specific APPS configuration.

Column 2, CNT

Enter the container type. Refer to Table 5-1 for a list of the container types and their uses.

Column 3, Display/Print Line 1

"Display/Print Line 1," enter the information that will display on the first display line of the operator interface terminal, and on print line 1 of the dispatch label. Up to 21 characters can be entered in this field. This field can be edited for special output display messages.

Column 4, Display/Print Line 2

The contents of this field only appear on the second display line of the operator interface terminal. The second line of the dispatch label is determined by the content identification number. Normally, the display/print line 2 field can be edited (up to 21 characters).

NOTE: If the output is chained, note the chaining information in this column: alternating (type Z), momentary (type Y), or high-density (type X), and its associated output number.

Column 5, ZIP Code

Enter the ZIP code range assigned to the output.

Column 6, Shape

When specifying a mail shape/type other than the sort program default, selections must be made from the following valid code list:

P – Parcel
L – Letter bundle
F – Flat bundle

Column 7, Optional Endorsement Line (OEL)

Enter OEL information as necessary. The OEL information provided by the mailer is normally located on the top line of the address block of a flat or letter bundle. It contains characters that identify the presort level of the bundle.

C – Carrier (Firm)
A – ADC
M – Mixed
3 – 3-digit
5 – 5-digit.

The OEL type field does not apply to sort programs that are designated as parcel only.

Column 8, Height

This column is used to specify a range of height measurement in inches for the package/bundle being sorted Sorting is in increments of one inch and can range from 0 to 15 inches.

Column 9, Weight

This column is used to specify a range of weight measurement in pounds for the package/bundle being sorted. Sorting is in increments of one pound and can range from 0 to 25 pounds.

Special Handling

This column is used to specify a special handling output/bin. The special handling options and the corresponding codes are:

Code	Definition
71	Certified Mail
73	Insured Mail
77	Registered Mail
21	Mercury, Origin Confirm
22	Mercury, Destination Confirm
23	Jupiter, Manifesting
EO	Express Mail
L0	Global Priority Mail
M0	COD Mail
C0	Customs Declaration
91	UCC/EAN Code per Publication 91 (Delivery Confirmation)

5.6.3 Worksheet Review

When the worksheet is completed, review it with the various functional groups to determine if the sort program meets their needs. These functional groups should include:

- mail processing representatives;
- in-plant support;
- customer service; and
- transportation.

5.7 WebAPPS

WebAPPS is the sort program system application that is used to create and maintain sort programs for the APPS. WebAPPS is a web-based application that is different from the sort program system currently being used for other mail processing equipment.

5.7.1 Training

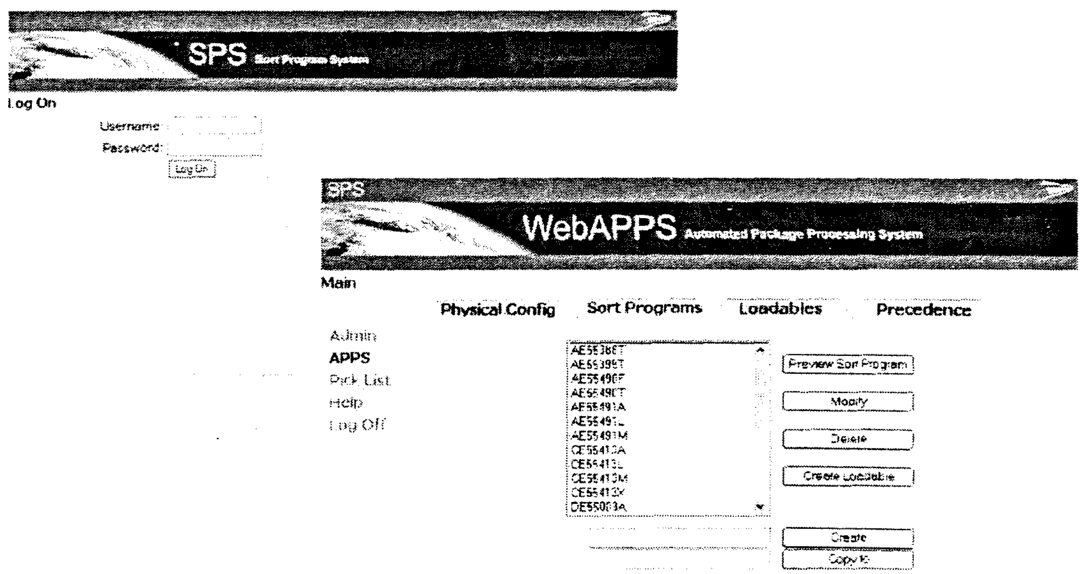
The WebAPPS training course instructs participants in the development and maintenance of sort programs for the APPS.

Before the course begins, participants will receive *The APPS Machine Sort Programs Creation WebAPPS Checklist and Spreadsheet Guide*, which will help the participant plan their APPS sort programs in a spreadsheet format. Participants will be required to have completed worksheets with their site's sort program information at the training session. In addition, it is recommended that the participant have a copy of their APPS site-survey configuration drawing, provided by Lockheed Martin to the site coordinator. This drawing will be used to help answer any site-specific questions the participant may have during the training.

The SPS/WebAPPS training course, #50601-07, is held at the National Center for Employee Development (NCED) training site in Norman, OK. Course registration can be completed via the Automated Enrollment System (AES) through the NCED web site at http://nced.usps.gov.

The WebAPPS application is accessed through the USPS® intranet browser and the site's WebAPPS IP address. Figure 5-10 shows samples of WebAPPS user screens.

Figure 5–10: WebAPPS Screens



5.8 Test and Review

Once the sort program has been created on the WebAPPS application, it must be downloaded from National Directory Support System (NDSS) and tested on the APPS. Testing should include the download process, output display information, label printing, and sortation of mail. In addition, the review should evaluate the proper placement of high-density outputs and general operating efficiency.

First, the sort program developer must ***load and test*** the sort program on the APPS machine. To do this, the new sort program is downloaded from the NDSS computer into the APPS SMS computer.

Second, the sort program developer must ***observe*** the operations. While observing, it is important to perform output verifications to determine the sortation accuracy.

Finally, after the test run is over, the sort program developer must ***analyze*** the available reports generated from the SMS computer. Review these reports with mail processing representatives to ensure proper placement of output assignments, proper induction load balancing, and output chaining.

The following items should be reviewed for each sort program test:

- Identify any high-density separations not previously identified;
- Validate output density distribution (a greater percentage of mail-pieces should be finalized to the second half of the outputs on a given side);
- On dual induction systems, validate 50/50 output balance; and
- Evaluate staggered configurations, and identify any inner outputs receiving a high volume.

5.9 Sort Program Updates

Any required updates identified during the testing and analysis are made with the WebAPPs application. It is recommended that the sort program developer perform periodic reviews of the APPS sort programs to ensure that the sortation of mail adheres to the current labeling lists and transportation schedules, and meets the local operating plan.

6.0 Staffing

This section of the manual provides USPS® managers and supervisors with an overview of the factors that affect required system staffing, the details and tools to develop site-specific requirements, and the information necessary to provide comprehensive staffing resources that will allow the APPS to operate at its maximum efficiency.

This guide provides general information about the staffing process for the APPS. It is not intended to make specific recommendations on staffing positions.

6.1 Introduction

The APPS requires a specialized process to determine effective and efficient staffing. Unlike the SPBS, throughput for the APPS is constant regardless of mail type, shape, and size. When determining staffing requirements for the APPS, managers and supervisors are required to consider the following factors: mail type, sort program, container type/mix, and other needs depending on the machine's configuration.

6.2 Methodology

Analysis was performed using multiple techniques to estimate the number of operators required to operate the APPS. Graphic and numeric simulation models were developed with AutoMod® and MS-Excel® software to determine the required staffing levels for each operation in different scenarios and container types. The analysis used data gathered from many SPBS locations, as well as the APPS that is located at the Twin Cities Metro Hub, Minneapolis, MN. The results from the analysis were validated on the first article system in Minneapolis and the resultant tool is provided for field use.

The main areas of the system that require operator support are the load/feed (unloaders), the semi-automatic induction, and the sorter. The primary assumptions in the model include a sustained throughput rate of 5,500 mail-pieces per hour per induction. During the setup, processing run, and dispatch period, the model assumes a constant number of operators. In the model, no operators perform duties outside the work unit, and outside resources are not available. Staffing for the video coding system/remote encoding center, data collection operator was not included in the analysis, but system operation assumes full remote encoding center support.

6.2.1 General Work Areas

The general information and data in this section are required to analyze and develop the staffing requirements for the APPS. Essential to the analysis is the mail transport equipment capacities for each mail type, both for the Feed Subsystem and the Output Sorter Subsystem areas.

The three work areas, discussed in this section and the entire document, were created to group the information for discussion and presentation:

- Feed/load;
- Semi-automatic induction; and
- Sorter/sweep operations.

Efficient operation of the system is supported by assigning specific operators to the three work areas, and further by breaking the sorter/sweep area into operator assignment areas by output groups. However, operators are expected to assist each other and perform all duties supporting the work area and the entire system. In the feed area, both the un-loader and culling stations should be attended to in a continuous manner whenever mail is available. Normally, the semi-automatic station operator should not leave that station to assist in other areas since this station should be staffed whenever mail is available in the system. Operators may rotate through all three of the work areas in a schedule determined locally by the site.

6.2.2 Operator Rotation

Operator rotation allows each operator on the APPS to perform all the various functions on the machine to keep it running at its maximum efficiency. Operator rotation provides the workers with a variety of tasks, allowing them to use different muscle groups to avoid fatigue of one major muscle group.

The functions that can be part of operator rotation for the APPS are the conveyor loader and culler in the Feed Subsection, the semi-automatic operator duties, and sweep functions.

Local In-Plant Support offices and Distribution Operations are responsible for developing and implementing a rotation schedule. In addition, supervisors must ensure that the transition time of operators moving from one function to another is kept at a minimum.

6.3 Container Selection

The selection of sorter output containers is the single most important factor in determining APPS staffing requirements. Container selection affects the feed system staffing, the range of increased requirements on the APPS sorter, staging space, and transportation resources. Selecting the proper container is the most sensitive aspect that can provide the best opportunity for increasing the system's productivity.

Another opportunity for managing productivity is the time period when the system "ramps up," which happens just prior to the need for servicing full containers. Because of the configuration of the APPS, and the opportunity to discharge into large containers, the period when containers start filling — but are not yet full — can exceed 45 minutes. Once the system reaches a "steady state" of operation, one container presented to the Feed Subsystem will yield one container filled at the sorter; and **adequate staffing of the sorter must be maintained** to ensure maximum system productivity.

6.3.1 Recommended Sorter Output Container

Table 6-1 shows the estimated average container type to select for a sorter output, based on distribution density, and by using an average mix of mail types. The information can be used as an initial recommendation, and adjusted for mail type, length of run, and site-specific factors.

Table 6–1: Container Selection per Density Category

Distribution Density Category	Lower Bound %	Upper Bound %	Recommended Container
Low	0.00	0.99	Sack/Pouch
Medium	1.00	1.75	Hamper
High	1.76	3.50	Pallet, Wiretainer

NOTE: With "standard" mail, the upper ranges of the "medium" category should be analyzed for conversion to wiretainers and pallet-boxes.

NOTE: Any output with an assigned density over 3.5 percent should be set up as a chained or split output.

For high-density outputs or high volume sort program runs, Table 6-2 shows the recommended container type to select for a sorter output. The information can be used as an initial recommendation and adjusted for mail transport equipment availability and site-specific factors.

Table 6–2: High-Density, High-Volume Container Selection

Use Preference	FC	Priority	STD
1st	Wiretainer	Wiretainer	Wiretainer
2nd	Hamper	Hamper	Pallet-Box
3rd	Pallet-Box	Pallet-Box	Hamper

6.3.2 Estimated Time Period Prior to Steady State

The following tables show the estimated average time it takes the system to "ramp-up," which happens prior to the need for servicing full containers. The site should develop a process so that operators can use this time period to perform other functions during machine initialization. Activities can include container preparation, labeling, and allied activities such as mail preparation.

Table 6–3: Estimated Time to Steady State by Typical Density Distribution

Mail Type	Minutes
IC FCM/PRIORITY	60
IC STD/OG FCM	38
OG PRIORITY/STD	11

Table 6–4: Estimated Time to Steady State by Density Category

High Density Category	Container Fill Time Hours-Minutes / Mail Type			
Container Type	Priority	LTR Bndls	FLT Bndls	SPRS
Pallets	0: 47	0: 49	0: 37	0: 52
Wiretainers	0: 36	0: 49	0: 37	0: 52
Hampers	0: 24	0: 25	0: 14	0: 42
Sacks-L	0: 05	0: 04	0: 03	0: 07

Medium Density Category	Container Fill Time Hours-Minutes / Mail Type			
Container Type	Priority	LTR Bndls	FLT Bndls	SPRS
Pallets	2: 27	2: 31	1: 55	2: 43
Wiretainers	1: 52	2: 30	1: 55	2: 43
Hampers	1: 14	1: 16	0: 43	2: 11
Sacks-L	0: 15	0: 12	0: 09	0: 20

Low Density Category	Container Fill Time Hours-Minutes / Mail Type			
Container Type	Priority	LTR Bndls	FLT Bndls	SPRS
Hampers	5: 04	5: 14	2: 59	8: 59
U-Carts	4: 05	5: 01	1: 59	5: 34
Sacks-L	1: 03	0: 50	0: 37	1: 23

6.3.3 Container Information

Table 6–5: Container Dimensions

Container	Length (inch)	Width (inch)	Height (inch)	Tare Weight (lbs)	Capacity (lbs)	Stacking Information (Empty)
BMC	64	43	70	475	2000	Not stackable
GPMC/APC	42	29	69	134	1200	Not stackable
Pallet	48	40	Vary	Vary	Vary	Stackable/foldable
Wiretainer	48	40	42	320	2000	Not stackable
Hamper(S/P)	48	31	38	75/100	800	Stackable 3 high
U-carts	21	14	40	80	120	Inserted 20 in row
Sack/Pouch	Multi	Multi	Multi	Multi	Multi	Stackable in other container

Table 6–6: Container Conversion Rates (Quantity of Mail in a Full Container)

Container	Priority Mail	LTR Bundles	FLT Bundles	SPRS	Stacking Information (filled)
BMC	170	377	288	409	Not stackable
GPMC/APC	85	214	163	232	Not stackable
Half Gaylord	170	188	193	288	Not stackable
Wiretainer	86	187	178	288	Not stackable
Hamper	43	95	122	210	Not stackable
U-carts	11	91	36	101	Not stackable
Sack/Pouch	11	17	10	30	Stackable in other container

NOTE: Source - Mail Condition Reporting System

6.4 Staffing

The staffing requirements for the APPS are based on mail type, sort program, container type/mix, and depend on the machine's configurations. A staffing calculation tool is described and provided in section 6.5 and generates the specific recommended staffing for typical configurations and distribution densities. The MS-Excel® tool is available on the compact disk in the back of this binder, and updates are available via the intranet under "Engineering."

NOTE: All staffing tables are valid for systems operating at the full sustained throughput rate of 5,500 mail-pieces per hour, per induction.

NOTE: Productivity can be increased by optimizing sort programs and by using large-wheeled containers.

6.4.1 Feed Area

The Feed Subsystem is the entry point for mail-pieces processed on the APPS. The Feed Subsystem consists of a high volume load area with two types of automated container unloaders: pallet-unloaders that shingle layers of bundled magazines and letters, and all purpose container unloaders that rapidly unload standard mail transport equipment. Each site will have a unique mix of container types from upstream operations and facilities.

Operators are expected to assist each other and perform all duties supporting the work area and the entire system. Effective operation of the feed area includes continuity of tasks and operations whenever mail is available at the station. Both the unloader side and the culling side of the feed area should be attended to in a continuous manner, by the same operator over a continuous block of time. Under certain circumstances (when the mix of induction containers is predominantly pallets or hampers) when the staffing tool recommends additional staffing for the feed area, the focus of the additional operator should be on servicing the unloader side of the feed area.

The feed operation requires operators to:

- Transport filled mail transport equipment from staging into unloaders;
- Prepare the load, remove strapping/plastic wrap, adjust the retaining bar, etc.;
- Operate the unloader controls;
- Transport empty mail transport equipment from the unloaders to the post induction staging area;
- Repair miscellaneous mail, collect or remove trash, etc.;
- Clear any jams;
- Cull and dress the mail on the load belt;
- Operate the load conveyor controls;
- Monitor the recirculation conveyor;
- Remove out-of-specification mail-pieces;
- Loosen and prepare bundled mail;
- Setup and tie-out activities; and
- Observe system operation and communicate with co-workers and supervisors.

The cycle time to unload a pallet or universal unloader depends on:

- The mail type, and the size of mail-pieces (density per container);
- The type of container, and the volume capacity;
- The mode of operation (automatic or manual);
- Primary unloaders have a faster unloading cycle time since clear space on the load belt is always available;
- Manual mode cycle time is operator-paced, and NOT recommended. Manual mode requires the operator to attend to the unloader control panels;
- Bundle integrity and the condition of the mail. The operator may stop the load belt to perform culling operations in situations where mail condition is poor. Stopping the load belt causes the unloaders to pause.

Calculation. Using the estimated container unloader times (see Appendix C), the container conversion tables, and the throughput rate of 5,500 mail pcs/hr, an estimated number of operator-hours/hour of system operation is calculated using the following formula:

$$\text{Estimated operator-hours/hour of system operation} = \frac{\text{Throughput (pcs/hr)} \times \text{Unloader servicing time (secs)}}{\text{Container conversion factor (pcs/cont)} \times 3600}$$

6.4.2 Semi-Automatic Induction Station

If the automatic induction systems are not available, or mail-pieces require operator intervention, then the mail-pieces are diverted to the semi-automatic induction station. At the semi-automatic induction station, an operator manually handles the items and properly orients the package on a conveyor where it will be scanned by the overhead automatic address recognition subsystem camera. Each package is then automatically dimensioned, weighed, and inducted onto the Sorter Subsystem. If the operator finds any mail-piece that is unsuitable for further APPS processing, then the operator can remove it at this station.

When the APPS is actively processing mail, and mail-pieces are available at the station, an operator continuously services each semi-automatic induction, including the period during which operators are rotating. Additional staffing at the semi-automatic induction station is not appropriate.

The semi-automatic induction operation requires the operator to:

- Singulate and face mail-pieces from the shoe sorter;
- Singulate and face mail-pieces from the rework roller conveyor;
- Inspect, evaluate, and correct obstructions to address block readability;
- Remove broken bundles and trash;
- Operate the conveyor controls;
- Clear any jams;
- Remove out-of-specification mail-pieces;
- Loosen and prepare mail bundling;
- Handle containers;
- Setup and tie-out activities; and
- Observe system operation and communicate with co-workers and supervisors.

The semi-automatic induction station must be staffed whenever mail is available at the station, including during operator rotation.

Under normal operations, the staffing level of one operator is effective and efficient. If an excessive number of mail-pieces become diverted to the semi-automatic station, then it is an early sign of problems elsewhere on the APPS.

Probable causes of excessive diversion to the semi-automatic station are:

- Overloading the Feed Subsystem;
- A disabled automatic induction station;
- Loading large quantities of out-of-specification mail-pieces;
- Loss of video coding system communication; or
- Too many full containers on the sorter module.

Supervisors should correct each of these issues at the source to eliminate the overall decrease in system efficiency.

6.4.3 Sorter/Sweep Area

The Sorter Subsystem is populated with mail transport equipment containers. Operators monitor the sorter and service the output containers. When containers are unavailable, the mail-pieces recirculate until the output is serviced and reactivated, or the preset recirculation limit is reached. At this time, the mail-pieces are directed to the semi-automatic rework conveyor. Usually, between 100 and 200 outputs are to be monitored and serviced during an APPS sort program run, per individual site configuration.

The sorter area staffing is the most sensitive to the system configuration variables. Container selection is the critical variable in determining overall sorter area staffing and operational productivity. Productivity can be increased by optimizing sort programs and using large-wheeled containers whenever possible.

Each site will have a site-specific mix of container types available for use that will be required for downstream operations and offices. The staffing tool provides staffing recommendations based on the typical containers to use for bundle and parcel type mail processing. The staffing tables are valid for systems operating at the full sustained throughput rate of 5,500 mail-pieces per hour per induction.
Operators are expected to assist each other and perform all duties supporting the work area and the entire system. Operators should service contiguous groups of outputs. On open-loop systems, when staffing recommendations suggest multiple operators, the assignment of an operator should focus on servicing the center of the system. Operators are expected to assist each other and perform all duties supporting the work area and the entire system.

The sorter operation requires the operator to:

- Transport mail transport equipment from staging to outputs;
- Transport filled mail transport equipment from outputs to dispatch staging areas;
- Prepare containers at outputs;
- Configure sack hangers/chutes, and roller extensions for proper containers;
- Print labels as necessary;
- Label containers;
- Identify signals on sorter and service outputs and containers;
- Operate the controls on the operator interface terminal;
- Repair miscellaneous mail, collect and remove trash, etc.;
- Clear any jams;
- Cull and dress containers;
- Loosen and prepare mail bundling;
- Setup and tie-out activities;
- Observe system operation and communicate with co-workers and supervisors.

The cycle time to service the sorter and individual output containers depends on the following:

- Mail type, size of mail-pieces (density per container), weight of mail-pieces;
- Type of container, volume capacity, wheeled and non-wheeled;
- Relative location (inside/outside) of the container when a staggered setup is being used;
- Location of mail transport equipment staging area, and the distance traveled to retrieve an empty container.

Calculation. Using the estimated output servicing times (see Appendix C), the container conversion tables, and the throughput rate of 5,500 mail-pieces per hour, an estimated number of operator-hours per hour of system operation is calculated by using the following formula:

$$\text{Estimated operator-hours/hour of system operation} = \frac{\text{Throughput (pcs/hr)} \times \text{Output servicing time (secs)}}{\text{Container conversion factor (pcs/cont)} \times 3600}$$

General Sorter Staffing Assumptions and Principles.

- Staffing is based on a "steady state" operation, which is the point of equilibrium where containers are filling up at a constant rate. Full staffing is not required at the beginning of a run.
- Sort program design will greatly affect the required staffing of the machine. Staffing requirements can be reduced by maximizing the use of wiretainers, and minimizing the use of sacks.
- Grouping low density outputs will increase the number of containers that can be serviced by a single operator.
- In an open-loop configuration, placing the lowest densities on the inside of the machine will minimize container transport distances.
- Forklifts are not permitted inside an open-loop configuration. Sort program assignments should minimize the number of pallets on the inside of the open-loop machines.
- In the closed-loop configuration, low density containers are placed closest to the sorter frame in a staggered setup to minimize the frequency of moving external containers during servicing.
- Sorter area staffing requirements are affected by the number of dispatch staging areas, and their proximity to the APPS machine. These areas must be located within the APPS work space unit.
- Additional information is available in section 5 of this guide, "Sort Programs."

6.5 APPS Staffing Tool

The APPS staffing calculation tool generates the specific recommended staffing for typical APPS configurations and distribution densities. The tool is a spreadsheet in MS-Excel® format and is available on the cd-rom in the back of this binder. Updates to the staffing tool are available via the USPS® Intranet under "Engineering."

The spreadsheet program helps to estimate the machine staffing requirements for the APPS, based on the machine's configuration, mail class, and feed/sorter containers used. The factors that affect the staffing requirements of the APPS are the sweep and feed unloading times, container conversion factors (number of pieces per container), throughput rate, and output density profile, which are imbedded in the analysis of the spreadsheet.

The tool provides a report with the estimated staffing requirements for the APPS broken down into the following three subsystems: feed, semi-automatic, and sorter.

6.5.1 Assumptions

To determine the best estimate of the staffing requirements for the APPS, the staffing tool assumes the following information.

- The staffing recommendations are based on the system requirements at a "steady state" operation and use standardized methods. Refer to section 6.3.2 for information about "steady state" estimations.
- The staffing recommendations do not include resources for rotations, breaks, leave, or data conversion operator staffing at the remote encoding centers.
- Staffing recommendations change as new or updated site-specific information is provided to the model.
- The largest capacity containers are assigned to the highest density distribution points in decreasing order.

6.5.2 Required Information for the Model

The tool requires basic information about the APPS machine's configuration, mail processing, and container information.

First, the model requires information about the site-specific APPS configuration. This information will help to determine the staffing table that will be used for the specific type of machine. The information required includes the machine type (open or closed), the number of inductions (single or dual), and the number of outputs (1-208 outputs for dual induction, or 1-150 for single induction). The number of inductions determines the estimated throughput of the machine. These requirements are different for open- and closed-loop APPS machines because of how the outputs are grouped.

The mail processing section of the model requires information to be entered about the type of mail class (Priority, First Class, Standard), and the type of distribution (outgoing, incoming). The sort program name will also be required. This information provides analysis to determine the conversion factors used for each mail class.

The container information section of the model requires the percentage breakdown of the following different containers unloaded onto the Feed Subsystem: BMC, GPMC/APC, wiretainer, hamper, or pallet. The percentage totals should equal 100 percent. The container section of the model also requires the number of each of the following types of container used on the outputs of the sorter: half Gaylord, wiretainer, hamper, u-cart, sack/pouch. The total should be equal to the total number of outputs on the specific machine.

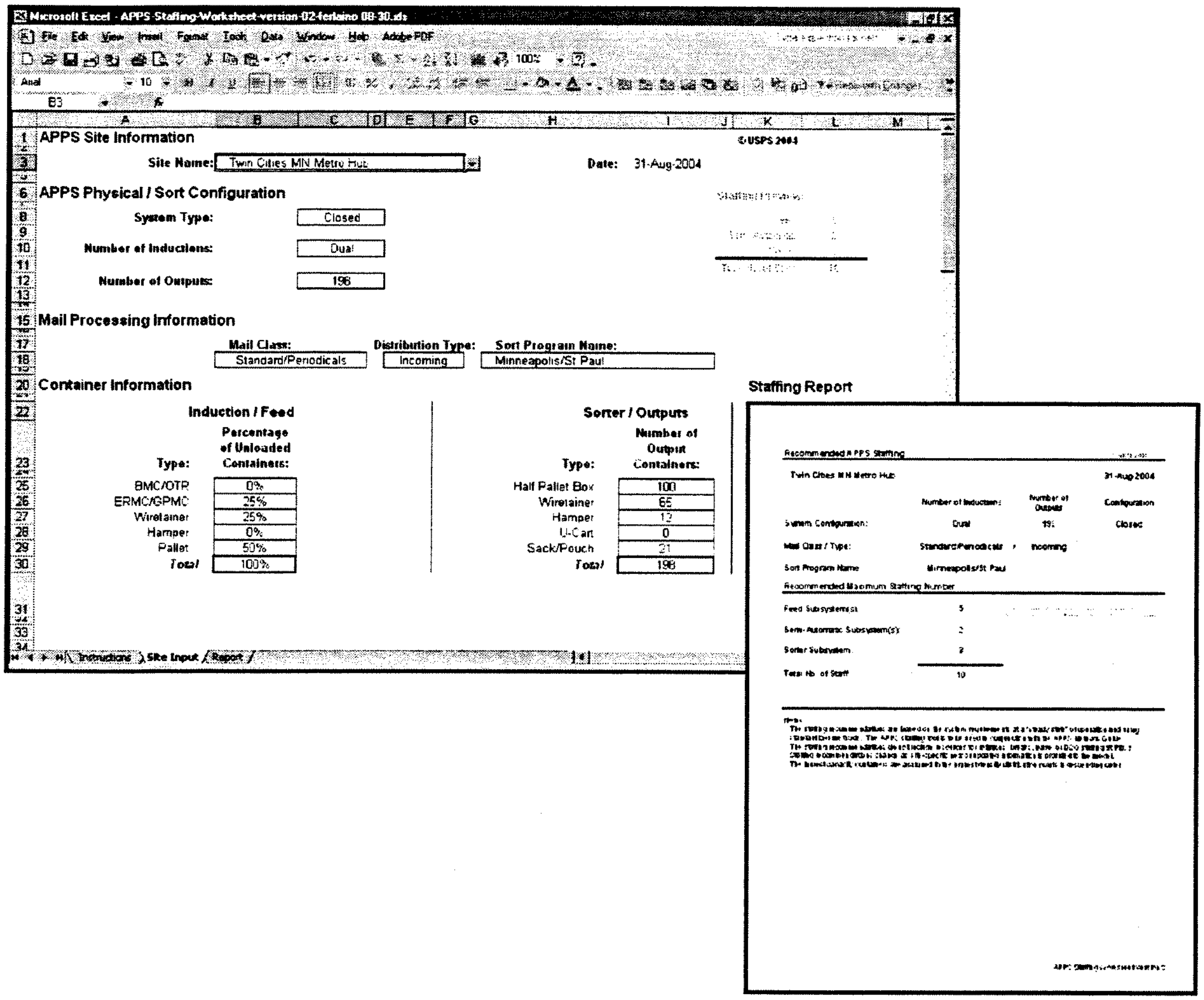
6.5.3 Staffing Report

The model creates a report that provides the recommendations for the maximum number of operators specific to each subsystem (feed, semi-automatic, sorter).

For dual APPS configurations, an odd number of operators on the Feed Subsystem will mean that two operators will be assigned to one induction and three will be assigned to the other. The induct that is unloading more pallets and hampers will be assigned the odd operator.

The semi-automatic induct requires one person per operating station. The number of sorter operators does not require an equal number of operators on each side of the machine. The majority of operators will tend to be required on the higher density outputs or those outputs using sacks/pouches.

Figure 6-1: Staffing Tool and Report



6.6 Management Operation Data System (MODS) Operations Numbers

The MODS numbers provide supervisors with the information about the system's productivity. Table 6-7 shows the MODS operation number by processing operation description.

Table 6–7: MODS Operations Numbers

LDC Non-Supervisory	Induction Type Single	Induction Type Dual	Description
13	152	242	APPS International-Export
13	153	243	APPS International-Import
13	154	244	APPS Outgoing Pref
13	155	245	APPS Outgoing Std
13	156	246	APPS Incoming Pref
13	157	247	APPS Incoming STD
13	158	248	APPS Priority Outgoing
13	159	249	APPS Priority Incoming
13	159C	249C	APPS Composite

7.0 Training Requirements

7.1 Introduction

This section of the manual provides USPS® managers and supervisors with the general information about training and the training requirements for APPS plant supervisors and operators, in-plant support specialists, and remote encoding center supervisors and keyers. Tables 7-1 through 7-3 show a complete list of plant courses for specific personnel required to attend a particular course, the course number, materials, length, and location.

Training listed for responsible positions must be completed before assignment to the system.

7.2 Training Method

APPS training courses employ a "train-the-trainer" delivery method. With this method of training representatives from a particular site attend a trainer's class at the National Center for Employee Development (NCED) in Norman, OK. The site representatives are required to have completed the field presenter's course prior to attending the APPS train-the-trainer sessions. After completing the training and returning to the field site, these new "trainers" present the APPS field training to the site personnel, including other supervisors, operators, or in-plant support personnel.

7.3 Remote Encoding Center (REC) Operations Training

The NCED assigns APPS REC operations train-the-trainer billets. A limited number of these train-the-trainer offerings are planned to serve the limited number of RECs assigned to process APPS images. REC trainers are expected to provide subsequent training beyond the initial trainer needs. Group leaders are responsible for conducting keyer training at the site. Supervisor trainers are responsible for training other supervisors and managers at their site.

REC supervisors and keyers are expected to be trained and ready for APPS image processing during their first plant's burn-in period. Keyer training should be delivered on a "just in time" basis. Additional training sessions may be necessary to support additional plants in deployment and plants that are in the early phases of operational "ramp-up."

Table 7-1 shows a listing of REC training, course number, course length, location, and materials required.

Table 7–1: Required Training for APPS Remote Encoding Center Operations Personnel

REC Personnel	Training Course	Length	Location
Supervisor Train the Trainer	Course #50603-99 APPS REC Supervisor/Keyer Train-the-Trainer	16 Hrs	NCED
	Prepares trainers and addresses VCS and APPS relationships, location, and purpose of each VCS component, keyer operations, and supervisor operations. Classroom and laboratory training delivered by Lockheed Martin.	Materials: TTT Student Guide, User Guide, Instructor Guide, Keyer Student Guide, REC Supervisor Student Guide.	
APPS VCS DCOs	Course #50501-16 APPS REC Keyer Training	**Length**	**Location**
	Addresses user interface, image manipulation, delivery address recognition, image qualification, foreign image processing, and normal image processing. Training delivered by USPS® field trainers who completed course #50603-99. Initial training scheduled prior to first supported plant burn-in.	4 Hrs	Selected REC sites
		Materials: Keyer Student Guide.	
APPS VCS Supervisors	Course #50501-15 APPS REC Supervisor Training	**Length**	**Location**
	Addresses user interface, image manipulation, delivery address recognition, image qualification, foreign image processing, normal image processing, and system/keyer administration. Training delivered by USPS® field trainers who completed course #50603-99. Initial training scheduled prior to first supported burn-in.	12.5 Hrs	Selected REC sites
		Materials: REC Supervisor Student Guide, User Guide.	

NOTE: Additional training for REC Electronics Technicians is listed below under "Field Maintenance Personnel."

7.4 Plant Operations Training Methods

The NCED assigns APPS trainer billets according to the APPS deployment schedule. APPS trainer session participants are supervisors and managers of distribution operations, and operations support specialists, who will be responsible for APPS operations or on-site training delivery. Each APPS plant site will receive three billets. Designated trainers will train supervisors, operators, and in-plant support personnel at their site. Billets for one site will be offered in two session dates.

The NCED assigns train-the-trainer billets on a "just in time" basis, which is about two to four weeks before the site's equipment burn-in period. Because the training requires operational system availability, the site trainers will deliver initial site training during the ten-day, burn-in period. The USPS® requires the contractor installation teams to make the equipment available for site training purposes during that period. Site staff members work with the contractor staff to schedule their training delivery according to essential installation activities. During the installation and acceptance period, training may be limited to those staff members who are required to support APPS ramp-up operation. After system acceptance, additional training sessions may be necessary to support the site's operational plan.

Separate courses for in-plant support personnel are not available; however, the supervisor course includes limited in-plant support content. Because of this, in-plant support staff members who are responsible for APPS operations are encouraged to attend the site's supervisor training. A specialized course on APPS sort programs is available for in-plant staff.

7.5 WebAPPS Sort Program System Training

The WebAPPS-SPS training course (described in table 7-2) instructs participants in the development and maintenance of sort programs for the APPS machine. Before the course begins, participants will receive *"The APPS Machine Sort Programs Creation WebAPPS Checklist and Spreadsheet Guide,"* which will guide the participant in planning their APPS sort programs on an MS-Excel® spreadsheet. Participants will be required to bring their spreadsheets to the first class, in addition to a copy of the APPS machine CAD drawing for their specific site.

Table 7–2: Required Training for APPS Plant Operations Personnel

Plant Personnel	Training Course	Length	Location
Supervisor Train the Trainer	Course #50604-99 APPS Plant Supervisor/Operator Train-the-Trainer	24 Hrs	NCED
	Prepares trainers and addresses safety, mail processing operations, unloading and feeding, semi-automatic induction, sweeping, jam clearing, system startup and shutdown, SMS user interface, troubleshooting errors, printer operation, and operation training materials. Classroom and lab training. Initial training offered by LM, subsequent training by NCED. Initial training scheduled 2-4 weeks prior to site equipment burn-in.	Materials: TTT Student Guide, User Guide, Instructor Guide, Operator Student Guide, Supervisor Student Guide.	
APPS Supervisors	Course #50501-11 APPS Plant Supervisor Training	**Length**	**Location**
	Provides an overview of the APPS, defines safety considerations, describes the system's operation, SMS user interface, system fault recognition, and report interpretation. On-site training delivered by USPS® trainers completing course #50604-99. Initial training scheduled during site equipment burn-in.	8 Hrs	APPS sites
		Materials: Supervisor Student Guide, User Guide.	
APPS Operators	Course #50501-12 APPS Operator Training	**Length**	**Location**
	Addresses safety, semi-automatic induction tasks, common system indicators, unloading and feeding operations, sweeping operations, and troubleshooting operational faults. On-site training offerred by USPS® trainers completing course #50604-99. Initial training scheduled during site equipment burn-in.	2 Hrs	APPS sites
		Materials: Operator Student Guide.	
In-Plant Support	Course #50601-07 WebAPPS SPS	**Length**	**Location**
	Prepares in-plant support to create and maintain sort programs for the APPS. Classroom and lab training by NCED. Training is scheduled in advance and in order of system deployment.	24 Hrs	NCED
		Materials: WebAPPs Checklist and Spreadsheet, User Guide, Student Guide.	

7.6 APPS Field Maintenance System Training

The APPS Field Maintenance System Training courses (described in Table 7-3) gives participants an overview of the APPS system, and addresses safety and basic maintenance operations. Each site will be authorized billets for three electronic technicians, six maintenance mechanics, and four maintenance supervisors. Remote encoding centers are authorized billets for six electronic technicians. The course schedules are driven by the plant's machine deployment.

Table 7–3: Required Training for APPS Field Maintenance Personnel

Maintenance Personnel	Training Course	Length	Location
APPS System Technicians	Course #55652-60 APPS Maintenance Training - Electronic Technician	120 Hrs	NCED, Norman, OK
	Addresses safety, overview of APPS, and maintenance of APPS system equipment. Classroom and lab training by NCED.	Materials: Training billets track with APPS deployment sites.	
APPS Maintenance Supervisors	Course #55652-66 APPS Maintenance Supervisor Course	24 Hrs	NCED, Norman, OK
	Addresses system overview, basic maintenance operations.	Materials: Training billets track with APPS deployment sites.	
APPS System Maintenance Mechanics	Course #55652-50 APPS Maintenance Training - Mail Processing Mechanic	**Length**	**Location**
	Addresses safety, overview of APPS, and maintenance of APPS system equipment. Classroom and lab training by NCED.	156 Hrs	NCED, Norman, OK
		Materials: Training billets track with APPS deployment sites.	
REC Electronic Technicians	Course #55652-70 APPS REC Maintenance Training	**Length**	**Location**
	Addresses safety, overview of APPS VCS, and maintenance of APPS VCS system. Classroom and lab training by NCED.	32 Hrs	NCED, Norman, OK
		Materials: Training billets track with APPS deployment sites.	

NOTE: Course length may change as development progresses.

8.0 Safety

This guide provides United States Postal Service® (USPS®) managers and supervisors with the general safety precautions for use with the Automated Package Processing System (APPS). Because of its large size, integrated subsystems, multiple functions, and various electrical and mechanical components, APPS presents potential hazards that require strict adherence to established safety protocols to ensure a safe operating environment.

The guide provides general information about safe operations for the APPS, but is ***NOT intended as a replacement for formal training or other standardized operator instruction.*** *Managers and supervisors working directly on the APPS are required to attend the supervisor/operator training courses described in section 7 of this guide and that include units on the safe operations of the APPS.*

8.1 General Safety Precautions/Requirements

Safety is the responsibility of every person in the USPS®. Managers and supervisors are responsible for instructing personnel in safety practices that apply to APPS operations.

Operating the APPS requires constant attention to detail and respect for potential hazards. Each individual working on the APPS must understand and apply the following precautions before operating any part of the system:

- Do **NOT** operate the equipment without proper authority, without adequate training, or if the proper procedures are unclear.
- Do **NOT** operate unsafe or defective equipment.
- Do **NOT** place food or drink on any part of the equipment, even if it is not in operation.
- Do **NOT** operate equipment without proper safety guards installed.
- Avoid unsafe acts and conditions (e.g., bypassing safety features, putting nonmail objects in the machine, horseplay, etc.).
- Follow all safety precautions.
- Stay mentally and physically alert. Do **NOT** operate any machinery under the influence of drugs (prescription, over-the-counter, or nonprescription) or alcohol.
- Practice good housekeeping.
- Report all hazardous conditions and operations to the immediate supervisor.
- Use all designated safety devices.
- Know how to summon medical aid.

- 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 moving parts when the equipment is in operation.
- Always stop the equipment before clearing any debris from the transport units.
- Make certain that all personnel are clear of moving parts before starting the equipment.
- Stop the equipment before opening any door or panel on the machine.
- Keep the equipment power off when performing the preventive maintenance procedures.
- Do **NOT** allow forklifts to pass through the elevated section of an open-loop machine.

8.2 APPS Specific Safety Precautions

Safety devices are provided throughout the APPS to ensure a safe work environment and prevent injury. The following operating safety precautions specifically relate to APPS operation.

- Only maintenance personnel are permitted to operate the APPS with a cover(s) open.
- Do **NOT** attempt to start or operate the equipment if it has been locked out.
- Do **NOT** disengage signal horns, lights, or other safety devices.
- Do **NOT** operate the system without e-stop systems or barriers in place.
- Keep clothing, hands, and feet dry as a precaution against electrical shock.
- Do **NOT** stand or ride on the conveyors, enclosures, or any other system components.
- Do **NOT** forcibly extract mail or mail-piece jams. Call maintenance personnel for jam conditions that are difficult to remove or located in maintenance access only areas.

8.3 APPS Safety Labels

Warning labels are affixed to all electrical enclosures and other APPS components where potential safety hazards exist.

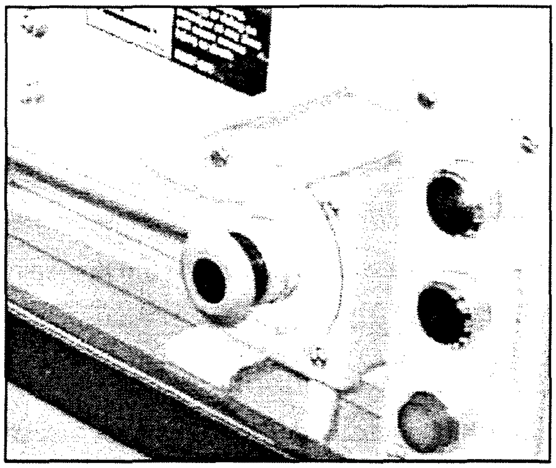
8.4 Emergency-Stop Switches

Two types of emergency stop (e-stop) devices, pushbutton and pull cord, are used throughout the APPS. E-stops are used only to stop the machine if an actual emergency has occurred or is imminent.

The APPS has a single e-stop circuit. Therefore, when any e-stop is activated, all movement on the sub-systems stop, the dynamic braking is activated on the sorter for a short period and the sorter then coasts to a stop, all voltage and energy is then removed from the moving parts of the system. Control computers remain in operation.

The pushbutton e-stop is round and red (see Figure 8-1). Operators engage the e-stop by pushing it, and reset the e-stop by pulling it. E-stops must always be easily accessible and not blocked by any obstruction. The person who resets an E-stop should be the same person who activated it.

Figure 8–1: E-Stop Switch



Because of the large size of the APPS, many e-stop switches are located throughout the machine. E-stops are located on:

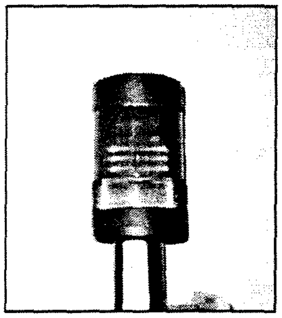
- both sides of each unloader;
- both sides of the load conveyor;
- the side of the long conveyor runs (pull cord);
- the outside of all power enclosure panel doors;
- the Sorter Susbystem Semi-automatic Induction Station;
- every Sorter Subsystem output control arm; and
- the supervisor's work station.

8.5 Alert Indicators and Stack Lights

Audible and visual indicator lights (stack lights) provide both a visual and audible warning sequence to alert the operators of the system's actions, and are located throughout the APPS. The stack lights use combinations of colors and sounds for various operating situations.

APPS uses two types of stack lights. The first type consists of a single blue light that is used only for maintenance, and is located on the auto and semi-auto induction lanes and unloaders (see Figure 8-2). The light indicates the status of the individual unloaders and induction lanes.

Figure 8–2: Maintenance Stack Light



The second type of stack light is a set of indicator lights of several colors (red, green, blue, and amber) that work with different hom signals. (See Figures 8-3.) Table 8-1 shows the standard for color usage on the stack lighting in the order of the color tower.

Figure 8–3: Stack Light Tower

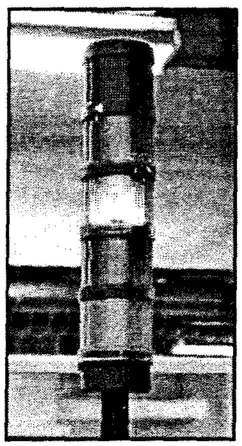


Table 8–1: Stack Light Tower Colors and System Function

Color	System
Red	E-stop/Interlock activated
Green	Power on
Blue	Maintenance mode/offline
Amber	Start-up (any other time – normally off)
Audible Alarm	Various

At the start of each subsystem, a warning signal alerts the operators of the system's startup. An amber light flashes for 10 seconds as a visible alert to all operators and an audible signal sounds for a period of five seconds. This start-up warning alerts personnel that the APPS is about to begin moving.

System startup is initiated from the System Manager Subsystem (in the central location) and happens in the following order:

1. Sorter backbone
2. Individual or dual induction areas
3. DCS and AARS Subsystems
4. Feed, Singulate, and Distribute Subsystems

A system startup sequence of horns and lights is designated for each piece of the system before they start their motion. Table 8-2 describes all possible alarm/light combinations.

Table 8–2: Alarm / Indicator Combinations and their Descriptions

System Status	Light	Audible
System start up	Flashing amber light	Alarm
System emergency stop	Solid red light	Two initial alarm beeps
System errors	Flashing red light	Two initial alarm beeps
System in normal mode; conveyor mode standby	Flashing green	Silent
System in normal mode; conveyor mode start	Solid green light	Silent
Unloader only; local unloader safety photo-cell triggered	Solid blue at a local unloader only	Silent
In-feed only; prime mode	Flashing blue on all local in feed light stacks	Silent
Maintenance mode/offline	Solid blue	Silent

Standby Mode. The green light will flash for all operations when the conveyors are not moving to indicate that the conveyors are in standby mode. The flashing green light will change to a solid green light only when the conveyors are moving, in normal or maintenance mode. The normal startup sequence will transition the flashing green to solid for both normal mode and maintenance mode, when a single belt is started with the start button. When using the JOG button, no startup sequence will occur and the flashing green light will remain flashing. When in maintenance, the blue light will also be on solid.

8.6 Barriers and Guards

The APPS is designed with barriers and guards to keep personnel safely away from moving parts and hazardous situations. The guards and barriers are designed and constructed to prevent individuals from having any part of their bodies in a danger zone, yet provide for safe mail searches and retrieval activities that can occur several times daily.

Barriers and guards for the APPS include:

- Sheet metal guarding
- Plastic guarding
- Wire mesh netting
- Controlled stop access gates
- E-stop interlocked maintenance access gates

8.6.1 APPS Guards

Sheet Metal Guarding. Sheet metal safety guards are installed for subsystem units and components. Guarding typically runs from the sides of conveyors down to six inches above the floor, allowing mail to fall to the floor for sweeping while preventing access under the guarding to moving parts. The sheet metal guarding is also located above the sorter frame, and extends above the sides of the Feed Subsystem conveyors.

Smoked Plastic Guarding. This guarding is smoked, unbreakable plastic or expanded metal to allow for simple mail searches. Smoked plastic guarding is located above the Singulation Subsystem conveyors and on the sides of the unstacker conveyor. Its see-through design allows for simple mail searches.

Wire Mesh Guarding. Wire mesh netting is located underneath the sorter frame. This type of guarding allows the operator to facilitate accessible mail searches and guarantees safety. At the curve of the sorter, protection is on the outside only, and composed of upper and lower parts. The upper part is constructed with clear crowned panels as close as possible to the sorter, while the lower part is made of steel net panels to prevent any risk to the operator.

8.6.2 APPS Barriers

Controlled Stop Access Gates. On 27′ load modules of the Feed Subsystem, controlled stop access gates provide protection to the operator during access to the end unloader. The controlled stop shuts down power only to that unloader, while the rest of the machine remain in operation.

Interlocked Maintenance Access Gates. These gates are located at the auto-induct entry points.

> **Only maintenance personnel are allowed access through these gates to the auto induction areas to clear a jam.**

As they enter the gate, the maintenance personnel press the white access request button on the operator interface terminal. This keeps the sorter section operating while maintenance personnel enter the space under the auto induction to safely clear any jam.

Subsystem Interlocks. Interlocks are installed on the APPS subsystems to keep the operators safe from potentially hazardous situations. The interlock switches are located on maintenance access doors and panels, and cause an e-stop condition when the doors and panels are opened for any reason. This keeps operators safe from coming in contact with the machine's moving parts.

8.7 Stepladder Safety for Maintenance Personnel Only

Maintenance personnel may be required to use ladders to clear some jams. Stepladders are the only type of ladder allowed for maintenance personnel to use for jam-clearing purposes. Stepladders are self-supporting portable ladders, nonadjustable in length, which have flat steps and a hinged back.

General safety precautions for using stepladders safely are:

- Do **NOT** use stepladders longer than 20 feet.
- Check the stability of the stepladder by standing on the first step from the bottom and twisting the ladder. If it feels unsteady, choose another stepladder.
- Stepladders with structural defects, such as broken or missing steps, missing cleats, broken or split rails, corroded components, or other faulty or defective components, must immediately be marked defective, or tagged with "Do Not Use" or similar language and withdrawn from service until repaired.

- Always report unsafe ladders to your supervisor so that corrective action may be taken.
- Do **NOT** use non-self-supporting portable ladders, such as single or extension ladders, with the APPS.
- Use the stepladders only for the purpose for which they were designed.
- Never use stepladders in the horizontal position, such as scaffolds or work platforms.
- Do **NOT** load the stepladder beyond its maximum intended load.
- Do **NOT** splice, tie, or fasten stepladders together to create longer sections.
- Do **NOT** set-up stepladders improperly.
- Do **NOT** use unsafe stepladders.
- Do **NOT** use makeshift stepladders, such as wooden two-by-fours nailed together.

APPENDIXES

Appendix A: APPS Containers and their Descriptions

STF Container ID (3 Char)	Container Tare Weight (#)	Fill Factor	Max Net Container Weight (#)	Max Container Volume (Cubic Inches)	Max Throat Dimensions (Inches)	Package Type Permitted (PFL) Any Combination	USPS Container Identifier	EIRS #	Container Actual Dimensions (Internal)
U1C	80	55	120	12920	-1	PFL	Utility Cart	62	34"L x 20"W x 19"H
H1C	75	45	800	42240	-1	PFL	Hamper	61	44"L x 32"W x 30"H
H1P	100	45	800	42523	-1	PFL	Hamper Plastic	61P	47.5"L x 30.87"W x 29"H
G1H		50	750	54990	-1	PFL	Half-Gaylord	99BS	47"L x 39"W x 30"H
W1R	320	50	2000	65280	-1	PFL	Wiretainer	84	48"L x 40"W x 34"H
W1P		70	800	61440	-1	PFL	WestPak	82S	48"L x 40"W x 32"H
S1W	3.4	60	70	8330	14" x 17"	PFL	Sack No. 1 White	01	40"L x 31"W
S2W	2.5	60	70	5040	14" x 10"	PFL	Sack No. 2 White	02	41"L x 24"W
S3W	1.8	60	70	3500	14" x 10"	PFL	Sack No. 3 White	04	30"L x 24"W
S3G	0.5	60	70	2240	14" x 8"	PFL	Sack No. 3 Green	07	25"L x 22"W
P1G	0.7	60	70	4340	14" x 10"	PFL	Pouch No. 1 Green	13	36"L x 24"W
P1P	0.6	60	70	8330	14" x 17"	PFL	Pouch Priority	12M	40"L x 31"W
P2P	0.4	60	70	6944	14" x 16"	PFL	Pouch Priority Plastic	12P	36"L x 30"W
P1E	0.8	60	70	7616	14" x 16"	PFL	Pouch Express	20	39"L x 30"W
B1P		70	750	109980	-1	P	Full Gaylord	99BL	47"L x 39"W x 60"H
B2P	70	70	2000	132480	-1	P	Postal Pak w/pallet	82	48"L x 40"W x 69"H
E1C	209	70	1200	74298	-1	P	Eastern Region Container	66E	40"L x 27"W x 61"H
A1C	250	70	1200	75516	-1	P	General Purpose Container	66G	40"L x 27"W x 62"H
A1P	260	1200		57600	-1	P	Universal Mail Container	68U	40"L x 24"W x 60"H
B1L	364	1500		119016	-1	P	BMC/OTR LD	69L	54"L x 38"W x 58"H
C1B		-1		-1	-1	PFL	Conveyor Belt		

NOTES: Unlimited/Exceeds machine outputs = -1

Container ID Naming Conventions: Alpha=Type of container; Numeric=Size of container; Alpha-Physical characteristics of container.
For example: S=Sack; 1=Size #1; W-White in color

Appendix B: Content Identification Numbers and Mail Processing Codes

D = Default Mail Processing Code in SPS
X = Valid Mail Processing Code in SPS
MPC 2 = Mechanized Flow
MPC 9 = Intra-Facility Flow
MPC 4 = Manual Flow

CIN	Content Identifier Number Text	Append Characters	MPC 2	MPC 4	MPC 9
0	INVALID CIN	0			D
130	IRREG/PRCL MECH REJECT	0			D
131	IRREG/PRCL UNASSIGNED	0			D
132	IRREG/PRCL READ REJECT	0			D
141	EXPRESS MAIL	8	D		
159	PRIORITY PARCELS	4	D		
166	REGISTERED MAIL	0	D		
168	STD LTRS & FLTS	0	D		
205	DELIVERY	18	D	X	
220	FIRM DIRECT FCM PARCELS	0	D	X	
287	PRCLS ACCT/CERT	6	D	X	
288	FCM PARCELS MXD ZONES	0	D	X	
289	FCM PARCELS 5D	0	D	X	
290	FCM PARCELS 3D	0	D	X	
291	FCM PARCELS ADC	0	D	X	
293	FCM PARCELS CITY	0	D	X	
294	FCM PARCELS SCF	0	D	X	
295	FCM PARCELS CR	0	D	X	
364	PER IRREG MXD ZONES	0	D	X	
389	PER IRREG 5D	0	D	X	
390	PER IRREG 3D	0	D	X	
391	PER IRREG ADC	0	D	X	
393	PER IRREG CITY	0	D	X	
394	PER IRREG SCF	0	D	X	
395	PER IRREG CR	0	D	X	
590	STD IRREG 5D	0	D	X	
591	STD IRREG 3D	0	D	X	
592	STD IRREG ADC	0	D	X	
595	STD IRREG CITY	0	D	X	
596	STD IRREG SCF	0	D	X	
597	STD IRREG CR	0	D	X	
602	STD IRREG MXD ZONES	0	D	X	
629	CAN STD MACH DRX	0	D	X	
630	CAN STD MACH WKG	0	D	X	
632	MEX STD MACH WKG	0	D	X	
633	FGN STD MACH DRX	0	D	X	
634	FGN STD MACH WKG	0	D	X	
701	INTERNATIONAL EXPRESS	8	D		
738	FGN FCM PRCLS DRX	0	D	X	
745	FGN FCM PRCLS WKG	0	D	X	
746	CAN FCM PRCLS WKG	0	D	X	
747	MEX FCM PRCLS WKG	0	D	X	
760	MILITARY PRIORITY	8	D		
769	INTL PRCLS OUTBOUND	10	D		
781	USER DEFINED	21			D

Appendix C: Modeling Data

Table AC–1: Estimated Unloader Servicing/Cycle Times

Container	Time (secs)
BMC	68
GPMC/APC	50
Pallet	131
Wiretainer	50
Hamper	53

NOTE: Includes walking times for standard staging area distances.

Table AC–2: Estimated Sorter Output Servicing Times

Container	Time (secs)
Pallet	152
Wiretainer	110
Hamper	91
U-carts	88
Sacks/Pouches	49

NOTE: Includes walking times for standard staging area distances and container labeling.

Appendix D: Sample Reports

Appendix D-1: End of Run Report

This report provides operational information about the sorting performance for a single run. A run is defined as the sorting that takes place against a single sort program. All time and count information in the report is based on the run. In the APPS system, different run situations can occur. On a single-sided machine (one induction area), only one sort program can be loaded at a time. As a result, the EOR Report displays the performance of the entire machine. On a dual-sided machine (two induction areas), two run situations can exist:

- One sort program can be loaded that uses both induction areas. In this case, the EOR report displays the performance of the entire machine.
- Two sort programs can be loaded (one for each induction area). In this case, the EOR report only reflects the performance of one induction area and a portion of the common system elements (the sorter and AARS).

NOTE: The Carrier Route Report (Section 1.3 of the EOR report) will only contain data if the run contained at least one Carrier ID.

APPS
End of Run Report

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Office	x	Tour Number	x	Run Number	x
Machine Number	x	Number of Personnel	x	MODS Number	x
Supervisor	x	Sort Program	x	Induction Area	x

1.1 Time Counts

Start Time	mm/dd/yy	0:00:00	Operational Time	0:00:00
Stop Time	mm/dd/yy	0:00:00	E Stop Time	0:00:00

		Idle Time	Run Time	Down Time	Maintenance Time	Jam Time
system		0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
		0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
Side 1						
	Auto Induction Lane 1	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 2	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 3	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Semi-Auto Induction Lane	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
Side 2						
	Auto Induction Lane 1	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 2	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 3	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Semi-Auto Induction Lane	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00

1.2 Production Totals:

	Total Pieces Fed	Total Pieces Accepted	Total Pieces Sorted	Total Pieces Rejected
Auto Induction Lane 1	0	0	0	0
Auto Induction Lane 2	0	0	0	0
Auto Induction Lane 3	0	0	0	0
Semi-Auto Induction Lane	0	0	0	0

APPS
End of Run Report

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Total Pieces Fed		0	
		Total	**Rate**
Total Pieces Accepted		0	0
	BCR/OCR	0	0
	VCS	0	0
	Manual Induct	0	0
Total Pieces Sorted		0	0
	BCR/OCR	0	0
	VCS	0	0
	Manual Induct	0	0
Total Pieces Rejected		0	0
	Out of Sort Plan	0	0
	VCS Timeout	0	0
	VCS Keyer Reject	0	0
	Manual Keyer Reject	0	0
	Mechanical Reject		
	Out of SPEC	0	0
	AARS Rejects	0	0
	Sweep Recirc Reject	0	0
	AARS Recirc Reject	0	0
	Bin Disabled Reject	0	0
Total APPS Rate			
	Throughput/Operational-Hr	0	
	Sorted/Operational-Hr	0	
	Throughput/Run-Hr	0	
	Sorted/Run-Hr	0	
Overall Equipment Effectiveness			
	OEE (Overall)	0.00	
	Machine Availability	0.00	
	Machine Performance	0.00	
	Machine Quality	0.00	
	Machine Efficiency	0.00	
	Target Throughput	x	

APPS
End of Run Report

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		Total	% of Accept	Induction Area 1	Induction Area 2
BCR/OCR	3-digit	0	0%		
	5-digit	0	0%		
	9-digit	0	0%		
	OEL	0	0%		
	Foreign	0	0%		
	Presort Sticker	0	0%		
	5-digit Postnet	0	0%		
	9-digit Postnet	0	0%		
	11-digit Postnet	0	0%		
	Planet	0	0%		
	5-digit Delivery Conf ZIP	0	0%		
	9-digit Delivery Conf ZIP	0	0%		
	BMC	0	0%		
	IBIP	0	0%		
	Special Services	0	0%		
VCS	3-digit	0	0%		
	5-digit	0	0%		
	9-digit	0	0%		
	OEL/Presort Sticker	0	0%		
	Foreign	0	0%		
Manual Key		0	0%		
Totals	3-digit	0	0%		
	5-digit	0	0%		
	9-digit	0	0%		
	Foreign	0	0%		
	OEL/Presort Sticker	0	0%		
Typing	Bundle Flat	0	0%		
	Bundle Letter	0	0%		
	Parcel	0	0%		

APPS
End of Run Report

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Bin Volume

Bin	Pieces	% of Total	BCR/OCR	VCS	Manual
1	0	0	0	0	0
2	0	0	0	0	0
3	.	.	.	.	.
4	.	.	.	.	.
5	.	.	.	.	.
6					
7					
8					
9					
10					
.					
.					
501	0		0	0	0
502	0		0	0	0
503	0		0	0	0
504	0		0	0	0

APPS
End of Run Report

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1.3 Carrier Route Report

ZIP	CID	TCR
<ZIP 1>	*<CID 1>*	0
<ZIP 1>	*<CID 2>*	0
<ZIP 1>	*<CID 3>*	0

APPS
End of Run Report

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1.4 Maintenance Report

Number of Logbook Incidents Opened	0
Maximum Number of Carrier Cells Lost	0
Number Carrier Cells Taken In and Out of Service at least Twice	0
Average Induction Time	
Induct Lane 1	0
Induct Lane 2	0
Induct Lane 3	0
Semi-Auto Lane	0
Lost Performance Due to Down Time	
Number of Emergency Stops	0
Number of Interlocks Broken	0
Number of Network Errors	0
Singulator Rejects	0%
Doubles Count	0%
Gap Error Count	0%
Number of Full Bins	0
Average Time to Sweep a Bin	0:00:00
VCS Interface Down Time	0:00:00

Appendix D-2: End of Day Reports

APPS
End of Day Report

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Office

MODS Day

Machine Number

1.4 Time Counts

Tour	Start Time	Stop Time	Idle Time	Run Time	Down Time	Maint Time	Jam Time	E-Stop Time
		0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
		0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
		.	.	.	.	.	.	.
		.	.	.	.	.	.	.
		0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00

		Idle Time	Run Time	Down Time	Maint Time	Jam Time
System Side 1						
	Auto Induction Lane 1	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
		.	.	.	.	.
		.	.	.	.	.
	Auto Induction Lane 2	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 3	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Semi-Auto Induction Lane	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
Side 2						
	Auto Induction Lane 1	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 2	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 3	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Semi-Auto Induction Lane	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00

APPS
End of Day Report

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1.5 Production Totals 0

		Total	Rate
Total Pieces Fed			
Total Pieces Accepted		0	0
	BCR/OCR	0	0
	VCS	0	0
	Manual Induct	0	0
Total Pieces Sorted		0	0
	BCR/OCR	0	0
	VCS	0	0
	Manual Induct	0	0
Total Pieces Rejected		0	0
	Out of Sort Plan	0	0
	VCS Timeout	0	0
	VCS Keyer Reject	0	0
	Manual Keyer Reject	0	0
	Mechanical Reject		
	Out of SPEC	0	0
	AARS Rejects	0	0
	Sweep Recirc Reject	0	0
	AARS Recirc Reject	0	0
	Bin Disabled Reject	0	0
Total APPS Rate			
	Throughput/Operational-Hr	0	
	Sorted/Operational-Hr	0	
	Throughput/Run-Hr	0	
	Sorted/Run-Hr	0	
Overall Equipment Effectiveness			
	OEE (Overall)	0.00	
	Machine Availability	0.00	
	Machine Performance	0.00	
	Machine Quality	0.00	
	Machine Efficiency	0.00	

APPS

End of Day Report

Software Version: <SWVERSION> Page 3 of 6 <DATEPRINTED>

		Total	% of Accept	Tour 1	Tour 2	Tour 3
BCR/OCR	3-digit	0	0%			
	5-digit	0	0%			
	9-digit	0	0%			
	OEL	0	0%			
	Foreign	0	0%			
	Presort Sticker	0	0%			
	5-digit Postnet	0	0%			
	9-digit Postnet	0	0%			
	11-digit Postnet	0	0%			
	Planet	0	0%			
	5-digit Delivery Conf ZIP	0	0%			
	9-digit Delivery Conf ZIP	0	0%			
	BMC	0	0%			
	IBIP	0	0%			
	Special Services	0	0%			
VCS	3-digit	0	0%			
	5-digit	0	0%			
	9-digit	0	0%			
	OEL/Presort Sticker	0	0%			
	Foreign	0	0%			
Manual Key		0	0%			
Totals	3-digit	0	0%			
	5-digit	0	0%			
	9-digit	0	0%			
	Foreign	0	0%			
	OEL/Presort Sticker	0	0%			
Typing	Bundle Flat	0	0%			
	Bundle Letter	0	0%			
	Parcel	0	0%			

APPS
End of Day Report

Software Version: <SWVERSION> Page 4 of 5 <DATEPRINTED>

2 Maintenance Report

Critical Faults

Date	Time	RTF	Description
mm/dd/yy	0:00:00	x	x

Incidents Opened

Date	Time	Incident #	Description
mm/dd/yy	0:00:00	x	x

Carrier Cell Faults

Date	Time	Carrier Cell	Description
mm/dd/yy	0:00:00	x	x

Network Errors

Date	Time	Subsystem	Description
mm/dd/yy	0:00:00	x	x

APPS
End of Day Report

Software Version: <SWVERSION> Page 5 of 5 <DATEPRINTED>

Number of Logbook Incidents Opened
Maximum Number of Carrier Cells Lost
Number Carrier Cells Taken In and Out of Service at least Twice
Average Induction Time
- Side 1
  - Induct Lane 1
  - Induct Lane 2
  - Induct Lane 3
  - Semi-Auto Lane
- Side 2
  - Induct Lane 1
  - Induct Lane 2
  - Induct Lane 3
  - Semi-Auto Lane

Lost Performance Due to Down Time
Number of Emergency Stop
Number of Interlocks Broken
Number of Network Errors
Singulator Rejects
- Side 1
  - Doubles Count
  - Gap Error Count
- Side 2
  - Double Count
  - Gap Error Count

Number of Full Bins
Average Time to Sweep a Bin
VCS Interface Down Time

Appendix D-3: Sort Program Summary Report

The Sort Program Summary Report provides performance statistics for an individual sort program accumulated over one or more runs that were previously completed. A list of the runs included in the report is provided at the beginning of the report. The Sort Program Summary Report is divided into two sections: time counts and production counts.

NOTE: The information presented in each field of the Sort Program Summary Report is the arithmetic sum of the data for each of the runs that are contained in the report.

APPS
Sort Program Summary Report

Software Version: <SWVERSION> Page 1 of 4 <DATEPRINTED>

Office	x	Selected Sort Program	<FILENAME>
Machine Number	x		
Number of Runs	x		
Time Period Start	mm/dd/yy		
Time Period Stop	mm/dd/yy		

Selected Runs

Date	Tour Number	Run Number	Run Start Time	Run Stop Time	Induction Area	MODS Number
mm/dd/yy	x	x	0:00:00	0:00:00	x	x
mm/dd/yy	x	x	0:00:00	0:00:00	x	x
mm/dd/yy	x	x	0:00:00	0:00:00	x	x

APPS
Sort Program Summary Report

Software Version: <SWVERSION> Page 2 of 4 <DATEPRINTED>

3.1 Time Counts

Operational Time	0:00:00
Idle Time	0:00:00
Run Time	0:00:00
Down Time	0:00:00

APPS
Sort Program Summary Report

Software Version: <SWVERSION> Page 3 of 4 <DATEPRINTED>

3.2 Production Totals

		Total	Rate
Total Pieces Fed		0	
Total Pieces Accepted		0	0
	BCR/OCR	0	0
	VCS	0	0
	Manual Induct	0	0
Total Pieces Sorted		0	0
	BCR/OCR	0	0
	VCS	0	0
	Manual Induct	0	0
Total Pieces Rejected		0	0
	Out of Sort Program	0	0
	VCS Timeout	0	0
	VCS Keyer Reject	0	0
	Manual Keyer Reject	0	0
	Mechanical Reject		
	Out of SPEC	0	0
	AARS Reject	0	0
	Sweep Recirc Reject	0	0
	AARS Recirc Reject	0	0
	Bin Disabled Reject	0	0
Total APPS Rate			
	Throughput/Operational-Hr	0	
	Sorted/Operational-Hr	0	
	Throughput/Run-Hr	0	
	Sorted/Run-Hr	0	

APPS
Sort Program Summary Report

Software Version: <SWVERSION> Page 4 of 4 <DATEPRINTED>

Bin Volume

Bin	**Pieces**	**% of Total**	**BCR/OCR**	**VCS**	**Manual**
1	0	0	0	0	0
2	0	0	0	0	0
3	.	.	.	.	.
4	.	.	.	.	.
5	.	.	.	.	.
6					
7					
8					
9					
10					
.					
.					
501	0		0	0	0
502	0		0	0	0
503	0		0	0	0
504	0		0	0	0

Appendix D-4: End of Tour Report

APPS
End of Tour Report

Software Version: <SWVERSION> Page 1 of 5 <DATEPRINTED>

Office
Machine
Number

Tour Number
MODS Day

1.1 Time Counts

Run	Start Time	Stop Time	Idle Time	Run Time	Down Time	Maint Time	Jam Time	E-Stop Time
		0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
		0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
		.	.	.	.	.	.	.
		.	.	.	.	.	.	.
		0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00

		Idle Time	Run Time	Down Time	Maint Time	Jam Time
System Side 1						
	Auto Induction Lane 1	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
		.	.	.	.	.
		.	.	.	.	.
	Auto Induction Lane 2	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 3	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Semi-Auto Induction Lane	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
Side 2						
	Auto Induction Lane 1	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 2	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 3	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Semi-Auto Induction Lane	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00

MODS Operational Run Time

MODS Number	Run Time

APPS
End of Tour Report

Software Version: <SWVERSION> Page 2 of 5 <DATEPRINTED>

1.2 Production Totals

		Total	Rate
Total Pieces Fed		0	
Total Pieces Accepted		0	0
	BCR/OCR	0	0
	VCS	0	0
	Manual Induct	0	0
Total Pieces Sorted		0	0
	BCR/OCR	0	0
	VCS	0	0
	Manual Induct	0	0
Total Pieces Rejected		0	0
	Out of Sort Program	0	0
	VCS Timeout	0	0
	VCS Keyer Reject	0	0
	Manual Keyer Reject	0	0
	Mechanical Reject		
	Out of SPEC	0	0
	AARS Reject	0	0
	Sweep Recirc Reject	0	0
	AARS Recirc Reject	0	0
	Bin Disabled Reject	0	0
Total APPS Rate			
	Throughput/Operational-Hr	0	
	Sorted/Operational-Hr	0	
	Throughput/Run-Hr	0	
	Sorted/Run-Hr	0	
Overall Equipment Effectiveness			
	OEE (Overall)	0.00	
	Machine Availability	0.00	
	Machine Performance	0.00	
	Machine Quality	0.00	
	Machine Efficiency	0.00	
	Target Throughput	x	

APPS

End of Tour Report

Software Version: <SWVERSION> Page 3 of 5 <DATEPRINTED>

		Total	% of Accept	Induction Area 1	Induction Area 2
BCR/OCR	3-digit	0	0%		
	5-digit	0	0%		
	9-digit	0	0%		
	OEL	0	0%		
	Foreign	0	0%		
	Presort Sticker	0	0%		
	5-digit Postnet	0	0%		
	9-digit Postnet	0	0%		
	11-digit Postnet	0	0%		
	Planet	0	0%		
	5-digit Delivery Conf ZIP	0	0%		
	9-digit Delivery Conf ZIP	0	0%		
	BMC	0	0%		
	IBIP	0	0%		
	Special Services	0	0%		
VCS	3-digit	0	0%		
	5-digit	0	0%		
	9-digit	0	0%		
	OEL/Presort Sticker	0	0%		
	Foreign	0	0%		
Manual Key		0	0%		
Totals	3-digit	0	0%		
	5-digit	0	0%		
	9-digit	0	0%		
	Foreign	0	0%		
	OEL/Presort Sticker	0	0%		
Typing	Bundle Flat	0	0%		
	Bundle Letter	0	0%		
	Parcel	0	0%		

APPS
End of Tour Report

Software Version: <SWVERSION> Page 4 of 5 <DATEPRINTED>

2 Maintenance Report

Critical Faults

Date	Time	RTF	Description
mm/dd/yy	0:00:00	x	x

Incidents Opened

Date	Time	Incident #	Description
mm/dd/yy	0:00:00	x	x

Carrier Cell Faults

Date	Time	Carrier Cell	Description
mm/dd/yy	0:00:00	x	x

Network Errors

Date	Time	Subsystem	Description
mm/dd/yy	0:00:00	x	x

APPS
End of Tour Report

Software Version: <SWVERSION> Page 5 of 5 <DATEPRINTED>

Number of Logbook Incidents Opened
Maximum Number of Carrier Cells Lost
Number Carrier Cells Taken In and Out of Service at least Twice
Average Induction Time
- Side 1
  - Induct Lane 1
  - Induct Lane 2
  - Induct Lane 3
  - Semi-Auto Lane
- Side 2
  - Induct Lane 1
  - Induct Lane 2
  - Induct Lane 3
  - Semi-Auto Lane

Lost Performance Due to Down Time
Number of Emergency Stop
Number of Interlocks Broken
Number of Network Errors
Singulator Rejects
- Side 1
  - Doubles Count
  - Gap Error Count
- Side 2
  - Double Count
  - Gap Error Count

Number of Full Bins
Average Time to Sweep a Bin
VCS Interface Down Time

Appendix D-5: Selected Period Summary Report

This report includes all of the runs (for the days) in the period specified by the user. The Selected Reports table at the beginning of the report lists the runs that are summarized by the report. The Time Counts table lists the system times for each of the days that are included in the report. The total row contains the sum for that column.

APPS
Selected Period Summary Report

Software Version: <SWVERSION> Page 1 of 5 <DATEPRINTED>

Office	x
Machine Number	x
Number of Runs	x
Time Period Start	mm/dd/yy
Time Period Stop	mm/dd/yy

Selected Reports

Date	Tour	Run	Sort Program
mm/dd/yy	x	x	*<filename>*
mm/dd/yy	x	x	*<filename>*
mm/dd/yy	x	x	*<filename>*
.	.	.	.
.	.	.	.

1.1 Time Counts

MODS Day Date	Operational Time	Idle Time	Run Time	Down Time	Maint Time	Jam Time	E-Stop Time
SRD1	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
SRD2	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
Total	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00

APPS

Selected Period Summary Report

Software Version: <SWVERSION> Page 2 of 5 <DATEPRINTED>

1.2 Production Totals

Total Pieces Fed		0	
		Total	**Rate**
Total Pieces Accepted		0	0
	BCR/OCR	0	0
	VCS	0	0
	Manual Induct	0	0
Total Pieces Sorted		0	0
	BCR/OCR	0	0
	VCS	0	0
	Manual Induct	0	0
Total Pieces Rejected		0	0
	Out of Sort Program	0	0
	VCS Timeout	0	0
	VCS Keyer Reject	0	0
	Manual Keyer Reject	0	0
	Mechanical Reject		
	Out of SPEC	0	0
	AARS Reject	0	0
	Sweep Recirc Reject	0	0
	AARS Recirc Reject	0	0
	Bin Disabled Reject	0	0
Total APPS Rate			
	Throughput/Operational-Hr	0	
	Sorted/Operational-Hr	0	
	Throughput/Run-Hr	0	
	Sorted/Run-Hr	0	
Overall Equipment Effectiveness		Single	Dual
	OEE (Overall)	0.00	0.00
	Machine Availability	0.00	0.00
	Machine Performance	0.00	0.00
	Machine Quality	0.00	0.00
	Machine Efficiency	0.00	0.00

APPS
Selected Period Summary Report

Software Version: <SWVERSION> Page 3 of 5 <DATEPRINTED>

		Total	% of Accept
BCR/OCR	3-digit	0	0%
	5-digit	0	0%
	9-digit	0	0%
	OEL	0	0%
	Foreign	0	0%
	Presort Sticker	0	0%
	5-digit Postnet	0	0%
	9-digit Postnet	0	0%
	11-digit Postnet	0	0%
	Planet	0	0%
	5-digit Delivery Conf ZIP	0	0%
	9-digit Delivery Conf ZIP	0	0%
	BMC	0	0%
	IBIP	0	0%
	Special Services	0	0%
VCS	3-digit	0	0%
	5-digit	0	0%
	9-digit	0	0%
	OEL/Presort Sticker	0	0%
	Foreign	0	0%
Manual Key		0	0%
Totals	3-digit	0	0%
	5-digit	0	0%
	9-digit	0	0%
	OEL/Presort Sticker	0	0%
	Foreign	0	0%
Typing	Bundle Flat	0	0%
	Bundle Letter	0	0%
	Parcel	0	0%

APPS
Selected Period Summary Report

Software Version: <SWVERSION> Page 4 of 5 <DATEPRINTED>

3 Maintenance Report

Critical Faults

Date	Time	RTF	Description
mm/dd/yy	0:00:00	x	x

Incidents Opened

Date	Time	Incident #	Description
mm/dd/yy	0:00:00	x	x

Carrier Cell Faults

Date	Time	Carrier Cell	Description
mm/dd/yy	0:00:00	x	x

Network Errors

Date	Time	Subsystem	Description
mm/dd/yy	0:00:00	x	x

APPS
Selected Period Summary Report

Software Version: <SWVERSION> Page 5 of 5 <DATEPRINTED>

Number of Logbook Incidents Opened	0
Maximum Number of Carrier Cells Lost	0
Number Carrier Cells Taken In and Out of Service at least Twice	0
Average Induction Time	
Side 1	
Induct Lane 1	0
Induct Lane 2	0
Induct Lane 3	0
Semi-Auto Lane	0
Side 2	
Induct Lane 1	0
Induct Lane 2	0
Induct Lane 3	0
Semi-Auto Lane	0
Lost Performance Due to Down Time	0
Number of Emergency Stops	0
Number of Interlocks Broken	0
Number of Network Errors	0
Singulator Rejects	0%
Side 1	0%
Doubles Count	0%
Gap Error Count	0%
Side 2	0%
Doubles Count	0%
Gap Error Count	0%
Number of Full Bins	0
Average Time to Sweep a Bin	0:00:00
VCS Interface Down Time	0:00:00

Appendix D-6: Density Analysis Report

The Density Analysis Report provides statistical data for a specified sort program. The information in the report is based on mail-pieces that were successfully processed and may be sorted by output/bin number, Key Code/ZIP Code, or by the number of pieces in each output/bin. The sample provided is sorted by output/bin number.

APPS
Density Analysis Report

Software Version: <SWVERSION> Page 1 of 2 <DATEPRINTED>

Office	x
Machine Number	x
Time Period Start	mm/dd/yy 0:00:00
Time Period End	mm/dd/yy 0:00:00
Sort Program Name	*<filename>*
Sort Program Date	mm/dd/yy
Pieces Fed	0
Pieces Accepted	0

APPS
Density Analysis Report

Software Version: <SWVERSION> Page 2 of 2 <DATEPRINTED>

Bin Information

Bin Number	ZIP	Count	% of Fed	Volume	Weight
<Bin 1>	*<ZIP 1>*	0	0	0	0
<Bin 1>	*<ZIP 2>*	0	0	0	0
<Bin 2>	*<ZIP 3>*	0	0	0	0
<Bin 3>	*<ZIP 4>*	0	0	0	0
<Bin 4>	*<ZIP 5>*	0	0	0	0
<Bin 4>	*<ZIP 6>*	0	0	0	0
<Bin 4>	*<ZIP 7>*	0	0	0	0
<Bin 5>	*<ZIP 8>*	0	0	0	0
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.

Appendix D-7: Online Machine Summary

APPS
Online Machine Summary

Software Version: <SWVERSION> Page 1 of 6 <DATEPRINTED>

Office	x	Tour Number		Run Number	
Machine Number	x	Number of Personnel		MODS Number	
Supervisor	x	Sortplan		Induction Area	

1.1 Time Counts

Start Time	mm/dd/yy	0:00:00	Operational Time	0:00:00
Stop Time	mm/dd/yy	0:00:00	E Stop Time	0:00:00

		Idle Time	Run Time	Down Time	Maint Time	Jam Time
System Side 1						
	Auto Induction Lane 1	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
		.	.	.	.	.
		.	.	.	.	.
	Auto Induction Lane 2	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 3	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Semi-Auto Induction Lane	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
Side 2						
	Auto Induction Lane 1	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 2	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Auto Induction Lane 3	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
	Semi-Auto Induction Lane	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00

1.2 Production Totals:

	Total Pieces Fed	Total Pieces Accepted	Total Pieces Sorted	Total Pieces Rejected
System Side 1				
Auto Induction Lane 1	0	0	0	
Auto Induction Lane 2	0	0	0	
Auto Induction Lane 3	0	0	0	
Semi-Auto Induction Lane	0	0	0	
Side 2				
Auto Induction Lane 1	0	0	0	
Auto Induction Lane 2	0	0	0	
Auto Induction Lane 3	0	0	0	
Semi-Auto Induction Lane	0	0	0	

APPS
Online Machine Summary

Software Version: <SWVERSION> Page 2 of 6 <DATEPRINTED>

1.2 Production Totals

		Total	Rate
Total Pieces Fed		0	
Total Pieces Accepted		0	0
	BCR/OCR	0	0
	VCS	0	0
	Manual Induct	0	0
Total Pieces Sorted		0	0
	BCR/OCR	0	0
	VCS	0	0
	Manual Induct	0	0
Total Pieces Rejected		0	0
	Out of Sort Plan	0	0
	VCS Timeout	0	0
	VCS Keyer Reject	0	0
	Manual Keyer Reject	0	0
	Mechanical Reject		
	Out of SPEC	0	0
	AARS Reject	0	0
	Sweep Recirc Reject	0	0
	AARS Recirc Reject	0	0
	Bin Disabled Reject	0	0
Total APPS Rate			
	Throughput/Operational-Hr	0	
	Sorted/Operational-Hr	0	
	Throughput/Run-Hr	0	
	Sorted/Run-Hr	0	
Overall Equipment Effectiveness			
	OEE (Overall)	0.00	0.00
	Machine Availability	0.00	0.00
	Machine Performance	0.00	0.00
	Machine Quality	0.00	0.00
	Machine Efficiency	0.00	0.00
	Target Throughput		

APPS
Online Machine Summary

Software Version: <SWVERSION> Page 3 of 6 <DATEPRINTED>

		Total	% of Accept	Induction Area 1	Induction Area 2
BCR/OCR	3-digit	0	0%		
	5-digit	0	0%		
	9-digit	0	0%		
	OEL	0	0%		
	Foreign	0	0%		
	Presort Sticker	0	0%		
	5-digit Postnet	0	0%		
	9-digit Postnet	0	0%		
	11-digit Postnet	0	0%		
	Planet	0	0%		
	5-digit Delivery Conf ZIP	0	0%		
	9-digit Delivery Conf ZIP	0	0%		
	BMC	0	0%		
	IBIP	0	0%		
	Special Services	0	0%		
VCS	3-digit	0	0%		
	5-digit	0	0%		
	9-digit	0	0%		
	OEL/Presort Sticker	0	0%		
	Foreign	0	0%		
Manual Key		0	0%		
Totals	3-digit	0	0%		
	5-digit	0	0%		
	9-digit	0	0%		
	Foreign	0	0%		
	OEL/Presort Sticker	0	0%		
Typing	Bundle Flat	0	0%		
	Bundle Letter	0	0%		
	Parcel	0	0%		

APPS
Online Machine Summary

Software Version: <SWVERSION> Page 4 of 6 <DATEPRINTED>

Bin Volume

Bin	Pieces	% of Total	BCR/OCR	VCS	Manual
1	0	0	0	0	0
2	0	0	0	0	0
3	.	.	.	.	.
4	.	.	.	.	.
5	.	.	.	.	.
6					
7					
8					
9					
10					
.					
.					
501	0		0	0	0
502	0		0	0	0
503	0		0	0	0

APPS
Online Machine Summary

Software Version: <SWVERSION> Page 5 of 6 <DATEPRINTED>

1.3 Carrier Route Report

ZIP	CID	TCR
<ZIP 1>	*<CID 1>*	0
<ZIP 1>	*<CID 2>*	0
<ZIP 1>	*<CID 3>*	0

APPS
Online Machine Summary

1.4 Maintenance Report

Number of Logbook Incidents Opened	0
Maximum Number of Carrier Cells Lost	0
Number Carrier Cells Taken In and Out of Service at least Twice	0
Average Induction Time	
Side 1	
Induct Lane 1	0
Induct Lane 2	0
Induct Lane 3	0
Semi-Auto Lane	0
Side 2	
Induct Lane 1	0
Induct Lane 2	0
Induct Lane 3	0
Semi-Auto Lane	0
Lost Performance Due to Down Time	
Number of Emergency Stops	0
Number of Interlocks Broken	0
Number of Network Errors	0
Singulator Rejects	0%
Side 1	
Doubles Count	0%
Gap Error Count	0%
Side 2	
Doubles Count	0%
Gap Error Count	0%
Number of Full Bins	0
Average Time to Sweep a Bin	0:00:00
VCS Interface Down Time	0:00:00

Appendix D-8: General Field Descriptions

Below are some of the common field descriptions. Not all are used in every report, and not every field is defined.

Field	Description
Office	The name of the office performing the run.
Machine Number	The serial number for the APPS machine.
Supervisor	The name of the supervisor for the run.
Tour Number	The Tour Number in which the run took place.
Number of Personnel	The number of people working on the run.
Sort Program	The sort program file name.
Run Number	The Run Number for the run.
MODS Number	The MODS Number for the run.
Induction Area	The induction area on which the run took place; valid values are "1," "2," or "1&2."
MODS Date	The date the run was started, adjusted to conform to the MODS Day Start Time.

General Section of Selected Period Summary Report

Fields under "Selected Reports" are described below.

Field	Description
Date	MODS Day for the specific run.
Tour	Tour Number in the MODS Day for the specific run.
Run	Run Number in the specific Tour Number and MODS Day.
Sort Program	File name of the sort program used for the specific run.

1.1 Time Counts

Field	Description
Start Time (Run)	Time when the run started. This is set when the user sets up the run on the SMC. **Note:** Time is local time.
Stop Time (Run)	Time when the run ended. This is set when the user ends the run via the SMC. **Note:** Time is local time.
Start Time (Tour)	Start Time for Tour X. **Note:** Time is local time.
Stop Time (Tour)	Stop Time for Tour X. **Note:** Time is local time.
Operational Time	The amount of time for a run. Operational Time = Stop Time – Start Time
E-Stop Time *	The amount of time the system has been stopped because of an E-Stop.
Idle Time *	The amount of time the system, side, or induction lane is not processing mail. Idle Time = Operational Time – (Run Time + Down Time + Jam Time) **Note:** Idle Time for the Induction Lanes will not add up to the Idle Time for the Side. **Note:** Idle Time for the Sides will not necessarily add up to the System Idle Time.
Run Time *	The amount of time the system, side, or induction lane is processing mail. Run Time is started when the FSD successfully responds to the Startup command. The stop time for this parameter is when the system, side, or individual induction lane enters Down Time, Jam Time, or Idle Time. **Note:** Run Time for the Induction Lanes will not add up to the Run Time for the Side. **Note:** Run Time for the Sides will not necessarily add up to the System Run Time.
Down Time *	The amount of time the system, side, or induction lane is down due to Emergency Stops, maintenance activities, and other events. Down Time = Maintenance Time + E-Stop Time + Power Outage Time + Fire Alarm Time **Note:** Down Time for the Induction Lanes will not add up to the Down Time for the Side. **Note:** Down Time for the Sides will not necessarily add up to the System Down Time.
Maintenance Time *	The amount of time the system, side, or induction lane is down due to a hardware or software fault that stops the system, side, or individual induction lane. **Note:** Maintenance Time for the Induction Lanes will not add up to the Maintenance Time for the Side. **Note:** Maintenance Time for the Sides will not necessarily add up to the System Maintenance Time.
Jam Time *	The amount of time the system, side, or induction lane is down due to a jam that stops the system, side, or individual induction lane. **Note:** Jam Time for the Induction Lanes will not add up to the Jam Time for the Side. **Note:** Jam Time for the Sides will not necessarily add up to the System Jam Time.

*Idle Time, Run Time, Down Time, Maintenance Time, Jam Time, and E-Stop Time reported for each Tour on the End of Day Report represent the times reported under "System" on the corresponding End of Tour Reports.

1.2 Production Totals

Field	Description
Total Pieces Fed (System)	Number of pieces fed into the system. This is the number of pieces that are inducted onto the sorter. System = Side 1 + Side 2
Total Pieces Fed (Side X)	Number of pieces fed into the system (onto the sorter) from Side X. Side X = Sum of all four induction lanes
Total Pieces Fed (Induction Lane Y)	Number of pieces fed into the system (onto the sorter) from Side X Induction Lane Y.
Total Pieces Accepted (System)	Number of pieces accepted into the system. This is the number of pieces fed onto the sorter that have a good sort program lookup. System = Side 1 + Side 2
Total Pieces Accepted (Side X)	Number of pieces accepted into the system from Side X. Side X = Sum of all four induction lanes
Total Pieces Accepted (Induction Lane Y)	Number of pieces accepted into the system from Side X Induction Lane Y.
Total Pieces Sorted (System)	Number of pieces sorted according to the sort program. This does not include pieces sorted to reject or rework or to a designated reject bin. System = Side 1 + Side 2
Total Pieces Sorted (Side X)	Number of pieces from Side X that were sorted according to the sort program. Side X = Sum of all four induction lanes
Total Pieces Sorted (Induction Lane Y)	Number of pieces from Side X Induction Lane Y that were sorted according to the sort program.
Total Pieces Rejected (System)	Number of pieces rejected in the system. This is the number of pieces that are sent to rework (Bins 501, 502, 503, or 504), a reject bin specified by the sort program, or the out of sort program bin. System = Side 1 + Side 2
Total Pieces Rejected (Side X)	Number of pieces from Side X that are rejected in the system. Side X = Sum of all four induction lanes
Total Pieces Rejected (Induction Lane Y)	Number of pieces from Side X Induction Lane Y that are rejected in the system.
Total Pieces Accepted	
BCR/OCR	Number of pieces accepted into the system (good sort program lookup) using BCR/OCR.
VCS	Number of pieces accepted into the system (good sort program lookup) using VCS.
Manual Induct	Number of pieces accepted into the system (good sort program lookup) that are manually keyed.

Field	Description
Total Pieces Sorted	
BCR/OCR	Number of pieces sorted by the system using BCR/OCR.
VCS	Number of pieces sorted by the system using VCS.
Manual Induct	Number of pieces sorted by the system that are manually keyed.
Total Pieces Rejected by Sorter	
Out of Sort Program	Number of pieces fed into the system that don't have a sort program lookup.
VCS Timeout	Number of pieces fed into the system that were timed-out from VCS.
VCS Keyer Reject	Number of pieces fed into the system that were rejected by a VCS keyer.
Semi-Auto VCS Keyer Reject	Number of pieces fed into the system from the Semi-Auto Induction Station that were rejected by a VCS keyer.
Manual Keyer Reject	Number of pieces fed into the system that were rejected by the Manual Keyer at the Semi-Auto Induction Station.
Induct Reject (Mechanical)	Number of pieces fed into the system that were rejected by the Induction Subsystem.
Sorter Reject (Mechanical)	Number of pieces fed into the system that were rejected by the Sorter Subsystem.
AARS Reject (Mechanical)	Number of pieces fed into the system that were rejected by the AARS because the Image Server Timed Out, the Image Server Buffer was Full, Missed Parcel, or the VCS queue was full.
Sweep Recirc Reject	Number of pieces fed into the system that were rejected because the destination bin was being swept and the piece exceeded the re-circulation count.
AARS Recirc Reject	Number of pieces fed into the system that were rejected because the AARS did not return a result in time and the piece exceeded the re-circulation count.
Bin Disable Reject	Number of pieces rejected because the destination bin was disabled.
Total Pieces Out of Spec	
Over Size	Number of pieces rejected by the FSD or the Semi-Auto Induct as oversize.
Over Weight	Number of pieces rejected by the FSD or the Semi-Auto Induct as overweight.
Total APPS Rate	
Throughput/Operational-Hr	Throughput Rate Per Operational Hour. Rate = Total Pieces Fed/Operational Time
Sorted/Operational-Hr	Sorted Rate Per Operational Hour. Rate = Total Pieces Sorted/Operational Time
Throughput/Run-Hr	Throughput Rate Per Run Hour. Rate = Total Pieces Fed/Run Time

Field	Description
Sorted/Run-Hr	Sorted Rate Per Run Hour. Rate = Total Pieces Sorted/Run Time
Breakdown of Total Pieces Sorted *% of Accept = Total/Total Number of Pieces Accepted into the System*	
BCR/OCR	
3-digit	Number of pieces sorted where the address was resolved using BCR/OCR with a three-digit ZIP Code.
5-digit	Number of pieces sorted where the address was resolved using BCR/OCR with a five-digit ZIP Code.
9-digit	Number of pieces sorted where the address was resolved using BCR/OCR with a nine-digit ZIP Code.
OEL	Number of pieces sorted using BCR/OCR and the Optional Endorsement Line.
Foreign	Number of pieces sorted using BCR/OCR where the address is a foreign address.
Presort Sticker	Number of pieces sorted using BCR/OCR using the Presort Sticker.
5-digit Postnet	Number of pieces sorted using BCR with a five digit Postnet Bar Code.
9-digit Postnet	Number of pieces sorted using BCR with a nine digit Postnet Bar Code.
11-digit Postnet	Number of pieces sorted using BCR with a eleven digit Postnet Bar Code.
Planet	Number of pieces sorted using BCR with a PLANET Bar Code.
5-digit Delivery Conf ZIP	Number of pieces sorted using BCR with a Delivery Confirmation Bar Bode that contained a five-digit ZIP code. The Delivery Confirmation Bar Code is a UCC/EAN 128 bar code with an AI 420 preceding the five-digit ZIP code.
9-digit Delivery Conf ZIP	Number of pieces sorted using BCR with a Delivery Confirmation Bar Code that contained a nine-digit ZIP code. The Delivery Confirmation Bar Code is a UCC/EAN 128 bar code with an AI 420 preceding the nine-digit ZIP code.
BMC	The count of mail-pieces sorted using BCR using a 5-digit ZIP width modulated bar code of the type AIM/USS 128, Code 39 , or I2of5. The AI 9 in the bar code follows the 5-digit ZIP.
IBIP	Number of pieces sorted using BCR that contained a IBIP Bar code.
Special Services	Number of pieces sorted using BCR/OCR and the Special Services code. Special Services codes are typically found in the first two digits of the bar code prefix. The Special service code values are 71, 73, 77, 81, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 35, 36, E0, , 90 and 91.
VCS	
3-digit	Number of pieces sorted where the address was resolved using VCS with a three-digit ZIP Code.
5-digit	Number of pieces sorted where the address was resolved using VCS with a five-digit ZIP Code.

Field	Description
9-digit	Number of pieces sorted where the address was resolved using VCS with a nine-digit ZIP Code.
OEL/Presort Sticker	Number of pieces sorted where the address was resolved using VCS with an OEL or Presort Sticker.
Foreign	Number of pieces sorted where the address was resolved using VCS and the address was a foreign address.
Manual Key	Number of pieces sorted that were manually keyed.
Totals	
3-digit	Total number of pieces sorted that were resolved with a three-digit ZIP Code. NTOT3 = NBO3 + NV3
5-digit	Total number of pieces sorted that were resolved with a five-digit ZIP Code. NTOT5 = NBO5 + NV5
9-digit	Total number of pieces sorted that were resolved with a nine-digit ZIP Code. NTOT9 = NBO9 + NV9
Foreign	Total number of pieces sorted that contain a foreign address. NTOTFGN = NBOFGN + NVFGN
OEL/Presort Sticker	Total number of pieces sorted that were sorted using the OEL or Presort Sticker. NTOTPS = NBOOEL + NBOPS + NVOELPS
Typing	
Bundle Flat	Number of pieces sorted that have a package type of bundle flats.
Bundle Letter	Number of pieces sorted that have a package type of bundle letters.
Parcel	Number of pieces sorted that have a package type of package.

Overall Equipment Effectiveness

Field	Description
OEE (Overall)	Overall Equipment Effectiveness. OEE = (Machine Availability) x (Machine Performance) x (Machine Quality)
Machine Availability	The amount of run time divided by the sum of the run time and the down time. Machine Availability = Run Time/(Run Time + Down Time)
Machine Performance	Total pieces fed per hour of operation divided by the machine target rate. Machine Performance = Total Pieces Fed/(Operational Time x Target Throughput)
Machine Quality	Total pieces sorted divided by the total pieces fed. Machine Quality = Total Pieces Sorted/Total Pieces Fed
Machine Efficiency	Total pieces fed per run hour divided by the machine target rate. Machine Efficiency = Total Pieces Fed/(Run Time x Target Throughput)
Target Throughput	Machine target rate. This number is dependent on the configuration and usage of the machine, as follows: 1. 14,900 Pieces/Hr – Dual-sided machine with one sort program running on both sides of the machine. 2. 9,310 Pieces/Hr – Dual-sided machine with one sort program running on one side of the machine. 3. 9,310 Pieces/Hr – Single-sided machine.

Bin Volume

This section includes totals for the Rework Overflow Outputs/Bins (#501 & #503) and the Rework Roller Conveyors (Outputs/Bins #502 and #504) leading to the Semi-Auto Induction Stations.

Field	Description
Pieces	Number of pieces sorted to Bin X.
% of Total	Percentage of pieces sorted to Bin X as compared to the total number of pieces sorted.
BCR/OCR	Number of pieces sorted to Bin X that were resolved using BCR/OCR.
VCS	Number of pieces sorted to Bin X that were resolved using VCS.
Manual	Number of pieces sorted to Bin X that were manually keyed.

1.3 Carrier Route Report

Field	Description
ZIP	5-digit ZIP Code X
CID	Specific Carrier ID for ZIP Code X
TCR	Number of pieces for the specific Carrier ID for ZIP Code X
Total	Total number of pieces for ZIP Code X

1.4 Maintenance Report

Field	Description
Critical Faults, Incidents Opened, Carrier Cell Faults, Network Errors	
Date	Date fault occurred or incident was opened.
Time	Time that fault occurred or incident was opened.
RTF	Real Time Fault number of critical fault.
Incident #	Incident number.
Carrier Cell	Carrier cell number.
Subsystem	Subsystem affected by network error.
Description	Text description of the fault or incident.
Number of Logbook Incidents Opened	Number of open incidents created.
Maximum Number of Carrier Cells Lost	Maximum number of carrier cells lost at a single point in time.
Number Carrier Cells Taken In and Out of Service at Least Twice	Number of carrier cells taken out of service and then reinstated two or more times.
Average Induction Time	Average time between image capture and induction onto the sorter for pieces passing through a specific induction lane.
Lost Performance Due to Down Time	The number of pieces that could have been processed, but weren't, due to Down Time. This parameter is computed as the amount of Down Time multiplied by the Machine Target Rate. Lost Performance = Sum of Down Time Seconds divided by Machine Target Rate divided by 3600 seconds per hour.
Number of Emergency Stops	Number of Emergency Stops activated.
Number of Interlocks Broken	Number of Interlocks broken.
Number of Network Errors	The total number of times that the SMS lost connection with an APPS subsystem.
Singulator Rejects	Percentage of pieces not properly singulated (either doubles or under-spaced). This parameter is computed as the total singulation errors (on the system or side) divided by the total pieces singulated (on the system or side) times 100. Singulator Rejects = (Total Singulation Errors/Total Pieces Singulated) x 100 Total Singulation Errors = Doubles Count + Gap Errors Count
Doubles Count	Percentage of pieces rejected as doubles on Side X. Doubles Count = (Total Doubles Count on Side X/Total Pieces Singulated on Side X) x 100

Field	Description
Gap Error Count	Percentage of pieces rejected on Side X because they were under-spaced. Gap Error Count = (Total Gap Errors on Side X/Total Pieces Singulated on Side X) x 100
Number of Full Bins	The total number of bins that the sorter identifies as full.
Average Time to Sweep a Bin	The time to sweep a bin is the amount of time between the sorter notifying the SMS that a bin needs to be swept and the user pressing the sweep button. Average Time to Sweep a Bin = Total Time to Sweep/Bins Swept
VCS Interface Down Time	Amount of time that the VCS Interface was down.

Density Analysis Report

Fields under "Bin Information" are described below.

Field	Description
Bin Number	Bin X.
ZIP	The five-digit ZIP Code that is sorted to Bin X.
Count	Total number of pieces sorted to Bin X for the specific five-digit ZIP Code.
% of Fed	Percentage of the total pieces fed onto the sorter that were sorted to Bin X for the specific five-digit ZIP Code. % of Fed = (Count/Pieces Fed) x 100
Volume	Total volume of pieces sorted to Bin X (in square feet) for the specific five-digit ZIP Code.
Weight	Total weight of pieces sorted to Bin X (in pounds) for the specific five-digit ZIP Code.

Appendix E: Labels and Placards

Figure AE-1: One-Inch Label

Figure AE-2: Two-Inch Label

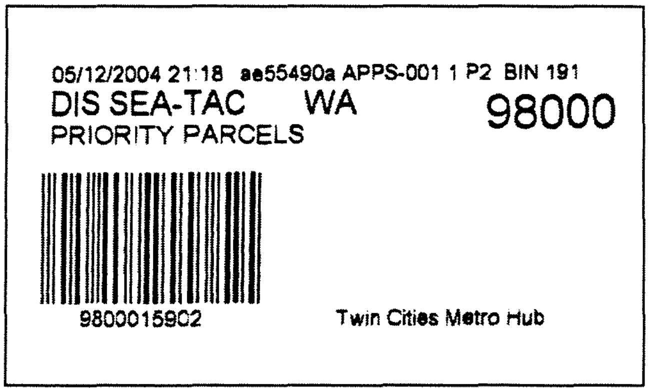


Figure AE-3: Placard

The actual size of a placard is two per one 8 ½" x 11" sheet of paper. The example below is not to scale.

DE55413A APPS-001 001 PRT3 BIN 139

RANDOLPH 54065

5D & CRRT BIN 139

Twin Cities Metro Hub 55413

DE55413A APPS-001 001 PRT3 BIN 139

RANDOLPH 54065

5D & CRRT BIN 139

Twin Cities Metro Hub 55413

Appendix F: APPS Staffing Report

This spreadsheet is in MS-Excel® format and can be accessed from the cd-rom located in the back of this *APPS Methods Guide*. Updates to the tool will be available on the USPS® Intranet under "Engineering."

Recommended APPS Staffing:

Twin Cities MN Metro Hub **31-Aug-2004**

	Number of Inductions	Number of Outputs	Configuration
System Configuration:	**Dual**	**198**	**Closed**
Mail Class / Type:	**Standard/Periodicals /**	**Incoming**	
Sort Program Name:	**Minneapolis/St Paul**		

Recommended Maximum Staffing Number:

Feed Subsystem(s):	**5**
Semi-Automatic Subsystem(s):	**2**
Sorter Subsystem:	**3**
Total No. of Staff:	**10**

NOTE: On dual induction systems, if recommended number is odd, assign the third person to the induct feeding the greater number of pallets and/or hampers.

Notes:

The staffing recommendations are based on the system requirements at a "steady state" of operation and using standardized methods. The APPS staffing tool is to be used in conjunction with the APPS Methods Guide.
The staffing recommendations do not include resources for rotations, breaks, leave, or DCO staffing at RECs.
Staffing recommendations change as site-specific new or updated information is provided to the model.
The largest capacity containers are assigned to the highest density distribution points in descending order.

APPENDIX G: APPS Related Acronyms

AARS	Automatic Address Recognition Subystem
ACS	Address Change Service
ADC	Area Distribution Center
AFF	Automated Flats Feeder
AFSM	Automated Flat Sorting Machine
APC	All Purpose Container
APCU	All Purpose Container Unloader
ATHS	Automated Tray Handling System
ATS	Automatic Tray Sleever
BCR	Bar Code Reader
BCS	Bar Code System
BMC	Bulk Mail Container
BMC	Bulk Mail Center
BMEU	Business Mail Entry Unit
CFS	Computerized Forwarding System
CIN	Contents Identification Number
CSBCS	Carrier Sequence Bar Code Sorter
DAR	Decision Analysis Report
DBCS	Delivery Bar Code Server
DCS	Data Collection Subsystem
DCO	Data Collection Operator
DOD	Day of Delivery
DPPS	Delivery Print Packaging System
EOD	End Of Day
EOR	End Of Report
EOT	End Of Tour
ERMC	Eastern Regional Mail Container
ESD(s)	Electrostatic Discharge (Sensitive)
ESSPK	Equipment Site Spares Kit
E-STOP	Emergency Stop Switch
FAR	Flat Address Reader
FAT	First Article Test
FEs	Field Engineers
FFT	Flats Forwarding Terminal
FICS	Flat Identification Code System
FIFO	First In First Out
FIRES	Flat Interim Remote Encoding System
FMC	Flat Mail Carts
FSD	Feed Singulate Distribution
FSM	Flat Sorting Machine
FSS	Flats Sequencing System
GPMC	General Purpose Mail Container
GUI	Graphical User Interface
HASP	Hub and Spoke Project
HD	High Density
HMI	Human Machine Interface

I/S	Induction Station
IDS	Integrated Data System
IFMCC	In-Feed Main Control Cabinet
IMCC	Induction Main Control Cabinet
INP	Incoming Primary
INS	Incoming Secondary
INT	International
IOS	Interoperability Specification
IPF	Integrated Processing Facility
IPP	Irregular Parcels and Pieces
IS	Image Server
LAN	Local Area Network
LCD	Liquid Crystal Display
LDC	Labor Distribution Code
LED	Light Emitting Diode
LIPS	Linear Integrated Parcel Sorter
MAINT	Maintenance
MCC	Main Control Cabinet
MCR	Master Control Relay
MDC	Material Distribution Center
MDP	Main Distribution Panel
MEA	Maintenance Engineering Analyst
MHE	Mail Handling Equipment
MMP	Managed Mail Processing
MODS	Management Operating Data System
MPC	Mail Processing Code
MPE	Mail Processing Equipment
MPE	Main Processing Equipment
MS	Maintenance Series
MSF	Maintenance Support Facility
MSHB	Maintenance Series Handbook
MT	Maintenance Technician
MTE	Mail Transport Equipment
MTESC	Mail Transport Equipment Service Centers
MTSC	Maintenance Technical Support Center
N/A	Not Applicable
NCED	National Center for Employee Development
NDSS	National Directory Support System
NEC	National Electric Code
OCC	Output Control Cabinet
OCR	Optical Character Recognition
ODBC	Open Database Connectivity
OEL	Optional Endorsement Line
OEM	Original Equipment Manufacturer
OIT	Operator Interface Terminal
OS	Operating System
OSHA	Occupational Safety and Health Administration
OTR	Over the Road Container
P&DC	Processing and Distribution Center
PARS	Postal Automation Redirection System
PC	Personal Computer
PC104	Re-architecture of SPBS Control System
PEDC	Postal Employee Development Center

PKG	Package
POSTNET	Postal Numerical Encoding System
PRI	Priority
PSTN	Postal Satellite Training System
PT/SV	Package Typing/Singulation Verification
PVDS	Plant Verified Drop Shipment
RBDS	Rule-Based Decision System
REC	Remote Encoding Center
RTF	Run Time Fault
RTS	Return to Sender
SAR	Secondary Address Reader
SCF	Sectional Center Facility
SIC	Semi-automatic Induction Controller
SiS	Singulation Subsystem
SLDI	Side LASER Dimensioning Instrumentation
SM	System Manager
SMCC	Sorter Main Control Cabinet
SMS	System Manager Subsystem
SN	Serial Number
SPBS	Small Parcel and Bundle Sorter
SPC	Sort program Compiler
SS	Subsystem Specification
SSPK	Site Spare Parts Kit
STF	Standard Text File
SUPV	Supervisor
TLDI	Top LASER Dimensioning Instrumentation
TMDC	Topeka Material Distribution Center
TMS	Tray Management System
TRT	Total Run Time
TTT	Train The Trainer
UAA	Undeliverable As Addressed
UFSM	Upgraded Flat Sorting Machine
UPS	Uninterruptible Power Supply
USPS®	United States Postal Service®
VCC	Video Coding Computer
VCS	Video Coding Subsystem
VDT	Video Display Terminal
WABCR	Wide Area Bar Code Reader
WAN	Wide Area Network
WebEOR	Web End or Run
WebMODS	Web Management Operating Data System
Wiretainer	Wire Container
WSU	Work Space Unit
ZIP	Zone Improvement Program

APPS Staffing Worksheet Instructions

Select or Enter the following data:

Site / Configuration

Site Name: Facility name, select from pull down list.

Machine Type: Select machine type Open or Closed loop.

Number of Inductions: Select Single or Dual induction(s).

Number of Outputs: Enter the number of outputs used in the sort program.
Single induction systems can be configured from 1 to 150 outputs.
Dual induction systems can be configured from 1 to 208 outputs.
The number of outputs used to estimate staffing can be less than the physical number on the system. The number entered in this cell should equal the actual number of outputs assigned in the sort program.

Mail Processing

Mail Class: Select class from First, Standard/Periodicals, or Priority.

Distribution Type: Select Incoming or Outgoing distribution.

Sort Program Name:
Site can input any sort program name for easy reference; input name prints on report.

Container Information

Induction / Feed: Enter the estimated percentage of each type of container that will be unloaded for the mail type and sort program selected. Range is 0% to 100%, with a maximum total of 100%.
Induction container types include: BMC/OTR, ERMC/GPMC, Wiretainer, Hamper, Pallet. Sacks are NOT a valid container type for input, as sufficient mail volume cannot be produced from sacks unloaded at the load conveyor to sustain the optimal throughput of the system.

Sorter / Outputs: Enter the actual number of each type of container that is assigned to the outputs for the sort program selected. Range is 0 to the number selected in the system "outputs" cell in the "Sort Configuration" section.
Sorter output container types include Half Pallet Box, Wiretainer, Hamper, U-Cart, Sack/Pouch.

Staffing Preview and Report

The staffing preview section provides an instant "what-if" result.
The report page includes important notes that qualify the results generated by the model.
The view button will preview the printed report and provide the opportunity to print
The print button initiates a one copy print job, to the assigned windows printer.

APPS Site Information

Site Name: Twin Cities MN Metro Hub

Date: 12-Sep-2004

APPS Physical / Sort Configuration

System Type: Closed

Number of Inductions: Dual

Number of Outputs: 198

Staffing Preview:

Feed:	5
Semi-Automatic:	2
Sorter:	3
Total No. of Staff:	10

Mail Processing Information

Mail Class:	Distribution Type:	Sort Program Name:
Standard/Periodicals	Incoming	Minneapolis/St. Paul

Container Information

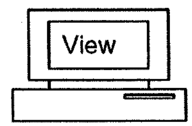
Induction / Feed

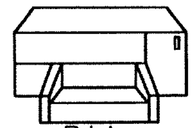
Type:	Percentage of Unloaded Containers:
BMC/OTR	0%
ERMC/GPMC	25%
Wiretainer	25%
Hamper	0%
Pallet	50%
Total	100%

Sorter / Outputs

Type:	Number of Output Containers:
Half Pallet Box	100
Wiretainer	65
Hamper	12
U-Cart	0
Sack/Pouch	21
Total	198

Staffing Report





Recommended APPS Staffing:

Twin Cities MN Metro Hub **12-Sep-2004**

	Number of Inductions	Number of Outputs	Configuration
System Configuration:	**Dual**	**198**	**Closed**
Mail Class / Type:	**Standard/Periodicals** /	**Incoming**	
Sort Program Name:	**Minneapolis/St. Paul**		

Recommended Maximum Staffing Number:

Feed Subsystem(s):	**5**
Semi-Automatic Subsystem(s):	**2**
Sorter Subsystem:	**3**
Total No. of Staff:	**10**

NOTE: On dual induction systems, if recommended number is odd, assign the third person to the induct feeding the greater number of pallets and/or hampers.

Notes:

The staffing recommendations are based on the system requirements at a "steady state" of operation and using standardized methods. The APPS staffing tool is to be used in conjunction with the APPS Methods Guide.

The staffing recommendations do not include resources for rotations, breaks, leave, or DCO staffing at RECs.

Staffing recommendations change as site-specific new or updated information is provided to the model.

The largest capacity containers are assigned to the highest density distribution points in descending order.