TAB 76

FSM 881

Flats Sorting Machine Guidelines

Handbook PO 406-A
December 1993

Flats Sorting Machine (FSM 881) Guidelines

Handbook PO-406-A December 1993

A. Material Transmitted. This is a complete revision of Handbook PO-406, *Flats Sorting Machine (FSM 775) Guidelines*. The identifier has been changed to 406-A.

B. Explanation. This handbook describes the Model 881 Flats Sorting Machine and explains operational procedures to ensure proper implementation.

C. Distribution.

1. **Initial Distribution.** This handbook is distributed to all present and proposed FSM offices, Headquarters, and to Processing and Distribution area offices, centers, and facilities.
2. **Additional Copies.** Order copies from your materiel distribution center (MDC) on Form 7380, *MDC Supply Requisition*.

D. Rescission. This obsoletes all previous issues of Handbook PO-406. Discard all previous issues of this handbook.

E. Effective Date. This material is effective upon receipt.

F. Comments and Questions.

1. **Content.** Address comments or questions regarding the content of this handbook to:
   MANAGER
   PROCESSING POLICIES AND PROGRAMS
   US POSTAL SERVICE
   475 L'ENFANT PLZ SW RM 7540
   WASHINGTON DC 20260-2804
2. **Clarity.** Direct any comments or questions regarding the language or organization of this handbook to:
   DIRECTIVES MANAGEMENT
   US POSTAL SERVICE
   475 L'ENFANT PLZ SW RM 2800
   WASHINGTON DC 20260-1540

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Chapter 1

General Information

110 Overview

111 Introduction

Careful planning, ongoing direction, and coordination are very important to the development, implementation, and continued operation of a successful mechanized operation. It is also important that all levels of management accept and understand new mail processing systems so that they can encourage and support positive attitudes at operating levels.

112 Content

This book outlines procedures to ensure proper implementation of the 881 flats sorter system. In order to derive economic benefits from this new sorter, it is vital that personnel adhere to these procedures.

120 Purpose

This handbook is designed to help postal management establish methods and techniques to properly utilize Model 881 Multiple Position Flats Sorting Machines (MPFSMs) and to provide related information pertinent to effective MPFSM operations.

Chapter 2

Equipment

210 General Description

The Model 881 Flats Sorting Machine (FSM) is a new mechanized flats sorter with four feed stations (two on each end of the machine) that insert flats onto a single transport system. The 881 also has a turnaround wheel at both ends of the machine. The FSM sorts to 100 separations under control of a computer system that translates keycode data to bin destination codes. The Model 881 has five basic components: consoles, bins, end units, control panel, and computer cabinet.

220 Machine Description

221 Consoles

221.1 General Description

There are four operator consoles, two on each side of the FSM at opposite ends. Each console is individually operated and is equipped with the following:

a. An adjustable elbow rest pad.
b. A keyboard assembly with:
   (1) A START button,
   (2) A STOP button, and
   (3) An EMERGENCY STOP button, and
   (4) A key pad (see Appendix 1).
c. An induction belt and window.
d. Color-coded lights.

221.2 Keyboard Assembly

221.21 Keyboard

The keyboard is right-hand operated. The key pad contains 15 unmarked keys to be utilized in alpha distribution. These keys are available for special use in sorting operations and will be defined by each facility. The numbered keys are sequentially arranged from bottom to top (as on an adding machine). The start button on the keyboard turns the feeder belt on and signals the computer that the console is ready. The stop button on the keyboard turns the feeder belt off and signals the computer that the console is idle.

221.22 Key Pad

221.221 *ALT Key*

A TWO-DIGIT or ALT key is located to the left center of the key pad. Operators use this key to activate an alternate file in the sortplan.

221.222 *Repeat Key*

A REPEAT key is located at top center. Operators use this key when two or more flats with the same bin destination run consecutively.

221.223 *CL Key*

A CL (clear) key is located at middle right. Operators use this key to clear codes that have been keyed incorrectly so that a new key code may be accepted.

221.224 *REJ Key*

A REJ (reject) key is located at lower right. This key can be programmed and used for a high-volume direct.

221.23 Keyboard Shelf

221.231 *Adjustable Assembly*

The keyboard assembly is adjustable allowing it to swivel closer to or away from the operator.

221.232 *Adjustable Mount*

The mount adjusts horizontally by releasing the catch located underneath the right side of the shelf.

221.24 Advance Feed Mechanism

221.241 *Step 1*

The feed belt advances flat mail from right to left.

221.242 *Step 2*

As mail approaches the induction station, a HALT switch discontinues the advance.

221.3 Induction Belt

An induction belt is located at each operator console. Keyed flats tossed onto the induction belt activate the photoelectric sensors that insert the flat onto the mail transport belt.

221.4 Console Color-Coded Lights

There are four color-coded lights located above the induction cycle that indicate the status of the induction cycle. The table below shows where the lights appear on the machine in right to left order and identifies their purpose.

Code	Purpose
a. Code (green)	Indicates the code cycle is ready to receive a key code.
b. Wait (yellow)	Indicates a correct key code has been keyed and the induction belt is waiting to move the flat onto the main transport belt.
c. Arc Lk (white)	Indicates the repeat key was hit (provided that a valid code was previously entered).
d. Reject (red)	Indicates that the computer received an improper key code or a code that is non-existent in the sort plan.

222 Bins

222.1 Sort Bins

Fifty programmable sort bins are located on both sides of the machine. Removable flat trays at each bin are intended to be covered, strapped, labeled, and dispatched at a downstream operation.

222.2 Bypass Bin

Bypass occurs when a mailpiece is not diverted at its destination bin. The by-pass may result from any one of the following:

a. A stuck diverter gate;
b. Improper insertion of a flat at an induction station;
c. A momentary jam that causes the flat to slip from its designated position on the transport belt; or
d. One of several other possible events that result in loss of tracking or diverter actuation.

223 End Units

There are two end units, one at each end of the FSM. The movement of the main transport belt is circular and continuous. Flats sorted for bins opposite the keyer are transported around the end unit of the FSM. The end unit covers have an interlock switch that, when lifted, automatically trips the emergency stop circuit.

224 Control Panel

224.1 Location and Function

The control panel is located next to console #1 at one end of the FSM. The panel is primarily used to:

a. indicate if sort plans have been selected and
b. start and stop the machine. The panel also contains indicator lights that, when illuminated, indicate there is trouble with that particular function (see Appendix 2).

224.2 Description

224.21 Start #1 and Start #2 Keys

The key selects which of the two start buttons can start the FSM, start button #1 located on the control panel or start button #2 located on console #3. Removing the key locks out the function.

224.22 Program Indicator Lights

Program indicator light #1 lights up if a sort plan has been selected. All program indicator lights go on if the FSM is in the maintenance mode.

224.23 START Indicator/Button

When pushed, this button causes the FSM motor to start after a 6-second delay. The indicator/button remains lighted when the FSM is running.

224.24 STOP Button

The operator uses the STOP button for normal machine stops. When the STOP button is pushed, power to all feed stations is shut off. The transport belt continues for one revolution to assure that no mail remains in the main transport belt.

224.25 Emergency Stop

When operators activate any EMERGENCY STOP button, the EMERGENCY STOP light on the control panel comes on. The EMERGENCY STOP button causes the machine to stop immediately. Manual reset is necessary before restart. To reset, pull up the button. Interlock switches produce the same results as EMERGENCY STOP buttons. These switches are located at each feed station and on removable panels on turnaround modules. EMERGENCY STOP buttons are located as follows (see Appendix 3):

a. On the control panel,
b. On each keyboard console,
c. On each end unit, and
d. Under every fifth bin/tray.

224.26 **Lights**

The 24V light comes on when the system power is on. The jam light comes on when a jam occurs. A red jam indicator lights up also on the module where the jam occurs. Jam lights reset when the start button is pushed after the jam has been cleared. The following lights identify machine malfunction and indicate maintenance is needed:

a. The MOTOR CIRCUIT BREAKER light,
b. The ELECTRONIC CIRCUIT BREAKER light,
c. The COMPRESSED AIR light, and
d. The ELECTRONIC VOLTAGE light (see Appendix 2).

225 Computer Cabinet

225.1 System Control

A PDP-11/53 computer system located in the computer cabinet controls the operations of the FSM 881.

225.2 Functions

The PDP-11/53 computer and disk drives have information storage capabilities and work together to perform many functions that control the FSM system. Some of these functions include:

a. Storing bin density data.
b. Storing statistical information.
c. Assisting in troubleshooting.
d. Interrupting service for input and output devices.
e. Storing software programs and sort plans.
f. Providing FSM run controls through interface cards.

225.3 Tasks

The PDP-11/53 performs many tasks while the FSM is running. When the tasks have been completed, the PDP-11/53 passes the information to the FSM through interface cards located in the computer cabinet.

230 Printer and Terminal

231 Letter Printer

Currently, a Digital LA210 letter printer is used with the FSM 881.

232 Keyboard and Terminal

A Digital LK201 keyboard and a VT320 display terminal are also currently used with the FSM 881.

233 System Commands

The operator enters FSM 881 system commands via the terminal keyboard. PDP-11/53 computer outputs and management reports are routed to the printer.

240 Flat Mail Barcode Reader

241 Location

A flat mail barcode reader is installed on each side of the FSM 881 on the module following each set of two input stations. At each input station, operators place each barcoded flat mailpiece with the barcode facing outward into the machine for subsequent presentation to the barcode reader.

242 Function

The barcode reader reads a 5-digit, 9-digit, or 11-digit barcode placed in virtually any location on the face of a flat mailpiece and oriented parallel to any edge.

250 Dimensions

The FSM 881 with computer cabinet and printer/terminal measures:

a. Length: 82 feet.
b. Width: 13 feet.
c. Height: 7 feet.

Chapter 3

Criteria For Use

310 Machine Use

311 Makeup Requirements

Use Model 881 Flats Sorting Machines (FSMs) with approved make-up requirements. The area manager, Distribution Networks, must approve changes to the requirements.

312 Volume Requirements

312.1 Controlling Factors

Daily flat volumes and space availability are controlling factors when determining if and how many machines should be located in a post office.

312.2 Sort Rate

The Model 881 has a maximum sort rate of approximately 14,000 pieces per machine hour when using a 100-bin sort plan, and 20,600 when using two 50-bin sort plans.

320 Machine Sort Programs

321 Priorities

Sort programs for outgoing, MMP, SCF, incoming primary, incoming secondary, and box section may be applied to the FSM in the order of priority consistent with service standards. The operational numbers will be in the 140 series for mechanized keying sort plans and in the 960 series for barcode reading sort plans.

322 Authorization

322.1 Authority to Expand

Processing and Distribution plant managers have the authority to establish additional FSM tours as needed.

322.2 Distribution

322.21 **Approval**

Approval authority for distribution sort plans is as follows:

a. The area office manager, Distribution Networks, approves distribution sort plans and changes in intra-SCF distribution.
b. The area office manager, Distribution Networks, approves intra-regional distribution sort plans and changes.

322.22 **Dispatch**

Dispatch make-up must conform to the national labeling instructions.

322.23 **Deviations**

Processing Policies and Programs, Headquarters, approves deviations from requirements mentioned in 322.21 and 322.22.

322.3 Diagram Changes

322.31 **Postmaster/Manager**

Processing and Distribution plant managers are authorized to:

a. Make FSM diagram changes that may involve the relocation or exchange of bin locations, but do not involve the addition or deletion of separation items; and
b. Make changes to the incoming diagrams including additions, deletions, or combination of local zones and firm directs, as needed.

322.32 **Area Office Manager, Distribution Networks**

Diagram changes made at the direction of the area office manager, Distribution Networks, must be forwarded to the area office when completed so that diagram files may be updated.

323 Machine Distribution of Flat Mail

323.1 Sort Plan

Separate flat mail to ADC/SDC, SCF, incoming primary, incoming secondary, firm, box, or ZIP Code according to approved sort plan programs.

323.2 Memory Items

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

323.3 Distribution Accuracy

FSM sort operators must key at an accuracy rate of 95 per cent.

324 Sort Plan Requirements

Use established distribution sort plans to distribute mail to proper separations, observing the criteria listed in 324.1 and 324.2:

324.1 Outgoing Primary

Densities and local service commitments must be the criteria for separation assignments. Distribution requirements, established by the area office as mandatory separations, must also be followed.

324.2 Incoming Secondary

Consider scheme densities, number of routes, firm directs, and box sections when establishing sort plans for incoming secondaries. Use the four consoles of the FSM 881 as follows for secondary distribution:

a. Each console assigned the same sort plan distributing to all 100 bins.
b. Consoles #1 and #2 assigned identical sort plans that sort to Bins #1-50. Consoles #3 and #4 also assigned identical sort plans that sort to Bins #51-100 (two sort plans may also be used with one sort plan assigned to three consoles).
c. All four consoles may be assigned separate sort plans either for keying or barcode reading.

330 Runtime

331 Minimum Runtime

Sufficient volume for start-up and operation at a throughput necessary to achieve acceptable productivity shall be determined locally.

332 Maximum Runtime

Runtime must not preclude access to the FSM for maintenance. Locally established maintenance windows are required to maintain equipment in optimum operating condition.

340 Bin Assignments

341 Label Diagram

Prepare a labeling diagram of the separation and code numbers assigned to each bin. This must be completed prior to machine installation and approved by the area manager, Distribution Networks. Bin assignments for subsequent machines should be identical.

342 Making Bin Assignments

In developing keying sort plans, make bin assignments beginning at bin #1. When developing barcode reading sort programs, make bin assignments beginning at bin #4. Consider each of the following:

a. Sort plans by ZIP Code sequence,
b. Sort plans based upon the most efficient sweep arrangement,
c. Sort plans in which common separations are in the same location, and
d. Sort plans based on bin density.

343 Duplicate Bin Assignments

343.1 Keying Operation

To maximize the efficiency of the FSM 881 system, assign approximately five of the highest density separations to both sides of the FSM (Bins #1-5 and #51-55). The actual number of duplicate bins required is the smallest number of bins, generally not to exceed five, the densities of which total 30-40 percent of the volume for that sort plan.

343.2 Barcode Operation

Due to limitations of the barcode reader, the high density bins for barcode sort programs are bins #4-8 and bins #54-58.

344 Labels

344.1 Distinctive

Make bin labels distinctive by sort plan so that sweepers do not mistakenly read a label assigned to another program.

344.2 Update

Update labels to reflect program changes.

Chapter 4

Conditions for Machine Operation

410 Staffing Guidelines

411 General

When available, craft personnel assigned to the flats sorting machine (FSM) keying operation should be qualified keyboard operators to allow for rotation and leave replacement (sick leave, annual leave, etc.). When sorting completely in the barcode reading mode, consider the use of mail processors.

412 Keyboard and BCS Operations

412.1 Minimum Operators

Maintain the following minimum number of trained employees for each Model 881 machine crew:

a. 5-day week: 9 employees.

b. 7-day week: 11 employees.

412.2 Additional Operators

Those authorized above the crew requirements provide relief for all types of absences.

420 Personnel Requirements

421 Positions

Depending on available and anticipated mail volumes and sort plans being used, the Model 881 uses a maximum of seven positions as follows:

a. Keyboard Operation.
   (1) *Keyers: four.*
   (2) *Sweeper/Loaders: up to three.*

b. BCS Operation.
   (1) *Feeders: four.*
   (2) *Sweeper/Loaders: up to three.*

422 Rotation

422.1 Scheduled Basis

Operators rotate on a scheduled basis to other assignments.

422.2 Frequency

As a matter of day-to-day operating procedure, operators will not key or feed bar coded flats more than 45 minutes per rotation. Determine rotation schedules based on the number of qualified operators assigned. Rotation assignments include keying, sweeping, feeding, and loading the feed table.

430 Quality Control

431 Verification

It is necessary to verify mail sorted during machine operations to assure quality performance and to prevent missent mail caused by either operator error or machine malfunction. Some separations require that more attention be given to verification, while others may require none at all.

432 Diagnostic Testing

Quality Control can perform diagnostic testing to identify FSM quality problems by using the flats sorting machine distribution quality (FSMDQ) test.

440 Environmental Conditions

Control the environmental factors surrounding the flats sorting machine to minimize distractions. Restrict the area in and around the machines to managers or personnel required to be there. Take precautionary measures to keep the area from becoming overrun with equipment.

Chapter 5

FSM Operating Procedures

510 Strategy

Use approved flats sorting machine (FSM) criteria and operating procedures to obtain optimum productivity and efficiency.

520 Supervisor Duties and Responsibilities

Supervisors assigned to the FSM are responsible for:

a. Assigning a loader to ensure that control feed tables are loaded with mail before starting the machine.
b. Ensuring an equitable starting assignment rotation of employees in accordance with 410 (see section 422).
c. Ensuring that sufficient quantities of machinable mail are available for continuous operation.
d. Requiring operators to work whatever assigned distribution is necessary to ensure they retain a working knowledge of and remain proficient in operating the machine.
e. Keeping distribution current and mail sorted in proper time sequence.
f. Requiring that staff report to supervisors immediately and, through them, contact the source unit if excessive amounts of non-machinable mail are received.
g. Requiring that sweepers verify mail, as necessary, prior to making scheduled dispatches.
h. Ensuring safe working conditions and operation of the FSM.
i. Monitoring equipment and crew performance during the operation and reviewing performance reports-error message logs.
j. Contacting maintenance when problems arise or when equipment is not operating effectively.

530 Procedures

531 Pre-Start Procedures

Before operating the machine:

a. Determine the type of mail to be processed.
b. Ensure there is sufficient volume available to achieve operational objectives (see 330).
c. Check these logistics; see that:
   (1) Empty trays are on hand.
   (2) Label holders are filled.
   (3) Sufficient equipment of appropriate style is on hand.
   (4) Feed tables are loaded.

532 Operating the FSM

532.1 User Accounts

532.11 Nonprivileged

When mail processing supervisors log on, they use a nonprivileged account, which provides access to the menus required to operate the FSM 881.

532.12 Privileged

When maintenance personnel log on, they use a privileged account, which provides access to maintenance menus for handling sort plans, diagnostic testing, and other maintenance functions.

532.2 Main Menu for Maintenance Personnel (see Appendix 4)

After logging in, select item 13, "Call Supervisors Menu," from the Main Menu for Maintenance Personnel; enter 13 from the keyboard and hit Return.

532.3 Start of Run (see Appendix 5)

532.31 Steps

a. The system responds with the "Start of Run" screen, which shows the facility, machine number, date, and time.
b. The system prompts you to enter the

supervisor's name and the tour number and to hit the Return key.

c. The system then prompts you to specify the number of employees assigned to the FSM and to hit the Return key.
d. The system prompts you for sort plan number #1, which is used for console #1, and to hit Return; type in the sort plan code (example A02) and hit the Return key.
e. The system requires the supervisor to assign the sort plan for each console individually by entering the desired sort plan at the prompt for each console and pressing Return.
f. Enter PF-1 Start. FSM prompts with save config Y or N. See Priv Guide.

532.32 Password

532.321 *Selection*

After sort plans have been selected for each console, the system prompts for a password. The system allows supervisors to enter a password of their choice, which remains in effect for the duration of this run only.

532.322 *Entering the Password*

After selection:

a. The system will prompt you for the password. Enter FSM as the password (or other locally determined password).
b. The system then requests that the password be verified by reentering it and hitting the Return key.

532.4 Mail Sorting Status (see Appendix 6)

532.41 Display Screen

The Mail Sorting Status display screen is updated every 11 seconds and provides the supervisor with operational data such as:

a. Facility name.
b. Machine number.
c. Date and time.
d. Console status and production information.
e. FSM performance statistics.

532.42 Exit

To exit the Mail Sorting Status enter the Password and the Supervisor Menu appears.

532.5 Supervisor's Menu (see Appendix 7)

532.51 Option #1: End Run (with Restart Option)

This option allows the operator to stop the sort program or restart it with the scheme change. If the sort program is stopped, the supervisor can pull end of run reports.

532.52 Quit Control Program (Sorting Continued)

This option allows the supervisor or maintenance personnel to stop the monitoring function (Supervisor Control Display) and return to the Maintenance Main Menu to perform other functions without interrupting the sorting of mail.

532.53 Change Console Status (see Appendix 8)

This option allows the supervisor to:

a. Take consoles out of service, and
b. Perform distribution verification functions.

532.54 Print Operational Statistics Menu (see Appendix 9)

This option displays and/or prints the following reports:

a. Bin Profile Report.
b. Bin Overflow Profile Report.
c. On-Line Summary Report.
d. FMBCR Performance Report.

532.55 Modify Sort Plan for Present Run (see Appendix 10)

This option allows for temporary movement of a ZIP Code from one bin to another. The change remains in effect for the current runs only.

532.56 View Loaded Sort Plan

Provides information on the selected sort plan.

532.57 ZIP Code Viewing

See Privileged User's Manual.

540 On-Tour Operations

After operations have started:

a. Know arrival profile of Mail Supply: where and whom to call for mail.
b. Ensure operations are completed in a safe manner.
c. Ensure EMERGENCY STOP button is engaged to clear jams.
d. Ensure machine is restarted promptly when jam has been cleared.

550 Production Reports

The production reports are similar in composition to those used on other mechanized units.

The use of hour and piece meters located in the computer, in conjunction with designated productivity adjustments for bypass, determine throughput.

560 Tour Closeout

561 General

Tour ending requires using efficient procedures, which may vary depending on the operation scheduled to follow the closeout.

562 Machine Not in Use by Next Tour

Designate crew assignments in advance of closeout. Remove nonmachinable items as early as possible. Pre-sweep to eliminate congestion. Be aware of workhour usage. If time to dispatch or end of tour is critical, the entire crew may be needed to close out and set up (per local designation). If, however, time is not critical, save workhours by sending some crew members to other units. Complete required production and downtime forms.

563 Machine in Use by Next Tour

Follow these procedures if the machine is not used for next tour:

a. Assign closeout tasks.
b. Give verbal unit condition report to the incoming supervisor.
c. Ensure that sufficient mail volume is available.
d. Note any variance in normal mail patterns or a possible cause for the plan to fail.

564 Preparing Machine for Turnover

Follow these procedures if the machine is to be used by the next tour:

a. Sweep in a manner that ensures an orderly and efficient crew change according to established procedures.
b. Ensure removal of dispatch and rework mails pertinent to your operation.
c. Complete and distribute production and downtime reports.

570 Management Reports

571 Types Available

Several management reports are available from the FSM 881 that the operations supervisor can use. They are:

a. *Bin Profile Report.* The "Bin Profile Report" provides:
   (1) Date, time, tour, FSM#, and schemes run.
   (2) A piece count of flats distributed to each bin with a percentage of the total mail sorted during that run.
   (3) Total number of pieces sorted to Bins #001-050, #051-100, and #001-100.
b. *Bin Overflow Report.* The "Bin Overflow Report" provides:
   (1) Date, time, tour, FSM#, and schemes run.
   (2) Pieces of mail going to the overflow bins.
   (3) Number of NoCode flats and Checksum errors.
   (4) A breakdown by bin number of the coded flats deposited in the overflow bins.
c. *Summary Report.* The Summary Report provides many different statistics for each console, and by machine, such as:
   (1) Run times.
   (2) Console off time.
   (3) Number of pieces from each console and average pieces per hour.
   (4) A breakdown of the types of key entries for each console.
d. *End of Run Report.* The end of Run Report is broken into five sections as follows:
   (1) Part 1, Operational Report
   (2) Part 2, Time Counts
   (3) Part 3, Production Totals and Throughput Rates
   (4) Part 4, Maintenance Report
   (5) Part 5, MODS Data Refer to the "FSM 881 Non-Privileged" User's Manual for a complete description of these reports.

572 Report Generation

Select the desired report from the "Operational Statistics Menu" by selecting highlighted option or the first letter of each report. The system responds by delaying the selected report on the CRT. OUTPUT TO PRINTER? (Y/N) appears at the bottom of the display. By typing the letter

(Y), a printout of the report is printed on the printer then the system returns to the menu.

580 Machine Operator Assignments

581 Keyboard Operator

581.1 Qualifications/Responsibilities

The keyboard operator must be qualified to work on approved machine programs. Responsibilities are:

a. Performs machine flat distribution accurately.
b. Keys for a designated period and rotates on a scheduled basis.
c. Feeds barcoded flats and rotates on a scheduled basis.
d. Remains at console sorting until relieved for rotation to other work assignments, or for personal needs.
e. Performs assigned manual distribution or other assigned duties when no machine assignment is available.

581.2 Position at Console

581.21 Location of Chair

The operator chair is positioned to allow comfortable arm movement and a downward line of vision to the mailpiece.

581.22 Left Arm

The left arm is positioned comfortably close to the body with the elbow resting on the adjustable pad to allow for a restful working position.

581.23 Whole Body

As the forearm extends outward to bring the left hand into position to pick up the flat, the position of the whole body should be adjusted to allow the left thumb and forefinger to pick up the flat on the left edge just below the upper left corner. When actually inserting flats into the machine, use a tossing motion to allow for a stroke of 4 to 6 inches.

581.24 Right Arm

The right arm should hang straight down from the shoulder bent at the elbow in a comfortable position with keyboard adjusted to fit the right hand. Adjust the keyboard by rotating the angle of the keyboard on the keyboard shelf and by moving it horizontally.

581.3 Loading Duties

581.31 Feeding the Mail

When feeding the mail:

a. Ensure that console feed tables are loaded with machinable mail for start of operations.
b. Face and orient all mail properly on the feed table.
c. Keep console feed tables loaded with machinable mail during operation.
d. Load flats lying flat, in stacks approximately 6 inches, with address facing the operator. (It is difficult to see the address on the topmost pieces if stacks are too high.)
e. Place stacks next to edge of the feeder belt closest to the operator.

581.32 Culling Nonmachinable Mail

581.321 *General*

The FSM 881 accepts a wide variety of mail. Generally stated, this means flat mail within the following range:

a. Minimum Size: 6" high x 6" wide.
b. Maximum Size: 12" high x 15" wide.
c. Weight: Up to one pound.
d. Thickness: Up to .75".

Note: Open magazines transport with loose edge trailing. (Loose pages catch the wind if on the leading edge.)

581.322 *What to Cull*

Notify the supervisor immediately if there is an excessive amount of nonmachinable mail. Below is a partial list of high-risk items that tend to cause jamming:

a. *Flimsies.* Pieces too flimsy to withstand pusher finger pressure. They fold over causing jam.
b. *Oversize Flats.* If a flat is too high, even though it is inserted and begins transport, the top edge will catch on the screen cover at the turnaround.
c. *Newspapers.*
d. *Partially Filled Envelopes.* Envelopes not uniformly filled can cause the pusher finger to bend the envelope.
e. *Miscellaneous.* Some items transport well if programmed for sortation to a bin on the front side, but they cause jams in the turn.

581.323 *What to Use*

Place a cardboard tray on top of the machine by each keying station so keyers can place culls into it. Place culls not removed by the loader into

these trays without disrupting the movement or rhythm of the keyer.

581.324 *Riffling*

Riffle mail during loading to identify mail that runs (all for one separation or ZIP Code). Remove this mail and send it to manual cases or the tie out area to be bound and dispatched to prevent feeding mail that is stuck together.

581.4 Mail Supply (Utility Cart/Truck, Etc.)

Place mail supplies to minimize walking. Place at least one supply truck close to Consoles #1 and #2, and Consoles #3 and #4. Keep the loading aisle narrow. Aisles three feet wide allow for safe movement and keep travel distance short.

581.5 Sweeper Duties

581.51 Bins

Withdraw and verify mail from the bins, as scheduled. Empty full bins immediately. Avoid premature (uneconomical) sweeping, except when dispatches are necessary. Check low-density bins periodically. Verify designated separations; remove errors and uncancelled mail. Properly prepare errors removed for further distribution. If excessive errors are detected, advise the supervisor immediately.

581.52 Trays

FSM 881 trays are designed for quick removal. When a tray is full, replace it with an empty one. Take the full tray to the transfer point or dispatch area. Stack trays prepared for dispatch properly to prevent their falling from transport equipment. Use approved and safe techniques. The sweeper is responsible for labelling trays as they are replaced.

581.6 Clearing Jams

Follow the procedures below to clear jams:

a. Set the emergency stop button prior to entering the machine area to clear a jam. Most jams are cleared by sweepers unless occurring in the feeder section. When a jam occurs, the pusher finger pivots in the opposite direction to the transport belt travel.
b. Return the pusher finger to the original position by removing the object causing the jam. To remove a mailpiece without damaging it, it is advisable to move the piece in a backward direction, allowing any part caught on the finger to slide off. A jerking motion forward or straight up may cause additional damage.
c. Reset the EMERGENCY STOP button.
d. Give the all clear signal for restart.

581.61 Feeder Section

581.611 *Locating the Jam*

Jams occur in the feeder section when a piece obstructs finger travel soon after insertion. Often, these happen in the area of the feed station immediately in front of the operator who keyed the piece. As a jam occurs, the red light on top of the machine directly opposite the keyer lights up. A jam is sometimes accompanied by an audible snap as the pusher finger pivots. This also helps to locate the jam area, as the red light goes out if the jam clears itself.

581.612 *Clearing the Jam*

To clear the jam:

a. Push the EMERGENCY STOP.
b. Lift the blue doors of the induction station where the jam is located.
c. If the jammed flat is accessible, remove it. If the jam is directly behind the feeder assembly, swing out the feeder assembly and remove the flat.
d. Swing the feeder assembly back into place, if necessary.
e. Close the blue doors.
f. Reset the EMERGENCY STOP button.
g. Give the all clear signal for restart.

581.62 Bins Section

581.621 *Locating the Jam*

Most bin section jams occur at Bins #1 and #51 due to a change in the angle of the deflection from the feeder sections. Clear the jam by releasing the obstructed pusher finger. Use slightly backward sliding motion to prevent damage to the mailpiece.

581.622 *Clearing the Jam*

To clear the jam:

a. Set the EMERGENCY STOP.
b. Remove the bin closest to the jam.
c. Step into the vacated bin area.
d. With the left hand, relieve the pressure by pulling the pusher finger to the left.
e. With the right hand, remove the flat.
f. Replace the pusher finger without letting it snap.
g. Safely step out of the bin area and replace the bin.

h. Reset the EMERGENCY STOP button.
i. Give the all clear signal for restart.

581.63 Turn End Unit

To clear the jam:

a. Set the EMERGENCY STOP.
b. Lift the hydraulic cover of the end unit.
c. With the left hand, relieve the pressure by pulling the pusher finger backward.
d. With the right hand, remove the flat.
e. Release the pusher finger without letting it snap back.
f. Lower the end unit cover.
g. Reset the EMERGENCY STOP button.
h. Give the all clear signal for restart.

581.64 Summary

Supervisors must ensure that operators adhere to the following safety practices when clearing jams:

a. Always set the EMERGENCY STOP button.
b. Be careful when pulling on a jammed flat.
c. Remove a bin and step into the vacant area when necessary.
d. Be cautious when stepping backward out of the bin area.
e. Release the pusher finger gently when clearing a jam.
f. Be careful that hair, clothing, jewelry, etc., does not become entangled in machinery.
g. Never consider clearing jams to be routine or unimportant.

Chapter 6

Safety

610 Personal Safety

Safe operation of this system is a mandate, not an option. Safeguards for personal and system safety have been incorporated into the design. Personnel are the most valuable asset of the U.S. Postal Service; therefore, people must be trained to use and operate mechanized equipment in a manner that ensures personal safety.

620 System Safety

Safety training must also address maintaining equipment in a safe and good operating condition at all times.

630 Accident Prevention

631 General

The acquisition, operation, and maintenance of modern machinery often involve a team effort. Flats sorting machines (FSMs) embody many safety features that are constantly being improved through engineering changes and modifications. Improving safeguards for the system is an ongoing program. All persons associated with operating FSMs have specific safety responsibilities.

632 Responsibilities

632.1 Supervisors

Supervisors have overall responsibility for:

a. Ensuring the safety of personnel involved in the operation or maintenance of the FSM.
b. Enforcing safety rules and regulations and insisting that personnel follow safe operating practices and procedures.
c. Correcting unsafe conditions promptly.
d. Ensuring that the FSM is in safe operational condition at all times.

632.2 Maintenance Personnel

Maintenance personnel are responsible for:

a. Ensuring that maintenance is performed in a manner that does not endanger them or others.
b. Supporting efforts to properly maintain guards and protective devices on the equipment.

632.3 Machine Operators

Console operators, loaders, or sweepers are responsible for adhering to prescribed operating instructions and rules applicable to the task being performed.

Chapter 7

Problem Solving

710 Purpose

Using new distribution systems can present situations that are costly in terms of unnecessary downtime. This chapter identifies a variety of problems frequently encountered by supervisors newly assigned to the flats sorting machine (FSM) and assists them to more easily recognize problems to correct them. These problems, and suggested solutions, are categorized according to the system of malfunction.

720 Problems and Possible Solutions

See Exhibit 720 for potential problems and suggested solutions.

730 User's Manuals

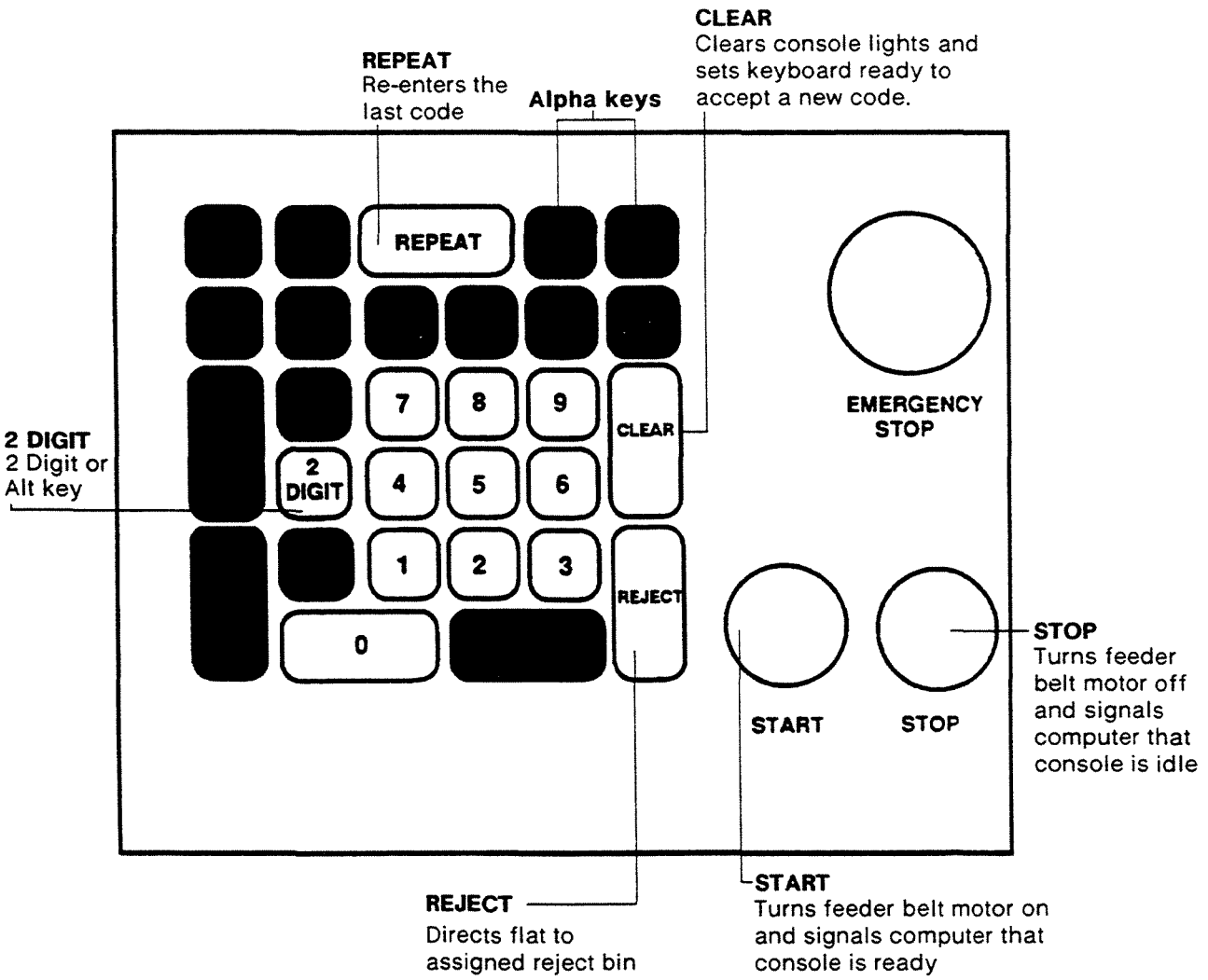
Four FSM 881 user's manuals have been developed to support operation and maintenance procedures as follows:

a. Volume 1, "Non-Privileged User's Manual," is for use by the FSM 881 supervisor.
b. Volume 2, "Privileged User's Manual," is for use by maintenance and operation support personnel.
c. Volume 3, "Sort Plan Manager User's Manual," is for use by maintenance and sort plan development personnel.
d. Volume 4, "Maintenance User's Manual," is for use by facility maintenance personnel. Each FSM site should have these User's Manuals available for reference.

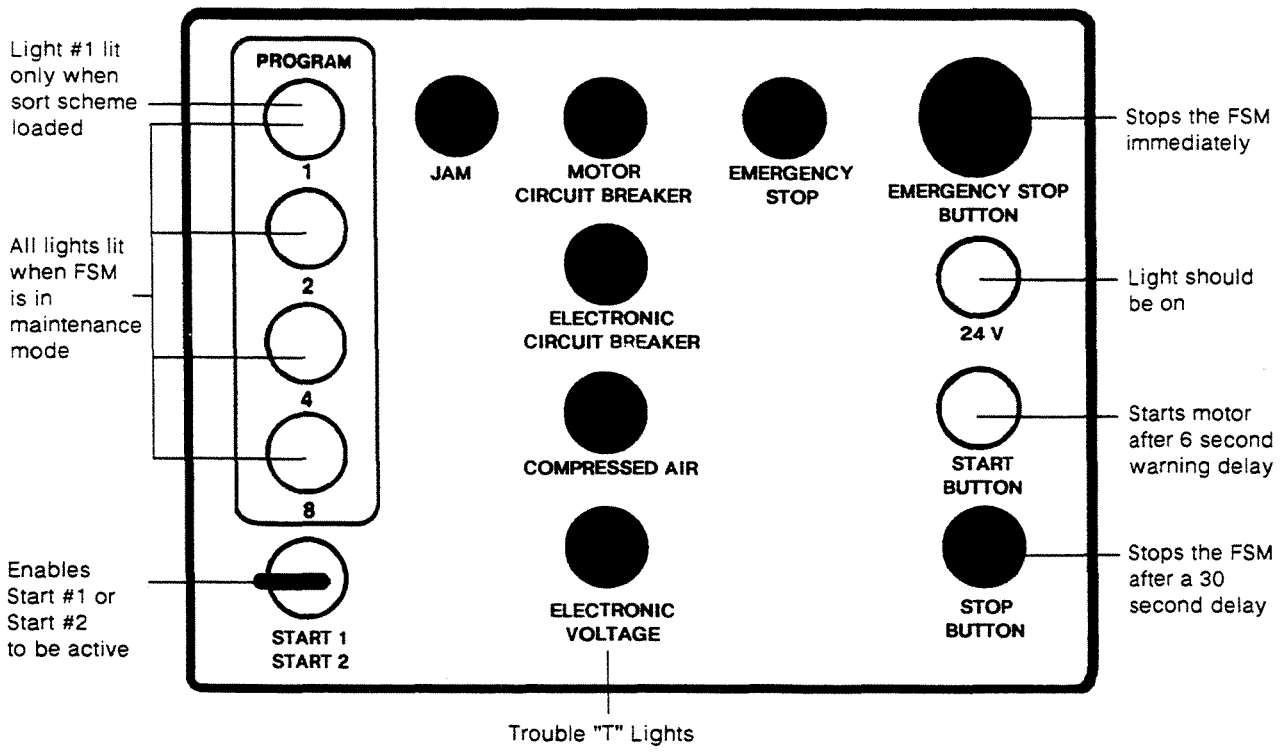
Potential Problems and Suggested Corrective Action

System Malfunction	Symptom	Corrective Action
Operating Computer	No Response	a. Ensure main power is turned on (check 24V indicator light on the control panel). b. Turn on power for the: (1) PDP-11/53 computer. (2) LA 210 Printer. (3) VT 220/320 Video Terminal.
Logging In	Account name not recognized The following message appears on the terminal: "HEL - Timeout on Response"	A privileged user must create a user account. Complete log-in procedure within 1 minute.
At Control Panel		
Machine Will Not Start	System booted, machine will not start	a. Position start key to activate start position #1. Ensure emergency stops are released. b. Start machine—depress START.
EMERGENCY STOP Light	EMERGENCY STOP Light on	Check all EMERGENCY STOP buttons at: a. Control panel, b. Operator console, c. Bin sections, and d. Interlock switches.
	Jam light still on	Check for the following: a. Jammed flat in bins section. b. Jammed flat in turn end. c. Jammed flat in feeder section. d. Pusher finger at last jam location is bent backwards and caught on lip of the transport belt cover.
Successive Starts and Stops	Machine starts; runs 1 or 2 seconds and stops two or three times in succession	Photoelectric cell is blocked in a turnaround area, most likely on the side of wheel and on inside of the machine. Notify mechanic.

Exhibit 720

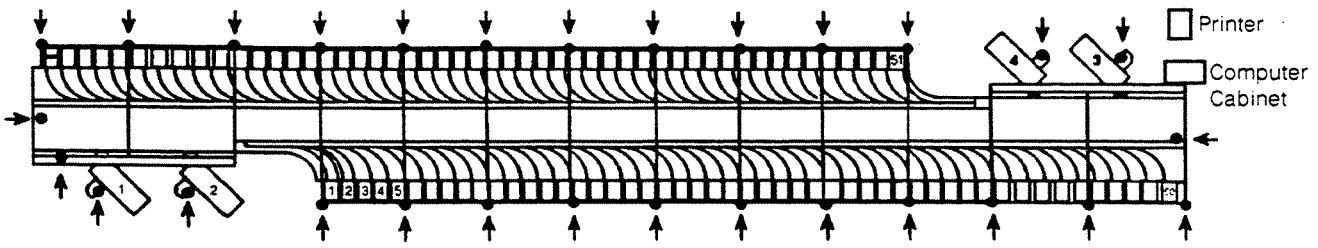

CLEAR
Clears console lights and sets keyboard ready to accept a new code.
REPEAT
Re-enters the last code
Alpha keys
REPEAT
7
8
9
CLEAR
2 DIGIT
4
5
6
1
2
3
REJECT
0
EMERGENCY STOP
START
STOP
2 DIGIT
2 Digit or Alt key
STOP
Turns feeder belt motor off and signals computer that console is idle
REJECT
Directs flat to assigned reject bin
START
Turns feeder belt motor on and signals computer that console is ready

Appendix 1


Light #1 lit only when sort scheme loaded
All lights lit when FSM is in maintenance mode
Enables Start #1 or Start #2 to be active
PROGRAM
1
2
4
8
START 1
START 2
JAM
MOTOR CIRCUIT BREAKER
EMERGENCY STOP
EMERGENCY STOP BUTTON
ELECTRONIC CIRCUIT BREAKER
24 V
COMPRESSED AIR
START BUTTON
ELECTRONIC VOLTAGE
STOP BUTTON
Trouble "T" Lights
Stops the FSM immediately
Light should be on
Starts motor after 6 second warning delay
Stops the FSM after a 30 second delay

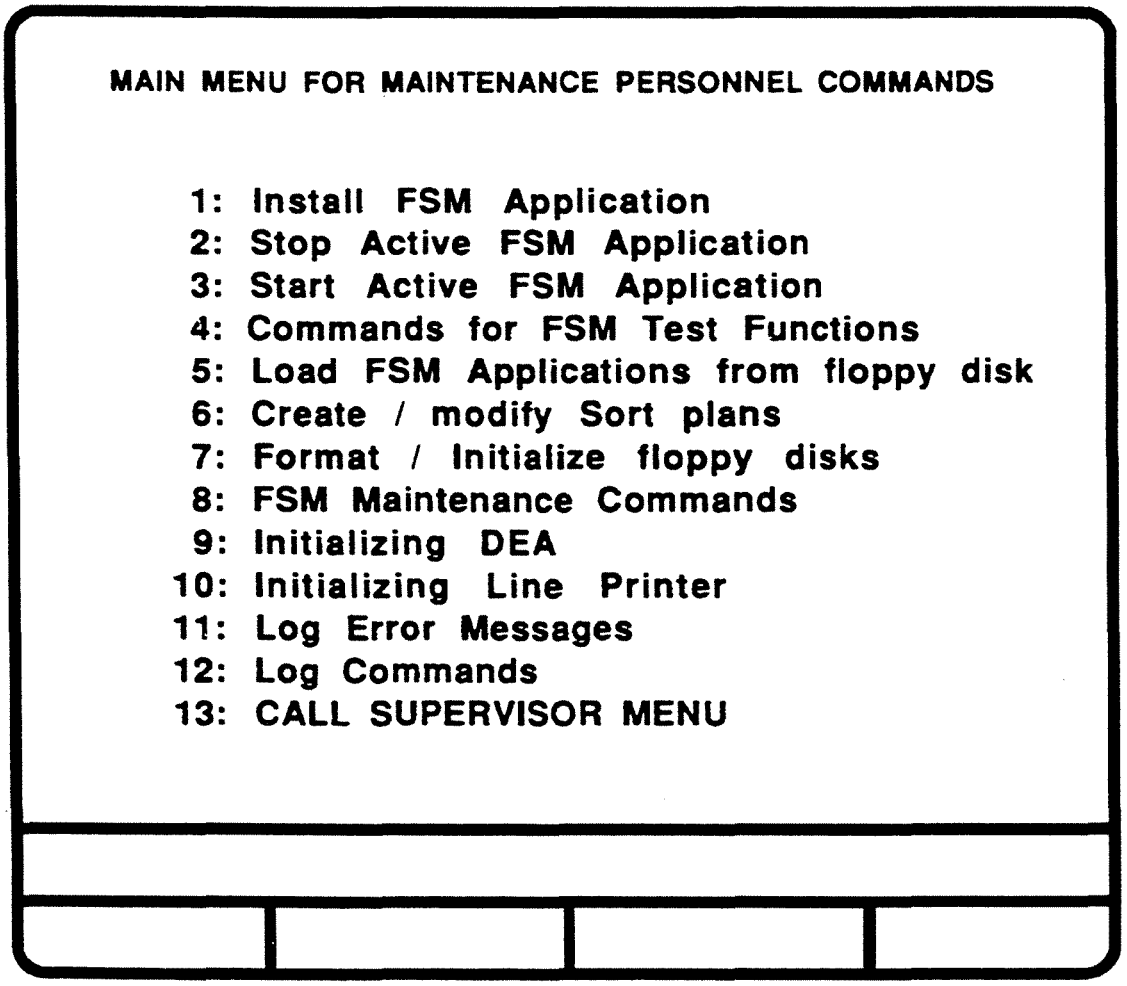
Appendix 2

Emergency Stop Locations
Control panel, at each console, at each end unit, and under every fifth bin

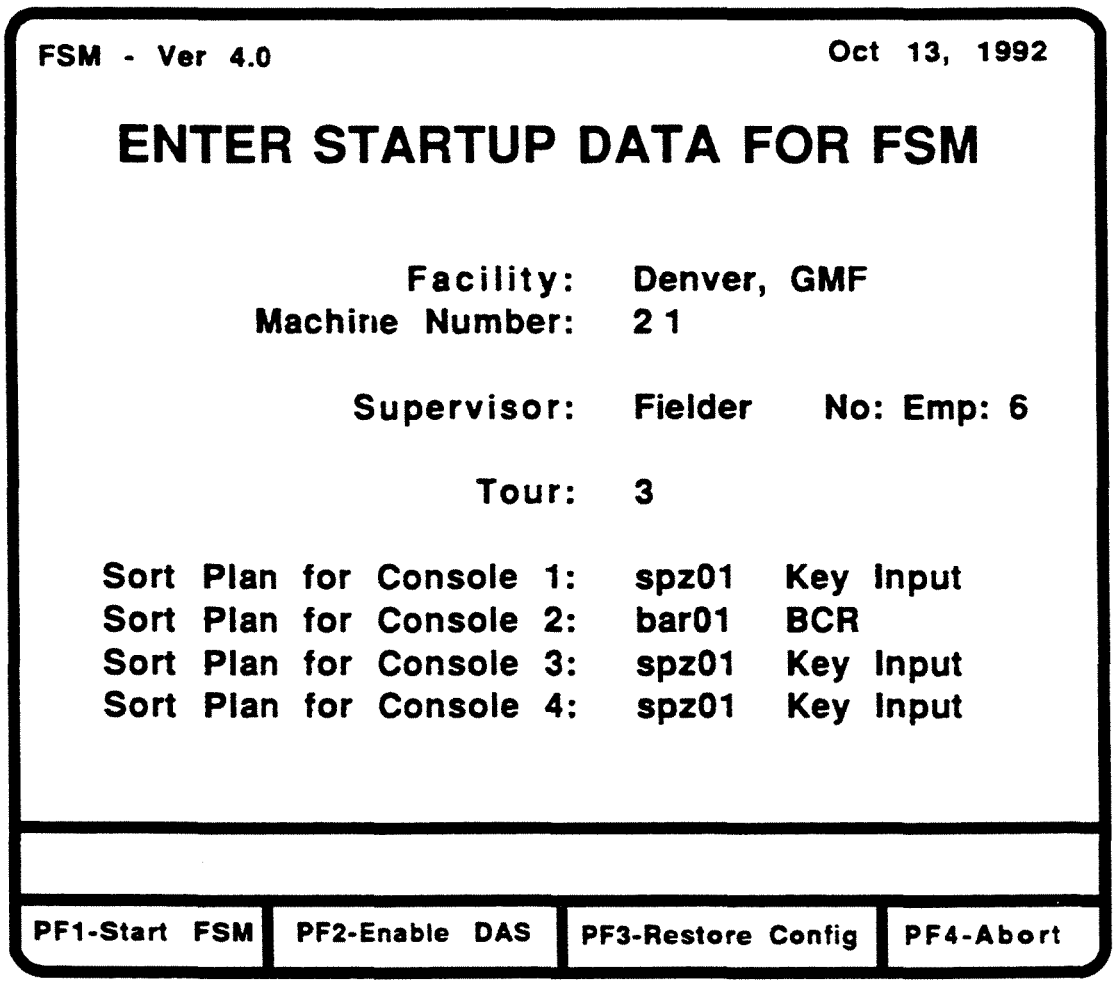


● = Control Panel

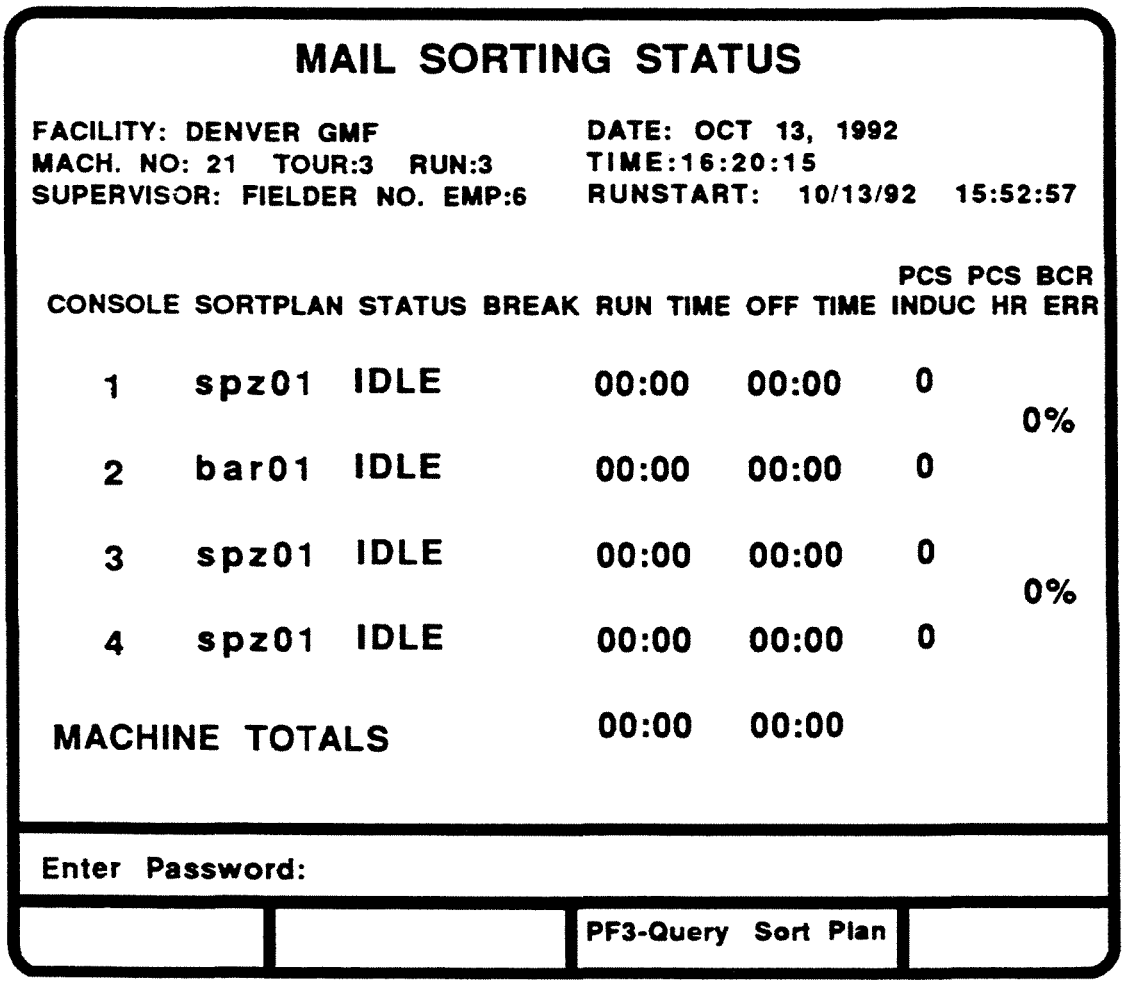
Appendix 3


MAIN MENU FOR MAINTENANCE PERSONNEL COMMANDS
1: Install FSM Application
2: Stop Active FSM Application
3: Start Active FSM Application
4: Commands for FSM Test Functions
5: Load FSM Applications from floppy disk
6: Create / modify Sort plans
7: Format / Initialize floppy disks
8: FSM Maintenance Commands
9: Initializing DEA
10: Initializing Line Printer
11: Log Error Messages
12: Log Commands
13: CALL SUPERVISOR MENU

Appendix 4


FSM - Ver 4.0
Oct 13, 1992
ENTER STARTUP DATA FOR FSM
Facility: Denver, GMF
Machine Number: 2 1
Supervisor: Fielder No: Emp: 6
Tour: 3
Sort Plan for Console 1: spz01 Key Input
Sort Plan for Console 2: bar01 BCR
Sort Plan for Console 3: spz01 Key Input
Sort Plan for Console 4: spz01 Key Input
PF1-Start FSM
PF2-Enable DAS
PF3-Restore Config
PF4-Abort

Appendix 5



MAIL SORTING STATUS

FACILITY: DENVER GMF
MACH. NO: 21 TOUR:3 RUN:3
SUPERVISOR: FIELDER NO. EMP:6

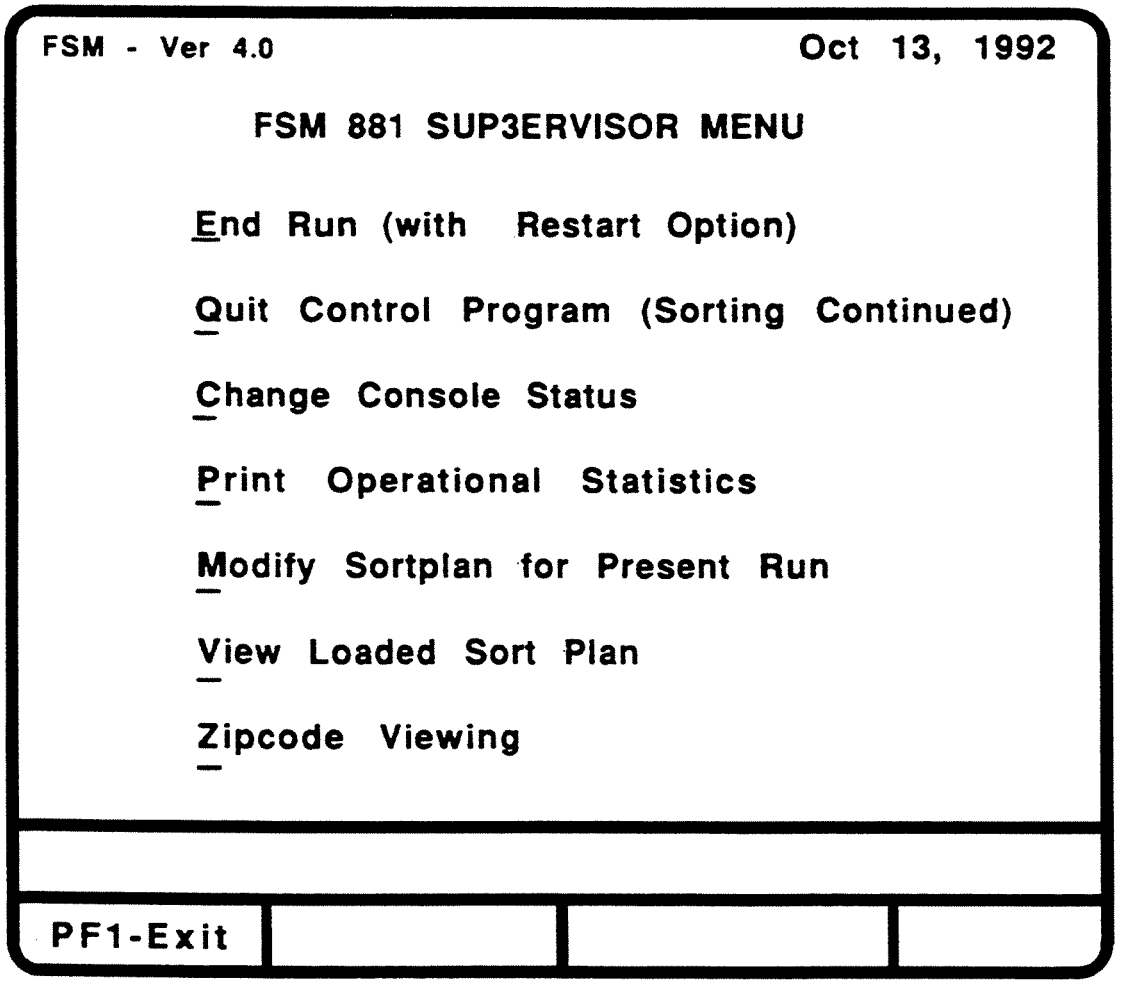
DATE: OCT 13, 1992
TIME:16:20:15
RUNSTART: 10/13/92 15:52:57

CONSOLE	SORTPLAN	STATUS	BREAK	RUN TIME	OFF TIME	PCS INDUC	PCS HR	BCR ERR
1	spz01	IDLE		00:00	00:00	0		
							0%	
2	bar01	IDLE		00:00	00:00	0		
3	spz01	IDLE		00:00	00:00	0		
							0%	
4	spz01	IDLE		00:00	00:00	0		
MACHINE TOTALS				00:00	00:00			

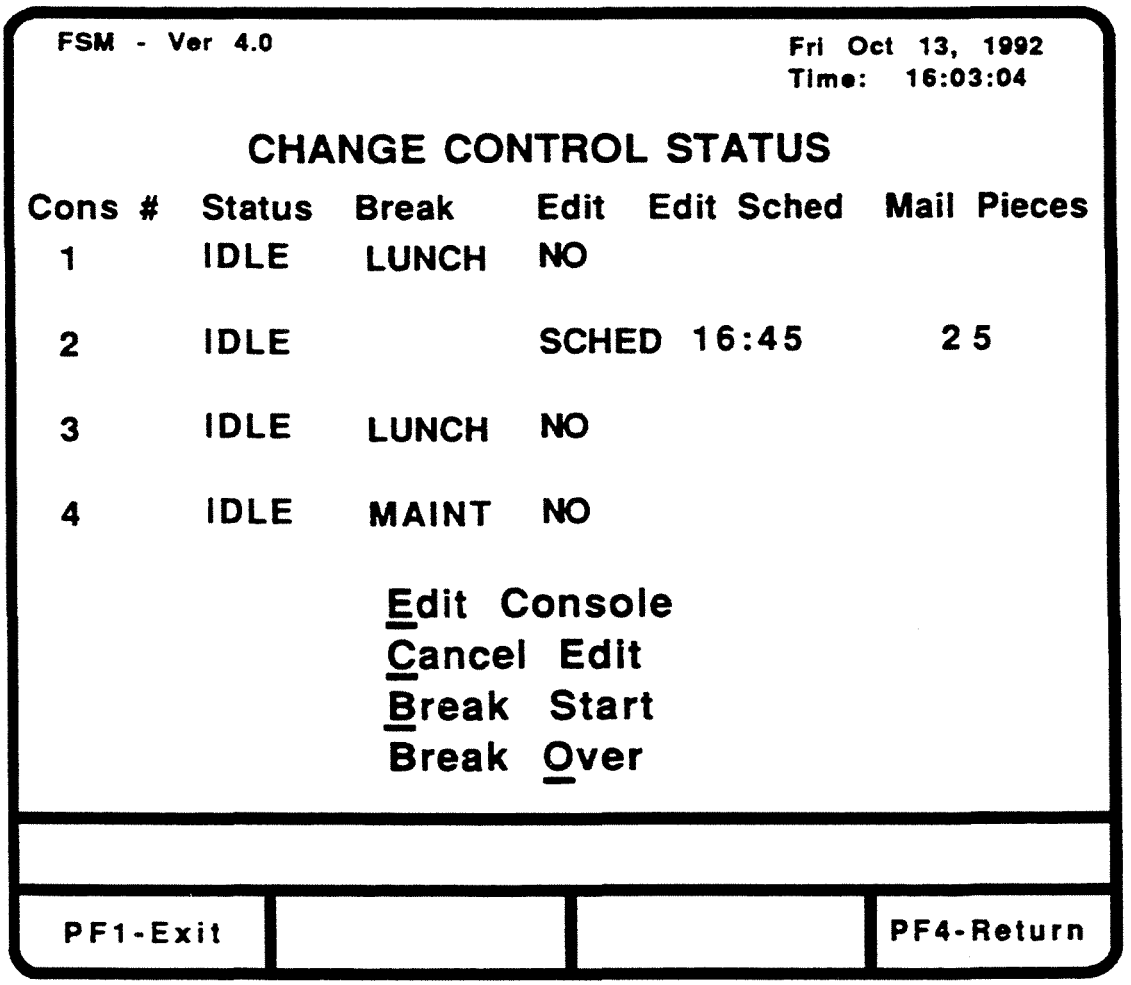
Enter Password:

PF3-Query Sort Plan

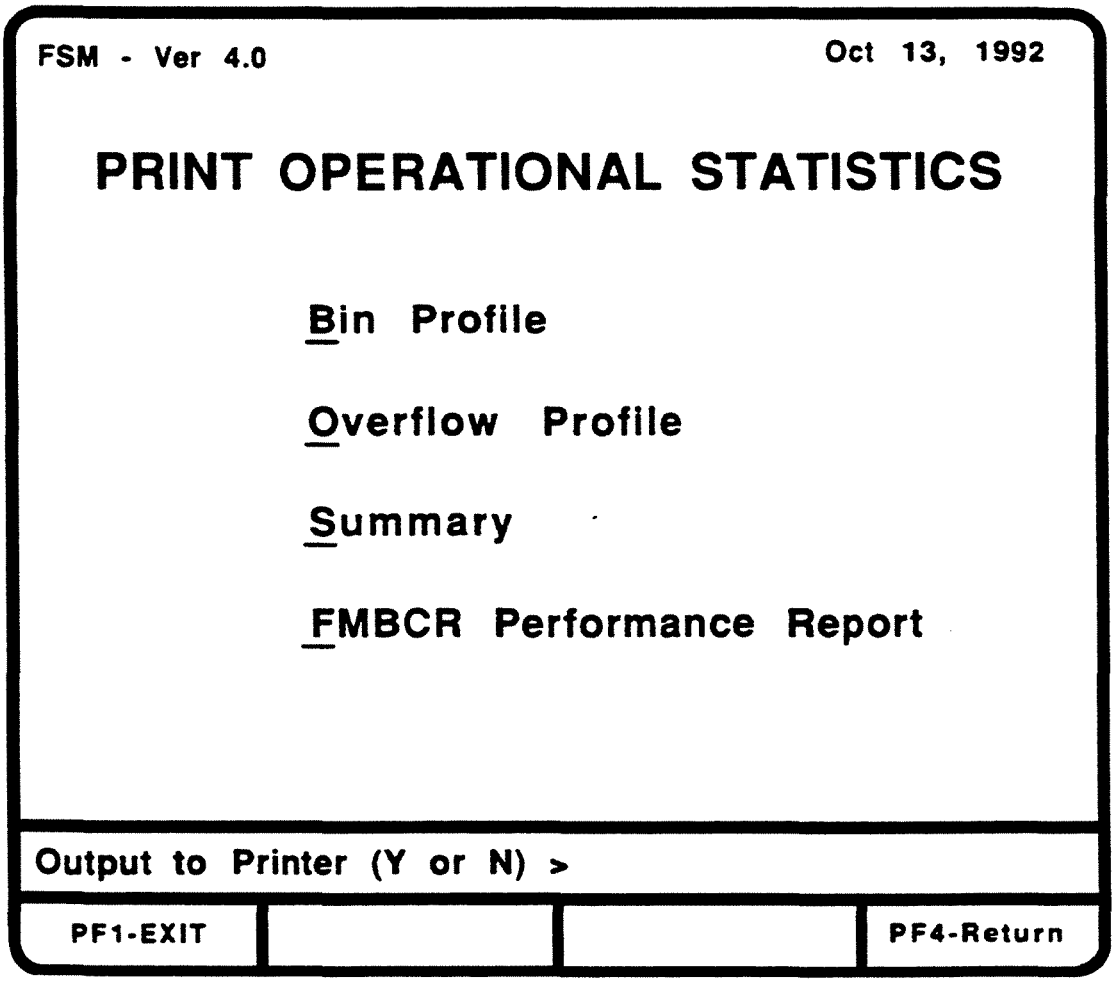
Appendix 6


FSM - Ver 4.0
Oct 13, 1992
FSM 881 SUP3ERVISOR MENU
End Run (with Restart Option)
Quit Control Program (Sorting Continued)
Change Console Status
Print Operational Statistics
Modify Sortplan for Present Run
View Loaded Sort Plan
Zipcode Viewing
PF1-Exit

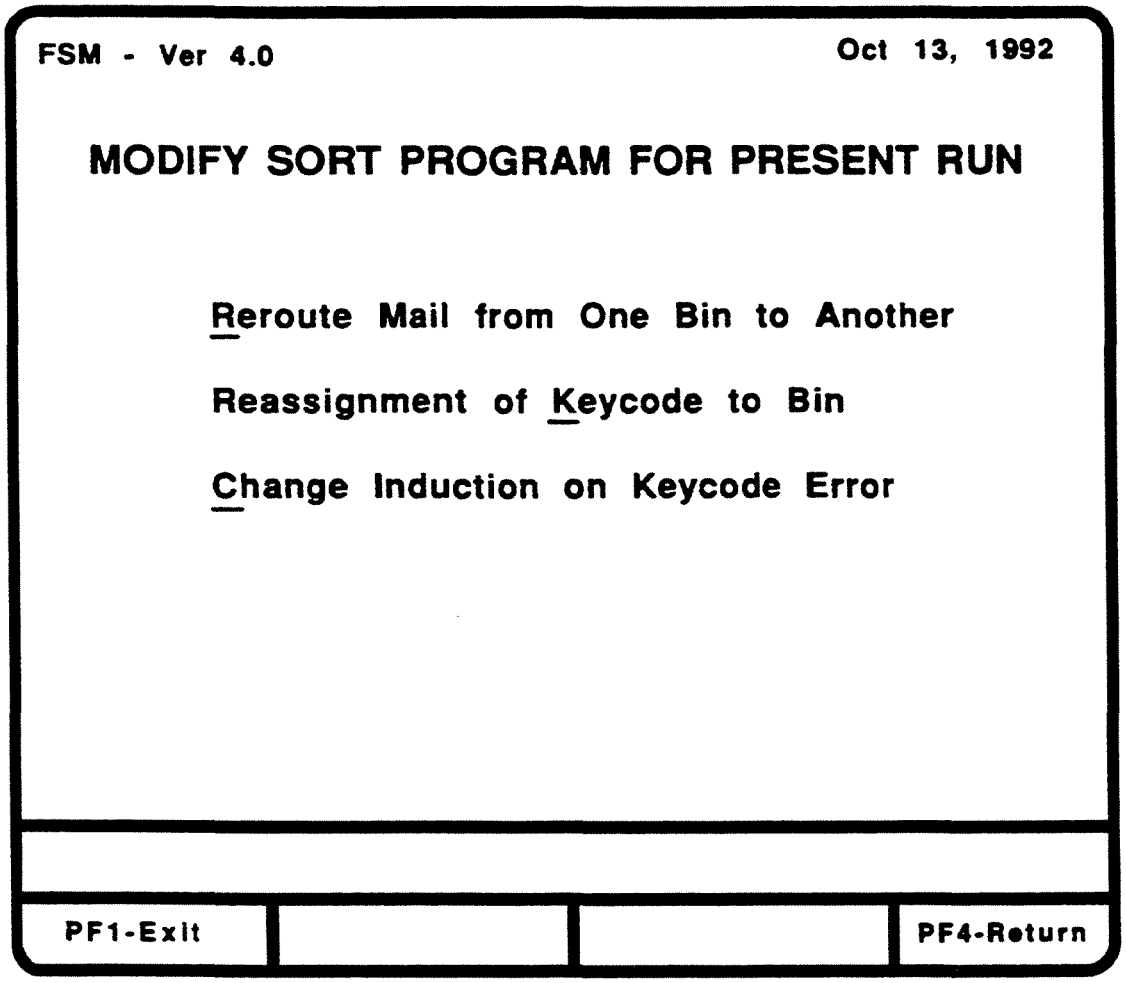
Appendix 7


FSM - Ver 4.0
Fri Oct 13, 1992
Time: 16:03:04
CHANGE CONTROL STATUS
Cons # Status Break Edit Edit Sched Mail Pieces
1 IDLE LUNCH NO
2 IDLE SCHED 16:45 25
3 IDLE LUNCH NO
4 IDLE MAINT NO
Edit Console
Cancel Edit
Break Start
Break Over
PF1-Exit
PF4-Return

Appendix 8


FSM - Ver 4.0
Oct 13, 1992
PRINT OPERATIONAL STATISTICS
Bin Profile
Overflow Profile
Summary
FMBCR Performance Report
Output to Printer (Y or N) >
PF1-EXIT
PF4-Return

Appendix 9


FSM - Ver 4.0
Oct 13, 1992
MODIFY SORT PROGRAM FOR PRESENT RUN
Reroute Mail from One Bin to Another
Reassignment of Keycode to Bin
Change Induction on Keycode Error
PF1-Exit
PF4-Return

Appendix 10