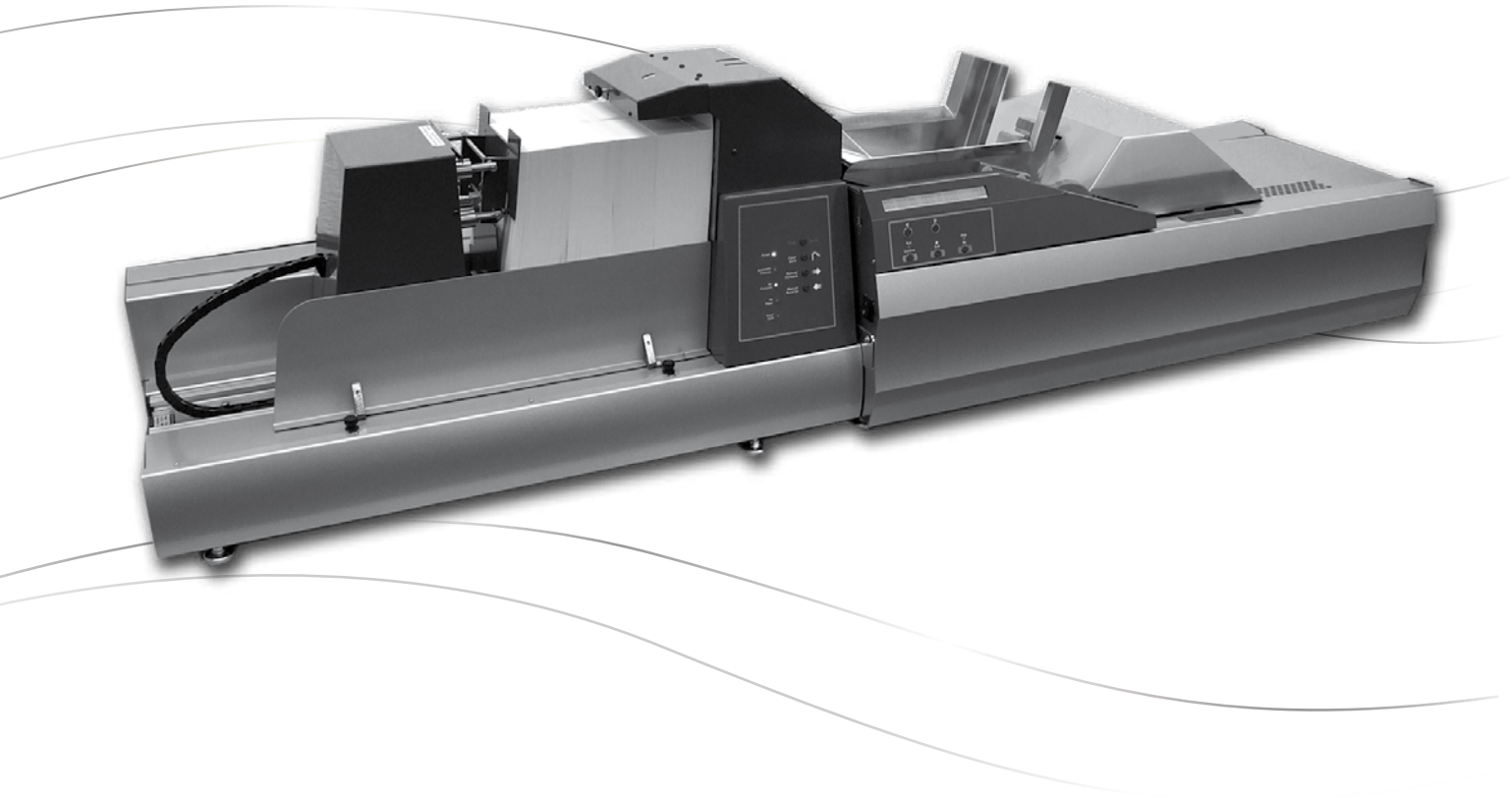
Pitney Bowes

SECAP

F731 Universal Feeder
F734/F735 High Capacity Loader



Service Manual

FORM SDT342A (7-07)

IMPORTANT:

Model and feature availability varies by country. Contact your machine supplier for more information.

This guide covers all models and features. Inclusion within this guide does not guarantee availability of a particular model or feature within your country.

Contents

Contents

Introduction • 1

1.1 PURPOSE

This document provides the information necessary to support the installation and site repair of the Pitney Bowes Model F731 Universal Feeder and F734/F735 High Capacity Loader.

1.2 EQUIPMENT COVERED/MODEL DESIGNATIONS

This manual applies to the Universal Feeder, its accessory equipment and the interface kits required for table top system operation.

The OMR/BCR Scanner Kits MUST be ordered as required, as the STANDARD Sheet Feeders WILL NOT include any scanning option.

1.2.1 Model Designations

F731 Universal Feeder (all voltage variations)

F734 High Capacity Loader - US Letter (8.5" x 11") material (all voltage variations)

F735 High Capacity Loader - DIN A4 (297mm x 210mm) material (all voltage variations)

1.2.2 Kit Designations

F736 OMR Top and Bottom Scan

F737 BCR Standard Top and Bottom. Fixed Beam Scanning

F738 BCR Standard Top and Bottom. Moving Beam Scanning

F739 BCR Custom Top and Bottom. Fixed/Moving Beam Scanning

F73A Software download tool for service

F73B Accumulator Anti-Curl Kit

F73C Accumulator Reverse Accumulation Kit

F73D High Capacity Loader Guide Strips Kit

1 • Introduction

1.3 SAFETY SUMMARY

Warning messages are used throughout this manual to alert you to potentially hazardous conditions. These warnings are explained below.

- ❑ **WARNING** — calls attention to improper practices that could cause injury.
- ❑ **CAUTION** — calls attention to improper practices that could damage the equipment or the material being run.
- ❑ **IMPORTANT** — calls attention to practices that could adversely affect equipment operation, if instructions are not followed exactly.

Familiarise yourself with proper procedures and methods before you install, operate or repair the equipment to avoid personal injury or damage to the equipment.

If you train service people or equipment operators, it is important to explain safety precautions to your students and encourage safety awareness.

Follow these precautions for your own safety:

- Treat every circuit like a gun that may be loaded. It may not be “live,” but be sure. Check with a neon tester or voltmeter, or simply unplug the machine.
- Know how to turn off the power in the work area and get help in an emergency.
- Don’t work on equipment under power unless it’s absolutely necessary. If you must, use extreme caution. Don’t grasp two sides of a live circuit at the same time - use one hand when reaching into a circuit, touching a grounded case or chassis with that wrist or elbow if possible. This prevents current from passing through vital organs. Observe this rule when connecting or disconnecting plugs or leads, or making any adjustments on a live circuit.
- Don’t underestimate the danger of shock: 1 mA (1/1000 amp) is uncomfortable; 5 mA is dangerous - you may jump back and be injured; 12 mA causes hand muscles to contract, so you cannot free yourself; 24 mA has proven fatal; and 100 mA (1/10 amp) is likely to be fatal.
- Use the right tools for the job. A tool which slips can cause a short - or a shock. Don’t reach into a circuit with metal tools, or while wearing rings or a watch. Even in low voltage circuits, a metal object can short circuit two terminals. When work ing on live circuits, use tools with insulated handles and try to keep your tool hand grounded.
- Don’t bypass safety devices, particularly fuses. Three-wire mains outlets are designed to ground equipment to make it safe. If a live wire shorts to a grounded frame, the only result is a blown fuse. If a live wire shorts to an ungrounded frame, the frame itself be comes live and potentially dangerous. A fuse is a weak link in a circuit, designed to break down before anything else does. The maximum safe current in a circuit is determined by the designers. Too large a fuse can pass excessive current, damaging expensive equipment.
- For electrical fires, use Type C, BC or ABC extinguishers only. Don’t use soda acid or other liquid stream extinguishers. They will damage electrical equipment and present a shock hazard to the user.

- Be extremely careful when lifting heavy equipment. Follow the guidelines below:
  a. Squat to lift and lower. DO NOT bend at the waist.
  b. Keep your low back bowed in while bending over.
  c. Keep the weight as close to you as possible.
  d. Bow your back in and raise up with your head first.
  e. If you must turn, turn with your feet, not your body.
  f. Never jerk or twist!
  g. Put the weight down by keeping your low back bowed in.
  h. Keep your feet apart, staggered if possible.
  i. Wear shoes with non-slip soles.
  j. Get help if you need it.
- If you use air pressure to clean a machine, use low pressure (30 psi or less) and use eye protection (goggles or face masks).
- When using solvents or cleaning fluids, make sure ventilation is adequate.

WARNING!

Always be sure the F731/F734/F735 is unplugged before you make any attempt to perform the maintenance outlined in this manual. If you must work on a "live" machine, note that line potential is present at the power panel and the motherboard.

CAUTION: DO NOT attempt to adjust key timing parameters in the service menu unless you have been trained and thoroughly understand what you're doing. Otherwise you could damage the equipment.

IMPORTANT:

If the Feeder is left unattended for a long period of time, or is used on a monthly basis, it is recommended that the feeder head is adjusted to the highest position. This will ensure that no flats occur on the spring loaded rollers.

1 • Introduction

1.4 Electrostatic Discharge (ESD) Procedures

Digital equipment can be easily damaged or destroyed by static charges. Micro processors and other integrated circuits contain tiny transistors not much more than a millionth of an inch across, which operate at 5 to 12 volts. You don't have to see a spark to ruin an integrated circuit - 50 volts is enough. Follow these guidelines to protect sensitive equipment from static damage:

- Always use a wrist grounding strap and anti-static mat when working on equipment sensitive to electrostatic discharge.
- Ground yourself before reaching into the equipment, or touching any circuit board or other electrical component. Just touching a doorknob or metal workbench may be enough, but the best guarantee is to turn the machine off but leave it plugged in, and ground yourself on the chassis, which is grounded through the three-wire power cord.
- Be careful of rugs - even a few steps can recharge you. Re-ground yourself whenever you've walked away and returned to the machine. Rugs are a major source of static build up in the body.
- Take greater precautions as the objects you handle get smaller. A board in the machine is better protected than one that is not plugged in; a chip on a board is better protected than one in your hand.
- Stay away from metal conductors. The plastic and resin that chips and boards are made of are much better insulators than metal. It's most important to keep your hands away from any metal which contacts the data. In particular, this means the long connector along the bottom of each board, and the pins coming out of the chips. These signal and data lines are directly connected to the fragile inner circuits of the chips. When handling a board, try not to touch the connector; when handling a chip, try not to touch the pins.

2.1 EQUIPMENT SPECIFICATIONS

2.1.1 Modes of Operation:

The Model F731 Sheet Feeder is designed to interface into a DI900/DI950 Inserting System. The Feeder may be used in conjunction with a Model F734/F735 High Capacity Loader.

2.1.2 Electrical

F731:	100-240VAC, 50/60Hz, 5A
F734/F735:	100-240VAC, 50/60Hz, 5A

2.1.3 Physical Dimensions

F731:	480mm High x 600mm Wide x 1000mm Long
	(19.7" High x 23.6" Wide x 39.4" Long)
F734/F735:	500mm High x 500mm Wide x 900mm Long
	(19.7" High x 19.7" Wide x 35.4" Long)

2.1.4 Weight

F731:	64kg (141 lb)
F734/F735:	60kg (132 lb)

2.1.5 Speed

Up to a maximum speed of 15,000 sheets per hour.

2.1.6 Noise Level

Below 70 dBA (F731)

Below 30 dBA (F734/F735)

2.1.7 Compliance

European Union	CE It is certified that the system complies with all applicable Directives of the European Union.
USA	FCC Part 15, UL 1950, Class A
Canada	ICES-003, CSA Standard C22.2, No 950-95
Australia/ New Zealand	AS/NZS 3548 (Equivalent to European EN55022)

Due to our continuing program of product improvement, equipment and material specifications as well as performance features are subject to change without notice. Actual throughput may vary from the speed specifications given here, depending on the type and condition of material run, system configuration, machine condition and operator skill.

2 • Specifications

2.2 Material Specifications

2.2.1 Weight (Sheets)

60g/m^2 (16 lb) minimum to 165g/m^2 (42 lb) (with DD)

2.2.2 Thickness (Booklets)

4mm (0.16") maximum

2.2.3 Length (without loader fitted)

175mm (7") minimum to 358mm (14") maximum

2.2.4 Width (without loader fitted)

130mm (5") minimum to 250mm (9.8") maximum

2.2.5 F731 Feed Tray Capacity (without loader fitted)

Up to a maximum stack height of 35mm. Can be reloaded whilst running.

2.2.6 F734/F735 Material Specifications

F734: 8.5" x 11" only, capacity up to 4,500 sheets

F735: DIN A4 size (210mm x 297mm) only, capacity up to 4,500 sheets

Due to our continuing program of product improvement, equipment and material specifications as well as performance features are subject to change without notice. Actual throughput may vary from the speed specifications given here, depending on the type and condition of material run, system configuration, machine condition and operator skill.

2.3 OMR SCAN DASH POSITIONING

The scan dash mark must be a minimum of 10mm in width. A solid black line is preferred, but if the mark is printed using hyphens, it must be at least two hyphens wide with no more than 0.8mm separation between the hyphens. The marks should be black ink on a light background.

There must be a clearance of a minimum of 12mm from any text to the first mark and also above the last mark before any printed text on the form. A spacing of at least 6mm is required either side of the scan marks.

Scan marks cannot be positioned within 10mm of the left and right hand sides of the form or within 30mm of the trailing edge or within 45mm of the leading edge.

Scan marks cannot be positioned down the centre of the form as defined in the Scanning Templates on the following pages.

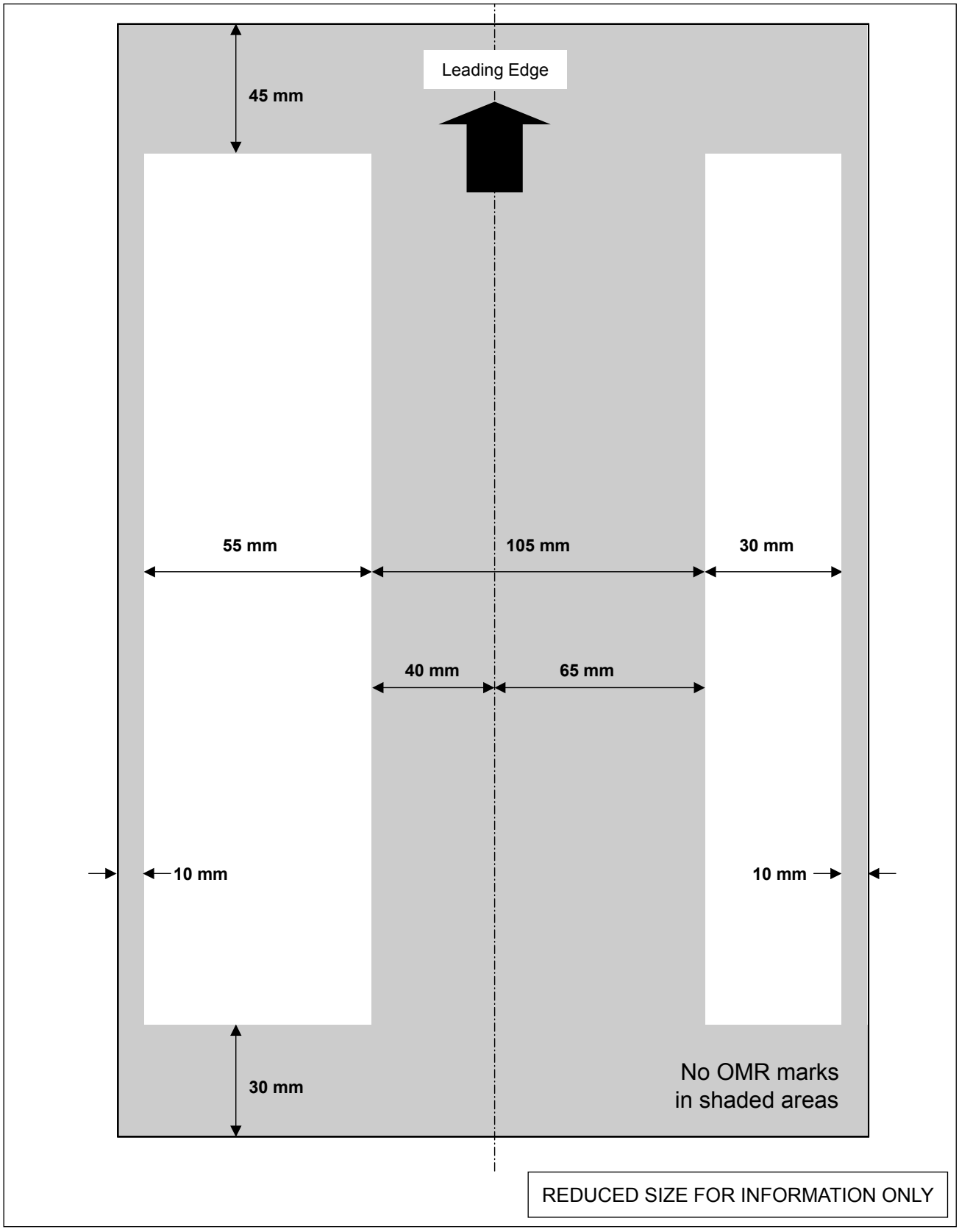


Figure 2-1 **Scan template - OMR Top Reading Standard (Kit F736)**

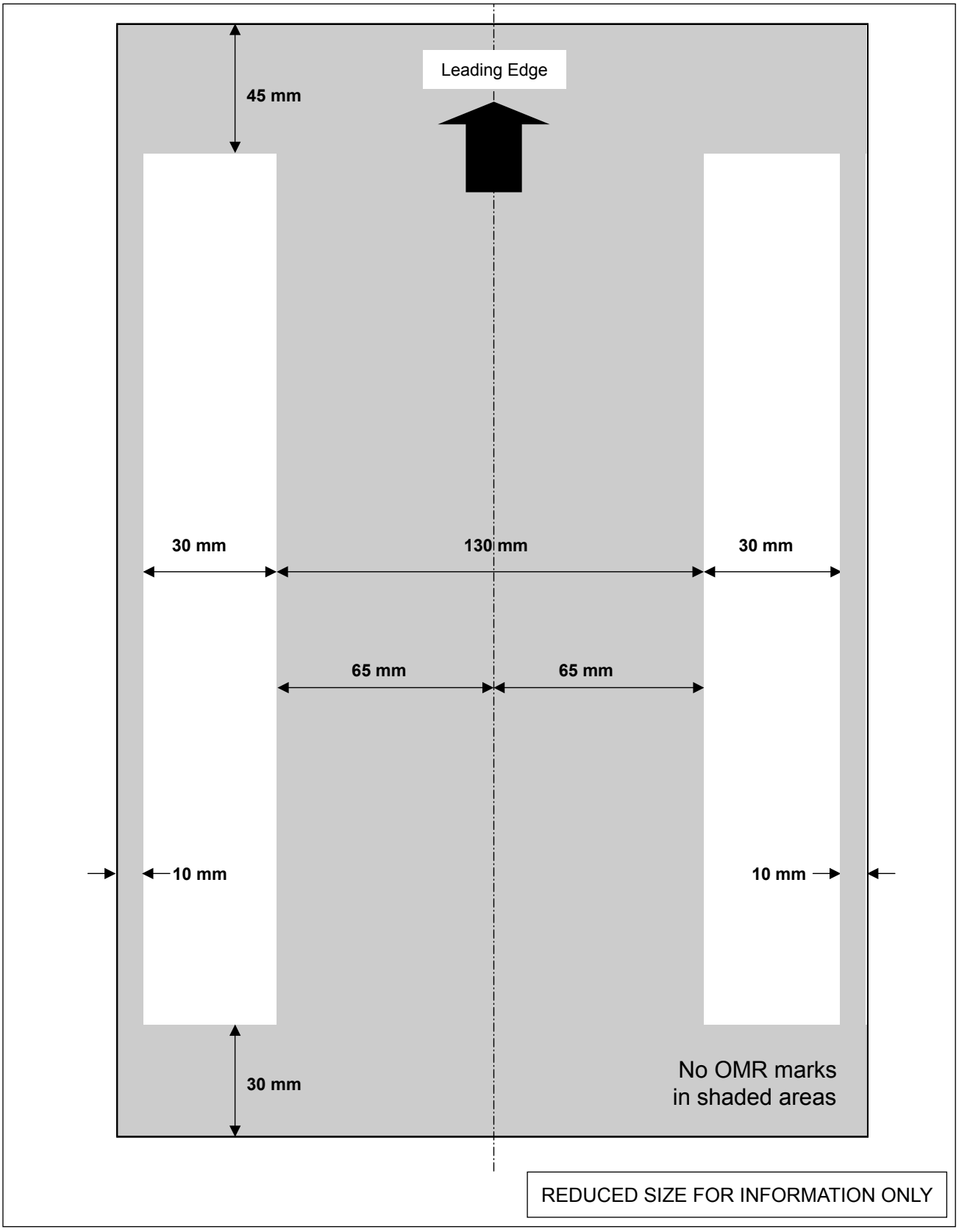


Figure 2-2 **Scan template - OMR Bottom Reading Standard (Kit F736)**

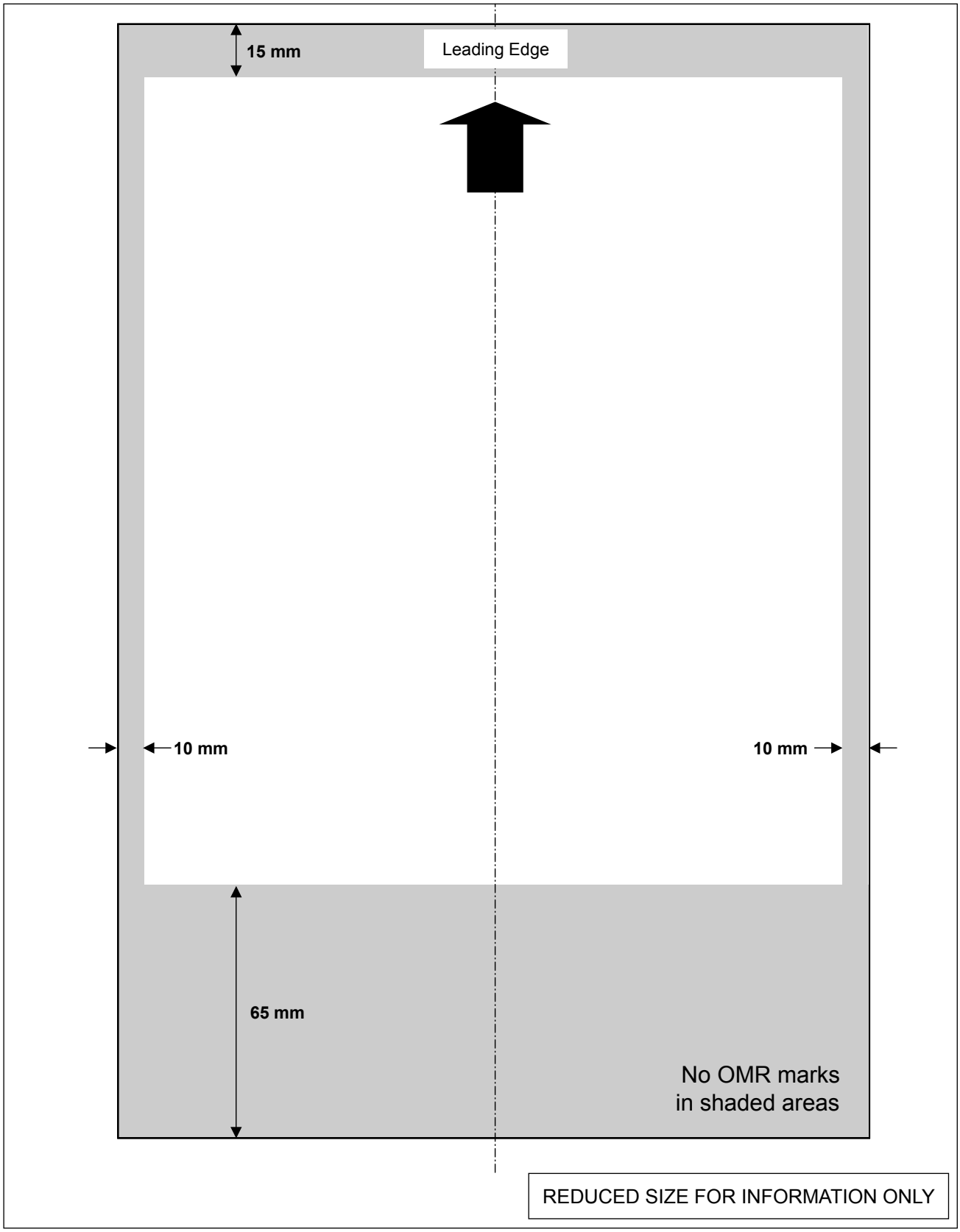


Figure 2-3 **Scan template - OMR Top and Bottom Reading Custom (Kit F739)**

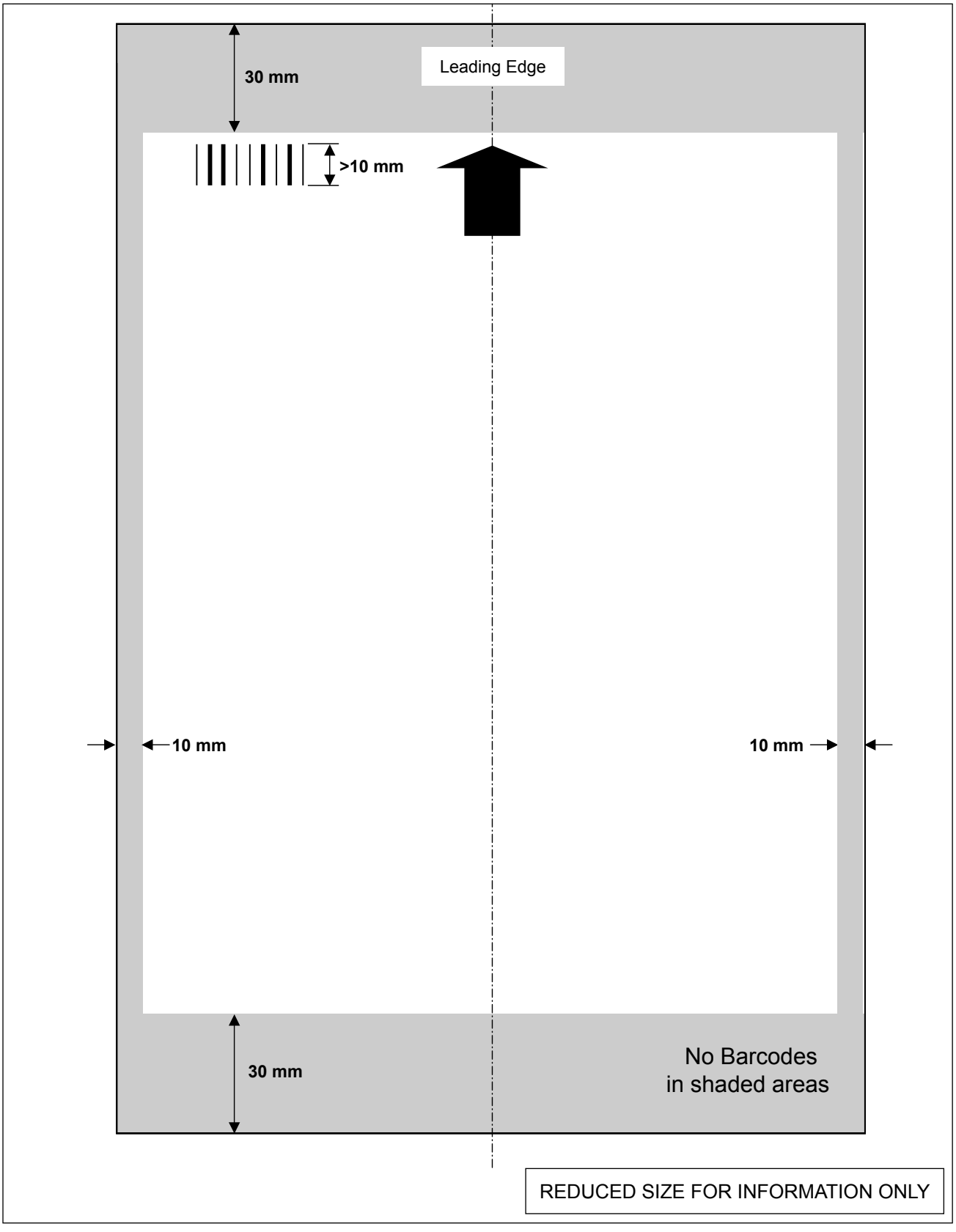


Figure 2-4 **Scan template - BCR Top and Bottom Reading Standard (Kit F737)**

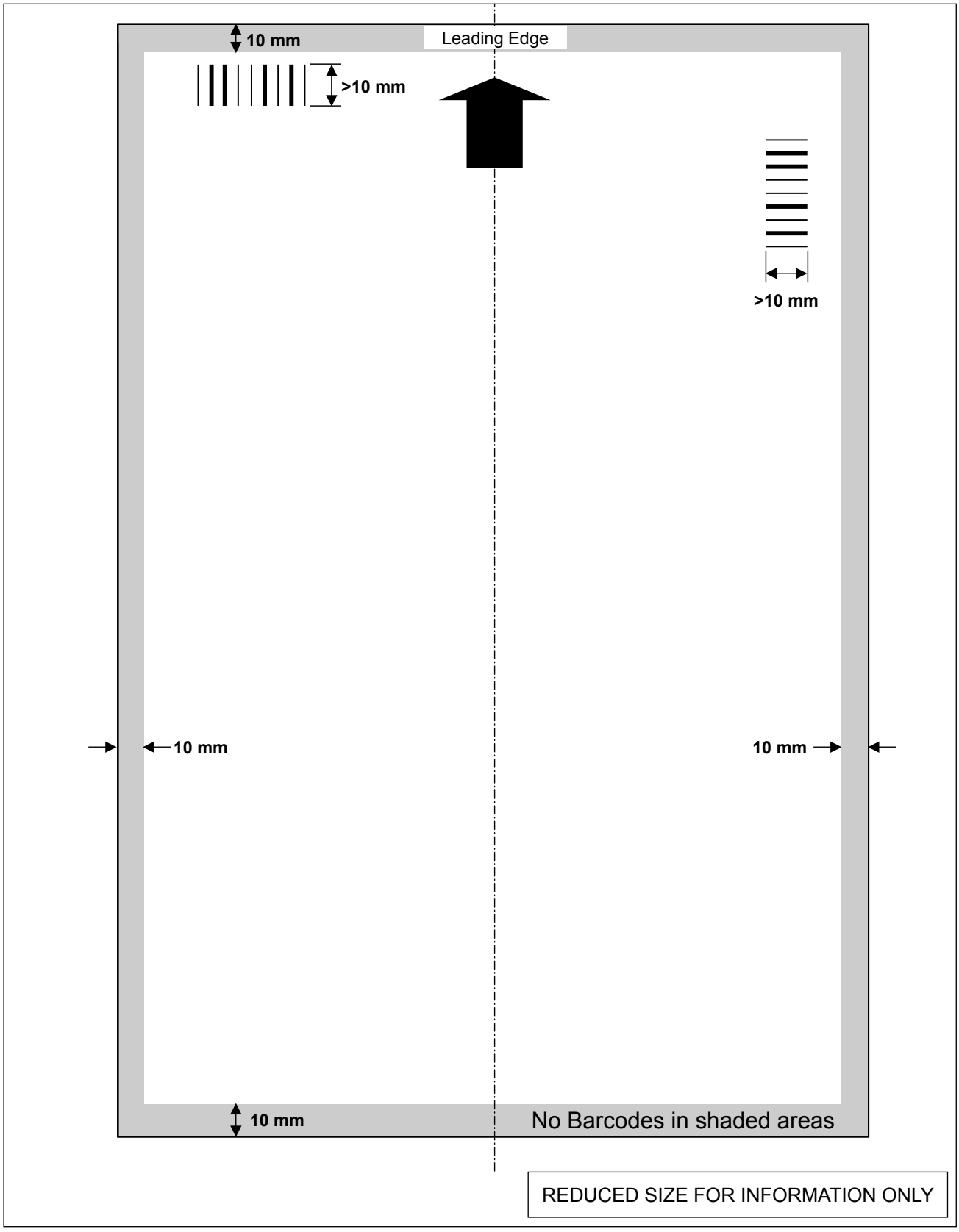


Figure 2-5 **Scan template - BCR Top and Bottom Reading Moving Beam (Kit F738)**

Theory of Operation • 3

3.1 INTRODUCTION

The Model F731/F734/F735 combination may be used as an input device for the DI900/DI950 Inserting System.

3.1.1 Standard Features

- ❑ Bottom feeding of material
- ❑ Variable speed control
- ❑ Overcount control
- ❑ Automatic double document detection
- ❑ Job storage - up to 99 jobs available
- ❑ Multi-function operator controls
- ❑ Easy to use self prompting display
- ❑ Out of material and jam detection
- ❑ Resettable sheet counter
- ❑ Batch count control
- ❑ Operator selectable scan line increments: 1/6", 1/8", 1/10" and 'User Definable'

3.2 THEORY OF OPERATION - F731

1. Power on, the LCD display will momentarily show the software level and then the job listing screen. Exit (blue) button LED will be on. 'USB' displays if the USB connection is active.

2. Using the arrow keys, select the job. Press the Run/Confirm (green) button.

3. Press the Run/Confirm (green) button to enter pre-run adjustments.

4. Item 3 of pre-run adjustments transports material to the accumulator and automatically measures the length and thickness of the material using the double detect sensor.

5. Press the Run/Confirm (green) button momentarily to single cycle the material, or press a little longer for continuous running of material. **This applies to stand alone operation only.** For system operation, the DI900/DI950 Control Panel should be used. The 'O' Ring Motor (M5) will run and drive the “O” ring belts. The Dump Roller Motor (M4) will also run.

6. Whenever the machine is powered up and running, the Retard Motor (M3) will run (if selected), and separate the material on the feed deck.

7. The Take Away Motor (M2) will drive the material into the accumulation area. If booklets are selected, then the Take Away Lift Motor (M6) will lift the upper take away roller to allow the booklet to enter. Subsequently the roller lowers to eject the booklet. The material also passes above or below the scanning head during this feed cycle. Each sheet fed must pass the ramp confirmation sensor. If a one piece per cycle job is selected, the trailing edge of the material passing this sensor will produce a signal for the collation dump rollers to operate, and transport the material into the SIT. The exit sensor will maintain operation of the dump rollers until the material clears the exit area.

   If more than one piece per cycle or a scanning job is selected, either the last sheet fed in the cycle, or the presence of an EOC/Clear Collation Deck on the material will produce a signal for the Dump rollers.

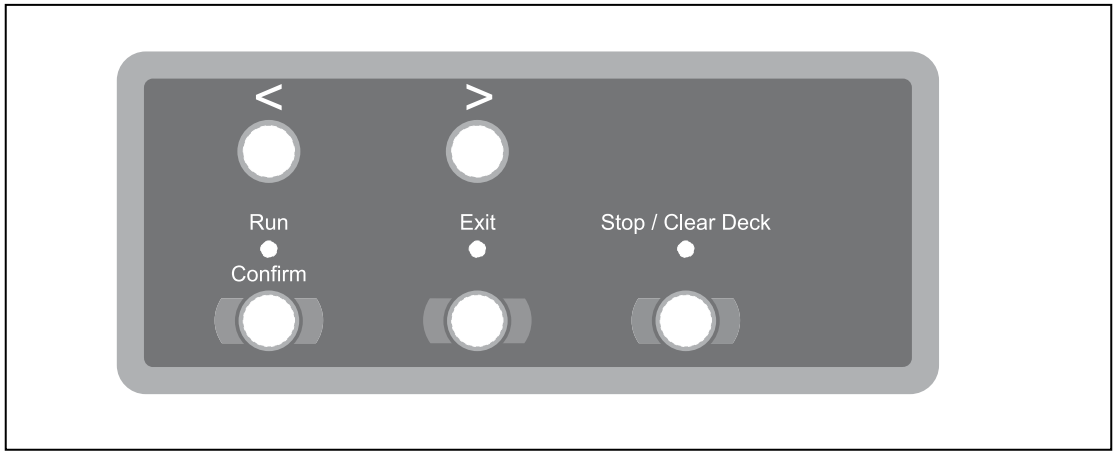


Figure 3-1 F731 Controls

8. Each time a new job is selected on the F731 Universal Feeder, the material exit speed is sent to the DI900/DI950 UIM, which in turn communicates this data to the SIT (F733) in order that the SIT input speed is compatible with the F731 exit speed.

3.3 THEORY OF OPERATION - F734/F735 HIGH CAPACITY LOADER

3.3.1 Information

The purpose of this module is to allow the operator to load a high number of sheets in one operation, up to a maximum of 4,500 sheets, which will enable them to concentrate on the Base Unit and exit areas of the system.

The F734/F735 can only be used in conjunction with an F731 Universal Feeder. It will not interface to any other Sheet Feeder used in the DI900/ DI950 range of Inserters.

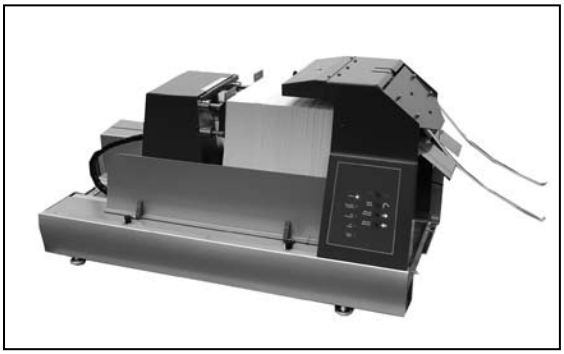


Figure 3-2 F734/F735 General View

The Model F734/F735 can be connected to any version of the F731 Universal Feeder, which means that the Loader can be retrofitted to existing installed machines.

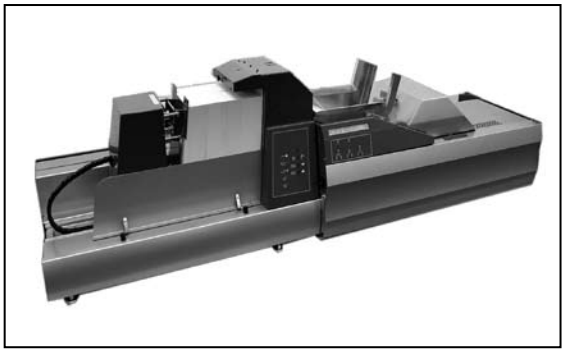


Figure 3-3 F734/F735 located onto a F731 Universal Feeder

When connected to the F731 Universal Feeder, operation of the Loader is controlled by the F731, so the Loader will only feed material into the Universal Feeder when required. In addition if the Universal Feeder/Inserter stops for any reason, the Loader will also stop.

The Loader incorporates interlocked front and top covers, in addition to Jam detection and out of material sensors. The machine also incorporates an interrupt plate, which the operator can use to stop the pressure assembly from advancing to the feed position, and is basically an Emergency Stop.

The machine also has a Separation Adjustment, which is intended for the use of the Operator. If the leading edge of the material is curled due to the operation of the Laser Printer, then the separation gap should be opened slightly.

Do NOT open up this separation gap by more than 2 to 3mm (approx. 1/10"). If the gap is too big, the flow of material down into the Universal Feeder will be adversely affected, as there will not be a continuous overlap of material, causing material jams.

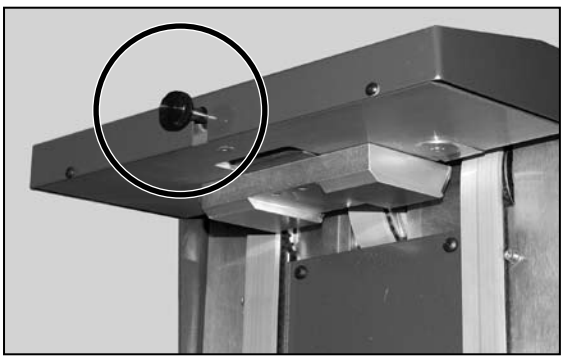


Figure 3-4 Separator Adjustment

3.3.2 Operation

After loading the material and closing the front cover, the Pressure Assembly is advanced to the feed position using the Manual Forward Button. When the Pressure Assembly drives up against the paper stack a switch detects this engagement and switches off the Pressure Assembly drive motor.

Pressing the Stop/Auto button sets the machine to Automatic mode of operation.

When loading the first batch of sheets, do not push the material in against the feed belts, as this will cause the first couple of sheets to twist and jam. Instead move the paper up to the Feed belts. For subsequent batches of material you can push the sheets up against the material already loaded.

After selecting the job on the F731 Universal Feeder and pressing the Run button, material will automatically feed from the Loader down into the Feeder Deck of the Universal Feeder.

Figure 3-5 F734/F735 Controls

A sensor mounted in the Feeder Deck measures the amount of material fed. After approximately 10 sheets, the Loader will switch off. As the material feeds through the Universal Feeder the sensor height determines when the Loader starts/stops. This sequence will continue until the Loader is empty.

There is a second sensor in the Feeder Deck of the Universal Feeder, which reflects off a reflector mounted on the Feed-out area of the Loader. This sensor is for jam detection. Should the material jam in the Feeder Deck area, then the Auto mode of the Loader will be suspended.

As the number of sheets on the material feed belts is never more than 15, the life of these belts will be considerably higher than on a standard Sheet Feeder without the Loader.

4.1 GENERAL

This section outlines procedures for installing and checking out the F731 Universal Feeder and F734/F735 High Capacity Loader at the customer's site.

4.2 REQUIRED TOOLS

- ❑ Standard Tool Kit with metric wrenches and screwdrivers.
- ❑ Set of metric hex ball drivers.

4.3 UNPACKING AND SETUP

4.3.1 Unpacking & Setup (F731 Universal Feeder)

1. Open the top of the shipping carton.

2. Remove the contents of the accessory section (power lead, etc).

3. Remove the machine from the shipping carton.

WARNING:	The machine is heavy. Care should be taken, and two persons are required to remove the machine from the shipping carton.

4. Remove the Rear Covers.

5. Raise the two right hand and the four central feet on the F731 by 10mm (1/2").

6. Physically locate the F731 onto the F733 Interface Transport Unit (SIT) with the two locating brackets.

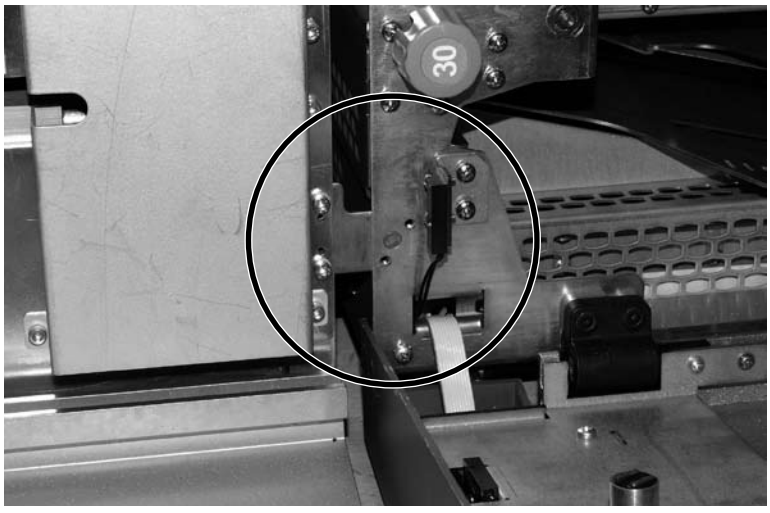


Figure 4-1 F731 located onto F733

7. The F731 must now be aligned. Three criteria need to be met:
   - The exit from the F731 must be level with the F733 input.
   - The F731 must be level front to back.
   - The F731 must be level left to right.

   Use a spirit level and adust the locating brackets and **LEFT HAND** feet of the F731 **only** until the unit is correctly aligned.

8. Lock brackets into place using the four screws provided.

9. Lower the two right hand and four central feet until they ***just touch the desk surface***.

10. Lock all the F731 feet in position.

11. Fit the Control Panel overlay and 4 User Guide decals as shown in the illustration.

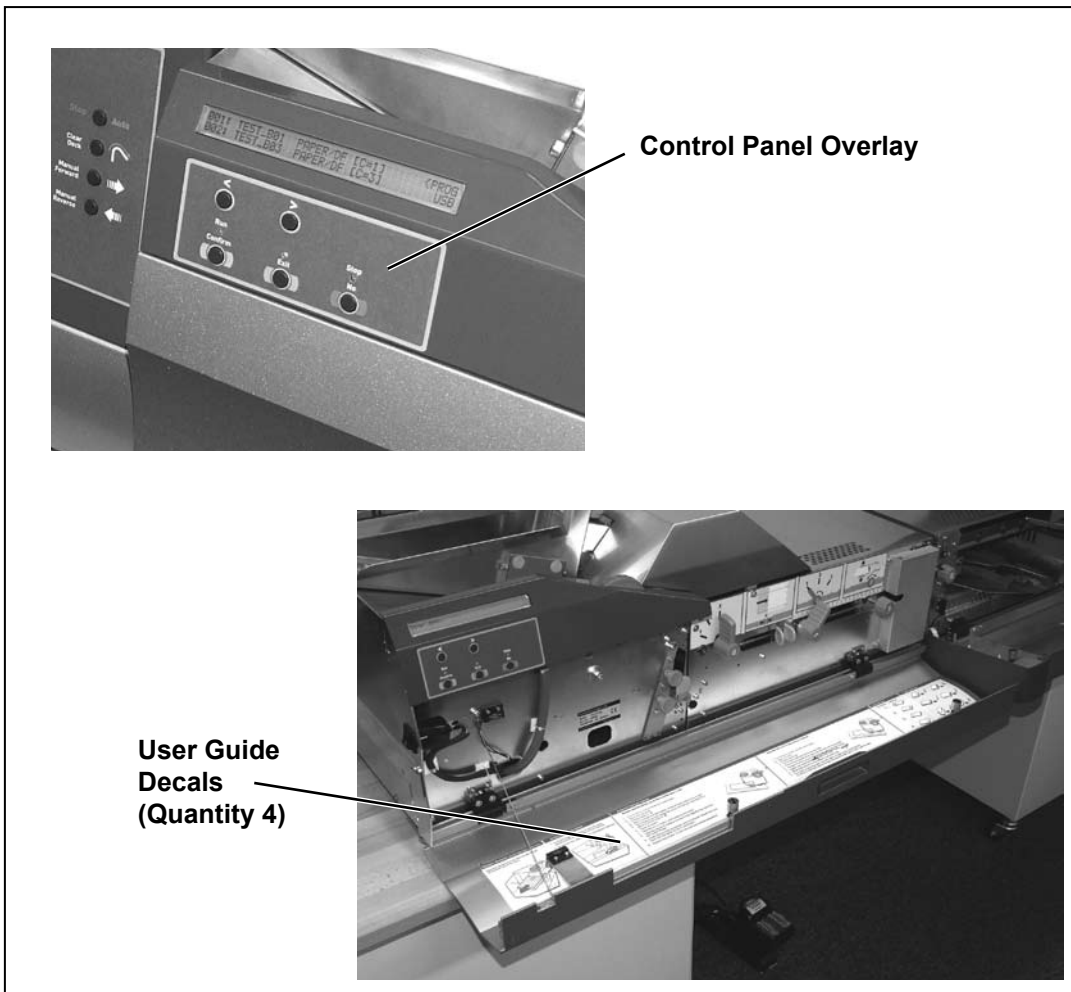


Figure 4-2 F731 Decals

12. Connect the USB cable between the F731 and the F733 (SIT).

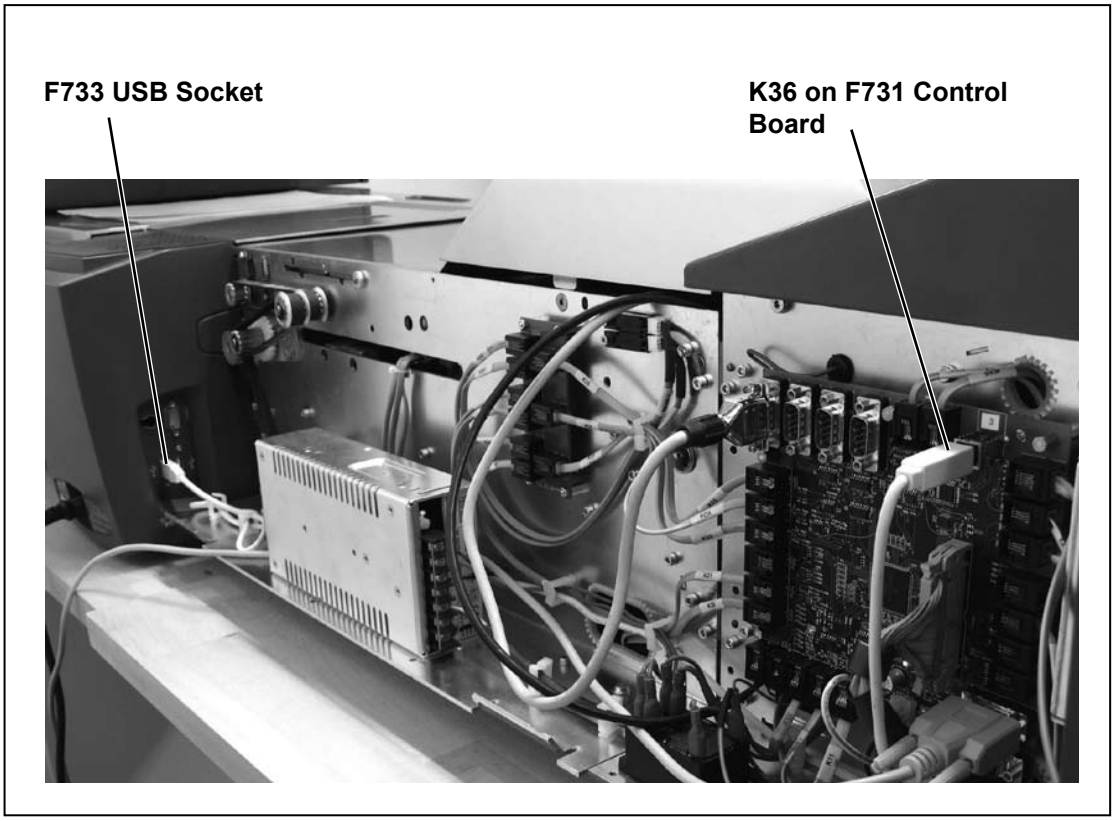


Figure 4-3 F731 to F733 (SIT) USB Cable

13. Power up the entire system and test.

    Check that a single sheet fed from the F731 Universal Feeder transports into the envelope with adequate end clearance in the envelope.

4.3.2 Unpacking & Setup (F734/F735 High Capacity Loader)

Install the F731 and make sure the system power is OFF before fitting the F734/F735.

1. Open the top of the shipping carton.

2. Remove the machine from the shipping carton.

> **WARNING:** The machine is heavy. Care should be taken, and two persons are required to remove the machine from the shipping carton.

3. Fit the Control Panel overlay to the F734/F735.

Figure 4-4 F734/F735 Control Panel Overlay

4. Raise the Exit Area Cover.

5. Open the Material Side Guides on the F731 Universal Feeder to their maximum.

5. Connect the mains power lead from the F734/F735 to the F731 Universal Feeder and turn the F734/F735 power switch to ON.

6. Connect the interface lead from the F734/F735 to plug K40 on the F731 Universal Feeder Control PCB.

7. Loosen the two screws locating the Alignment Bracket on the F731. The rear screw will be left untightened and so it should be loosened *just enough* to allow the Alignment Bbracket to be adjusted.

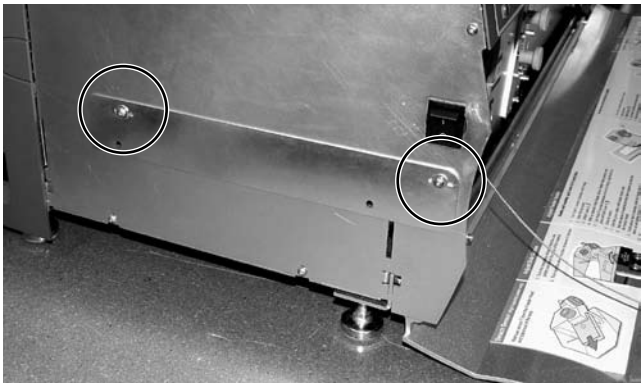


Figure 4-5 F734/F735 Alignment Bracket

8. Position the two docking pins on the F734/F735 High Capacity Loader into the receiving holes of the F731 Alignment Bracket.

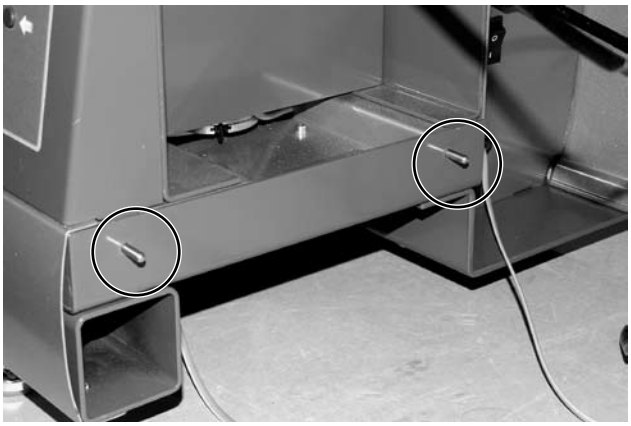


Figure 4-6 F734/F735 Locating Pins

NOTES:

1. Ensure that the cables are not trapped between the modules.

2. Lift the F734/F735 Exit Deck as you position the unit.

Figure 4-7 Lift F734/F735 Exit Deck

9. Remove the F731 Upper Rear Cover.

10. Fit and connect the F731 Input Sensor Assembly. The sensor assembly cable threads through the hole in the F731 Rear Frame and connects to K41 on the F731 Control PCB.

11. Fit the grommet and cable clamp as shown in the illustration.

12. Refit the F731 Upper Rear Cover.

Figure 4-8 F731 Input Sensor Cable

13. Set the F731 Material Side Guides to the width of the paper (A4 or US Letter).

14. Reconnect power to the system.

15. Using the **Clear Deck** button on the F734/F735, feed paper until it projects from the output of the F734/F735.

16. Adjust the alignment of the F734/F735 front to rear until the paper is correctly aligned between the F731 Material Side Guides. Lock the *front* screw securing the F731 Alignment Bracket.

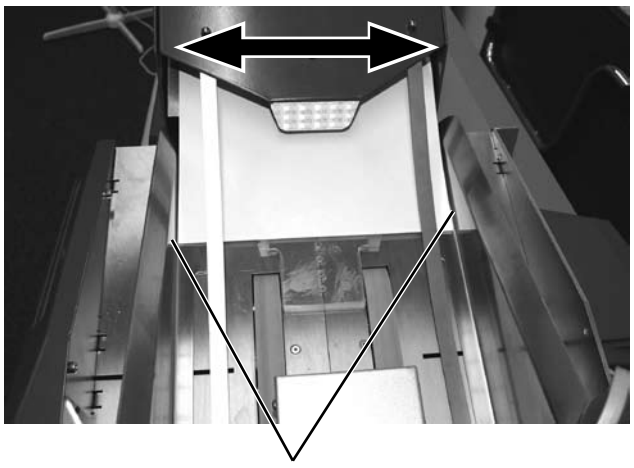


Figure 4-9 Front to Rear Alignment of F734/F735

17. With the aid of a spirit level, adjust the F734/F735 feet until the unit is level left to right. Lock the feet into position.

4.4 OPERATOR TRAINING

Before training the operator on the system, ensure that they are fully trained and proficient in operation of the DI900/DI950 Inserting System.

1. Ensure that the customer's job(s) and/or a standard test job are programmed into the system for training purposes.

2. Show and explain the machine layout and the functions of all the controls.

3. Switch the machine on. Explain the functions of the Display Panel and buttons.

4. Show how to select a pre-programmed job. Explain that the machine will always request pre-run adjustments when first selecting a job and explain when this is and isn't necessary.

5. Explain how to load material into the F734/F735 and/or F731 as applicable for the system installed. Show paper orientation symbols for loading material.

6. Run a job. Explain control of the system via the DI900/DI950 Control Panel. Include running a trial piece and checking its contents.

7. Show how to load material while the machine is running.

8. Material stoppage. Explain stoppage access positions and how to use the **Clear Deck** button.

9. Operator “Hands On”. Allow the operator to select a new job and adjust the system.

10. Call avoidance. Explain the use of the trouble shooting section within the operating guide.

11. Operator maintenance. Show how to clean the Feed Belts, etc.

12. Program the customer's live job(s) and/or instruction 'supervisor' on job programming based on their particular application(s).

4 • Installation

Troubleshooting & PM Procedures • 5

5.1 TROUBLESHOOTING CHARTS

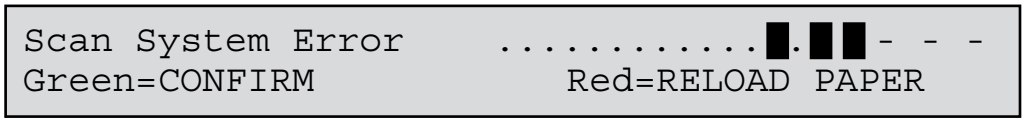
Problem	Possible Cause
System fails to start	No power at outlet. Check the supply circuit breaker or ON/OFF switch.
	Power cord disconnected or Main Power Switch on F734/F735 or F731 turned OFF.
F731 powers up but won't display program list or displays random characters.	F731 program has failed to load. Turn F731 Main Power Switch OFF then ON again to reset. Also make sure that the covers are securely closed.
F731 will not respond to controls, display prompts 'Cover Open'. Program button blinks.	A cover is open. Check the F734/F735 Front and Exit Area Covers and the F731 Front and Top Covers. Close all covers securely.
F731 will not respond to controls. Controls appear locked.	Turn the F731 main power switch OFF then ON again to reset.
	Communication with DI900/DI950 has been interrupted. Power down all modules together, then re-power system.
F734/F735 will not respond to controls, yellow indicator lights flash.	A cover is open. Check the F734/F735 Front and Exit Area Covers and the F731 Front and Top Covers. Close all covers securely.
	Check for an error condition on the F731 display.
Material feed appears slow/ sluggish.	Check for correct position of the F731 Feeder Side Guides.
	Clean the material feed belts.
	Check the Feeder Head/Separator adjustments.
Material stops in the F731 accumulation area. Display prompts 'Double feed error'.	Check the Accumulator Side Guide settings and the Ramp settings.
	Wrong program selected from listing.
Material stops in the separation area. Display prompts 'Double feed error'.	The F731 has detected a 'Double Feed'. Push the **Stop/Clear Deck** button to advance the material into the accumulator area for error correction. If double feeds persist, check the Feeder Head adjustment.
Multiple feed errors or stream feed errors.	Check the Feeder Head adjustment.

5 • Troubleshooting & PM Procedures

Problem	Possible Cause
Feeder display indicates 'DF Sensor Out of Limit'.	The material is too thick to be sensed by the double detection system.
	Check that you have selected the correct program.
	Check that the job is programmed correctly i.e. 'Paper' or 'Booklet' (if appropriate) selected in material selection to turn double detect off.
Feeder display indicates 'Current Job Not Compatible'.	Check the job setups on the F731 Universal Feeder **AND** the material listed for feeder Y on the DI900/ DI950 Inserter to ensure that both have the same material type and loading orientation.
	If scanning is being used, check it is selected in both the F731 **AND** the DI900/DI950 programs.
Feeder display indicates 'No Material for Double Feed Adjustment'.	Take a single sheet and load it onto the F731 Feed Deck.
	Material not being transported to Take-Away Roller. Adjust Feeder Head settings.
Feeder display indicates 'Wrong Accumulation Direction'.	Check the position of the Accumulator Ramp.
Feeder display indicates 'Wrong Input Frame Position'.	Check the position of the Input Frame.
Feeder display indicates 'Misfeed on Conveyor'.	Check the Accumulator Side Guides settings.
	Check to ensure that the green accumulator belts are properly installed on all pulleys.
Feeder display indicates 'Scan System Error'.	Scanner not positioned correctly above/below the scan marks.
	Scan head may be blocked or dusty. Clean scan head surface with a soft cloth.
F734/F735 will not go into automatic mode.	Check that the Input Sensor is properly installed.
	Check Exit Area Cover is closed.

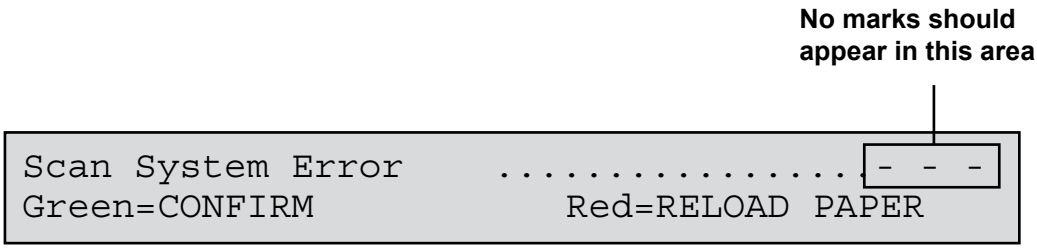
5.2 TROUBLESHOOTING USING THE SCAN ERROR SCREENS

It is possible to use the Scan Error Screens to check that the sheet feeder has read the appropriate scan marks. An example Scan Error Screen is shown below:



If some marks are missing or printed in the wrong position on the material, you will be able to see this by checking the display on the Scan Error Screen.

a. There should be no marks (black blocks on the display) indicated in the area shown in the illustration below. If marks are shown, a scanning error has been detected.



b. Whenever the sheet feeder stops and indicates a scanning error, you should compare the marks on the Sheet Feeder display with those on the material.

In cases a and b above, examine the page which has been transported under the scanning head and into the conveyor area. Check the print quality of the scan dash marks and their positions on the page. If the material appears to be OK, check the scanning program settings on the Sheet Feeder, especially the setting 'Distance Scan Head to First Mark'.

5.3 PREVENTIVE MAINTENANCE

This section of the manual provides inspection, preventive maintenance and lubrication procedures for the F731/F734/F735. The PM routine is recommended at least twice a year, and more often as usage dictates.

5.3.1 Equipment Inspection

1. Check with operator. Discuss and note any equipment problems reported by the operator.

2. Functional check. Carefully watch the equipment run and analyse its operation. Check for proper operation of **all** system components. If you notice any operator errors, explain correct setup, loading and running procedures.
   - ✓ Check that forms fall within specification and are loaded properly.
   - ✓ Check Universal Feeder for proper setup.
   - ✓ Check operation of safety interlocks.
   - ✓ Listen for unusual noises - scraping, grinding and so on.
   - ✓ Check for mechanical binds. Make sure that drive system components turn freely when cycled by hand.

5.3.2 PM Routine

1. Disconnect system from power supply.

2. Lower front and rear covers. Open top covers.

3. Clean paper dust and dirt from machines.

4. Inspect the following for signs of wear and clean or replace as required:
   Rubber Stepper Roller
   Upper and Lower Retard Rollers
   All O Ring Drive Belts

5. Refit covers.

6. Connect power supply.

7. Load system and test.

8. Clean all external covers.

6.1 DUMP ROLLER DRIVE MOTOR REMOVAL/REPLACEMENT

1. Disconnect the system from the power supply.
2. Lower the front and remove the rear covers.
3. Remove 4 screws securing the dump roller drive cover and remove the cover.
4. Remove 4 screws (2 each side) locating the lower right exit cover and remove the cover to gain access to the dump roller motor.
5. Remove the drive belt.
6. Disconnect the 2 connectors from the motor.
7. Remove the 4 screws which secure the dump roller motor and remove the motor.
8. Reassemble in reverse order.

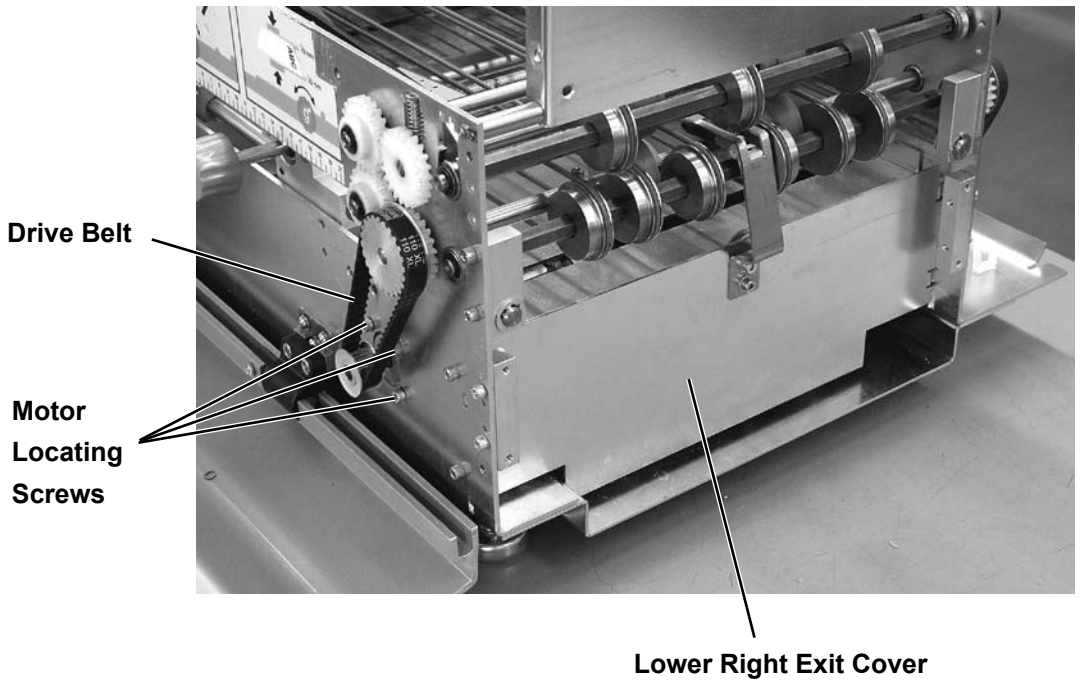


Figure 6-1 Dump Roller Motor Removal

6.2 "O" RING DRIVE MOTOR REMOVAL/REPLACEMENT

1. Disconnect the system from the power supply.
2. Remove the rear covers.
3. Remove 4 screws (2 each side) locating the lower right exit cover and remove the cover to gain access to the dump roller motor.
5. Remove the drive belt.
6. Disconnect the 2 connectors from the motor.
7. Remove the 4 screws which secure the dump roller motor and remove the motor.
8. Reassemble in reverse order.

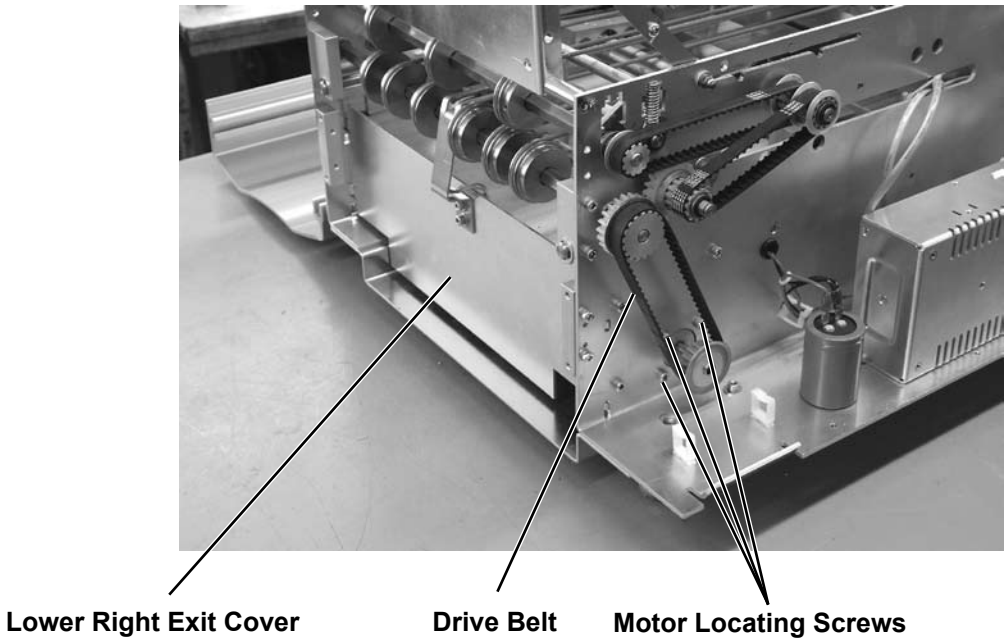


Figure 6-2 'O' Ring Drive Motor Removal

6.3 RETARD ROLLER/MOTOR ASSEMBLY REMOVAL/REPLACEMENT

1. Disconnect the system from the power supply.
2. Remove the two thumb screws and raise the upper separation assembly.
3. Remove the two 1.5mm set screws from the motor mounting.

Note: Care should be taken not to mislay any of the shim washers from the retard roller, as when the roller is refitted, it is imperative that the roller rotates in the centre of the shield opening.

3. Remove the Retard Roller/Motor.
4. Reassemble in reverse order, noting the refitting of the shims, and the one way clutch/bearing of the retard roller. The roller should manually rotate freely in the opposite direction of paper travel.

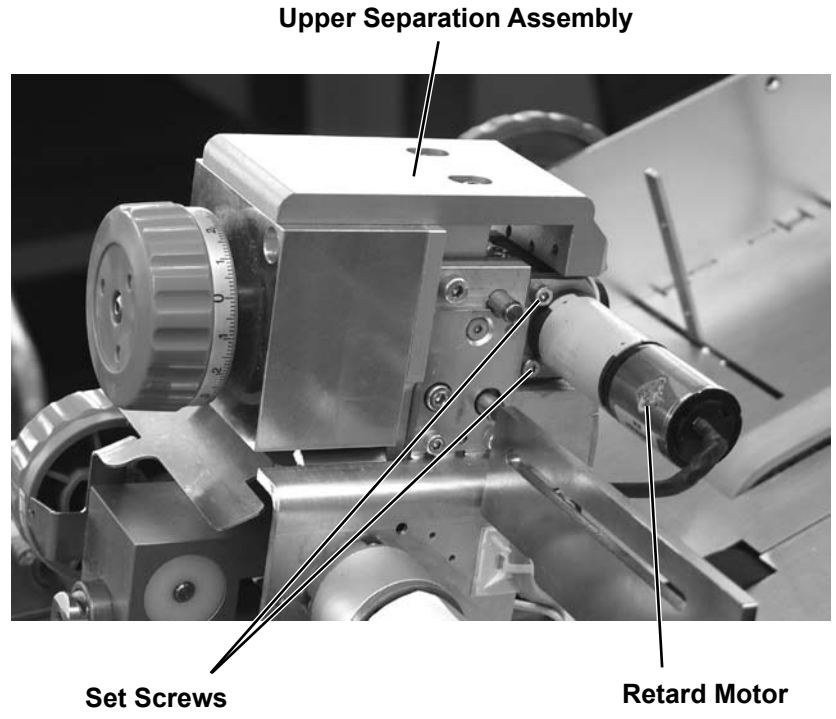


Figure 6-3 Retard Motor Removal

6.4 CHANGING THE HIGH FRICTION MATERIAL FEED BELTS

1. Disconnect the F731 power supply.
2. Lower front cover.
3. Remove:
   - Control Panel Cover
   - Left Hand Cover
   - Top Rear Cover
   - The two Lower Rear Covers

4. Remove the 8 screws (4 each side) holding the material side guides to their support brackets and remove the side guides.

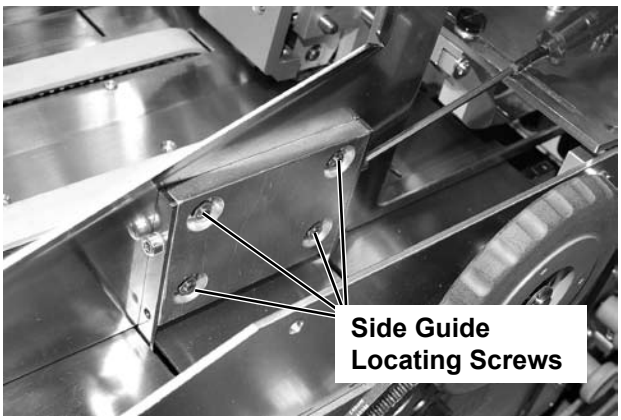


Figure 6-4 Material Side Guide Screws

5. Remove the two thumb screws and raise the upper separation assembly.

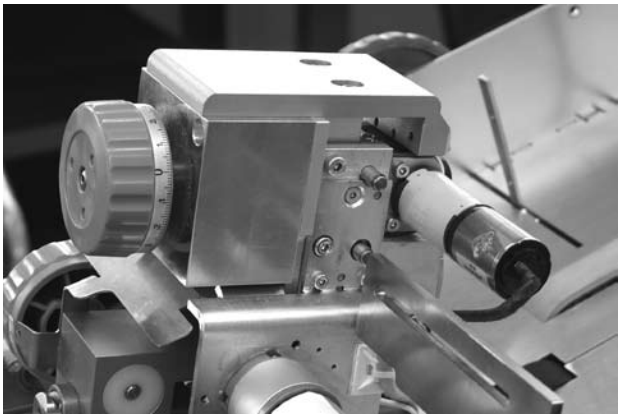


Figure 6-5 Raise Upper Separation Assembly

6. Remove the blue material side guide adjustment knob, including pulley and toothed belt.

Figure 6-7 Remove Knob, Pulley and Belt

7. Remove the two deck screws at the separator end of the deck and then remove the remaining 6 deck screws.

Figure 6-8 Remove Deck Locating Screws

8. Remove the 12 screws from the front of the machine as indicated. These locate the deck plate and the front bearing block.

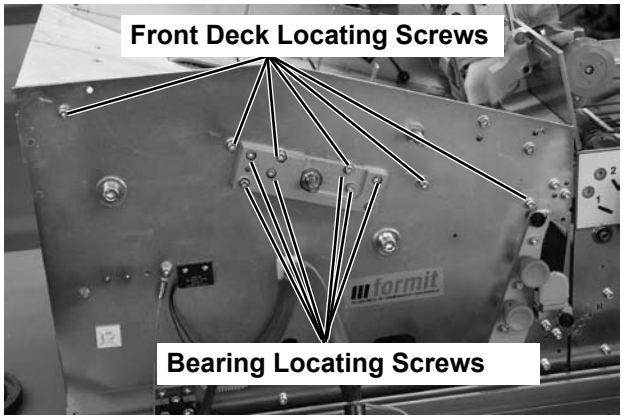


Figure 6-9 Screws Through Front Frame

9. Remove the C-clip and shims from the front of the side guide worm gear shaft.

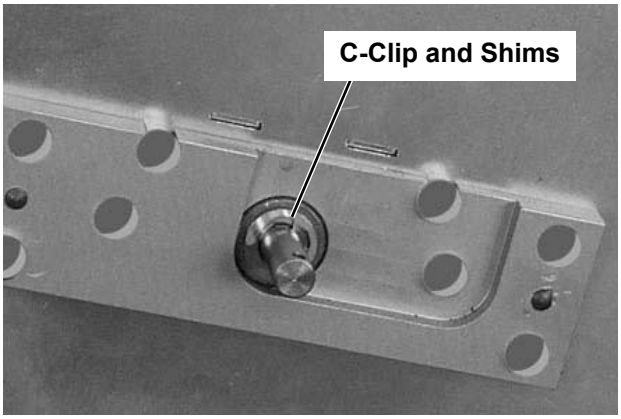


Figure 6-10 Remove C-Clip and Shims

10. Disconnect K34 from the control PCB on the rear of the machine and thread cable through the rear frame. Remove the front deck plate, taking care not to damage the sensor on the deck plate.

11. Remove the 8 screws from the rear of the machine as indicated and remove the rear deck plate.

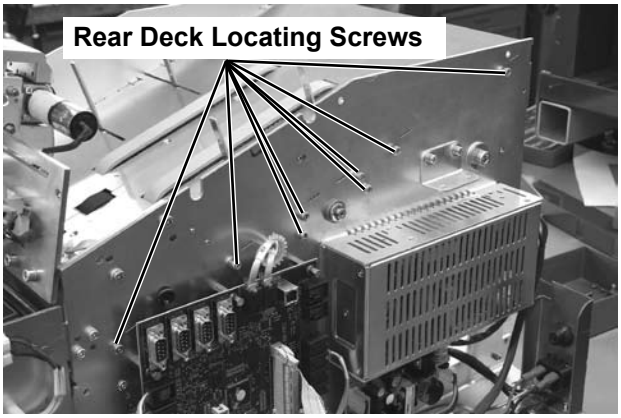


Figure 6-11 Remove Rear Deck Locating Screws

12. Remove the C-clip and shims from the rear of the side guide worm gear shaft.

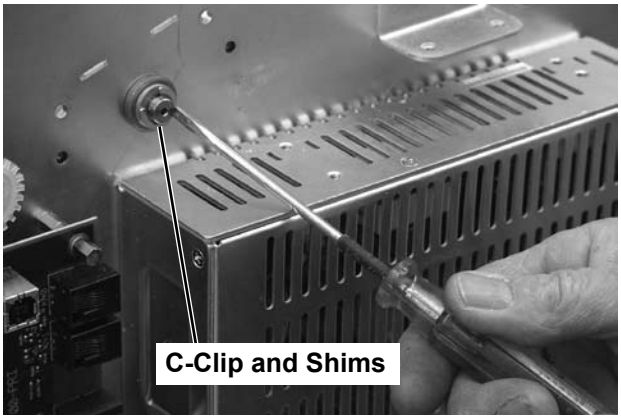


Figure 6-12 Remove C-Clip and Shims

13. Tap the side guide worm gear shaft from the front with a soft hammer and then withdraw the rear bearing.

14. Remove the bearing block from the front frame.

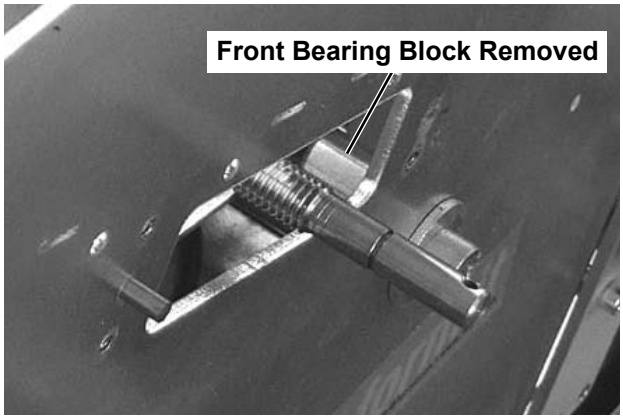


Figure 6-13 Remove Front Bearing Block

15. Fit the removal clamp as shown and tighten to remove tension from the feed belts.
16. The side guide mounting assembly can now be slid to the front to allow clearance to remove the rear high friction feed belt.
17. Withdraw the two support shafts through the front frame. This allows clearance to remove the front high friction feed belt.

Reassemble in reverse order.

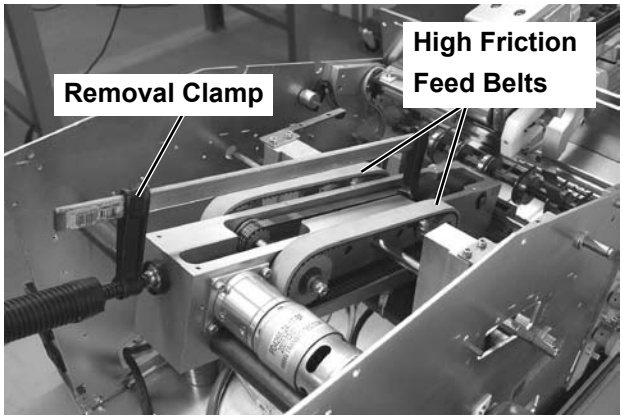


Figure 6-14 Removal Clamp Location

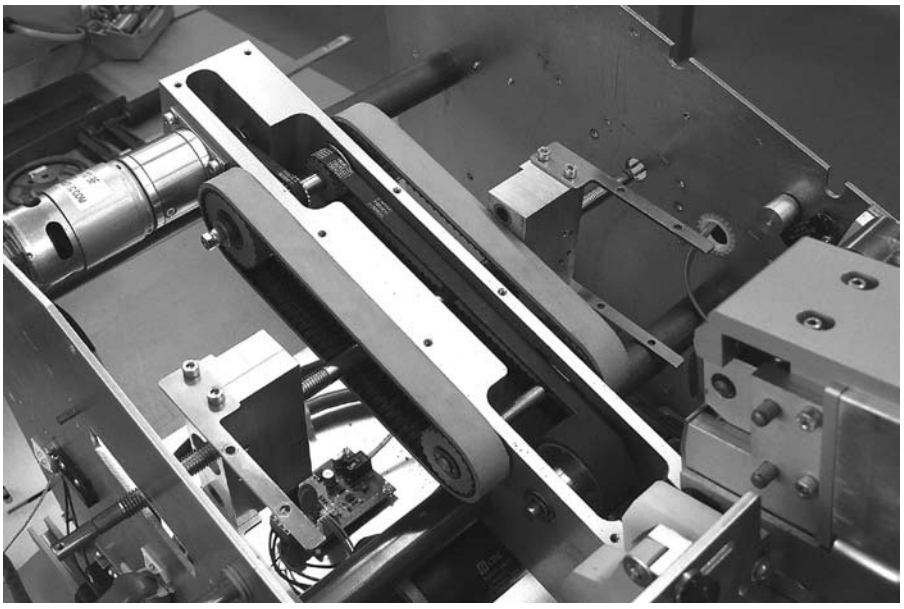


Figure 6-15 High Friction Feed Belts General View

6.5 OMR SCAN HEAD VOLTAGE ADJUSTMENT

Note: Check all voltages with reference to ground on the logic PCB (marked GND on the PCB)

1. Disconnect the power supply.
2. Remove the rear covers.
3. Slide access cover of scanner open so as to expose the potentiometer adjustment and test point.
4. Using a digital meter set for DC volts, connect the ground lead to the GND test point on the main logic PCB and the other lead to the test point on the scanner head.
5. Reconnect the power supply and switch on the Universal Feeder.
6. Carefully adjust the potentiometer until you obtain a reading of 650mV.
7. Refit the rear covers, and close the scanner access cover.

6.6 SET-UP FOR OMR SIMULATION PROGRAM - F731 UNIVERSAL FEEDER

1. Select 'New Scanning Job'.
2. Load job title as “**Simulat**”.
3. Select ‘Material: Paper/DF’.
4. Select 'Loading Orientation: 3 DOWN-BOTTOM'.
5. Select 'OMR DI900/DI950'.
6. Select 'Scan Line Increments' at 1/6th inch.
7. Program:
   BM Control - position 1
   EOC present - position 2
8. Press Exit (Blue).
9. Set 'Distance Lead Edge to Bench Mark' at 500mm.

6.7 DOUBLE DOCUMENT DETECTION

The Double Document Detection system on the Model F731 Universal Feeder employs Through - Beam sensors, which look through the material to determine the thickness.

The system operates automatically, and does not require any operator intervention for normal operation.

The first sheet fed, after selecting a job, is the reference piece for detection.

Each time a feed cycle takes place, the detection system scans the material every 10mm of paper travel. From these readings, the software produces an average figure for density of the single sheet. Based on this average, the software also determines what the figure would be if a double sheet fed.

As the printed material could easily vary in density in terms of block areas and solid print, some adjustment is required in order that these variations in print do not affect the correct operation of the Double Detection.

In Job setup, you can select:

- Paper — No double detection.
- Paper/DF — Double detection on, with system looking 7 consecutive times for a consistent reading.
- paper/DF+ — Double detection on, with a configurable figure (from 1-35) for the number of consecutive reads.

Example:

- If the application is for an A4 sheet with 15-20% printed coverage, a setting of 7 is sufficient.
- If the application has a large block area of 80mm in depth, this area would read in excess of the Double Reference reading, and consequently stop for a false double. In order to prevent this, a setting of 12 would be required, as in this case, the setting would cover an area in excess of the block area.

This adjustment is programmable by job. It is therefore possible to set up the operation of the Double Document Detection to compensate for a wide variation in print density.

6.8 F734/F735 PRESSURE ASSEMBLY ADJUSTMENT

During normal operation, the pressure assembly should move consistently toward the right as the paper stack is reduced. If this movement is not consistent and/or appears erratic, adjust the operation of the pressure assembly on/off switch as follows:

As a reference point, ensure that with the pressure plate in the released position, a measurement of 52.5mm ± 0.5 is obtained between the face of the pressure assembly and the actuating housing.

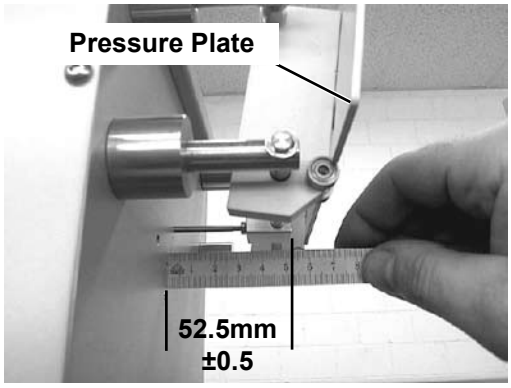


Figure 6-16 Pressure Plate Setting

With the power on, push the pressure plate by hand until the 'No Pressure' LED on the control panel switches off.

The distance between the released position and LED off position should be 5.0 mm ± 0.5

In order to adjust, loosen the lock nut and turn the axle.

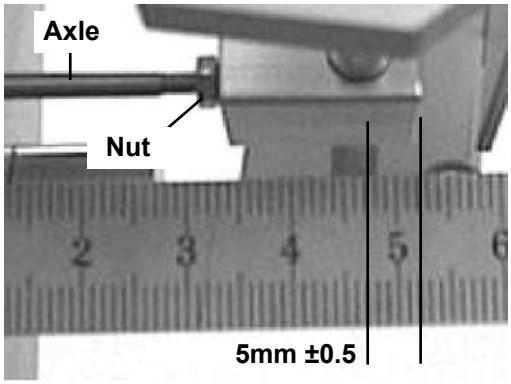


Figure 6-17 Pressure Plate LED Setting

6.9 REPLACEMENT OF THE F734/F735 MATERIAL FEED BELTS

There are three Material Feed Belts on the Model F734/F735 High Capacity Loader. These belts should be replaced as a set (all three at the same time) in order to ensure even wear and performance.

Remove the Top Cover assembly, including the Separator Assembly. Remove the metal material transport plates. Remove the two belt tensioners.

Note:

Take care to mark the positions of the Pulleys BEFORE removal, as they incorporate one way bearings. Incorrect reassembly will not permit correct direction of drive.

Also, take care not to lose the shims which are fitted to the Pulleys.

Figure 6-18 Material Feed Belt Drive

6.10 REPLACEMENT OF THE F734/F735 SEPARATOR ASSEMBLY

The Separator Assembly should be replaced as a complete unit. The rubbers cannot be replaced individually, as they need to wear and perform evenly.

When replacing this unit, please make sure that it is set square to the Loader, and not skewed, as this will adversely affect performance.

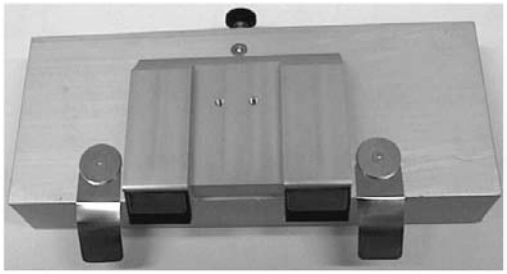


Figure 6-19 Separator Assembly

6.11 REPLACEMENT OF THE F734/F735 PRESSURE SPRINGS

Change the Pressure springs as a complete set of eight. You cannot change the springs individually, as this will adversely affect the performance.

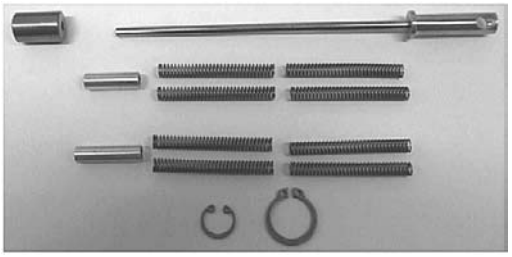


Figure 6-20 Pressure Springs

6.12 F731 SERVICE MENU

To access the Service Menu, press the **Green**, **Blue** and **Red** buttons simultaneously.

The default password is **17**, which is hard coded and cannot be changed. When entering the password, use the left arrow key to scroll to "**1**", then press **Green**. Again, with the left arrow key, scroll to "**7**", then press **Green** followed by **Red**.

You are now in the Service Menu.

The service menu offers the options listed later in this section. Use the **Arrow Buttons <>** to select an option, then press **Green** to confirm. When you are finished with any option, press **Red** to go to the next selection.

When you have finished using the Service Menu, press **Blue** (Exit) to leave the menu.

The service menu structure is split into three main sections:

- **System Test**
- **Service Parameters**
- **Software (SW) Download**

6.12.1 System Test

the following options are available:

Belt Cleaning

When selected, gives a single option 'Material Feed Belt'.

The Material Feed Belts should be cleaned if the belts appear contaminated and/or if material feed is sluggish.

This option allows you to stop and start the belts using the **Green** button to facilitate cleaning.

Press the button momentarily and the feed belts will run for approximately 3 seconds. Press and hold the button to run the feed belts continuously.

Motor Test

Allows you to test operation of the system's motors. Press and release the **Green** button to toggle each motor on or off. The options available are:

- Take-Away Roller
- Dump Rollers
- O Ring
- Material Feed Belt
- Retard Roller
- Take-Away Lift

LED and Key Test

This option carries out a sequence of tests on the control panel LEDs and the display.

A description of each test is given on the display as it is carried out.

BCR Test

This function allows you to test that a BCR scanner is reading a code.

When selected, the scanner red lights will flash slowly. Manually position the bar code above or below the scanner as applicable. If the code is read successfully, the lights will flash faster and the characters read will display on the operator display.

Show Sensor Status

The display will show the current status of every sensor on the system.

Blocking and unblocking each sensor will show on the display readout, allowing you to check sensor operation.

Double Feed Adjust

This allows you to check operation of the double feed sensing.

Before carrying out this adjustment release lever A, raise the separator and relock lever A to hold the separator in the raised position.

The system will initially remind you to remove any sheet that is in the separator. With the separator clear of material, press **Green** to advance to the next screen.

Press **Green** to start. The system will display 'Adjust DF sensor for zero sheet' as it calibrates itself.

If you receive a message that the sensor is not calibrated, clean the sensor and try again. If the problem continues, replace the sensor.

If OK, the next display shows 'Double Feed Test: Place one sheet'. Place a single sheet under the separator and press **Green**.

The display should show 'Adjust DF sensor for one sheet' as it calibrates. If all is OK, the display will show 'Double Feed Sensor O.K.'.

Total Feed Cycles

Provides a non-resettable total count for the number of sheets fed.

6.12.2 Service Parameters

The following options are available:

Display Scanned Marks Can be set to either yes or no. If set to yes, the feeder will stop after each sheet fed and display the scan marks read on the sheet for diagnostic and evaluation purposes. If set to no, the feeder will only stop for an actual scanning fault detected.

RS232 Terminal K47 The default setting is 'OFF'.

Press **Green** to edit this setting. Using the **Arrow Buttons** you can scroll through the following:

OPTION	DESCRIPTION
USB Monitor	Factory diagnostics only
DF+OMR/BCR Monitor	Factory diagnostics only
BCR Monitor	Factory diagnostics only
OMR Monitor	Factory diagnostics only
AVS Data (IF)	This option **must** be selected if you are connecting an AVS input scanning kit to the F731.

Error Mode Error mode operates on a double feed or scan error.

The available options are:

OPTION	DESCRIPTION
Outsorting (default)	Sends the set into the F733 SIT.
Stop	Stops the F731 with the faulty set in the accumulation area.
DF Immediate Stop	Stops with the double feed sheet or scanning error sheet immediately under the separation area before the accumulation area.

BCR Factory Test Used in the factory and not for field use.

Pre Run Adjustments Use **Green** to edit. The available options are:

OPTION	DESCRIPTION
First Run	The pre run adjustment procedure will only be requested when a new job is selected. i.e. even through a power cycle this will not be requested if the same job is being run.
Always	The pre run adjustment procedure will be requested EVERY TIME The user starts a job.

System Connection Use **Green** to edit. The available options are:

OPTION	DESCRIPTION
Off Line	Use when the system is being used NOT connected to the inserter. This can be useful for initial setup or testing.
On Line USB	Use for normal operation inline with an inserting system.

Language Select the language used in the display screens.

Scanner Installation This system can be fitted with a maximum of 4 Barcode type scanners and 2 OMR scanners.

This option sets the system so that it knows the location(s) of each scanner and its type.

The locations available are:

Top Rear

Top Front

Bottom Rear

Bottom Front

You can step through the settings for each of the available terminals on the Control Board. Each terminal can be set OFF or in one of the positions listed above.

There are four BCR terminals K30, K31, K32 and K33.

There are two OMR terminals K14 and K15.

When selecting a BCR terminal, first select the scanner position and press **Green** to confirm. Then press the **RIGHT** ARROW BUTTON. Now press **Green** to edit and select the type of scanner device that is fitted.

The device type does not need to be set for the two OMR terminals as the scanner type is fixed.

6.12.3 Software Download

This service option allows new system software to be installed on the system. The special download tool (F73A) must be used.

Figure 6-21 F73A Software Download Tool

Procedure:

1. Turn power off.
2. Remove rear covers.
3. Connect the serial plug on the end of the ribbon cable to K33 on the Control Board.
4. Switch power ON. The three LEDs on the download tool should all light.
5. Enter Service Menu and select ‘Software Download’.
6. The system will ask if you are sure. Press **Green** to commence the download.

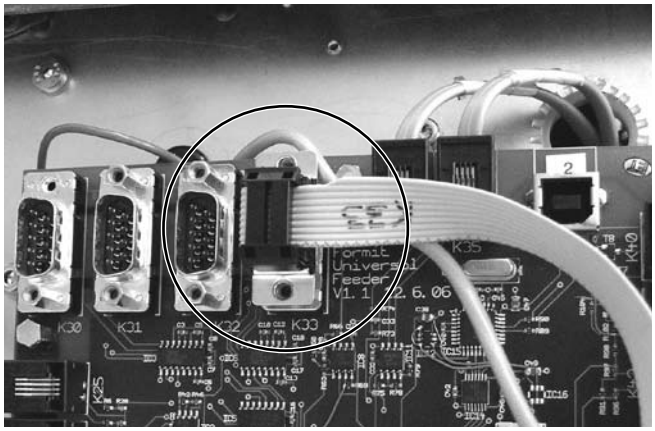


Figure 6-22 Download Tool Connection

7. The download will start, shown by the flashing amber LED on the download tool.
8. When the download is complete, the green LED will light, showing the download has completed OK.

   If the red LED lights, the download did NOT complete and the procedure should be started again.

6.13 OMR AND BCR FUNCTIONS

IMPORTANT:	No scanning jobs can be programmed unless at least one scanner is assigned in the Service Menu.

The following scanning functions are available with the Standard Software:

OMR – Classical
OMR – DI900/DI950
OMR – DI350/DI400
BCR – Standard functionality, +WAS off, +MC off, +BOC/WAS/MC off
BCR – Reduced functionality, +WAS off, +MC off, +BOC/WAS/MC off
* BCR – DI900/DI950 (3 of 9)
Bar Code test function in the User Menu
Bar Code, Ten additional characters for Custom use

* BCR – DI900/DI950 (2 of 5) available at a later date

OMR – Classical offers the following functions:

Benchmark
Safety – Present or Absent
Upstream Divert (UDV) into the bottom tray of the F733
Divert Set (DVS) into the upper tray of the F733
Clear Collation Deck (EOC for multi-line scanning)
Wrap Around sequence 2/3 lines, resets through 0 or 1, ascending or descending.
Match Code sequence 3/4 lines, resets through 0 or 1, ascending or descending.
Parity Code – Even
Parity Code – Odd
End Of Collation (For single line scanning)

Note: Apart from the Benchmark and Safety marks, which MUST accommodate positions 1 and 2, all other scan marks can be positioned in any order of sequence.

OMR – DI900/DI950 offers the following functions:

Functions available as DI900/DI950 UIM

Upstream Divert (UDV) into the bottom tray of the F733

Divert Set (DVS) into the upper tray of the F733

OMR – DI350/DI400 offers the following functions:

Benchmark

Safety

Not EOC

Not BOC

Parity – Even

Re-time

Select Feed 1 and 2

Auto-batch (Divert and continue, NOT Divert and stop)

Re-time

Wrap Around Sequence 3 lines, resets through 0 only, ascending only.

Re-time

Set up the Scanning program as follows:

- For Basic Scanning, select “Group 1”. This will automatically set the program to read the basic SIX scan lines.
- For Basic Scanning + Select Feed, select “Group 1”. For “Group 2” you need to allocate Select Feed 1, Select Feed 2 and Divert to Deck by selecting either ON or INGORED as required. You MUST select the Retiming mark.
- For Basic Scanning + Sequence, select “Group 1”. Scroll through ALL the “Group 2” selections and then select “Group 3”.
- For Basic Scanning + Select Feed + Sequence, follow the instructions given above.
- In the Service Menu, set for “Reverse Scanning” if running the material “Face Up” and “Foot First”.
- Reverse the Spooling of the print sequence from running on a DI350/DI400 Top Feed to an F731 Bottom Feed.

BCR – Standard Functionality offers the following functions:

End of collation
Beginning of collation
Outsort bin 1 (In Model F733 bottom tray)
Outsort bin 2 (In Model F733 upper tray)
Divert to Deck (In DI900/DI950 Base Unit)
Wrap around Sequence 3 marks including zero. 0-7 or 7-0 (ascending/descending)
Match Code 3 marks excluding zero. 1-7 or 7-1 (ascending/descending)
Select Feed 4 marks

BCR – Reduced Functionality offers the following functions:

End of collation
Beginning of collation
Outsort bin 1 (In Model F733 bottom tray)
Outsort bin 2 (In Model F733 upper tray)
Divert to Deck (In DI900/DI950 Base Unit)
Wrap around Sequence 2 marks including zero. 0-3 or 3-0 (ascending/descending)
Match Code 3 marks excluding zero. 1-7 or 7-1 (ascending/descending)
Select Feed 2 marks

6.14 BAR CODE SCANNING INFORMATION

When using either the Standard or reduced functionality using the Bar Code Scanning option, it is mandatory to use BOTH the End of Collation (EOC) and the Beginning of Collation (BOC) commands. A single page Collation will require both BOC AND EOC (count 3) to be printed on the page.

The Wrap Around Sequence (WAS) and Matching within a Collation (MC) are also mandatory, and must be printed in the appropriate sequences, unless you select Standard/Reduced BCR with WAS off, MC off, or BOC/WAS/MC off.

For standard Bar Code applications (Picket Fence orientation) it is recommended that the Bar Code is positioned in the Bottom half of the page. In any event, the Bar Code should not be printed within 75mm of the top of the page.

Bar Code Scanning Specifications

Code Types available:

Code 3 of 9, Code 2 of 5 interleaved, Code 128.

Scanner type:

Fixed Beam.

Code Orientation:

Picket Fence Only.

Both top and bottom scanning options are available.

Code Height:

Minimum 12 mm. Recommended height 18 mm.

Code Density:

Standard 0.25 mm, Minimum 0.125 mm.

Print Quality:

Minimum requirement ANSI Grade B.

Recommended ANSI Grade A.

Background paper colour – White

Code Length (including start/stop characters):

3 of 9 – 20 mm – Three data characters

2 of 5 – 12 mm – Four data characters

128 – 12 mm – Three data characters

Bar Code Placement:

A minimum clear zone of 12 mm is required above, below, left and right of the Bar Code.

A minimum clearance of 25 mm is required from the leading edge of the form to the Bar Code.

A minimum clearance of 25 mm is required from the trailing edge of the form to the Bar Code.

A minimum clearance of 12 mm is required from the left and right hand edges of the form to the Bar Code.

** Bottom Scan: For Bottom scan applications an area 59 mm either side of the centre line is unavailable for placement of Bar Codes.

Scan Functions Available:

Code 3 of 9, Code 128 (Standard functionality)

End of collation

Beginning of collation

Outsort bin 1 (In Model F733 bottom tray)

Outsort bin 2 (In Model F733 upper tray)

Divert to Deck (In DI900/DI950 Base Unit)

Wrap around Sequence 3 marks including zero. 0-7 or 7-0 (ascending/descending)

Match Code 3 marks excluding zero. 1-7 or 7-1 (ascending/descending)

Select Feed 4 marks

Code 2 of 5, Code 3 of 9, Code 128 (Reduced functionality)

End of collation

Beginning of collation

Outsort bin 1 (In Model F733 bottom tray)

Outsort bin 2 (In Model F733 upper tray)

Divert to Deck (In DI900/DI950 Base Unit)Wrap around Sequence 2 marks including zero. 0-3 or 3-0 (ascending/descending)

Match Code 3 marks excluding zero. 1-7 or 7-1 (ascending/descending)

Select Feed 2 marks

Custom Requirements:

Any other Code types/additional scan functions/ladder orientation can be processed with additional custom software and/or a moving beam scanner.

F731 BAR CODE SCANNING - STANDARD FUNCTIONALITY

BYTE1	EOC	BOC	OUT1	OUT2	DIV
BYTE2	WAS1	WAS2	WAS4	SF1	SF2
BYTE3	MC1	MC2	MC4	SF3	SF4
0					
1	X				
2		X			
3	X	X			
4			X		
5	X		X		
6		X	X		
7	X	X	X		
8				X	
9	X			X	
A		X		X	
B	X	X		X	
C			X	X	
D	X		X	X	
E		X	X	X	
F	X	X	X	X	
G					X
H	X				X
I		X			X
J	X	X			X
K			X		X
L	X		X		X
M		X	X		X
N	X	X	X		X
O				X	X
P	X			X	X
Q		X		X	X
R	X	X		X	X
S			X	X	X
T	X		X	X	X
U		X	X	X	X
V	X	X	X	X	X

MATCH CODE 3 WITHOUT 0, 1-7 OR 7-1
WRAP AROUND SEQUENCE 3 WITH 0, 0-7 OR 7-0

F731 BAR CODE SCANNING - REDUCED FUNCTIONALITY

BYTE1	EOC	BOC	OUT1
BYTE2	WAS1	WAS2	OUT2
BYTE3	MC1	MC2	MC4
BYTE4	SF1	SF2	DIV
0			
1	X		
2		X	
3	X	X	
4			X
5	X		X
6		X	X
7	X	X	X

MATCH CODE 3 WITHOUT 0, 1-7 OR 7-1
WRAP AROUND SEQUENCE 2 WITH 0, 0-3 OR 3-0

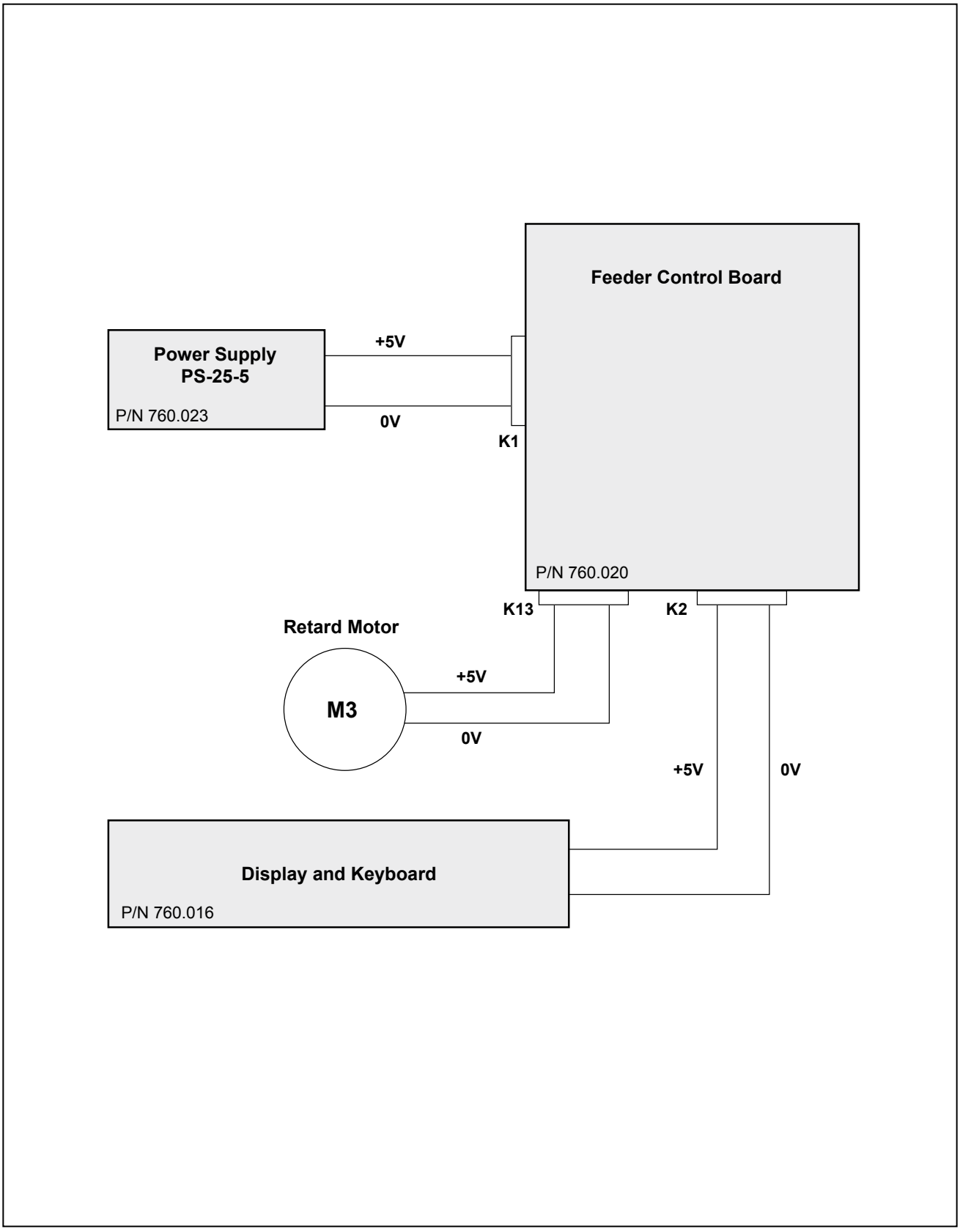


Figure 7-1 F731 5V Supplies

7 • Diagrams

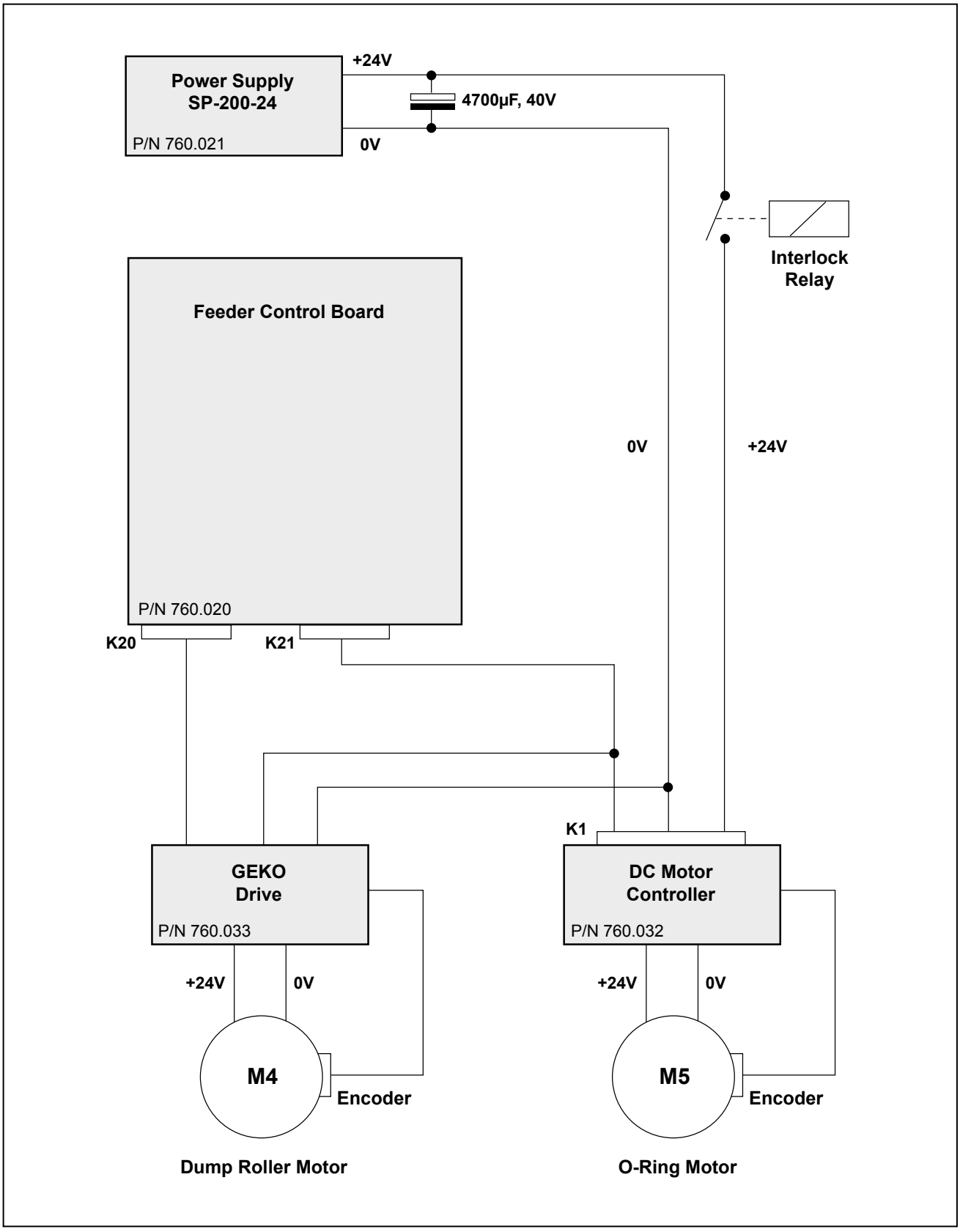


Figure 7-2 F731 24V Supplies (Part 1)

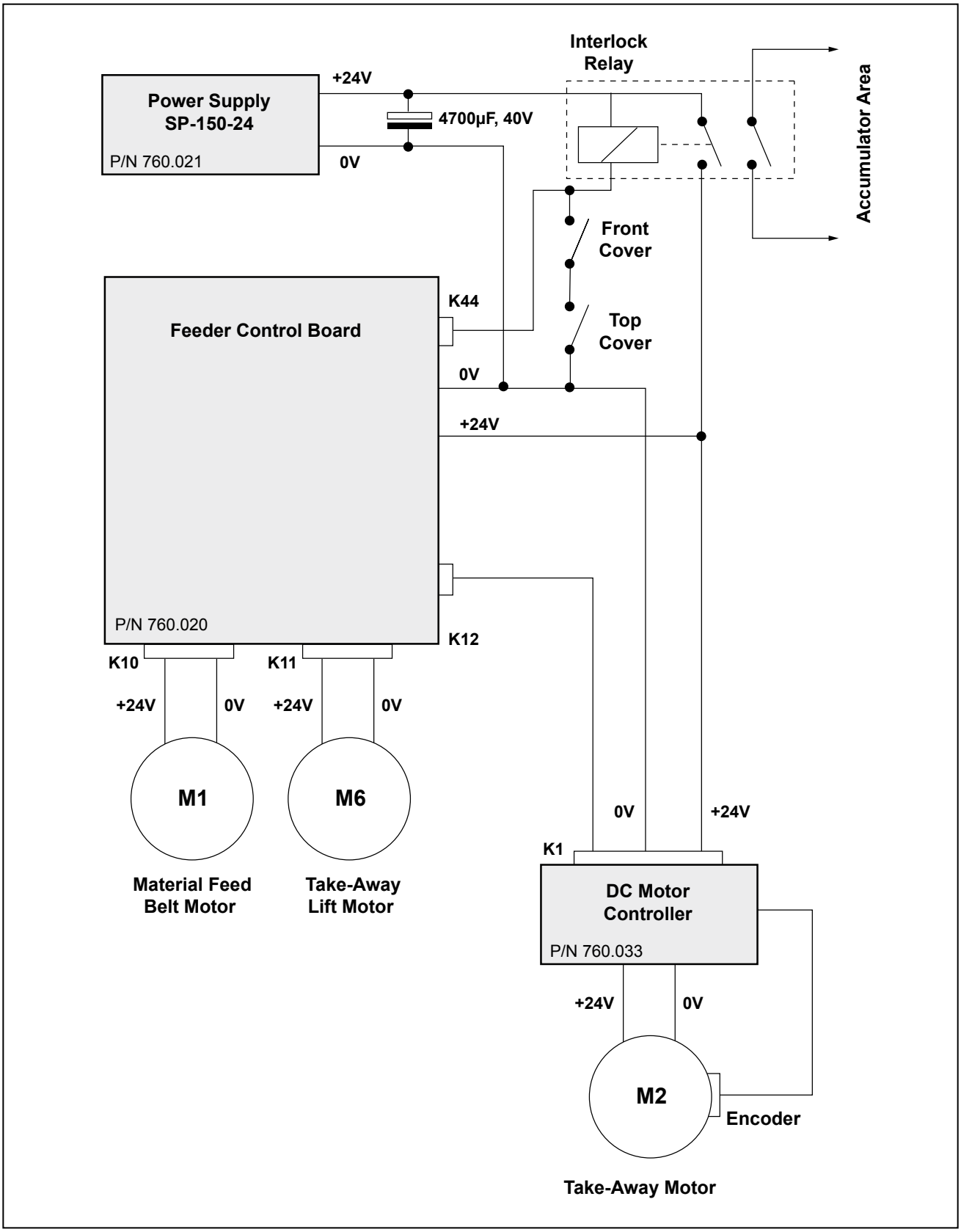


Figure 7-3 F731 24V Supplies (Part 2)

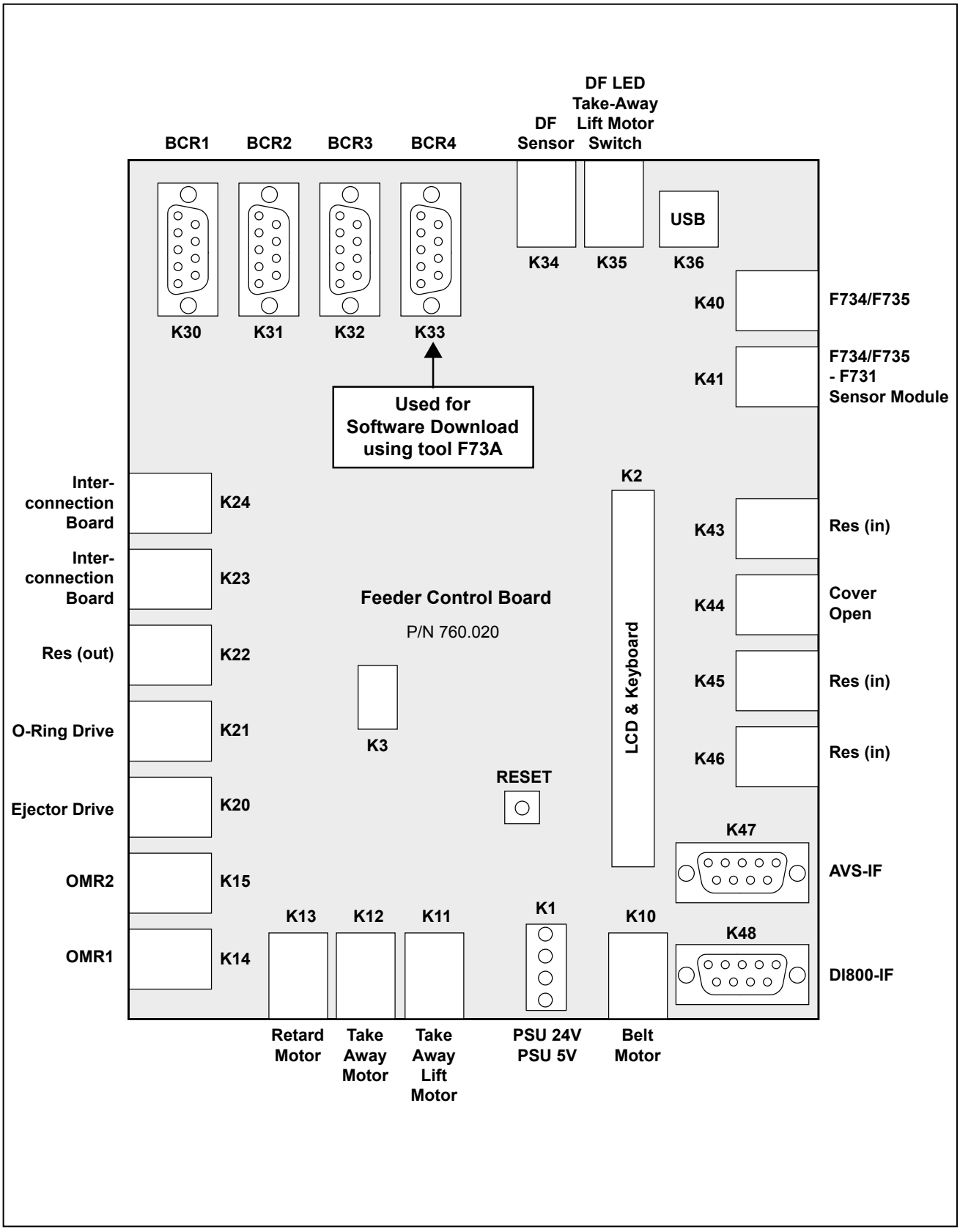


Figure 7-4 F731 Control PCB Connections

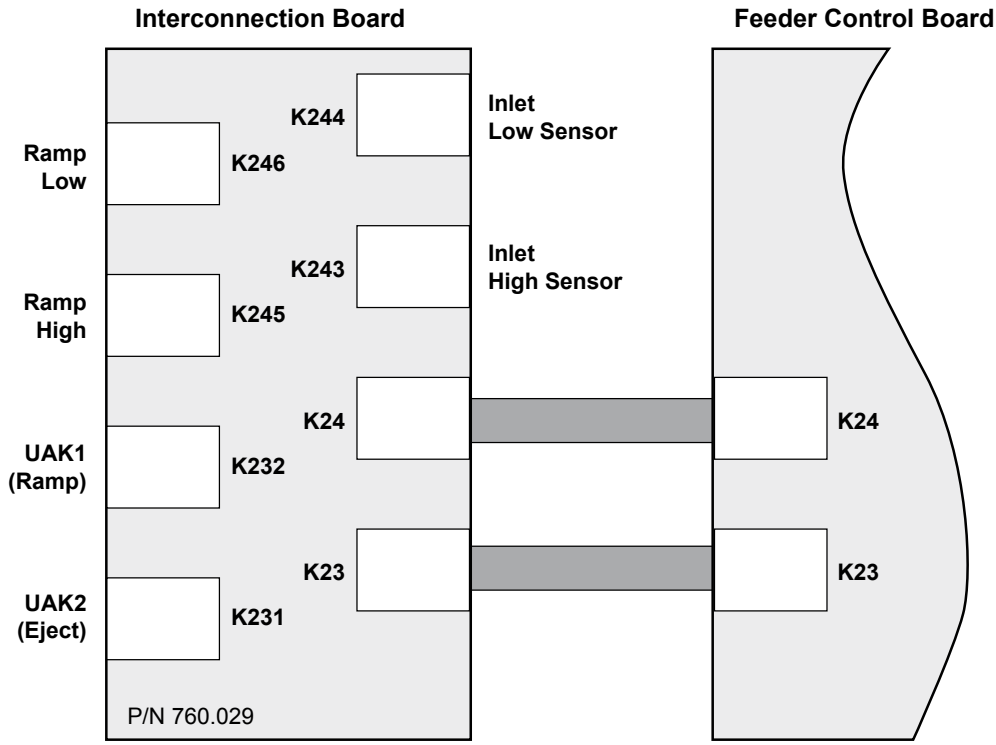


Figure 7-5 F731 Interconnection Board

7 • Diagrams

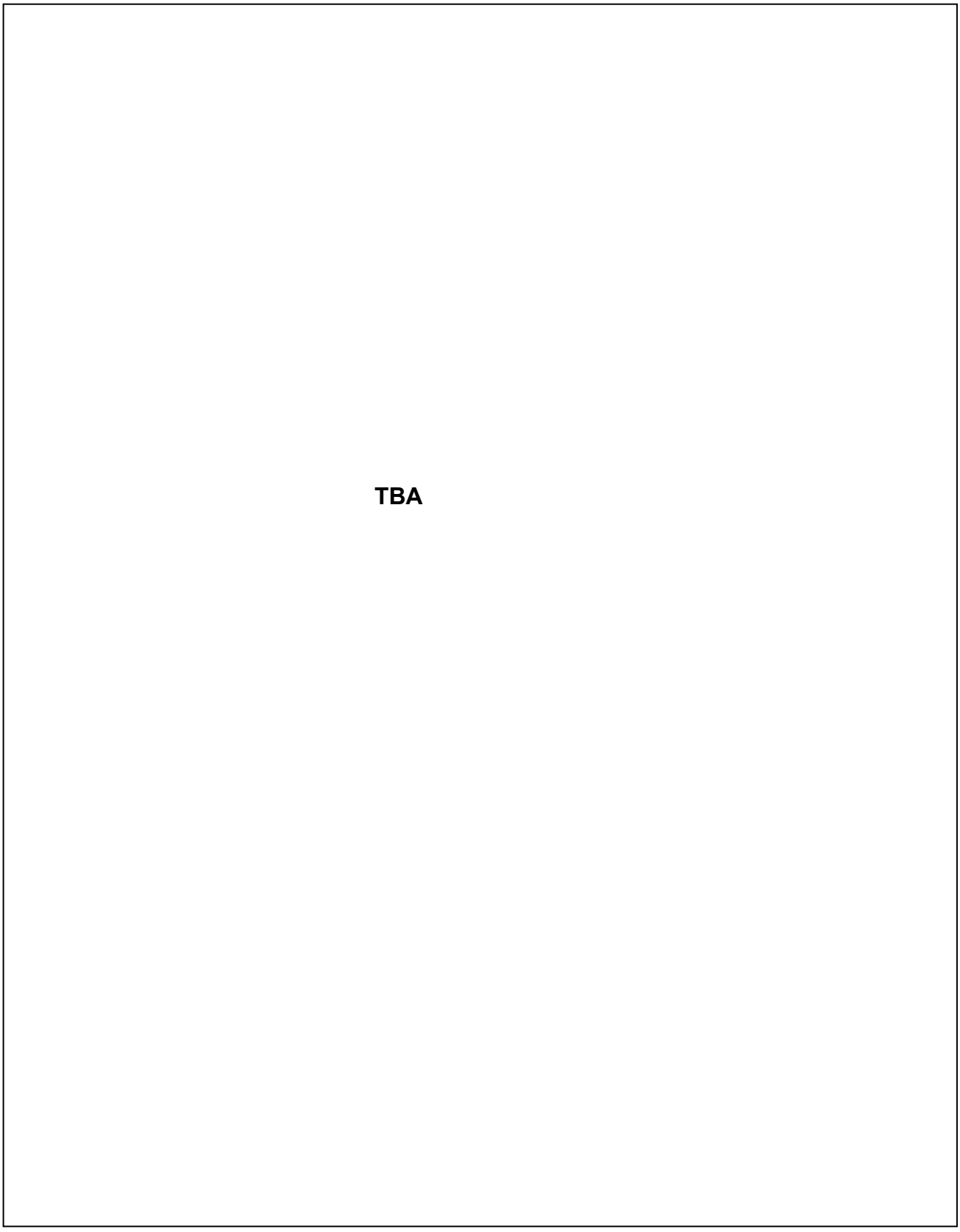


Figure 7-6 F734/F735 Schematic