MARSH®

PatrionPlus

Technical Manual

Videojet Technologies Inc., Wood Dale, IL 60191 U.S.A.; Tel: (618) 234-1122; Tel: (800) 527-6275; Fax: (618) 234-1529.

29669

Serial Numbers

Write the serial numbers from your Marsh equipment in the appropriate spaces on this page. If you need to call Technical Support, they will ask for this information.

Technical Support:

— Telephone – U.S. and Canada: 800-851-3441
— Telephone – International: 618-234-9093
— All FAX: 618-234-1265

E-mail: Blvl.TechSupport@videojet.com

Note: If you have more than one production line, you may want to copy this sheet and use one sheet per production line.

Controller

_____

Printheads

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

Ink Systems

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

Power Supplies

_____ _____

_____ _____

Shaft Encoders

_____ _____

Task 2 Key

_____

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The revision level for the entire manual is AG.

1-Introduction

The Marsh PatrionPlus is a light weight controller with a tactile keypad and built-in LCD. It is capable of driving up to eight printheads on one production line. Using the dual tasking feature, the PatrionPlus can drive an additional eight printheads on a second production line.

The Marsh PatrionPlus VJ7 Series and theMarsh PatrionPlus VJ16 Series each consist of three printheads able to print on porous or non-porous surfaces. VJ7 printheads prints one line of 7x5 dot matrix print with heights ranging from 3/8" (10 mm) to 1" (26 mm). V16 printheads print one line of 14x10 dot matrix print or two lines of 7x5 dot matrix print with print heights ranging from 3/8" (10 mm) to 2" (50 mm).

All VJ printheads use the ADS Ink system with various sizes of ink containers.

The Marsh HR Series printheads consist of the HR/120 with 120 orifices, and the HR/300 with 300 orifices. Both yield 150 dpi vertical resolution. Print heights range from 0.25" (6 mm) to 0.8" (20 mm) for HR/120 printheads, and 0.38" (0.96 cm) to 2" (5.08 cm) for HR/300 printheads. HR Series printheads are designed to print on porous surfaces only using a Series 2000 ink system.

Technical Support

Videojet Technologies Inc. provides phone service and support 24 hours a day, seven days a week. For more information about the Marsh PatrionPlus system or other Marsh products, please contact your local distributor or Videojet Technologies Inc.

Videojet Technologies Inc.

Address:	PO Box 388 Belleville, IL 62222-0388 USA
Telephone:	
USA and Canada	(800) 527-6275
International	(618) 234-1122
FAX:	(618) 234-1529
Web Site:	www.videojet.com

Technical Support

Telephone:	
USA and Canada	(800) 851-3441
International	(618) 234-9093
FAX:	(618) 234-1265
E-mail:	Blvl.TechSupport@videojet.com

When calling Technical Support for help with a product please have the serial number for that product ready.

2-Specifications

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Component Overview

Following is a typical PatrionPlus system using VJ7, VJ16 and HR Series Printheads, ADS and Series 2000 Ink Systems, and all related components.

Figure 2A: PatrionPlus System

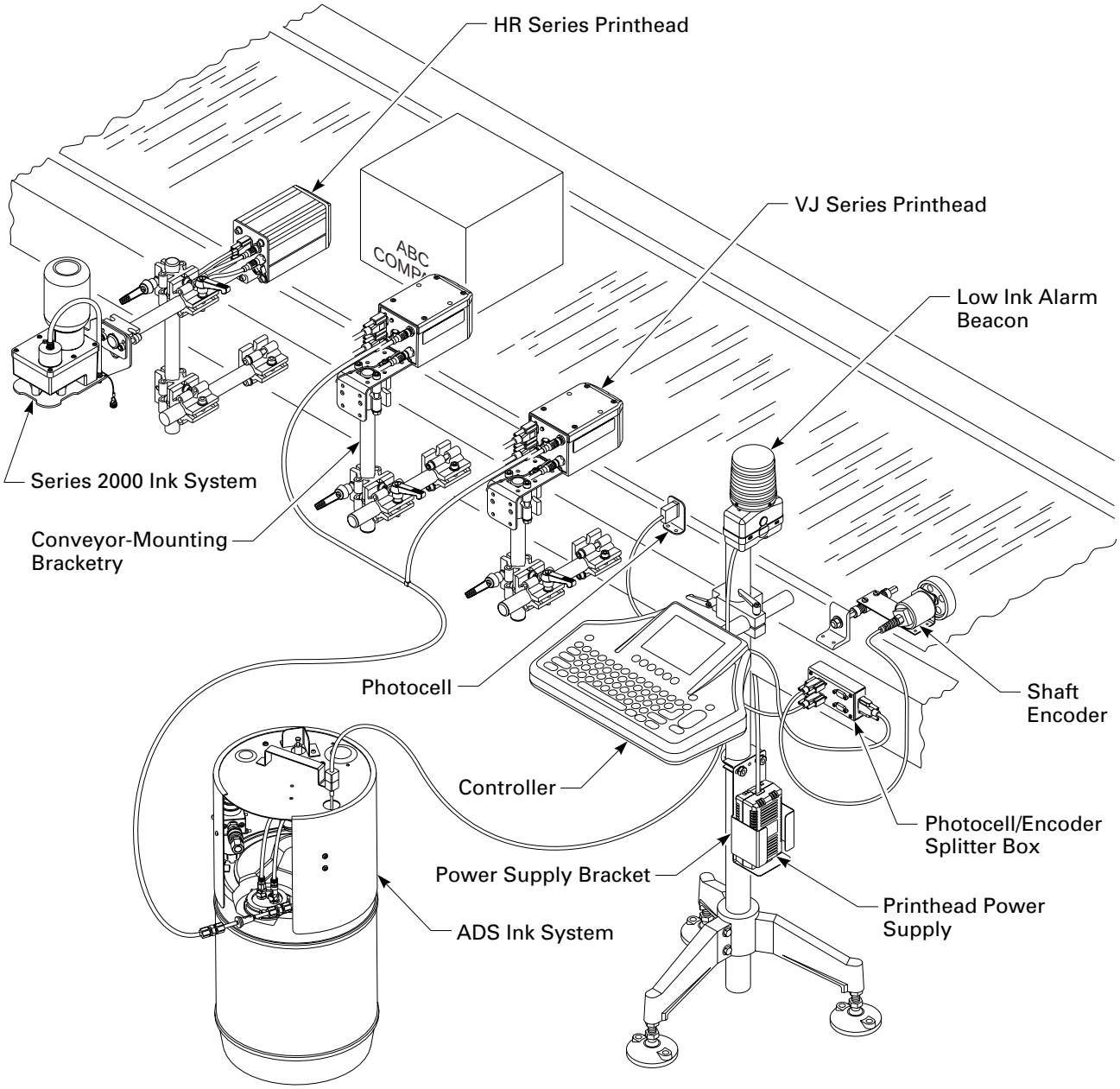
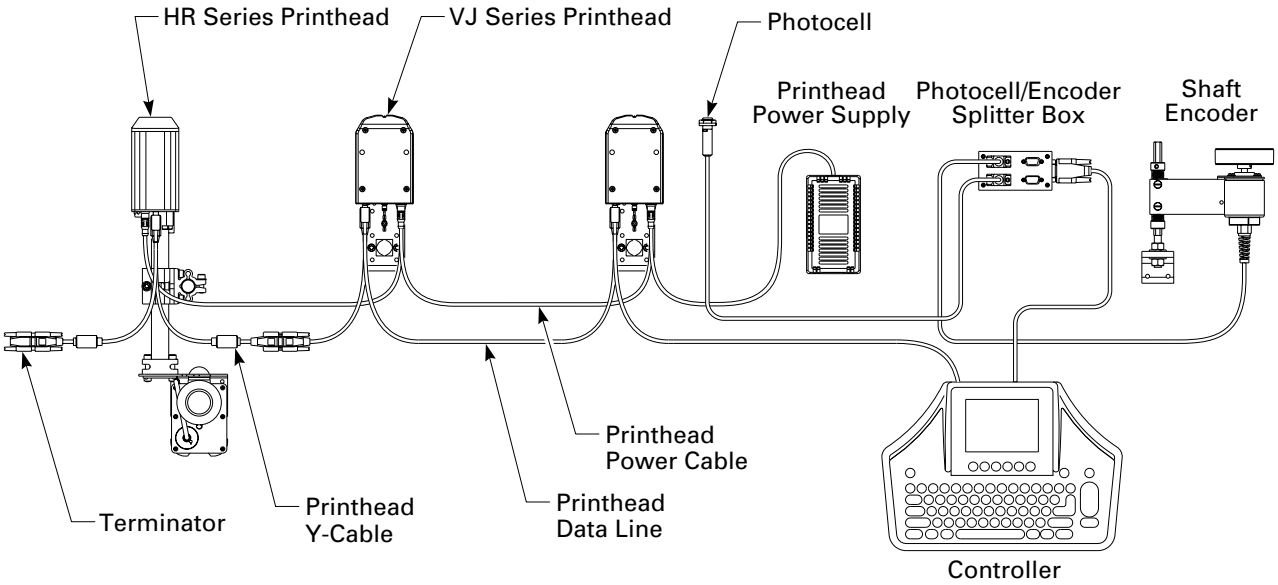


Figure 2B: PatrionPlus System Cable Routing



Controller

Drives up to eight lines of print on one production line. Using the dual tasking feature, the controller drives an additional eight lines of print on a second production line.

Certifications

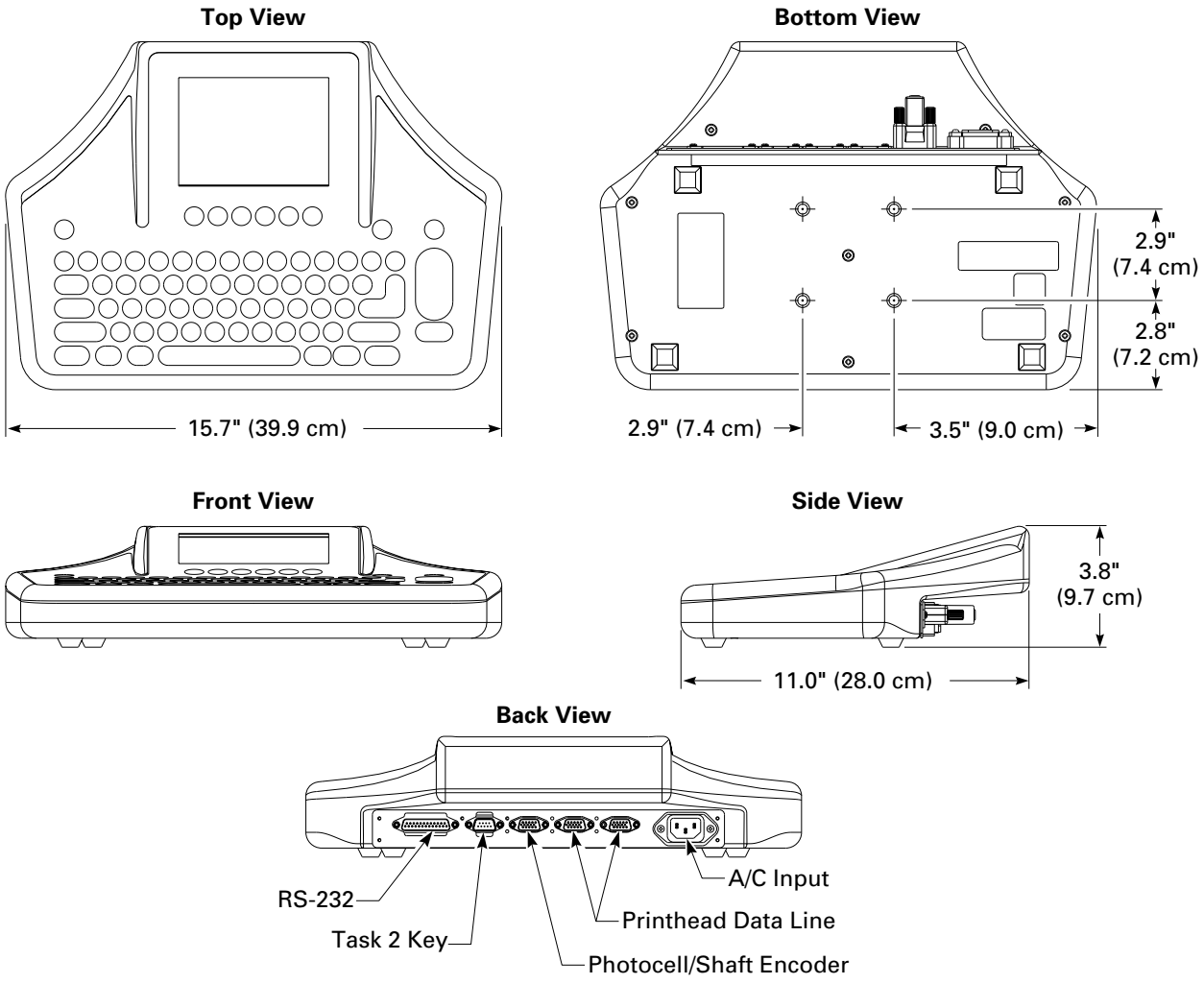
- ETL Listed in conformance with ANSI/UL Std. 1950
- CE Certified
- FCC Part 15A
- NEMA 12 - IP51
- CAN/CNA Std. C22.2 No. 950

To maintain CE/ETL approval, use only Marsh components with the PatrionPlus system. Failure to do so cancels CE/ETL approval.

Weight

7 lb (3 kg)

Figure 2C: Controller



Message Storage

360K

Electrical Requirements

100 - 230 volts; 50/60 Hz

Mounting Options

- Set on a Table
- Mount on a Floor Stand
- Mount in a NEMA Enclosure on a Flex Stand

See "Controller Mounting Options" on page 2-14 for more details.

ML8 Emulation

Allows you to operate the PatrionPlus system using a Keyboard Input Device (KID) or any other RS-232 device.

Software Features

Standard VJ/HR combo software for operations that meet the following criteria:

- Line speeds below 200 ft/min (61.5 m/sec)
- Print rates below 30 print cycles per minute
- Messages contain no external insert data transitted through the serial port

Optional VR or HR Only software for more complex operations such as:

- Print rates that exceed 30 print cycles per minute with complex messages including variable bar codes or multiple variable data fields.
- Print rates exceed 20 print cycles per minute where insert data is transmitted through the serial port from bar code scanners or other external devices, or by a networking system such as Print Manager.
- Any other operations where faster imaging rates are required.

Password protected

External encoder option

External control via RS-232 port

Backup and Restore – Enables you to:

- Keep printhead setup, message or logo files (VJ logos only) for backup purposes
- Restore files
- Copy files to other controllers

Messages

Using a dual task key, you can create and store up to 3,000 messages. Maximum message length: 65" (165.1 cm) or 78 characters (at the default software settings 50 ft/min (15 m/min) line speed and character width 40)

- Can contain the following elements:
  Text (six standard fonts available for VJ printheads and five standard fonts available for HR Series printheads. Custom fonts are also available for HR Series printheads if using Keymaster software.)
- Logos
- Counts
- Time, date, and expiration date codes
- Work shift codes
- Bar codes

Invert print feature for printing messages upside down

Bold feature for printing bold messages with VJ printheads

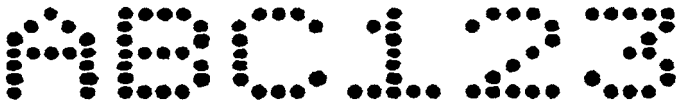
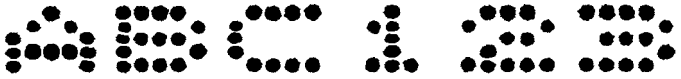
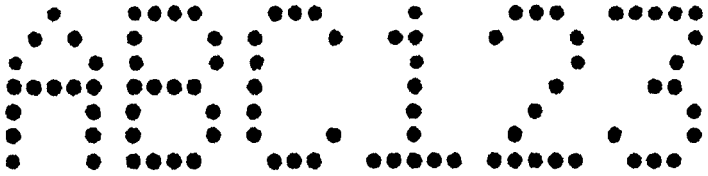
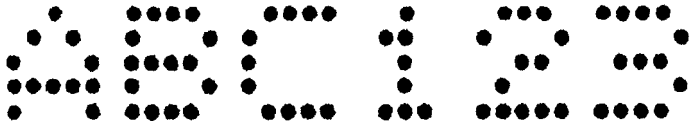
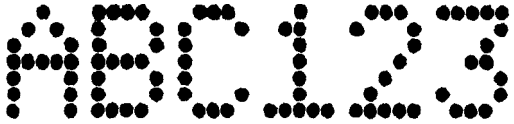
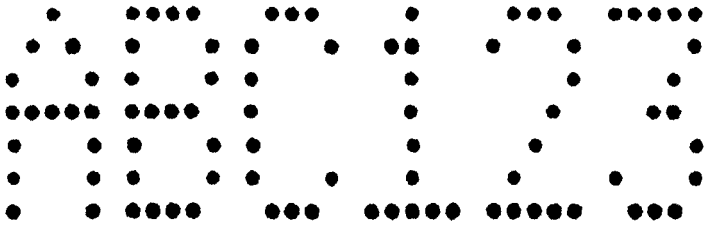
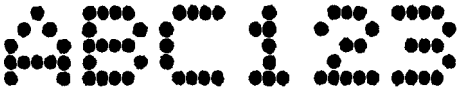
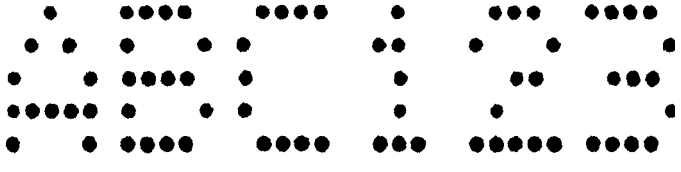
Available Bar Codes

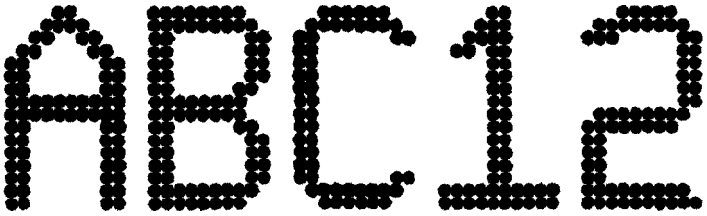
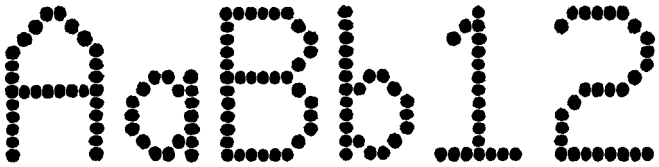
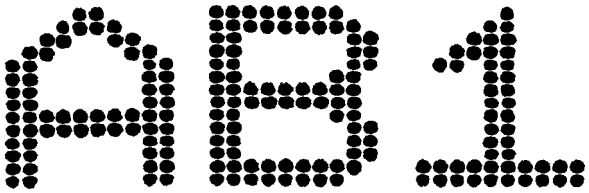
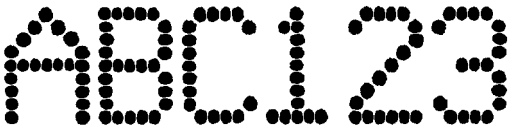
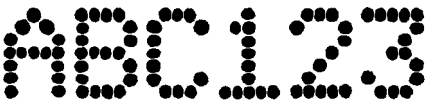
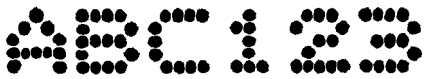
Bar codes printed with VJ or HR/120 printheads will not meet industry height specification standards.

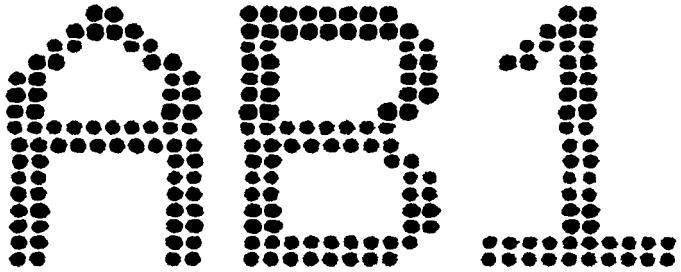
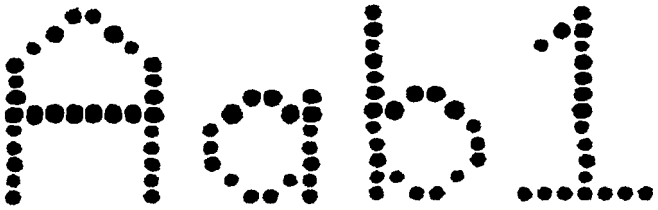
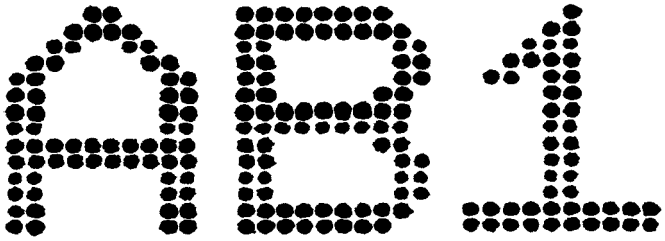
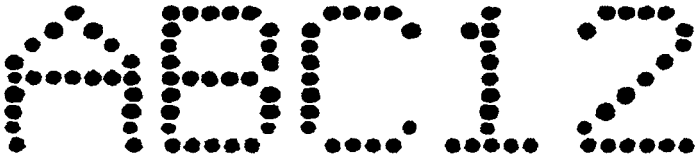
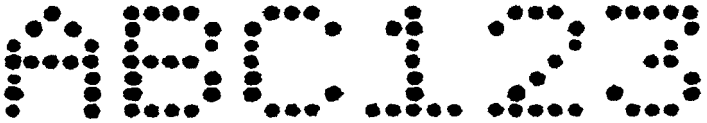
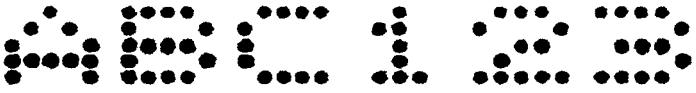
Code 39
Interleaved 2 of 5 (I 2 of 5)
I 2 of 5 UCC/EAN
UPC-A
EAN-13
UCC/EAN-128
Code 128

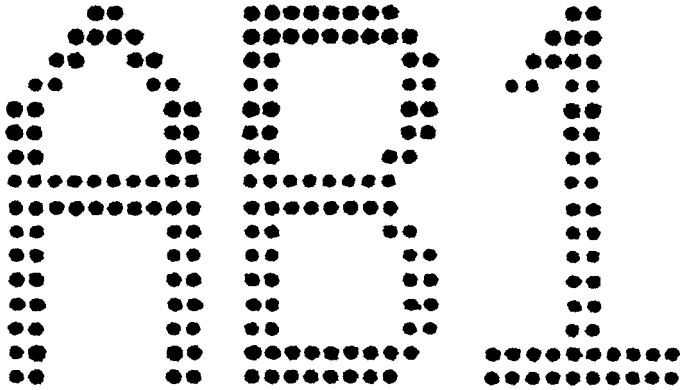
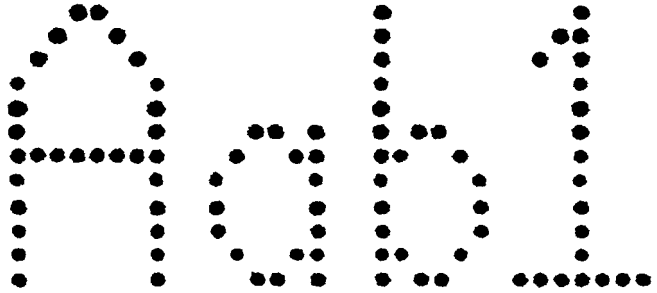
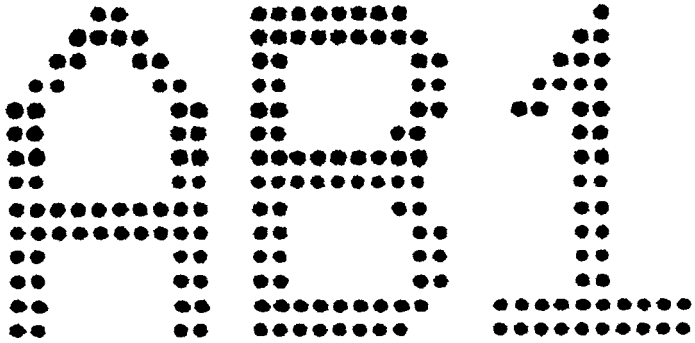
VJ7 and VJ16 Series Fonts

Note: Sample VJ fonts are actual size. Font widths may vary depending on character width chosen and line speed.

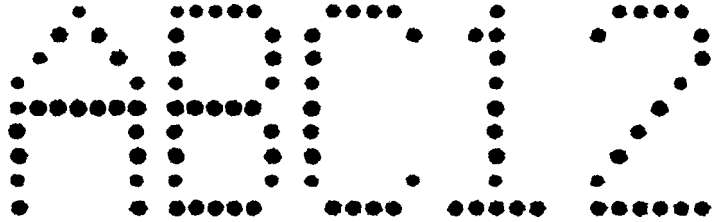
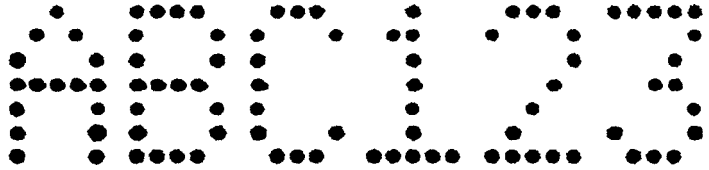
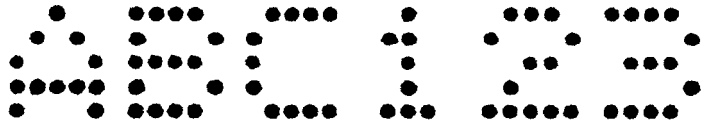
VJ Series Fonts			
Printhead	**Font**	**Height (dot center to dot center)**	**Sample**
0710	7 DOT	0.40" (10.16 mm)	
	5 DOT	0.26" (6.60 mm)	
0720	7 DOT	0.76" (19.30 mm)	
	5 DOT	0.50" (12.70 mm)	
07Combo	7 DOT	0.50" (12.70 mm)	
		1.00" (25.40 mm)	
	5 DOT	0.34" (8.64 mm)	
		0.67" (17.02 mm)	

VJ Series Fonts			
Printhead	**Font**	**Height (dot center to dot center)**	**Sample**
1620	16 DOT	0.99" (25.15 mm)	
	16 Dot	0.99" (25.15 mm)	
	14 DOT	0.86" (21.84 mm)	
	9 DOT	0.53" (13.46 mm)	
	7 DOT	0.40" (10.16 mm)	
	5 DOT	0.26" (6.60 mm)	

VJ Series Fonts			
Printhead	**Font**	**Height (dot center to dot center)**	**Sample**
1630	16 DOT	1.26" (32.00 mm)	
	16 Dot	1.26" (32.00 mm)	
	14 DOT	1.09" (27.69 mm)	
	9 DOT	0.67" (17.02 mm)	
	7 DOT	0.50" (12.70 mm)	
	5 DOT	0.34" (8.64 mm)	

VJ Series Fonts			
Printhead	**Font**	**Height (dot center to dot center)**	**Sample**
1650	16 DOT	1.89" (48.01 mm)	
	16 Dot	1.89" (48.01 mm)	
	14 DOT	1.64" (41.66 mm)	

Specifications

VJ Series Fonts			
Printhead	**Font**	**Height (dot center to dot center)**	**Sample**
1650	9 DOT	1.01" (25.65 mm)	
	7 DOT	0.76" (19.30 mm)	
	5 DOT	0.50" (12.70 mm)	

HR/120 Fonts

Note: Sample HR/120 fonts shown below are actual size. Font widths may vary depending on character width chosen and line speed.

HR/120 Fonts		
Font	**Height**	**Sample**
16 DOT	0.8" (2.30 mm)	ABC123
16 Dot	0.8" (20.3 mm)	abcy123
7 DOT	0.35" (8.9 mm)	ABC123
5 DOT	0.19" (4.8 mm)	ABC123
4 DOT	0.15" (3.8 mm)	ABC123

HR/300 Fonts

Note: Sample HR/300 fonts shown below are actual size. Font widths may vary depending on character width chosen and line speed.

HR/300 Fonts		
Font	**Height**	**Sample**
16 DOT	2" (50.8 mm)	ABC123
16 Dot	2" (50.8 mm)	abcy123
7 DOT	0.88" (22.4 mm)	ABC123
5 DOT	0.48" (12.2 mm)	ABC123
4 DOT	0.38" (9.7 mm)	ABC123

Printable Characters

In addition to printing all letters and numerals, the PatrionPlus is capable of printing the following:

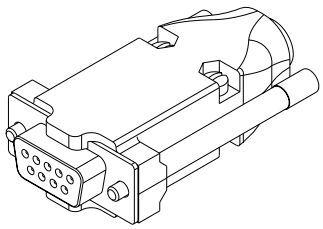
All fonts:				All fonts except 5 dot:			
!	exclamation	.	period	?	question	ì	grave I
“	quote	/	slash	™	trademark	í	aigu I
#	pound	:	colon	®	registered trademark	î	circumflex I
$	dollar	<	less than or				
%	percent		left arrow head	©	copyright	ï	umlaut I
&	AND sign	>	greater than or	¡	Spanish exclamation	ñ	Spanish N
‘	apostrophe		right arrow head	¿	Spanish question	ò	grave O
(	open parenthesis	@	AT sign	à	grave A	ó	aigu O
)	closed parenthesis	[	open bracket	á	aigu A	ô	circumflex O
*	asterisk	]	closed bracket	â	circumflex A	ö	umlaut O
+	plus	£	pound sterling	å	dot A	õ	tilde O
+	plus	fl	left arrow	ä	umlaut A	œ	OE
-	minus	‡	right arrow	ã	tilde A	ß	German S
€	Euro symbol			æ	AE	ù	grave U
				ç	cedilla C	ú	aigu U
				è	grave E	û	circumflex U
				é	aigu E	ü	umlaut U
				ê	circumflex E	ÿ	umlaut Y
				ë	umlaut E		

Task 2 Key

A Task 2 Key is required for dual tasking, printing on two production lines.

The Task 2 Key plugs into the Task 2 Key connector on the back of the controller.

Figure 2D: Task 2 Key



Controller Mounting Options

Floor Stand Mount

Offers flexibility so the stand can be moved if you need to change your layout. The controller is attached to a tripod stand. (See Figure 2E.)

NEMA Enclosure

Provides protection against harsh environments. Mounts on a Flex Stand. (See Figure 2F.)

Flex Stand

Available height: 5 ft (1.5 m)

Figure 2E: Floor Stand with Controller

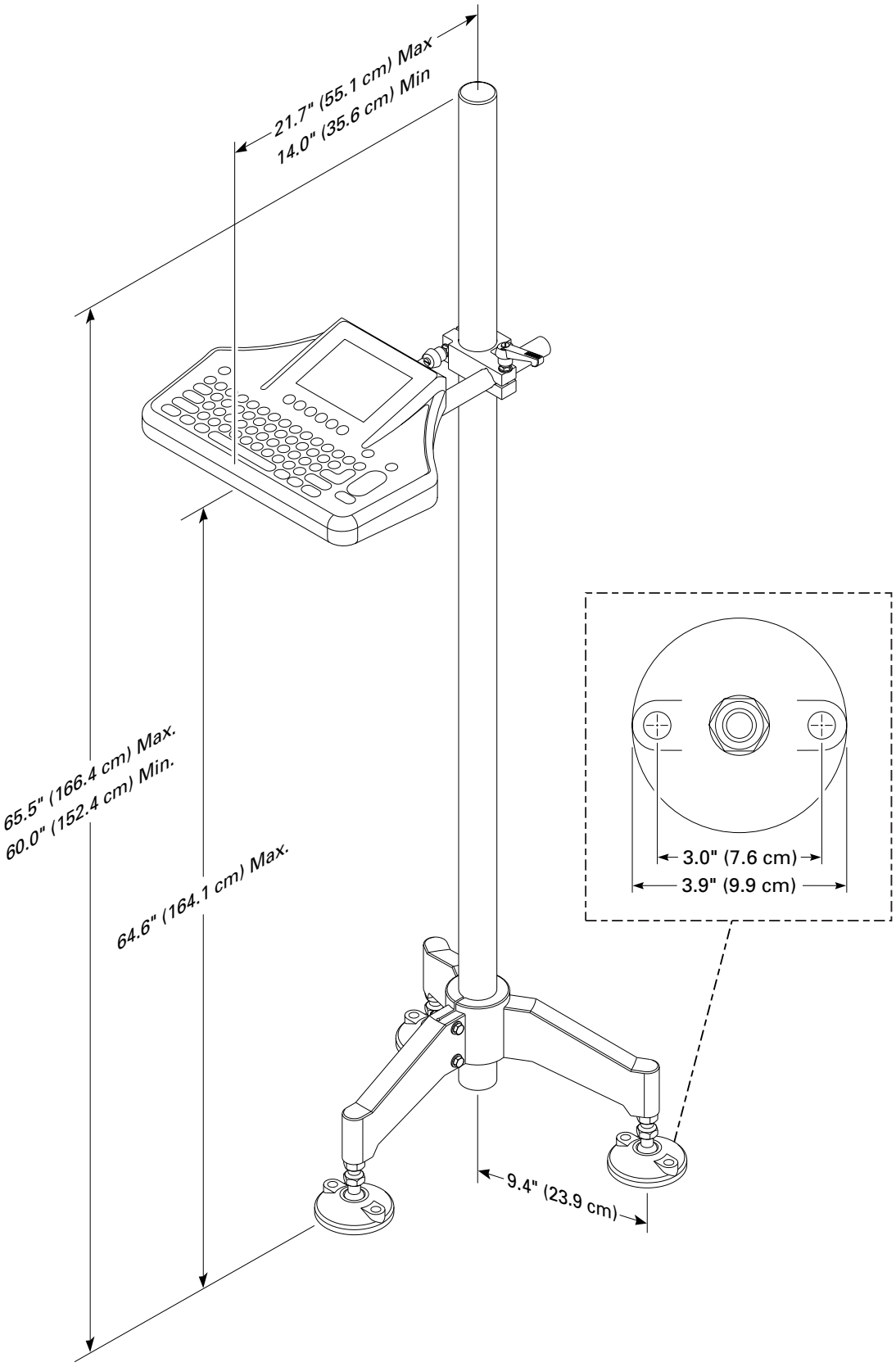


Figure 2F: NEMA Enclosure

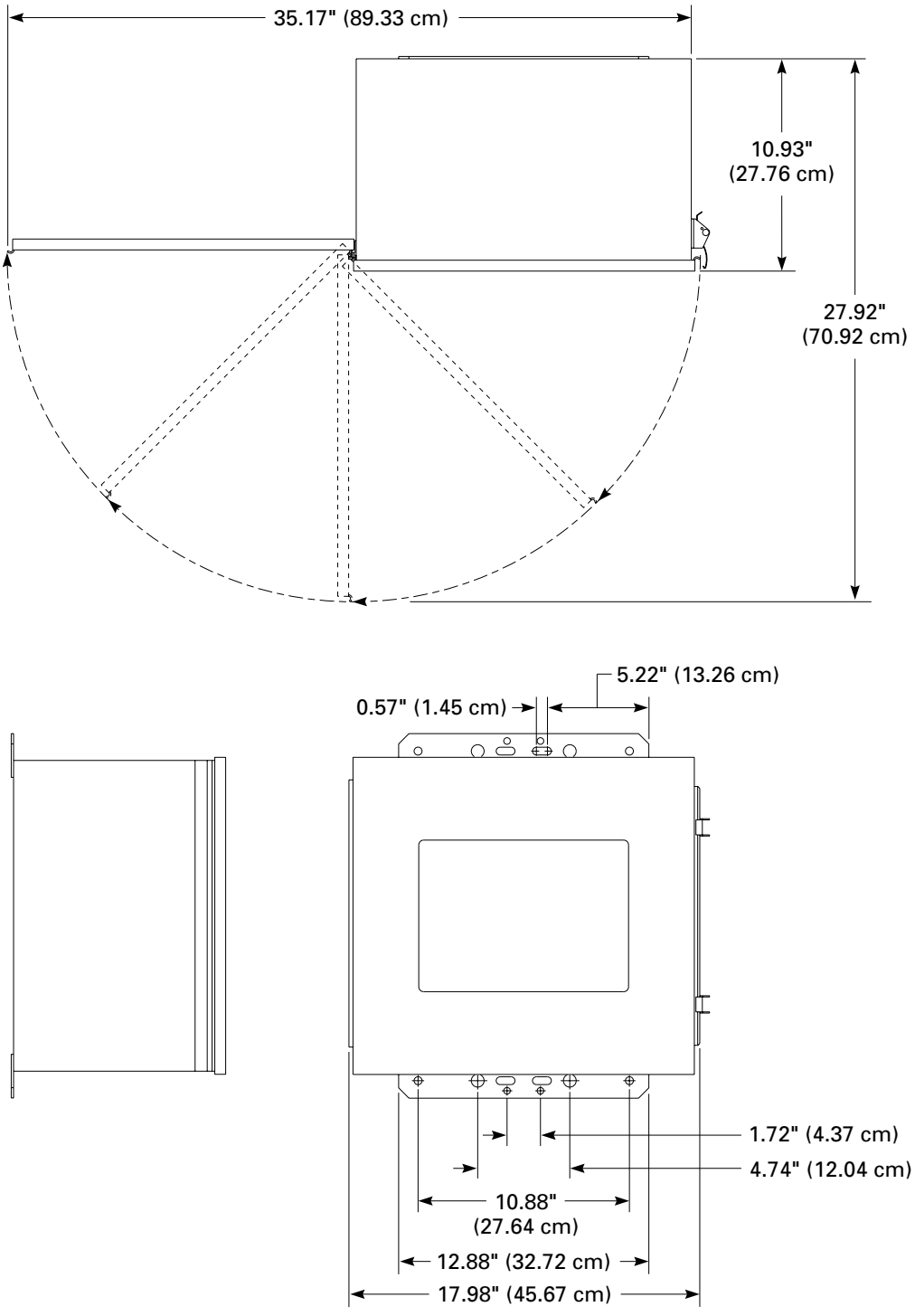
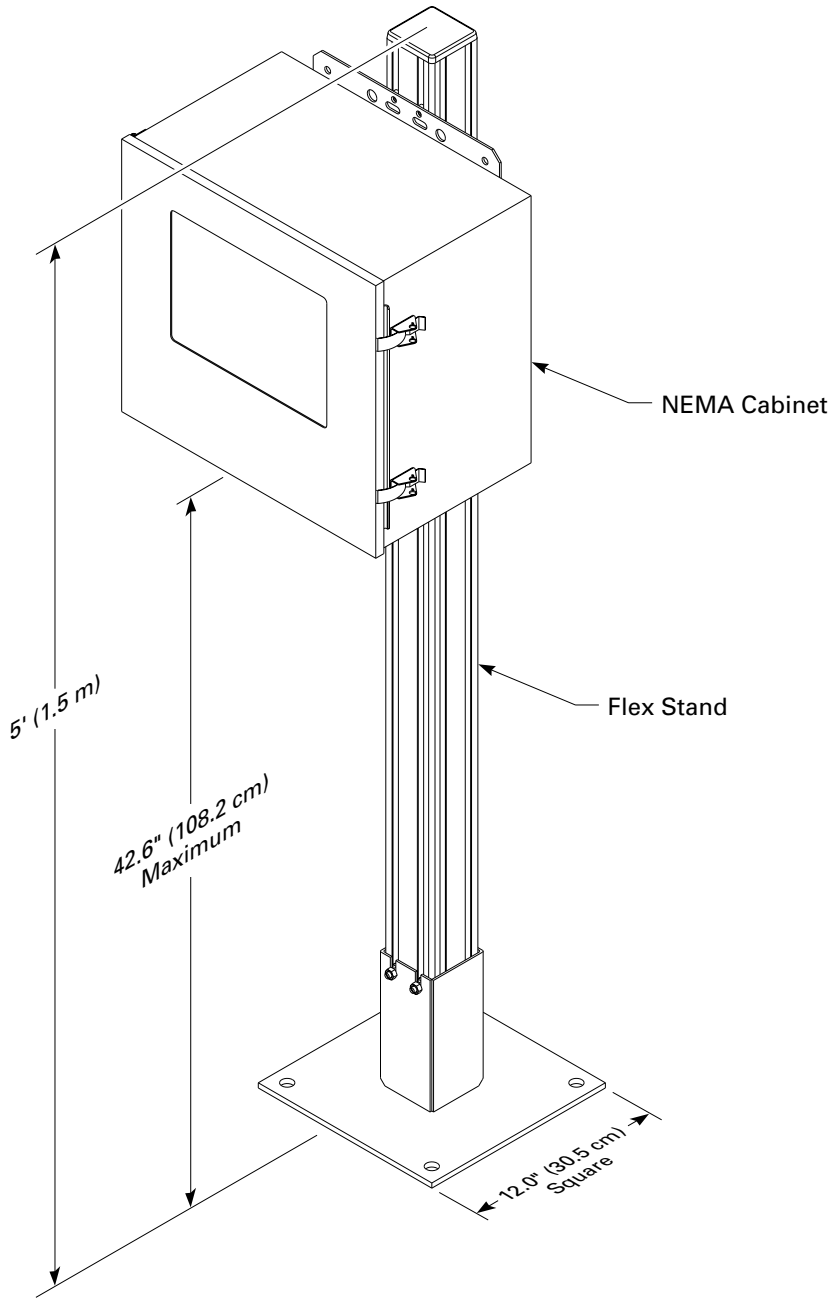


Figure 2G: Flex Stand with NEMA Enclosure



VJ7 Series Printheads

Contain seven valves and generate one line of print with characters based on a 7x5 dot matrix. See the font samples on page 2-6.

Throw Distance

0.25 in. (0.64 cm) maximum; measured from the bumper block.

Conveyor Line Speed

Maximum Line Speed: 200 ft/min (60.9 m/min)

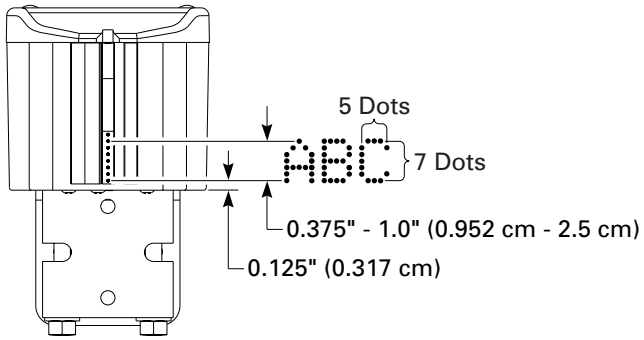
Substrates

Prints on porous or non-porous surfaces.

CAUTION: Once porous or non-porous ink is introduced into the printhead, do not change the ink type. Changing the type of ink will permanently damage the printhead and will void your warranty.

Figure 2H: VJ7 Series Printhead

Front View of Printhead



VJ16 Series Printheads

Contain 16 valves and generate one line of print with characters based on a 14x10 dot matrix or two lines with characters based on a 7x5 dot matrix. See the font samples on page 2-6.

Throw Distance

0.25 in. (0.64 cm) maximum; measured from the bumper block.

Conveyor Line Speed

Maximum Line Speed: 200 ft/min (60.9 m/min)

Substrates

Prints on porous or non-porous surfaces.

CAUTION: Once porous or non-porous ink is introduced into the printhead, do not change the ink type. Changing the type of ink will permanently damage the printhead and will void your warranty.

Figure 2I: VJ16 Series Printhead

Front View of Printhead

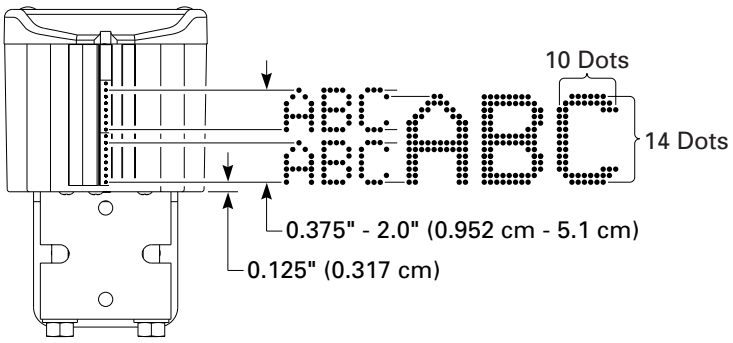


Figure 2J: VJ7 and VJ16 Series Printheads

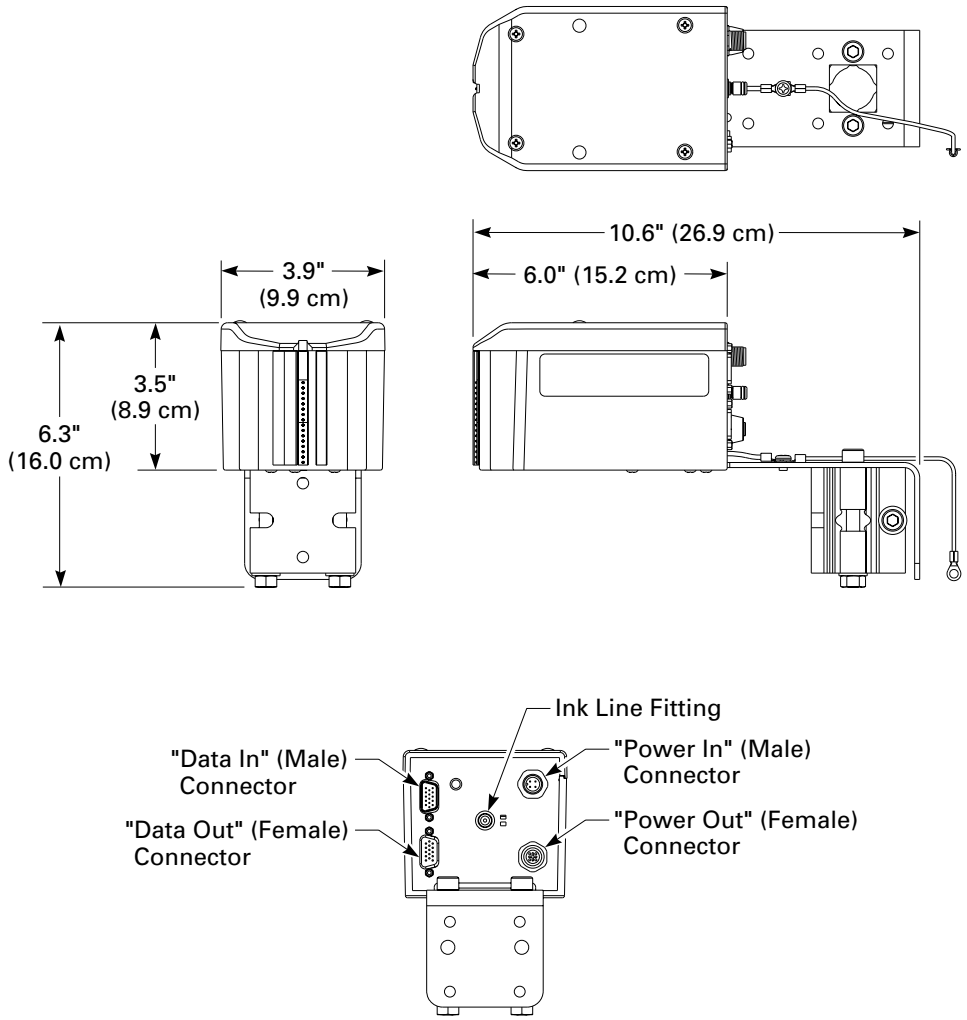
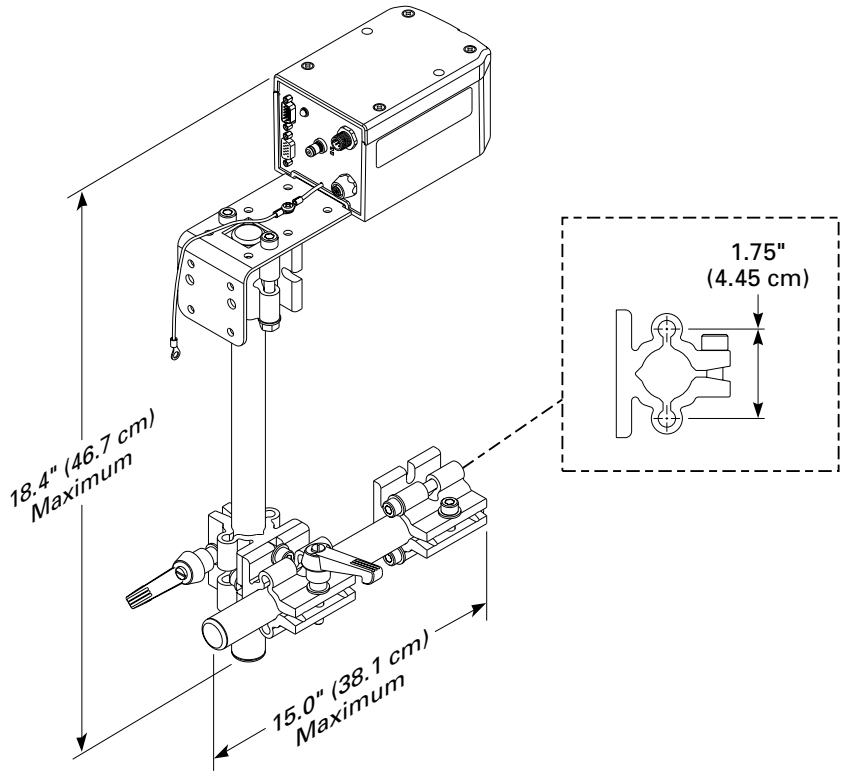


Figure 2K: Standard VJ Printhead Bracketry Dimensions

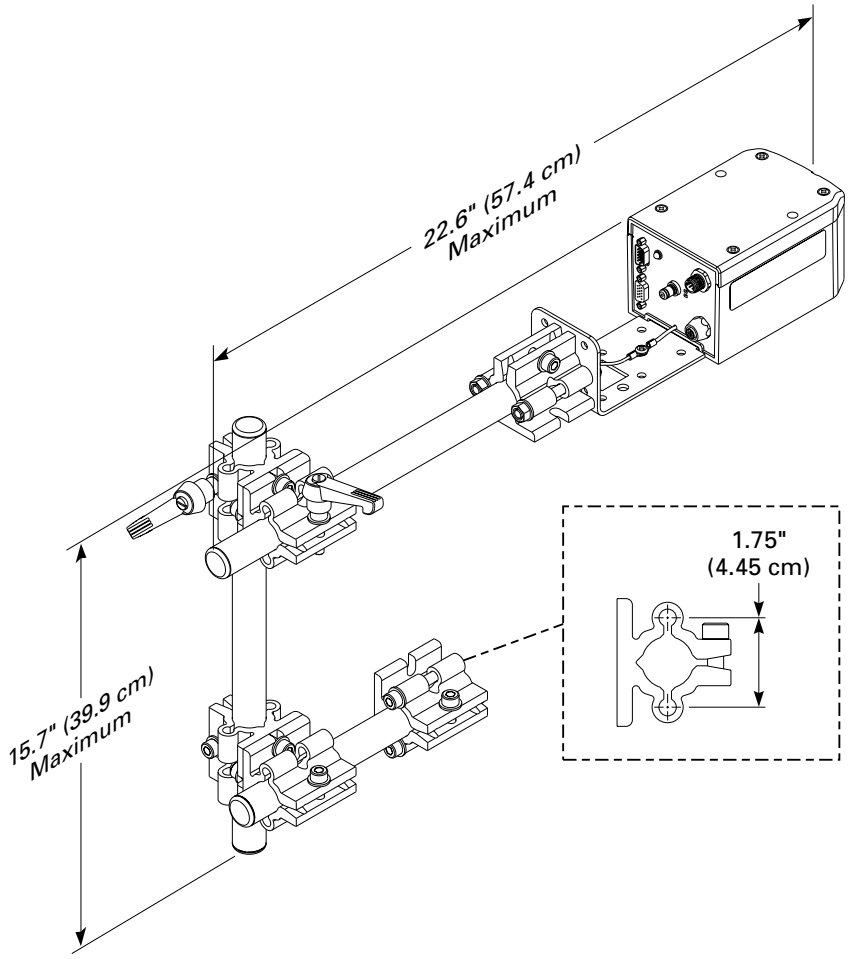


VJ Conveyor Extension Bracketry (Optional)

Order a 9" (23 cm) tube and a cross clamp from the Parts List.

Mounts on the standard printhead bracketry to extend the printhead over the conveyor. (See Figure 2L.)

Figure 2L: Conveyor Extension Bracketry Dimensions



HR/120 Printhead

Contains 120 print orifices or controllable dots, yielding 150 dpi vertical resolution.

Font Heights

See "HR/120 Fonts" on page 2-11

Throw Distance

0.25 in. (0.64 cm) maximum

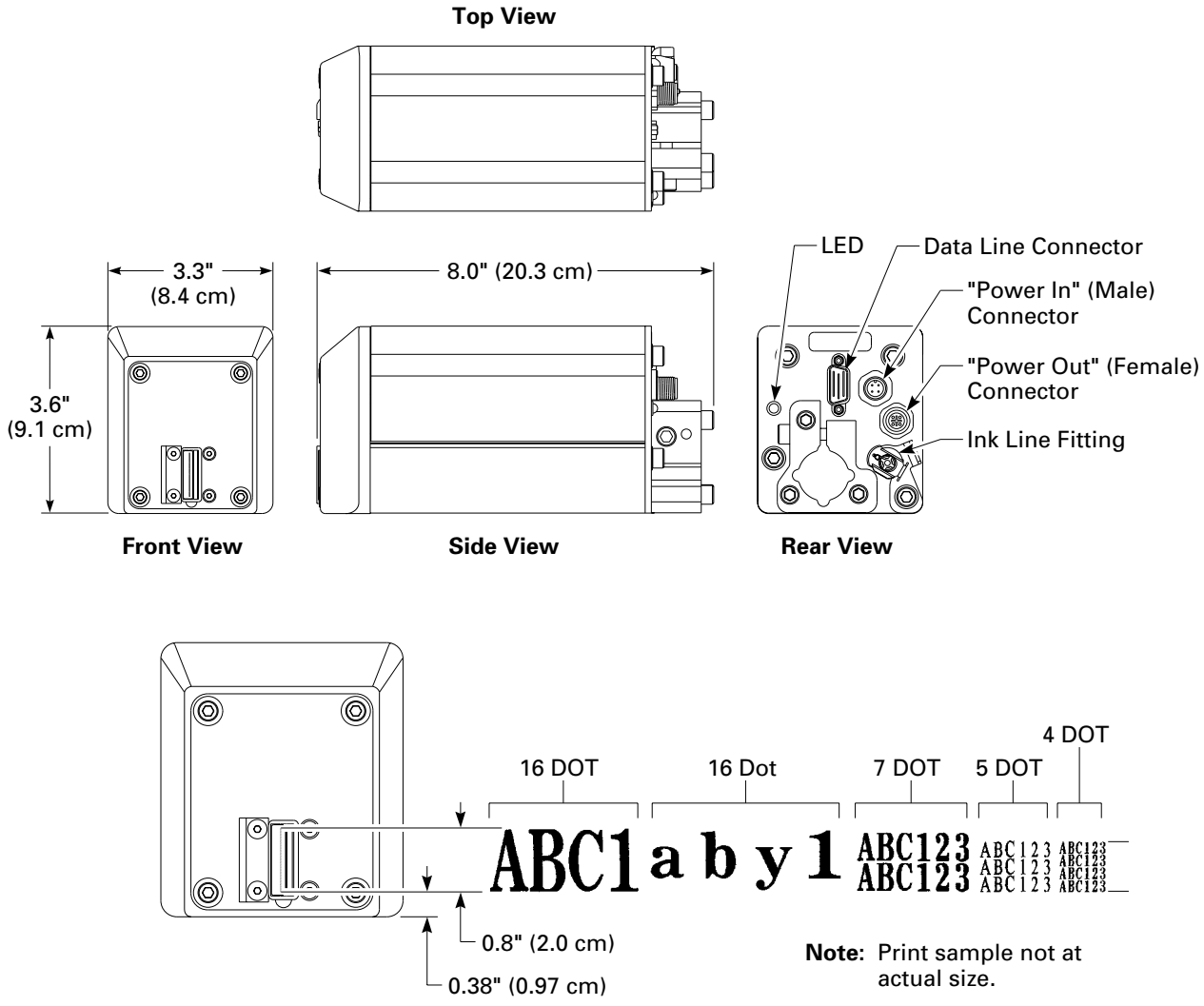
Conveyor Line Speeds

Maximum Line Speed: 200 ft/min (60.9 m/min)

Substrates

Prints on porous surfaces.

Figure 2M: HR/120 Printhead



HR/300 Printhead

Contains 300 print orifices or controllable dots, yielding 150 dpi vertical resolution.

Font Heights

See "HR/300 Fonts" on page 2-12

Throw Distance

0.25 in. (0.64 cm) maximum

Conveyor Line Speeds

Maximum Line Speed: 200 ft/min (60.9 m/min)

Substrates

Prints on porous surfaces.

Figure 2N: HR/300 Printhead

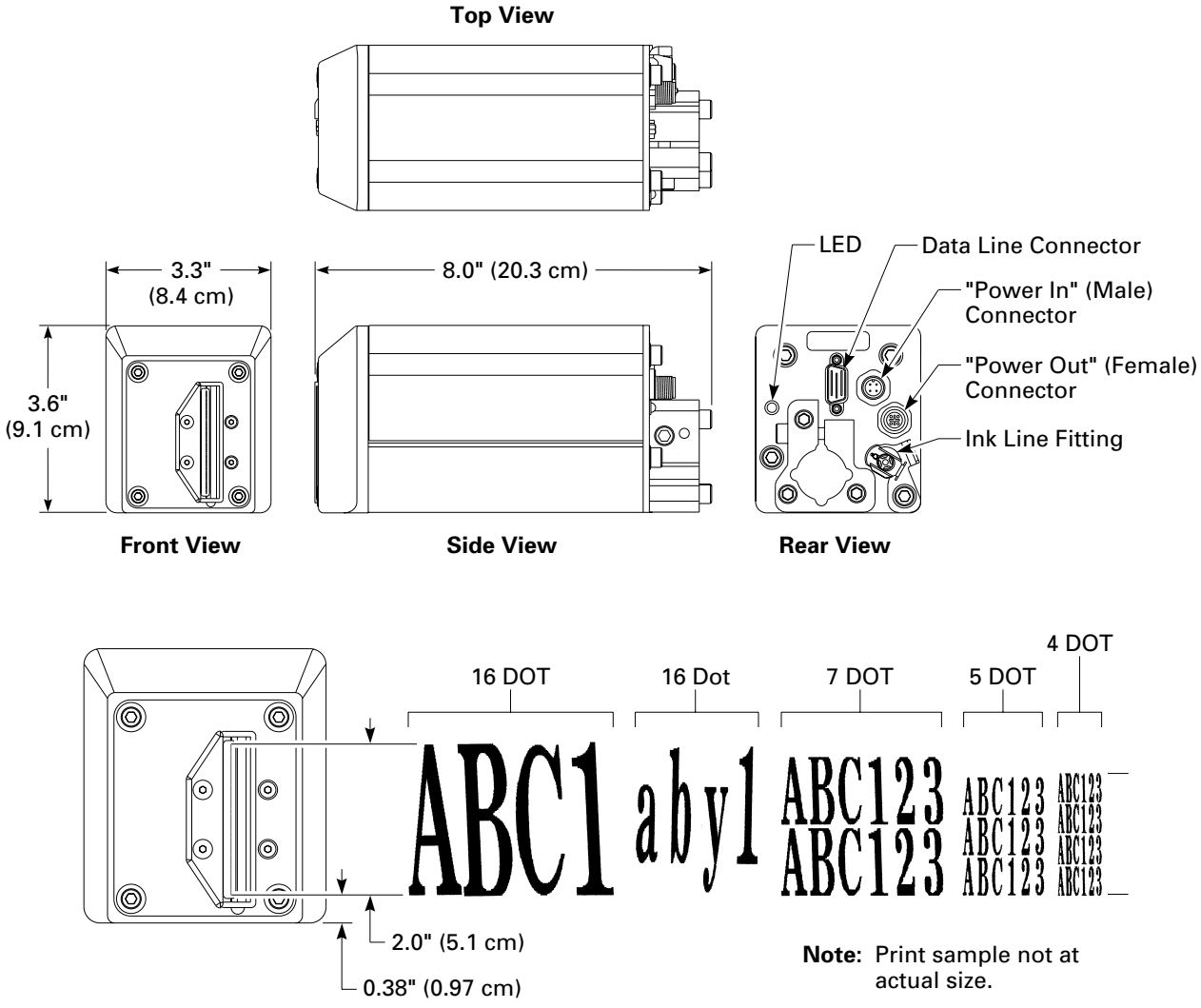
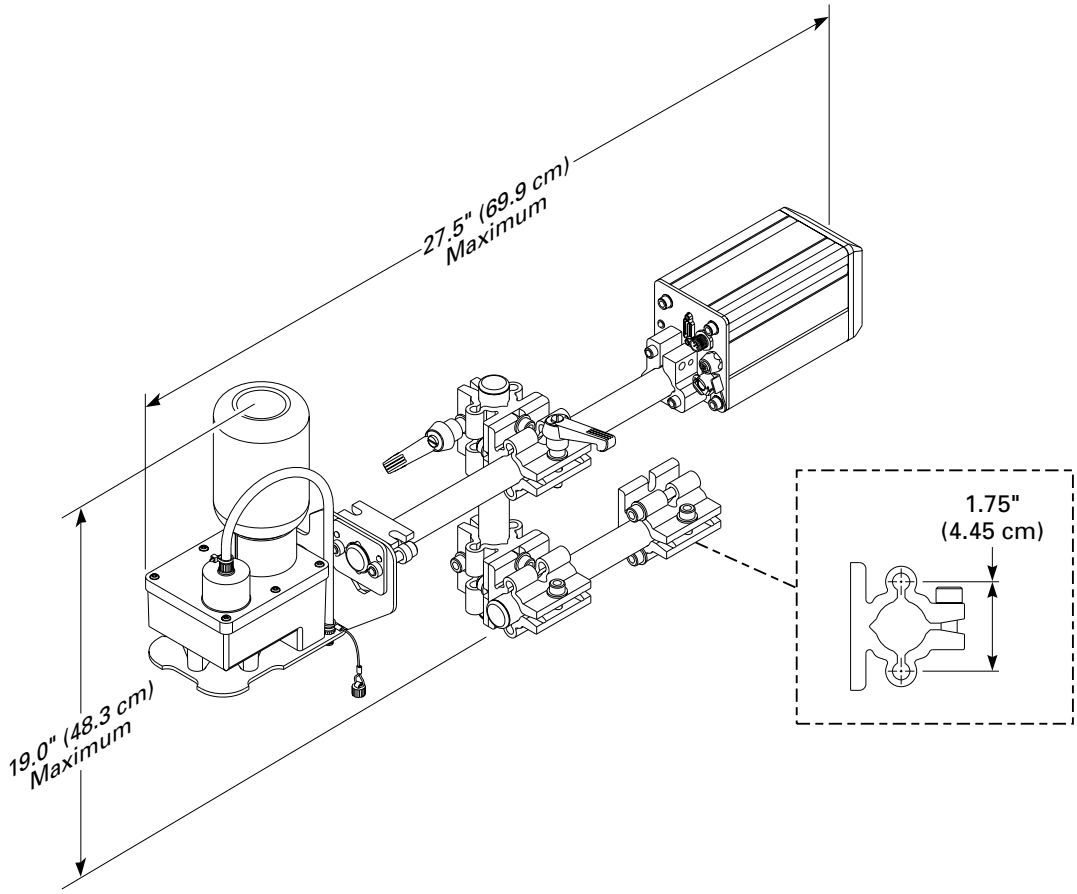


Figure 2O: Standard HR Series Conveyor-Mounting Bracketry Dimensions



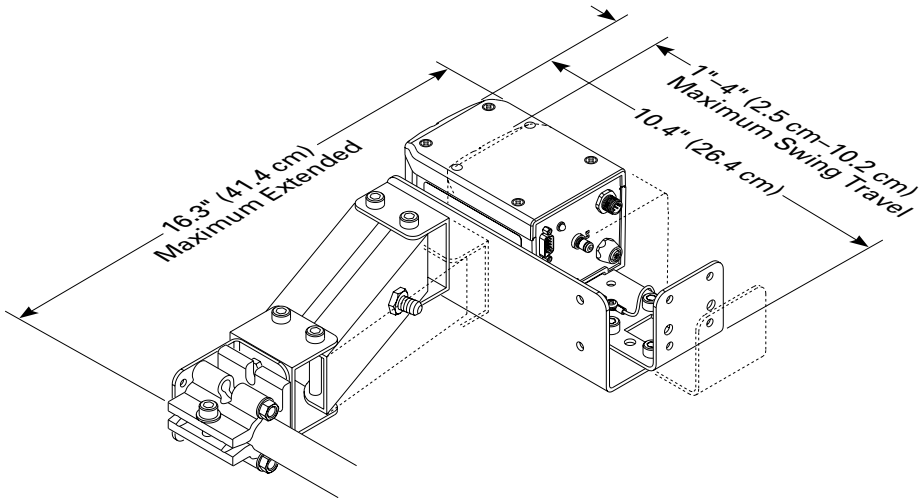
Swing Arm Bracketry

Maintains quality print for applications with varying box sizes. Mounts on standard printhead bracketry. (See Figure 2P.)

The swing arm is only available for VJ printheads.

Line Speed	Maximum Swing Travel
<50 fpm (<15 mpm)	4" (10.16 cm)
50-100 fpm (15-30 mpm)	3" (7.62 cm)
101-150 fpm (31-46 mpm)	2" (5.08 cm)
151-200 fpm (46-61 mpm)	1" (2.54 cm)

Figure 2P: Swing Arm Bracketry Dimensions



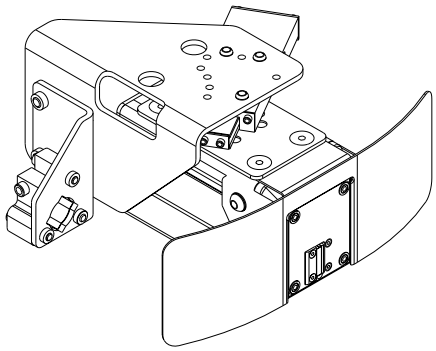
HR Slide Bracket

Provides up to 0.5" (1.3 cm) of horizontal travel to compensate for slight variations in box size or position.

Slide brackets are only available for HR Series printheads.

Maximum conveyor speed with a slide bracketry: 160 ft/min (49 m/min)

Figure 2Q: HR Slide Bracket



15" Square Tube (Optional)

Replaces the horizontal 15" (38 cm) round tube of the conveyor-mounting bracketry.

Provides stability and eases adjustments.

Data Lines

Data lines link printheads to the controller. (See Figure 2A.)

Data lines are available in the following lengths:

- 3' (0.9 m)
- 6' (1.8 m)
- 10' (3 m)
- 15' (4.5 m)
- 25' (7.6 m)

No printhead should be more than 100 feet (30 m) from the controller.

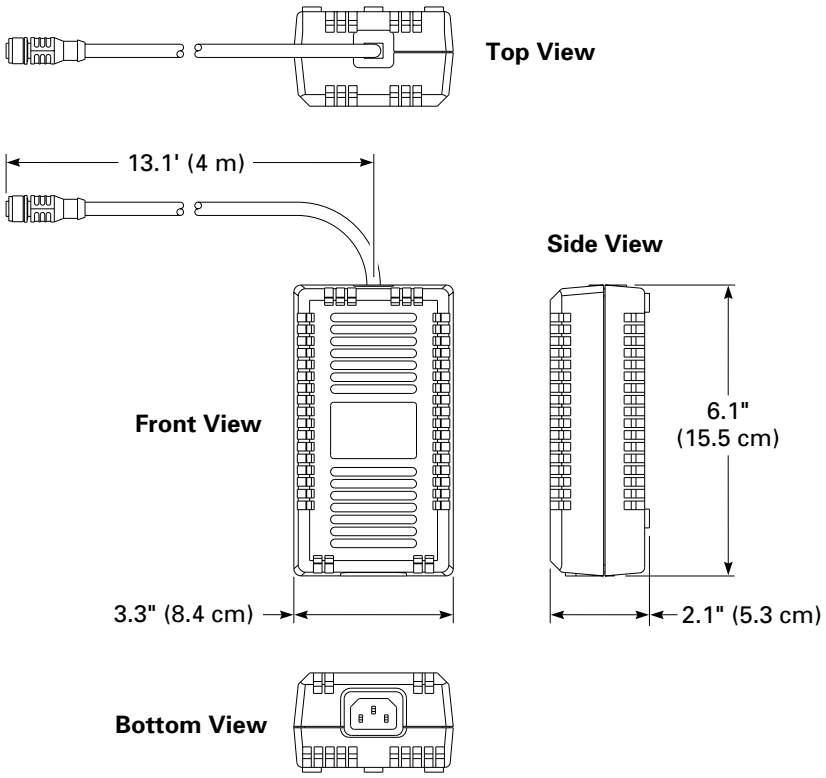
A data line and a Y-cable are required to link HR Series printheads to the controller. Y-cables are shipped with HR Series printheads.

Printhead Power Supply

Supplies power for up to four VJ7 and HR/120 printheads; or two VJ16 and HR/300 printheads. (See Figure 2R.)

Electrical Requirements: 100 - 230 volt; 50/60 Hz

Figure 2R: Printhead Power Supply



Printhead Power Cables

One power cable is required for each printhead. (See Figure 2A.)

Printhead power cables are available in the following lengths:

- 1.6' (0.5 m)
- 3.3' (1 m)
- 6.6' (2 m)
- 13.1' (4 m)

No printhead should be more than 100 feet from the controller.

Power Supply Bracket (Optional)

Holds one power supply, and mounts in a NEMA cabinet or on any flat surface. (See Figure 2A.)

Photocell

Detects product on the production line.

One photocell required for each task.

Two types are available:

Type	Sensing Range	Description
Diffuse Beam	Up to 4" (10.2 cm)	Sufficient for most applications.
Retroreflective	10' (3 m)	Requires the installation of a reflector. More reliable in dusty environments or when printing on uneven surfaces or preprinted surfaces.

Position photocell as close as possible to the leading edge of the first printhead.

The maximum distance from the photocell to the furthest printhead it triggers to print is 25" (63.5 cm).

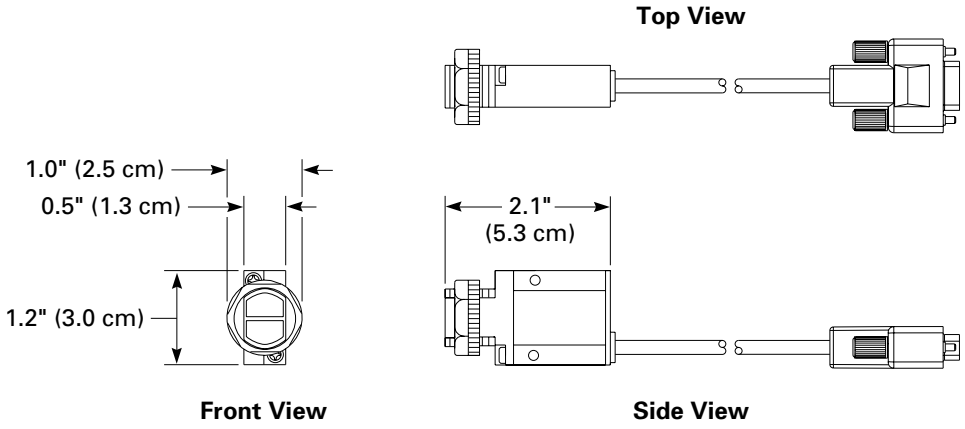
Connects to the 15-pin connector labelled P.C./S.E. (Photocell/Shaft Encoder) on the back of the controller or to the Splitter Box when a shaft encoder is used.

Cable lengths:

- 10' (3.05 m)
- 40' (12.2 m)
- 100' (30.5 m)

Weight: 0.2 lbs (0.09 kg)

Figure 2S: Photocell Dimensions



IndependentVJ Printhead Kit (Optional)

Allows a VJ7 or VJ16 Series printhead to print without being connected to a controller.

Messages are created and the print command is sent with the controller connected to the printhead. Once printing has started, the controller can be disconnected from the printhead, and the printhead continues to print the message. Multiple independent printheads can be used.

Time, Date, and Count functions cannot be used with an independent printhead.

Kit includes a photocell board with internal photocells.

ADS Ink System

The ADS ink system is capable of supplying ink for a maximum of eight lines of print, using any combination of VJ7 and VJ16 Series printheads. The ink system can withstand harsh environments and works well with high-speed applications.

Driven by compressed air:

- Minimum volume and pressure: 1 cfm at 25 psi
- Maximum pressure: 150 psi
- Pressure switch set to cycle on/off at 100 psi +/- 15 psi

Ink Containers

1-quart (0.9 L) ink bottle (disposable)

5-gallon (19 L) ink container (disposable)

5-gallon (19 L) waste-free ink container (reusable)

15-gallon (57 L) ink drum (disposable)

50-gallon (189 L) ink drum (disposable)

250-gallon (946 L) waste free ink tank (reusable)

Series 2000 Ink System

One Series 2000 ink system is required for each HR Series printhead. Does not require compressed air.

Mounts on the same bracketry as the HR Series printheads.

Ink Container

16.9 oz (500 ml) ink bottle

Low Ink Beacon (Optional)

Flashes red if your ink system reaches a low-ink state. (See Figure 2A.)

Mounts to a floor stand, flex stand, or any flat surface.

Ink Bottle Adapter Kit (Optional)

Allows the use of 8 oz (237 mL) Unicorn porous cartridge inks and solvent with VJ7 and VJ16 Series printheads.

Includes bracketry for installation on any flat surface and a connector assembly to connect the printhead to the ink container.

Shaft Encoder (Optional)

Use a shaft encoder for:

- Start and stop applications
- Variable-speed conveyors

The encoder wheel mounts directly on a conveyor and turns relative to the conveyor speed. While the wheel turns, the encoder sends a variable electrical pulse to the controller. The controller converts the pulse into the correct conveyor speed and ensures consistent print.

3600 pulses per revolution

Mounting bracket included with encoder

Requires a smooth belt conveyor

Connects to the Photocell/Encoder Splitter Box

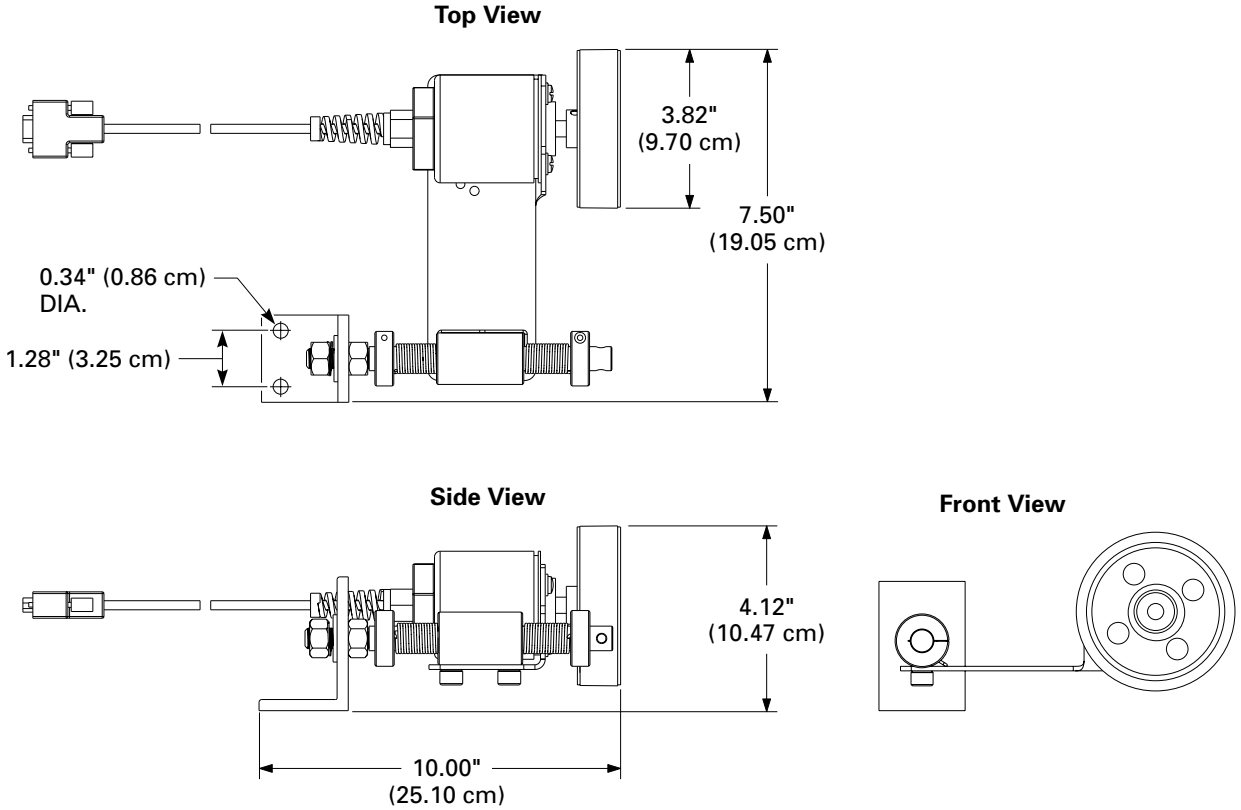
Voltage requirement: 12 VDC

Encoder cable length: 8' 10" (2.69 m)

Optional extension cables: 15', 50' and 100' (4.6 m, 15.2 m, and 30.5 m.)

Weight: 1.3 lbs (0.59 kg)

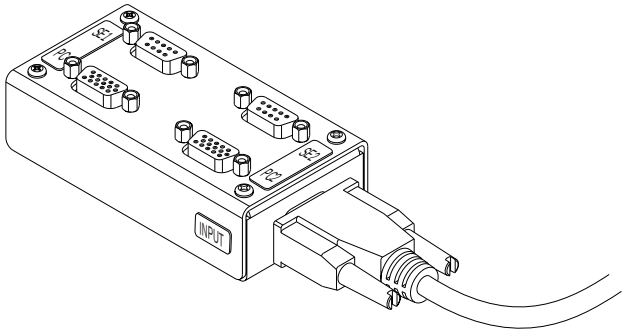
Figure 2T Shaft Encoder



Photocell/Encoder Splitter Box (Optional)

Required when using a shaft encoder and an external photocell with a PatrionPlus system or when dual tasking. (See Figure 2U.)

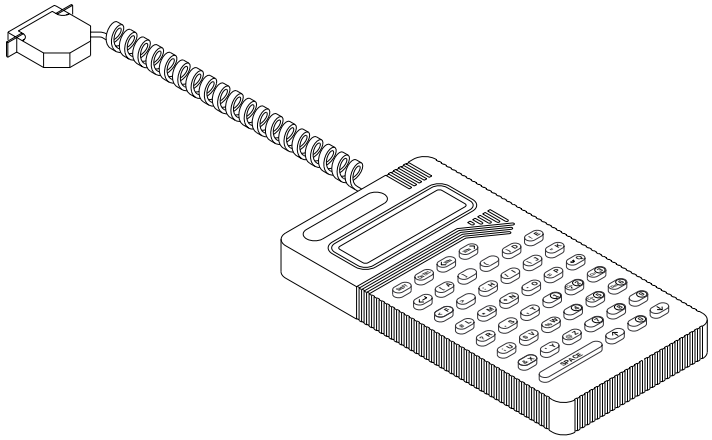
Figure 2U: Photocell/Encoder Splitter Box



Keyboard Input Device (Optional)

A Keyboard Input Device (KID) can be used as an external user interface with the controller. Connects to the 25-Pin RS-232 Connector on the back of the controller.

Figure 2V: Keyboard Input Device (KID 5)



Operating Environment

Temperature Limits

Temperature range: 40°F (4°C) to 120°F (49°C).

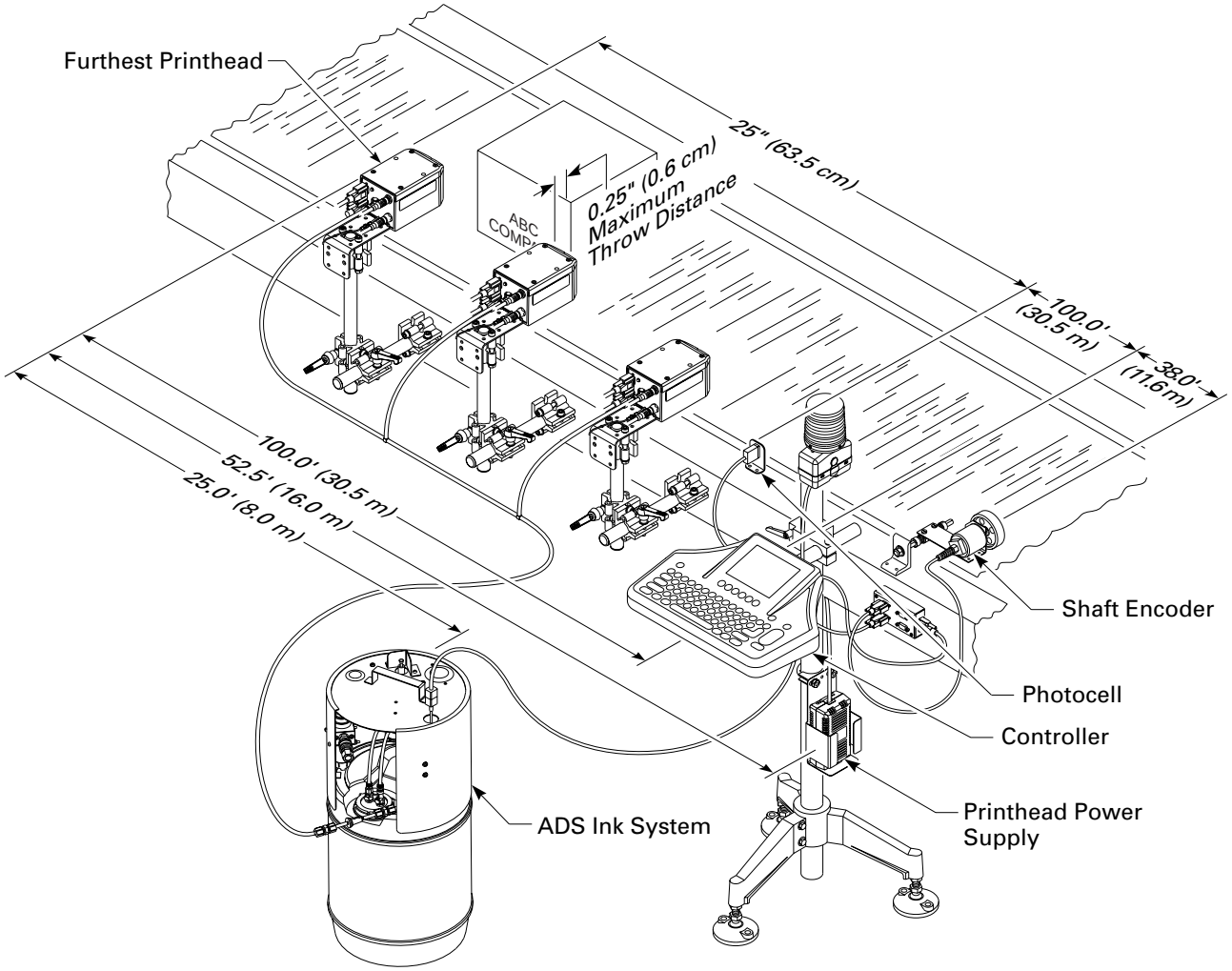
Electrical Requirements

Any clean, regulated power source between 100 VAC and 230 VAC at 50 or 60 Hz. The controller and printhead power supply should be connected to the same AC source.

Recommended Distances

A set of maximum-recommended distances between each system component has been established to ensure good print quality. (See Figure 2W.) The distance from the last printhead to the ink system, only applies to VJ printheads. HR Series printheads use Series 2000 ink systems.

Figure 2W: Recommended Component Distances



Note: Dimensions represent maximum cable lengths, not linear distances.

3-Installation

Table of Contents

Introduction

This section provides detailed information on installing your PatrionPlus controller and printheads. Before you get started, please read the Safety Instructions and the Establishing Locations information on the following pages.For details on installing your ink system, see your ink system technical manual.

Safety Instructions

***WARNING*: Failure to follow these safety procedures could result in personal injury and/or damage to the equipment.**

Follow these safety guidelines whenever you install, service, or operate your PatrionPlus system.

- Only trained personnel should install, operate, and service the equipment.
- Always wear safety glasses with side shields, and protective gloves when working with ink or equipment containing ink.
- Always read and obey the warning decals located on equipment. Do not remove or obstruct any warning or instruction labels located on equipment.
- Always read and obey all **WARNINGS** and **CAUTIONS** in this manual.
- All electrical wiring and connections must comply with applicable local codes. Consult the appropriate regulatory agency for further information.
- Disconnect the power cord from the power source before connecting or disconnecting any cables.
- Disconnect the power cord from the power source if there is a power failure, and do not reconnect the power cord until electrical power is completely restored.
- Do not smoke near equipment.
- Operate equipment in properly ventilated areas.
- Do not pour ink or cleaning solutions into sinks, sewers, or drains. Waste disposal must comply with local regulations; contact the appropriate regulatory agency for information.
- Certain inks and cleaning solutions are flammable and must be stored appropriately. Storage must comply with local regulations; contact the appropriate regulatory agency for information. The label on the bottle or the Material Safety Data Sheet will indicate flammability.
- If ink ingestion should occur, contact a physician immediately and refer to the Material Safety Data Sheet.

Establishing Locations

Before beginning installation it is important to establish locations for all system components. No printhead should be more than 100 feet (30.5 m) away from the controller. (See “Recommended Distances” on page 2-33 for details.)

Consider the following questions:

- Does the location allow for easy maintenance of the system?
- Is a power source available? The controller and power supply should be connected to the same AC outlet sourcce to ensure that power is applied to both items properly.
- If using an ADS ink system, is there an available air supply source?
- Is there adequate space for cables behind the controller?
- How long are the data lines and other cables?
- What optional equipment does the system need?

Conveyor Direction

After establishing a mounting location on the production line for your printheads, determine the conveyor direction. Stand behind the printhead to determine if the product will pass by the printhead in a right to left (Forward Print) or left to right (Reverse Print) direction. When you configure your printheads you will set the conveyor direction. (See “Printhead Configuration” on page 4-9.)

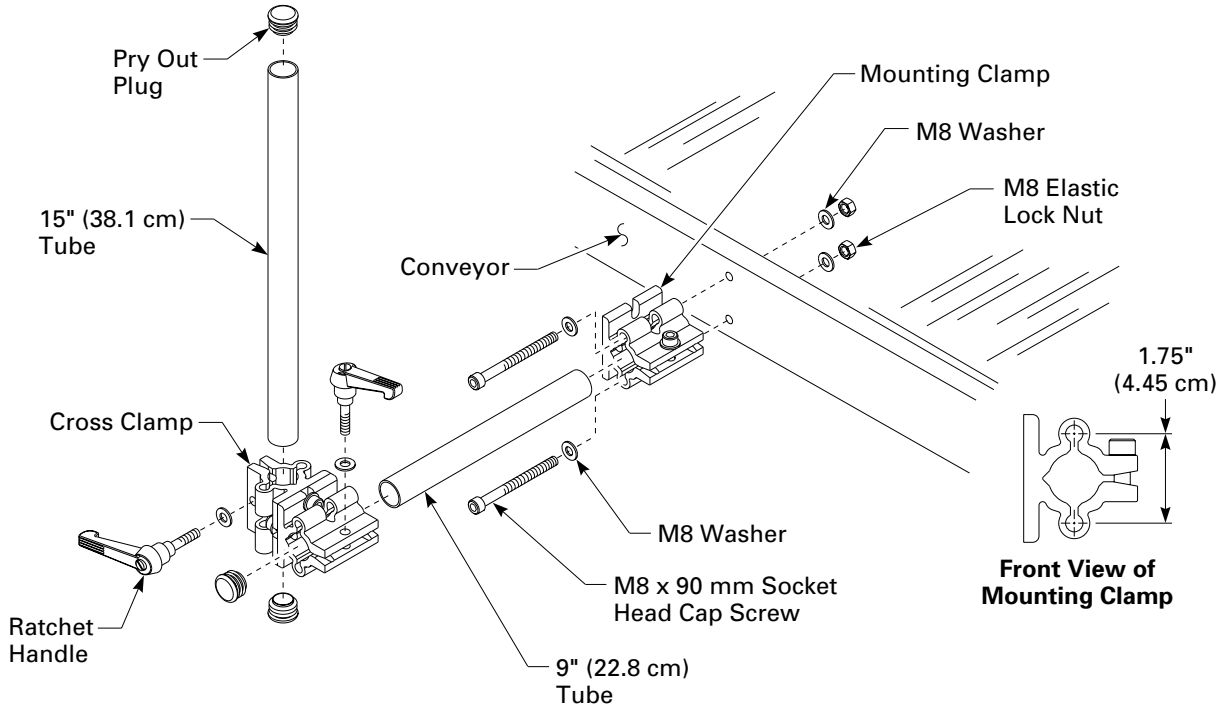
Standard Printhead Bracketry Installation

Standard printhead bracketry supports one printhead, and can be installed directly onto the conveyor. Note the following bracketry options that are available. (To order, see the Parts List.)

- An additional tube and cross clamp, allows you to configure the bracketry to extend the printhead over the conveyor. (See "Conveyor Extension Printhead Bracketry Installation" on page 3-5.)
- A VJ printhead swing arm can be used to accommodate minor variations in box sizes.

1) Using the bolts supplied, attach the mounting clamp to the conveyor. (See Figure 3A.)
2) Install remaining tubes, clamps, and pry out plugs. If desired, replace cross clamp bolts with ratchet handles to make adjustments easier.

Figure 3A: Standard Printhead Bracketry Installation

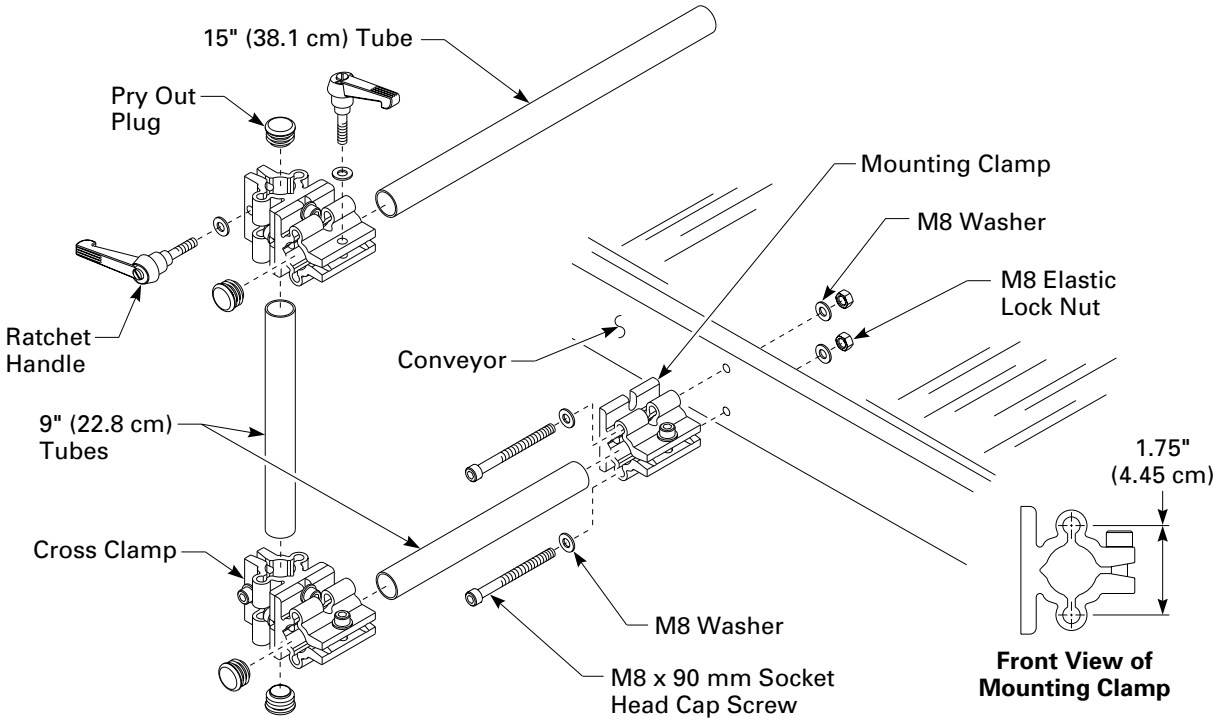


Conveyor Extension Printhead Bracketry Installation

Conveyor extension bracketry consists of the standard printhead mounting bracketry plus an additional cross clamp and tube.

1) Install the standard printhead bracketry according to the procedures on page 3-4.
2) Install the additional cross clamp and tube to extend the printhead over the conveyor. (See Figure 3B.)

Figure 3B: Conveyor Extension Printhead Bracketry Installation



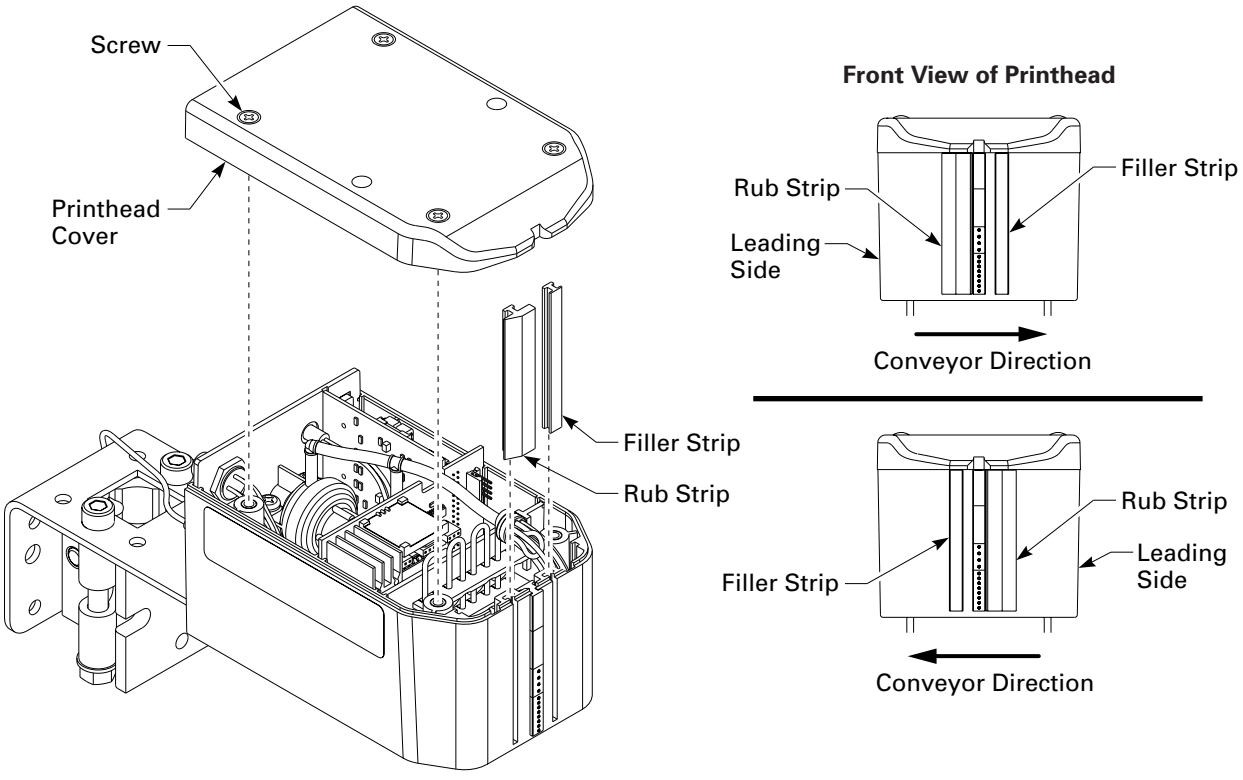
Repositioning the Rub Strip

Before installing a VJ printhead, make sure the rub strip is installed on the leading side of the nozzles. (The leading side is the side that the box will encounter first.)

If you need to reposition the rub strip, follow the procedures below.

1) Loosen the four screws on the top of the printhead, and remove the printhead cover.
2) Remove the rub strip and the filler strip.
3) Reinstall the rub strip on the leading side of the printhead.
4) Reinstall the filler strip.
5) Reinstall the printhead cover and tighten the four screws.

Figure 3C: Repositioning the Rub Strip



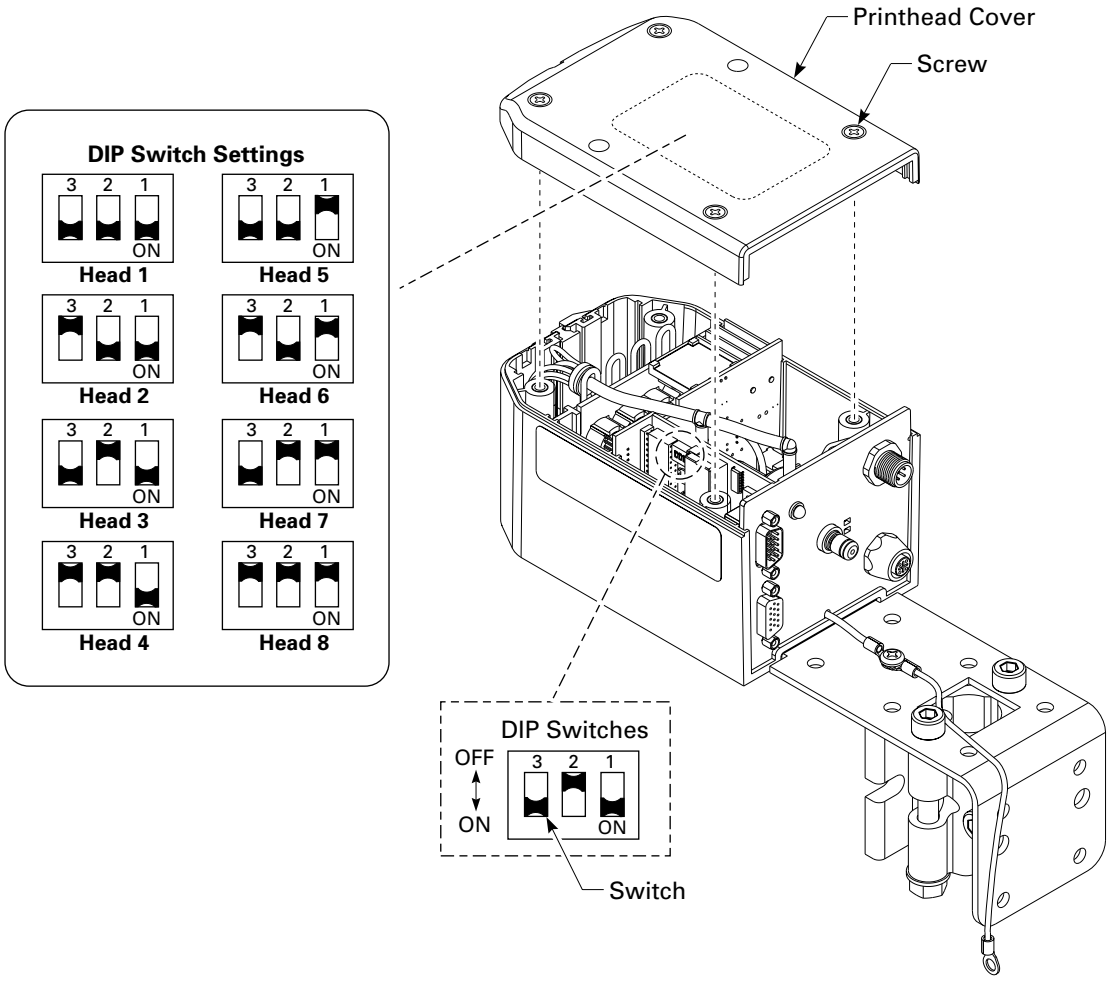
Setting Printhead DIP Switches in VJ Printheads

If you are installing multiple printheads, you must set the DIP switches in the printheads to assign each printhead to a print position. At the printhead setup screen, the printheads will appear from left right in the order of the DIP switch settings.

To set DIP switch settings in a VJ printhead follow the procedures below. If you have HR Series printheads, see the HR Series technical manual.

1) Loosen the four screws on the top of the printhead, and remove the printhead cover. (See Figure 3D.)
2) Set the DIP switches on the printhead controller board to the desired address for each printhead.
3) Reinstall the printhead cover and tighten the four screws.

Figure 3D: Setting DIP Switches in a VJ Printhead



VJ 7Combo Series Printhead Adjustment

PatrionPlus VJ 7COMBO printheads can print a single line of 1/2" (13 mm) or 1" (26 mm) high characters. The printhead is shipped configured to print 1/2" (13 mm) high characters. By reconfiguring the valve tubing you can change the print height to 1" (26 mm).

If you want to reconfigure a VJ 7Combo printhead follow the procedures below.

1) If you are adjusting an existing setup, be sure to flush the printhead with solvent, turn off the controller, and disconnect the power cable and data lines.
2) Disconnect the printhead ground wire from the printhead bracket. (See Figure 3E.)
3) Loosen the four screws on top of the printhead and remove the printhead cover.
4) If an independent printhead kit is installed, remove the photocell board.
5) Remove the blank nozzle blocks from the slot.
6) Lift the printhead assembly out of the printhead enclosure, being careful to simultaneously lift the nozzle blocks out of the nozzle block slot. (See Figure 3E.)
7) Carefully disconnect the valve tubing from each nozzle—one at a time—and reconnect the tubing to the appropriate new nozzle. (See Figure 3F.) Make sure the tubing is carefully aligned to prevent kinks in the tubing.
8) Replace the printhead assembly in the printhead enclosure while simultaneously installing the nozzle blocks into the slot. Nozzle blocks are keyed so there is only one way they can be put into the slot.
9) Replace the blank nozzle blocks in the slot.
10) Replace the photocell board, if an independent printhead kit was installed.
11) Reinstall the printhead cover and tighten the four screws.
12) Reconnect the printhead ground wire to the printhead bracket.

Figure 3E: Removing Printhead Assembly

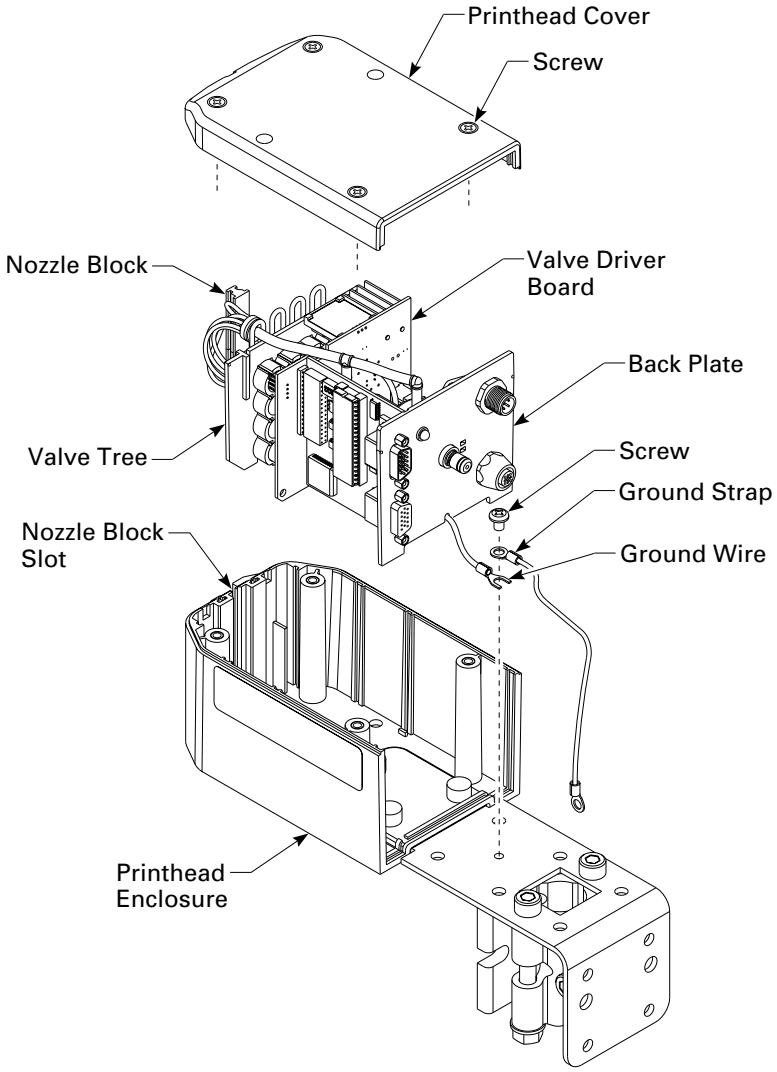
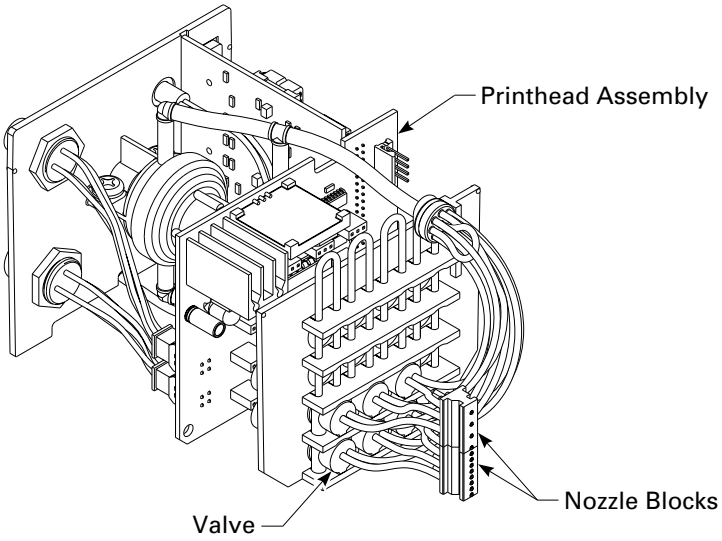
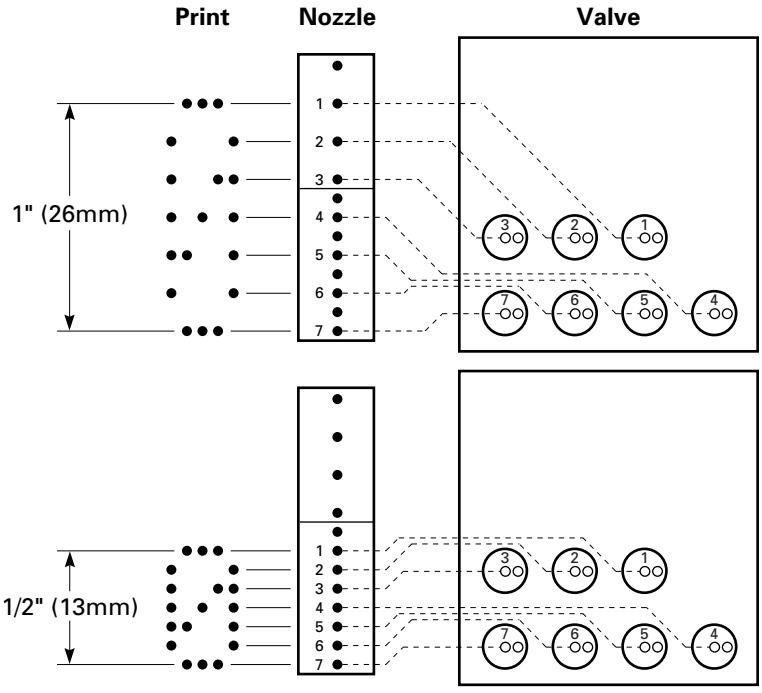


Figure 3F: VJ 7Combo Nozzle to Valve Configurations





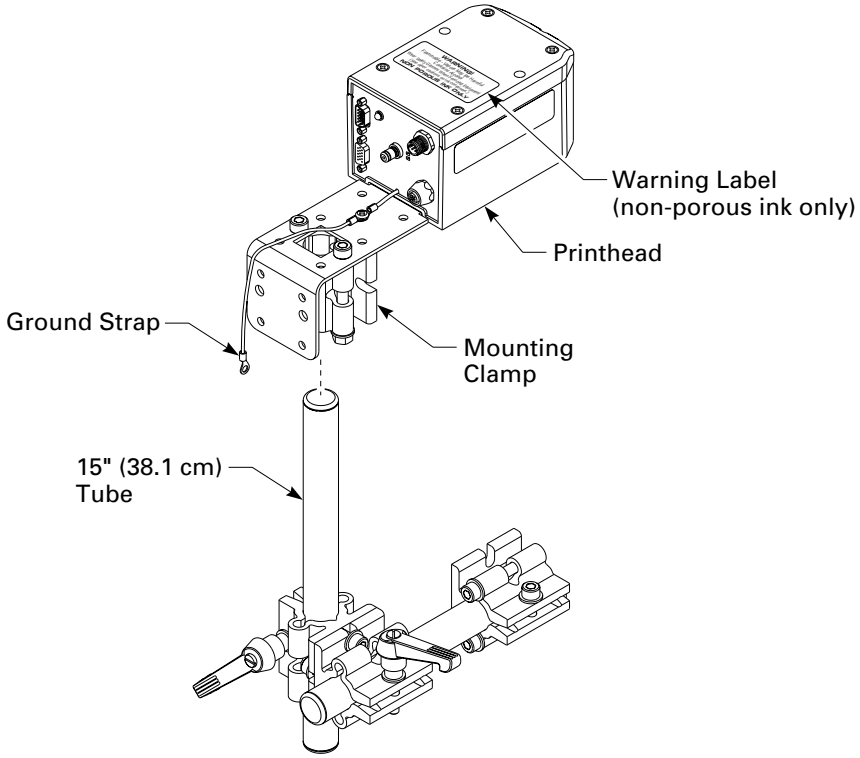
Nozzle to Valve Configurations
7Combo Series Printhead
(viewed from front of printhead)

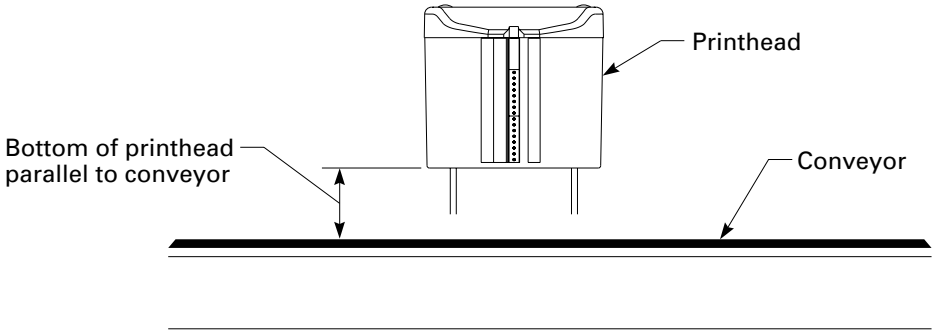
Standard VJ Printhead Mounting

Follow the directions below for standard printhead mounting. If you installed the conveyor extension printhead bracketry, go to "Extended Conveyor Printhead Mounting" on page 3-12.

1) Mount the printhead assembly onto the bracketry. (See Figure 3G.) Be sure that the bottom of the printhead is parallel with the conveyor.
2) Attach the ground strap to the conveyor or other ground source.
3) If using non-porous ink, apply the "Warning!" label (included with your printhead) to the printhead cover.

Figure 3G: Standard Printhead Mounting Configuration





Extended Conveyor Printhead Mounting

To install the printhead extended over the conveyor:

1) Remove the mounting clamp from the printhead bracket. (See Figure 3H.)
2) Disconnect the ground wire and ground strap from the bracket.
3) Remove the printhead from the bracket.
4) Rotate the bracket as shown in Figure 3I, and reinstall the bracket on the printhead.
5) Reconnect the ground wire and ground strap to the bracket.
6) Secure the mounting clamp to the bracket.
7) Install the mounting clamp on the 15" (38.1 cm) horizontal tube and tighten the clamp. Be sure that the bottom of the printhead is parallel with the conveyor.
8) If using non-porous ink, apply the "Warning!" label (included with your printhead) to the printhead cover.

Figure 3H: Remove Printhead Mounting Clamp

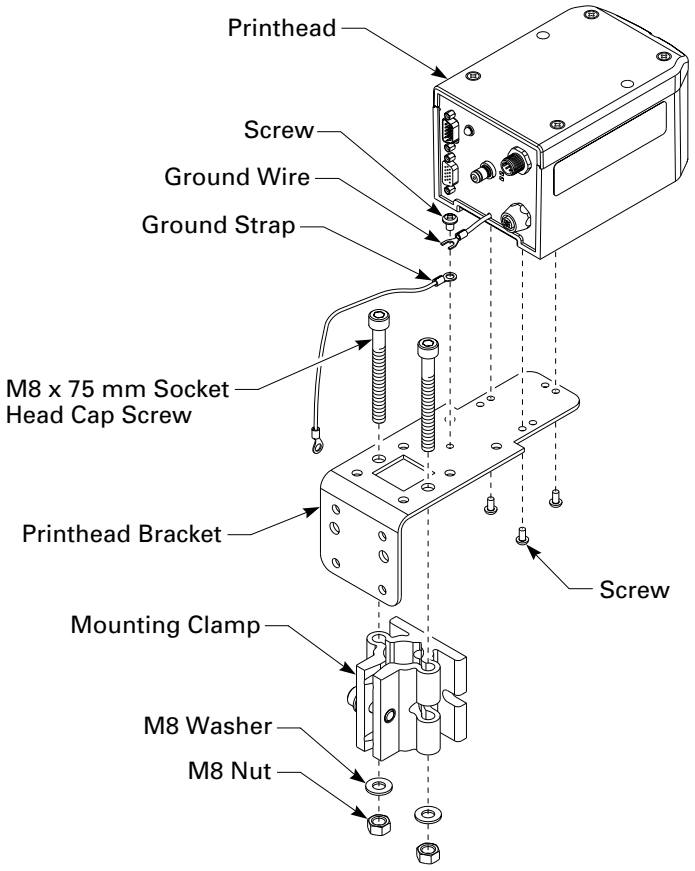
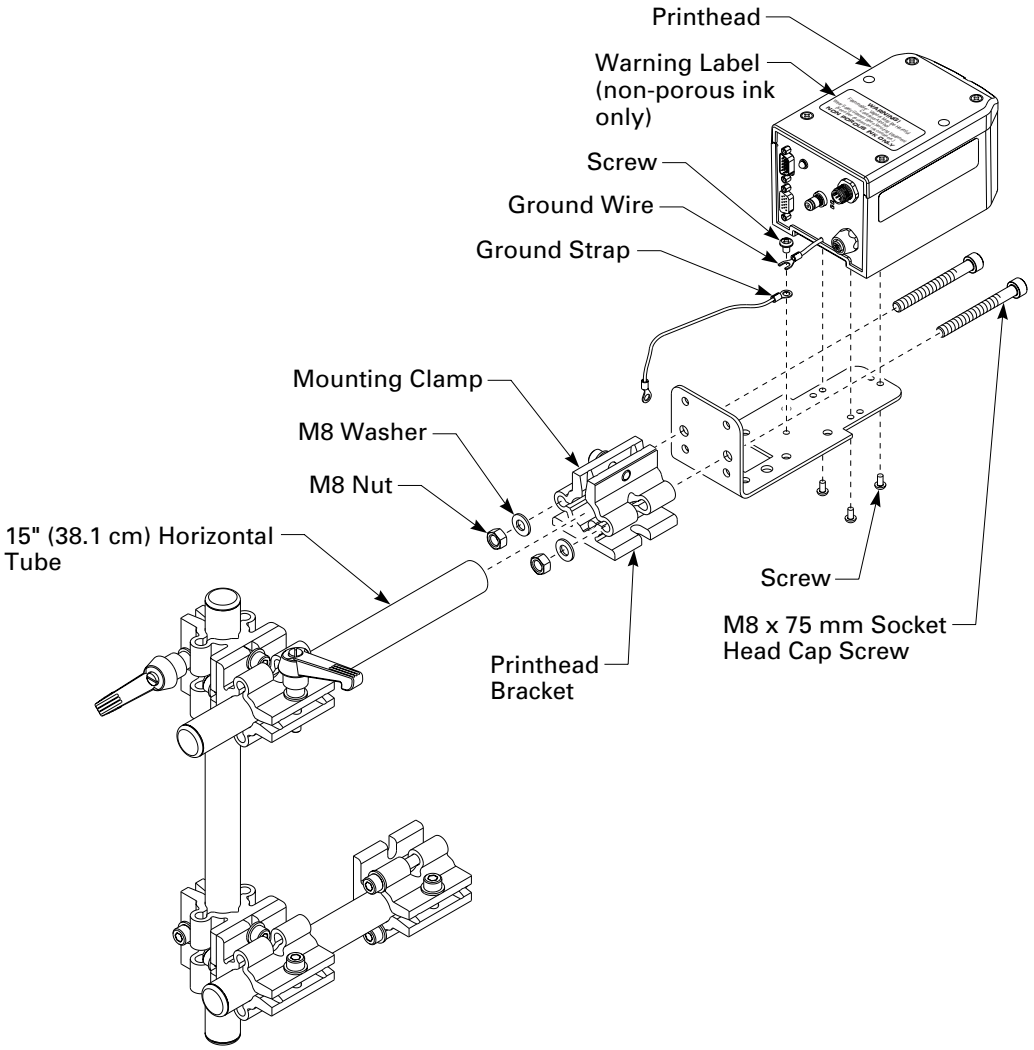
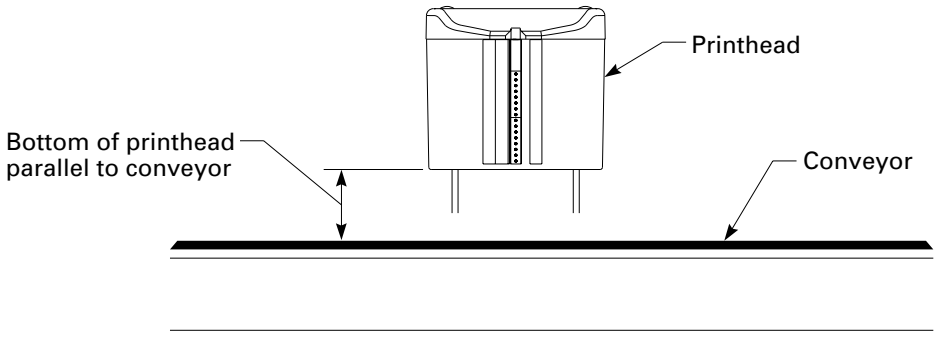


Figure 3I: Extended Conveyor Printhead Mounting





ADS Ink System Installation

1) On your production line, establish a location for your ADSink systemwithin 25' (8 m) of your furthest VJ printhead and near an air supply line.
2) Install your ink system according to the instructions in your ink system technical manual.

Note: The ADS Ink System is for use with VJ printheads only.

Series 2000 Ink System Installation

Install your ink system according to the instructions in your ink system technical manual.

Unicorn Ink Bottle Adapter Kit Installation

1) On your conveyor line, establish a location for your ink bottle kit within 3' (0.9 m) of the printhead.
2) Install the ink bottle kit according to the instructions shipped with the kit.

Note: The Unicorn Ink Bottle Adapter Kit is for use with VJ printheads only.

Low Ink Beacon Installation

1) On your production line, establish a location for the beacon within 10' (3 m) of the ink system that it will connect to.
2) Install the beacon according to the instructions shipped with the beacon.
3) Connect the beacon to your ink system using the alarm beacon cable, or to multiple ink systems by using low ink alarm Y-cables.

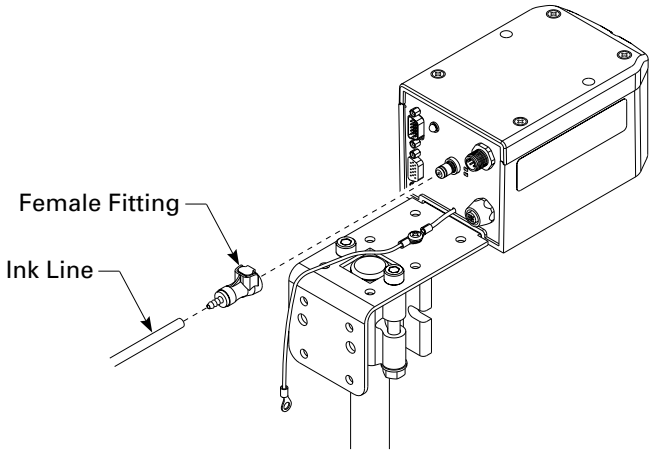
Ink Line Installation for VJ Printheads

Follow the directions below to install ink lines for one or more VJ printheads.

WARNING: You can use PatrionPlus printheads with either porous or non-porous (NP) ink, but not both. Once porous or non-porous ink is introduced into the printhead, do not change the ink type. Changing the type of ink will permanently damage the printhead and will void your warranty.

1) Install your ink system. (See your ink system technical manual.)
2) Locate the ink line connected to the ink system.
   - If you are installing only one printhead:
   a. Measure the ink line path between the ink system and your printhead, and cut the ink line tubing.
   b. Place the female fitting (shipped with the printhead) onto the open end of the ink line. (See Figure 3J.) Do not connect the ink line to the printhead yet.
   c. Continue with step 4.

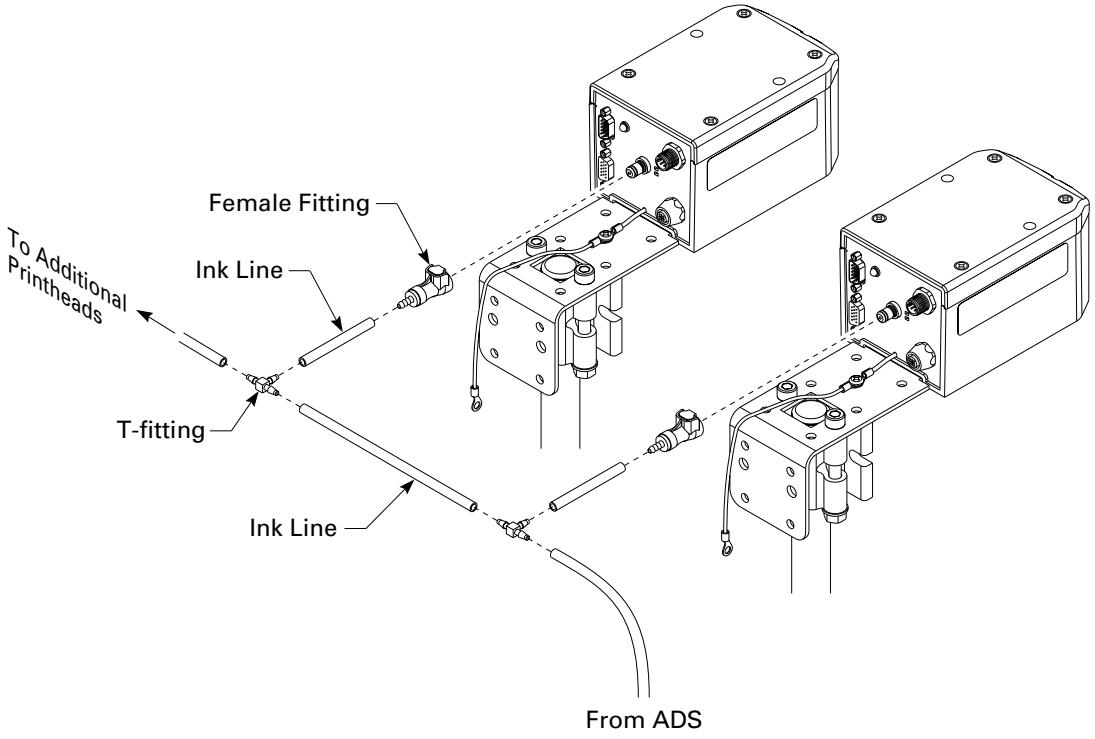
Figure 3J: Connecting the Ink Line



   - If you are installing more than one printhead:
   a. Measure the ink line path from the ink system to the point where you want your first T-fitting, and cut the ink line. (See Figure 3K.)
   b. Install a T-fitting (shipped with the printhead) on the ink line.
3) Continue measuring and cutting ink line tubing and installing T-fittings and female fittings (shipped with the printheads) until your daisy-chained, ink line network is complete. Do not connect ink lines to the printheads yet.

4) Purge the ink line (see your ink system technical manual).
5) Connect the ink line to the printhead. (See Figure 3K.)
6) Tie wrap, or restrain, the ink line as desired.

Figure 3K: Ink System T-fittings



Power Supply and Power Cable Installation

The power supply can be mounted on a table top, on a floor stand using the power supply bracket, or in a NEMA cabinet. The power supply bracket and NEMA cabinet are available as options. Be sure you have the appropriate number of power supplies. (See “Printhead Power Supply” on page 2-28.)

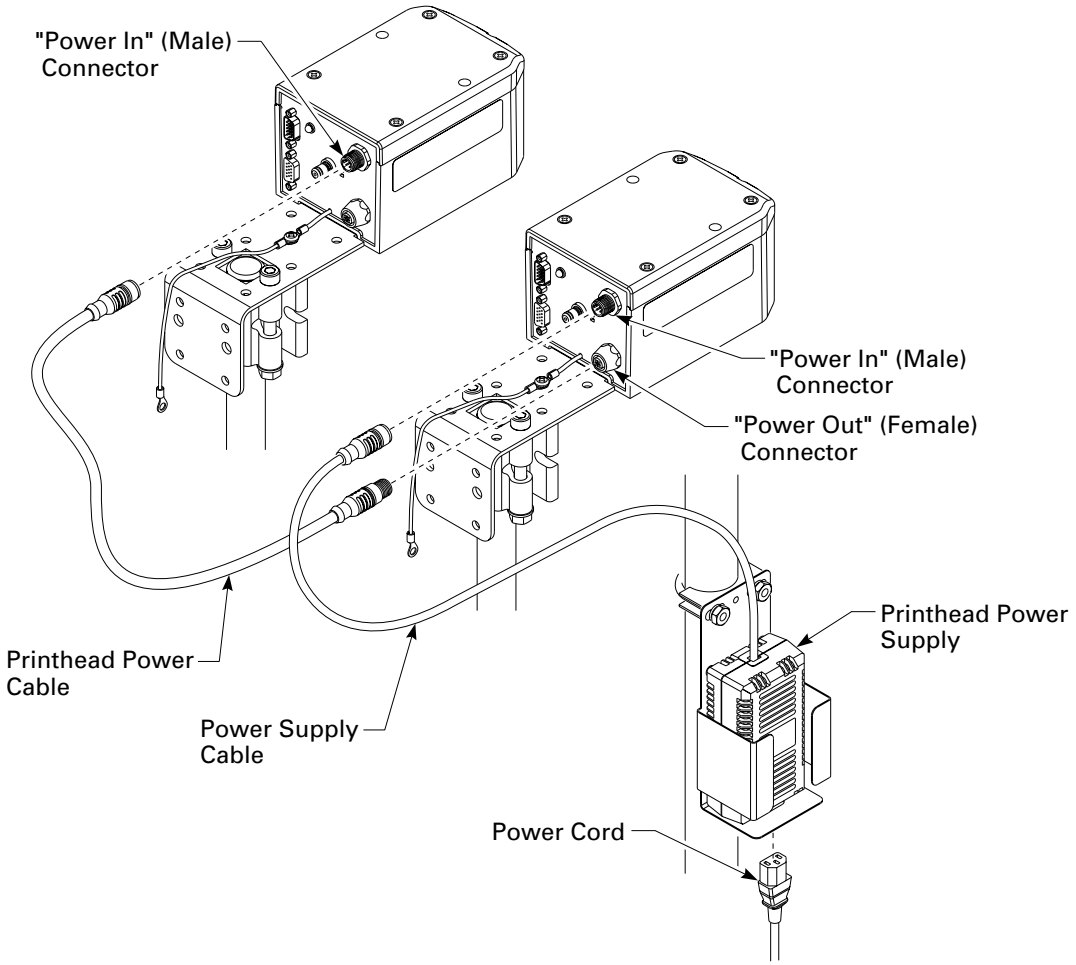
1) On your production line, establish a location for the power supply. The cable routing from the power supply to the furthest printhead must be less than 52.5' (16 m).
2) Set the power supply on a table top, or using a power supply bracket:
   - Mount the power supply on any flat surface
   - In your PatrionPlus NEMA cabinet (see the data sheet included with the NEMA cabinet)
   - Or on a floor stand (see the data sheet included with the bracket)
3) If you are using the power supply for more than one printhead, connect power cables to the "power out" (female) connectors on the back of all but your last printhead. (See Figure 3L.)
4) Connect all loose ends of power cables to the "power in" (male) connectors on your printheads.
5) Connect the power supply power cord to the power supply; **do not yet plug it into a power source.**

NOTE: After installation is complete, apply power to the printheads before plugging in the controller, or the controller may not recognize all printheads.

Power Supply Bracket

For information on installing the power supply using the power supply bracket, see the instructions included with the bracket.

Figure 3L: Installing the Power Supply



Controller Mounting Configurations

Once you have established a location (see “Establishing Locations” on page 3-3), choose which mounting option is best for your application. The options are table mount, NEMA enclosure, and floor stand mount.

Table Mount

Place the controller on a level table or other surface. No extra bracketry, or hardware is required.

NEMA Enclosure

The NEMA enclosure provides protection for the controller in harsh environments. The enclosure can be mounted to a vertical surface or onto a flex stand. To mount your controller in a NEMA enclosure, follow the instructions included with the enclosure.

Floor Stand Mount

The floor stand mount offers the most flexibility because it can be moved to accommodate changes in your system layout. To mount your controller on a floor stand, follow the instructions included with the floor stand controller bracketry kit.

Data Line Installation

1) Make sure the controller and printhead power supplies are unplugged.

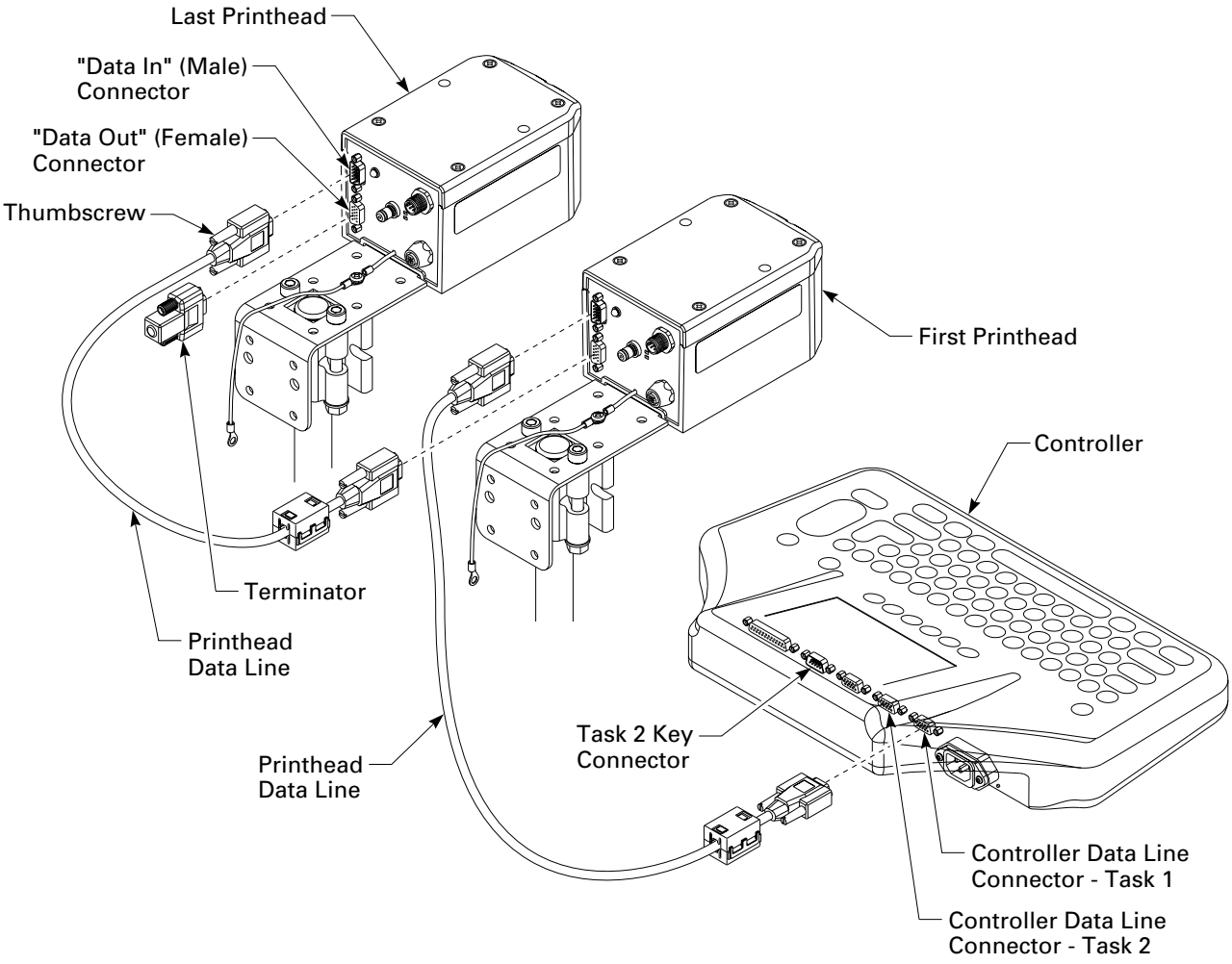
   CAUTION: Do not connect a printhead data line while the controller or printhead power supply is plugged in. Serious damage may result to the printhead and the controller.

2) Connect a data line to the top (male) connector of your first printhead, and tighten the two thumbscrews. (See Figure 3M.)
3) Remove and retain the terminator from the Task 1 connector on the back of the controller.
4) Connect the other end of the data line to the Task 1 connector on the back of the controller.
5) To serially link the first printhead with the second, connect a data line to the bottom (female) connector of your first printhead and to the top (male) connector of your second printhead.
6) Repeat step 5 until all printheads are serially linked.
7) Install the terminator on the unused bottom (female) connector of the last printhead.

   CAUTION: Proper operation cannot be guaranteed if a terminator is not installed on the unused connector.

8) If you are printing on two conveyors, install the Task 2 key on the Task 2 connector on the back of the controller.
9) Connect printheads for your second line to the Task 2 printhead connector on the back of the controller.
10) Connect the terminator included with the Task 2 key to the unused bottom (female) connector of the last printhead.

Figure 3M: Installing Data Lines

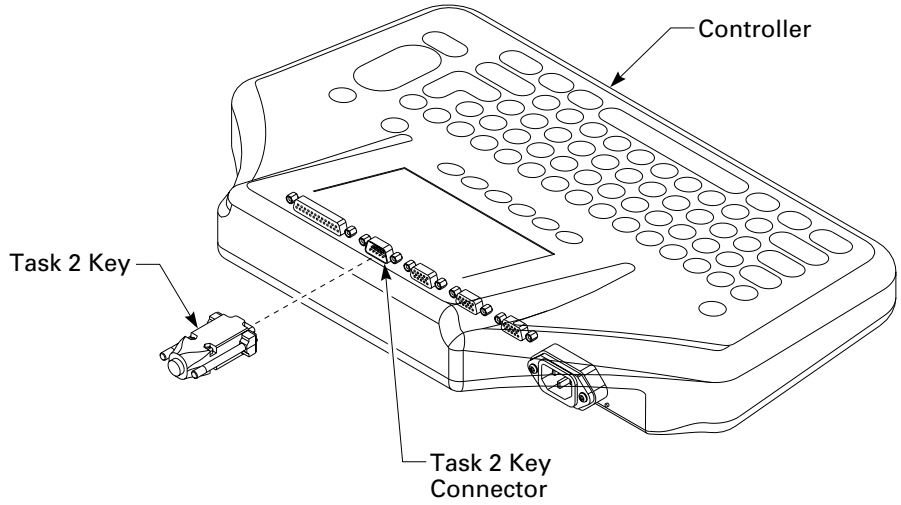


Task 2 Key Installation for Dual Tasking

Dual tasking allows you to print two different messages on two production lines. To do this, install the Task 2 Key on the Task 2 Key connector on the back of your controller. (See Figure 3N.) Retain the terminator shipped with the Task 2 Key for later use.

Note: Logos and custom fonts downloaded to the controller using Keymaster software, can only be loaded to Task 1.

Figure 3N: Task 2 Key



Photocell Installation

If you are installing a shaft encoder along with the photocell, you will need a splitter box. (To order see the Parts List.)

Installation instructions are shipped with the photocell.

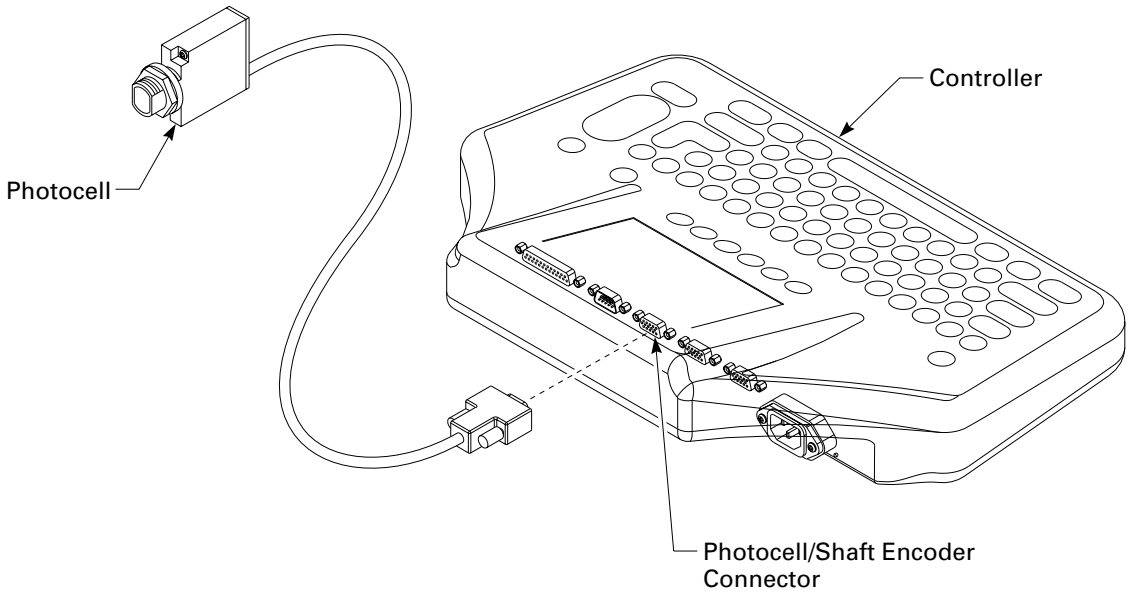
On your production line, establish a location for the photocell that meets the following criteria:

- The photocell is no further than 25" (63.5 cm) from the last printhead that the photocell triggers to print.
- The photocell is no further than 10' (3 m), 40' (12.2 m) or 100' (30.5 cm) from the controller depending on the length of your cable.
- The diffuse beam photocell is located no more than 4" (10.2 cm) from the product.
- The retroreflective photocell's reflector must be mounted directly across the conveyor and no further than 10' (3 m) from the photocell.

Connect the photocell to the controller in one of the following ways:

- If you have one production line (Task 1) and no shaft encoder, connect the photocell to the photocell/shaft encoder connector on the back of the controller. (See Figure 3O.)
- If you will be using a shaft encoder and/or two production lines (Task 1 and Task 2) connect your photocell to a splitter box. (See Figure 3P and Figure 3Q.)

Figure 3O: Installing a Photocell



Shaft Encoders

Use a shaft encoder when you have:

- Start-and-stop applications
- Variable line speeds

If you are installing a shaft encoder you will also need a splitter box. (To order see the Parts List.)

Installation instructions are shipped with the shaft encoder, however the installation may need to be modified due to variations in conveyor setup and product size.

Refer to the following general guidelines when installing a shaft encoder.

- Container speed must equal encoder wheel speed or the printed messages will be incorrectly aligned.
- Maintain steady contact with the moving surface that drives the encoder. If the encoder wheel bounces off the surface, it will send improper pulses to the controller.
- Keep the encoder wheel clean or it will not turn properly.
- Connect the splitter box cable to the Photocell/Shaft Encoder connector on the back of your controller. (See Figure 3Q and Figure 3R.)
- Two shaft encoders can be connected to the splitter box. (See Figure 3Q.)

Figure 3P: Installing the Splitter Box

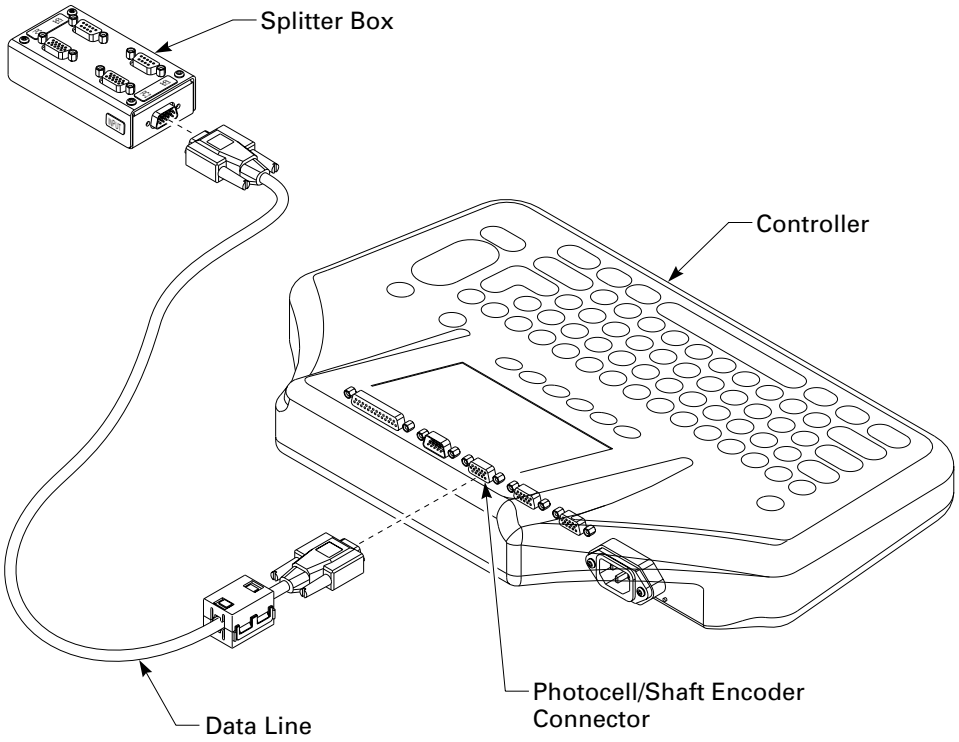
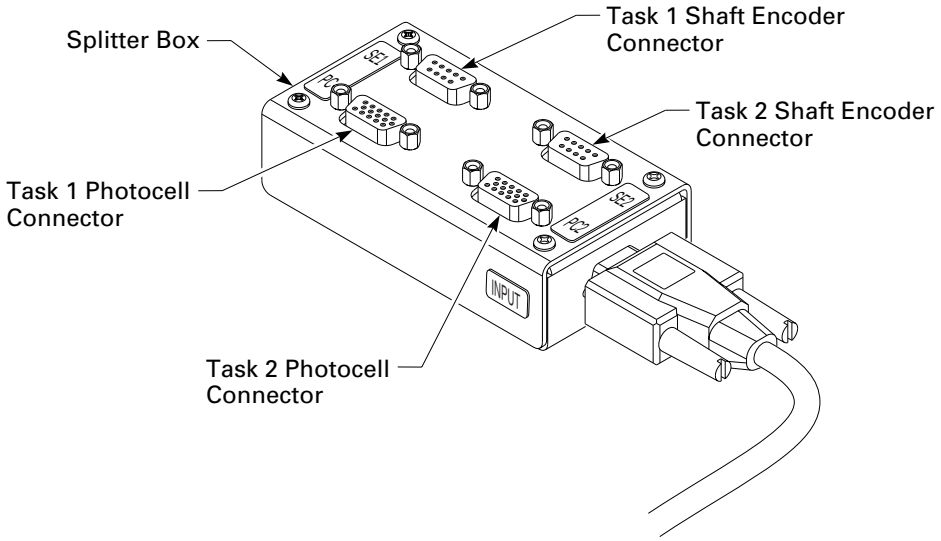


Figure 3Q: Splitter Box Connections



Optional External Devices

Your PatrionPlus controller is able to interface with other input devices. Remember to turn off the power to your controller before installing any cables.

Keyboard Input Device (KID)

A Keyboard Input Device, or KID, can be used to interface with the controller. (See the part's list on page 8-19.) To install a KID:

1) Unplug the controller power cable.
2) Modify your KID according to the data sheet shipped with your KID.
3) Plug the 25-pin connector into the RS-232 connector on the back of your controller. (See Figure 3R.)
4) See "Appendix A - KID 5" for operating commands.

RS-232 Devices

You can connect a scale, scanner, or PLC, for example, to the RS-232 connector on your controller. First, make sure you have the correct cabling to connect the device to the 25-pin RS-232 connector (DB25 female DCE). A null modem, gender changer, or size changer may be required. For more information, see "Appendix B - Pin Outs". If you need additional assistance, contact your MIS department, your local distributor, or Technical Support.

You will also need to make sure the communications settings for the device match these settings:

Baud rate: 9600

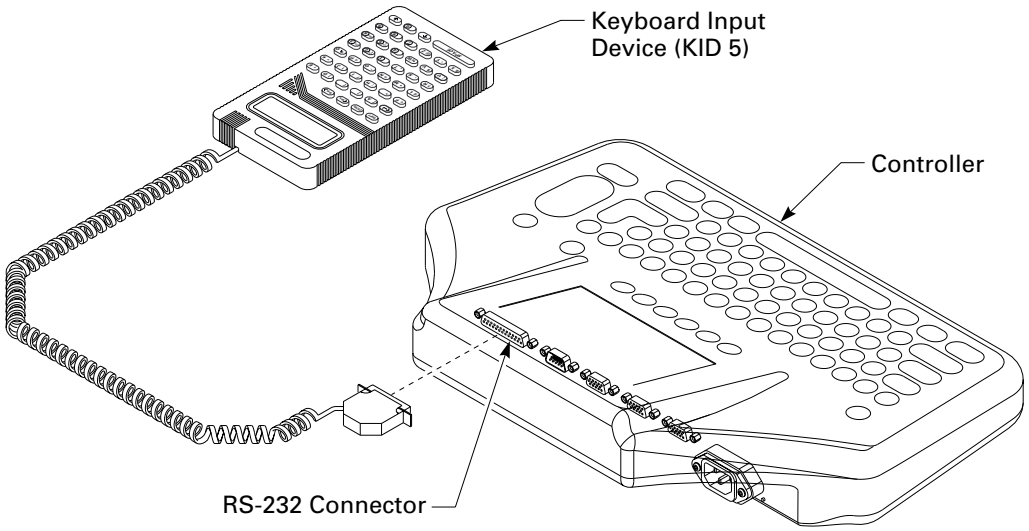
Parity: None

Data bits: 8

Stop bits: 2

Flow control: XON/XOFF

Figure 3R: Installing a Keyboard Input Device (KID 5)



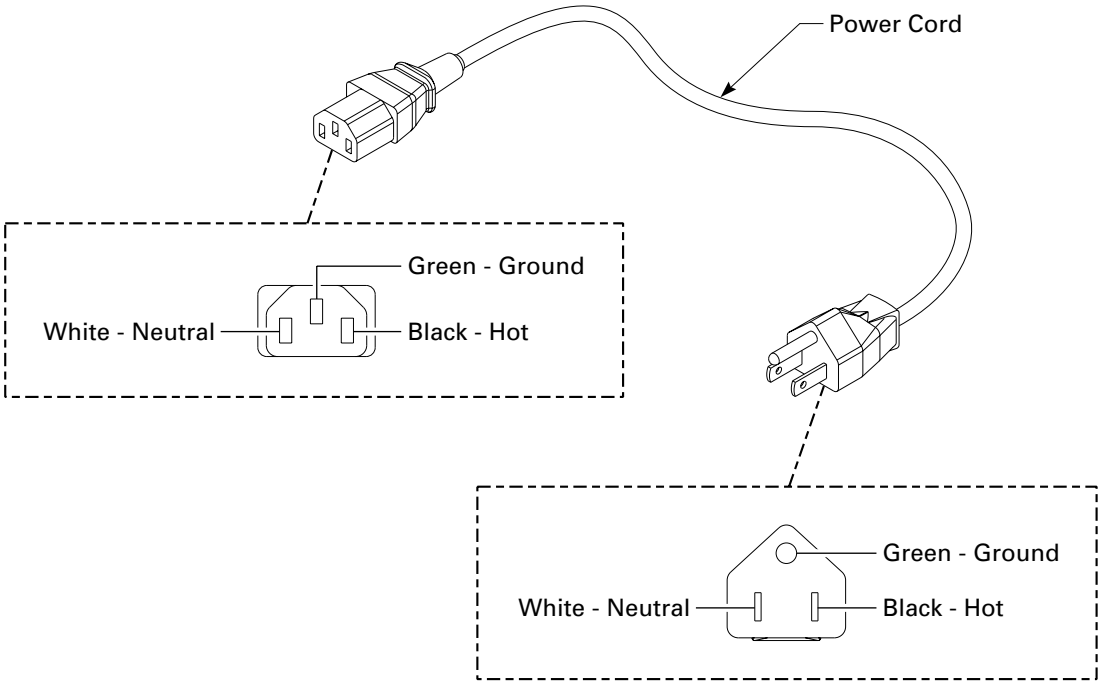
Powering the Controller

1) Connect the power cord to the power connector on the back of the controller. (If you need to modify the power cord, see Figure 3S.)
2) Plug the power cord in the your power source.

NOTE: After installation is complete, apply power to the printheads before plugging in the controller, or the controller may not recognize all printheads.

3) You are now ready to operate the controller.

Figure 3S: Power Cord Information



IMPORTANT!

As the colors of the wires in the main leads of this equipment may not correspond with the colored markings identifying the terminals in your plug, proceed as follows:

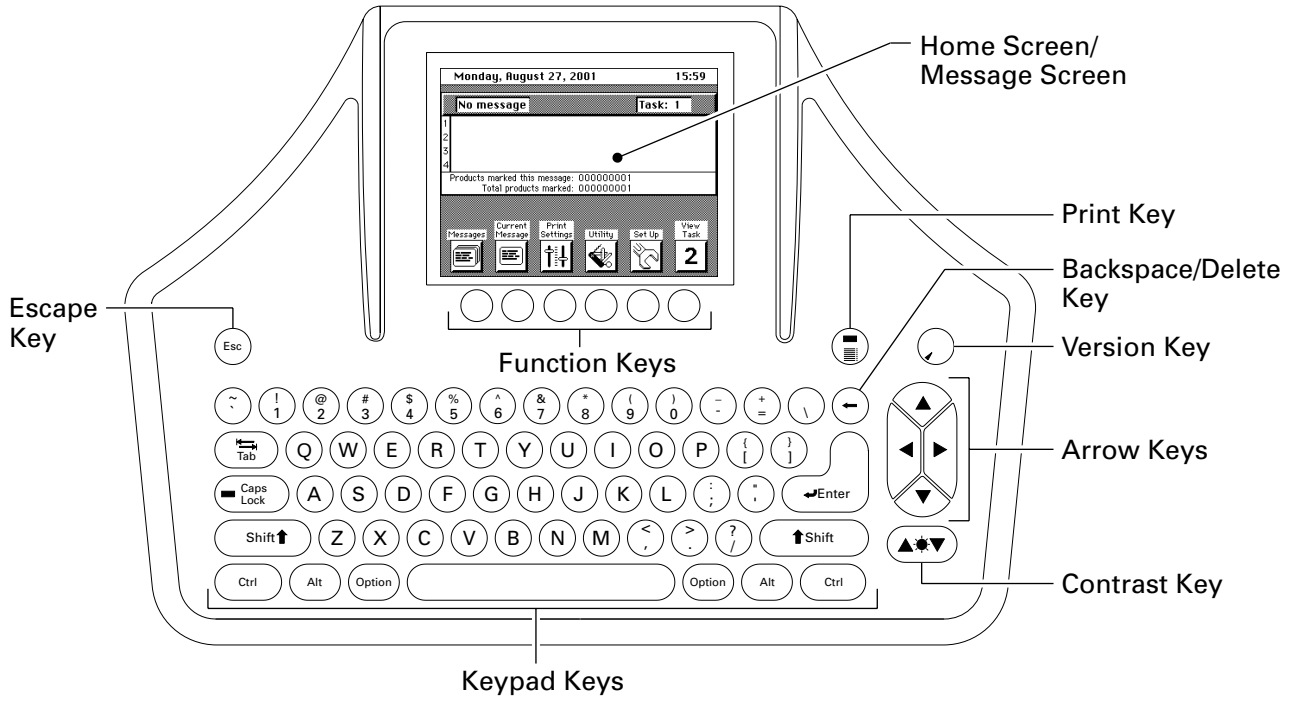
- the green or green/yellow wire must be connected to the terminal marked “E” (Earthed) or marked with the earth symbol, “⏚”.
- the blue or white wire must be connected to the terminal marked “N” (Neutral).
- the brown or black wire must be connected to the terminal marked “L” (Line).

WARNING: THIS EQUIPMENT MUST BE CONNECTED TO AN EARTHED GROUNDED OUTLET.

4-Operation

Table of Contents

Overview



Use the keypad keys on your controller to move within the system software.

Function Keys

Each function key corresponds to the icon displayed directly above it. Press the appropriate key to display the function you want.

Arrow Keys

Use the arrow keys to select items from the screen menus, to move within a message, and to move message elements.

Print Key

When the print key is green, the system is ready to print. When the print key is red, printing is stopped. Press the print key to switch between red and green.

Escape Key

The escape key allows you to exit a window and return to the previous window without saving any changes.

Backspace/Delete Key

Use the backspace/delete key to move the cursor to the left to backspace or to delete text or message elements.

Contrast Key

Use the contrast key to adjust the brightness of your controller display.

Screens

All actions begin from either the home screen or the message screen. (See "Software Menu Map" on page 4-3.)

Home Screen

The home screen is displayed at startup. You must be at the home screen to print a message. If a message was loaded to print during the last use of the controller, that message is displayed. If not, the screen appears empty. From the home screen you can access the message screen or select other functions by pressing the appropriate function key.

Access the home screen from the message screen by doing one of the following:

- Press **Esc** on the keypad, or
- Press **Messages** and select **Quit**.

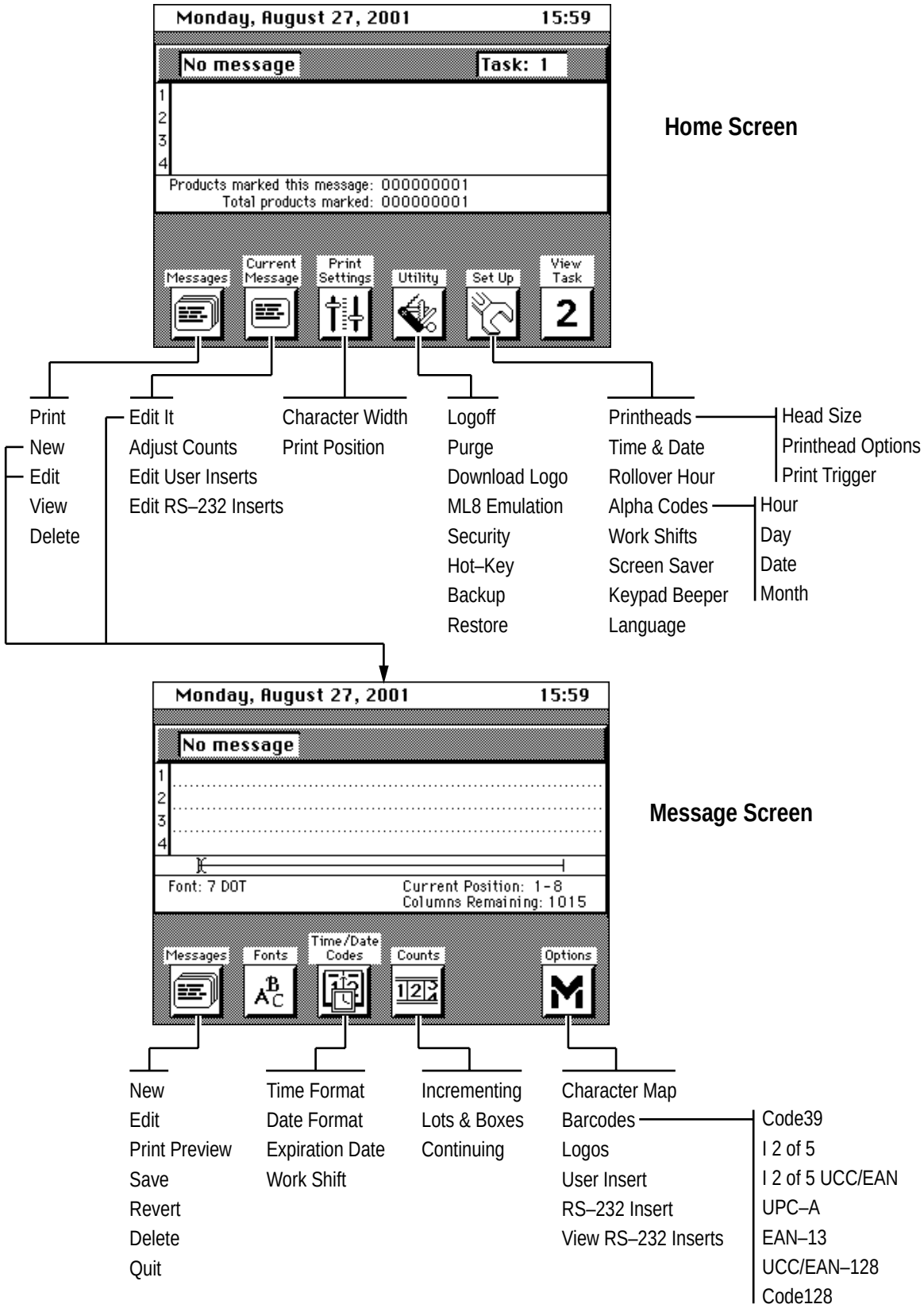
Message Screen

You will create, edit, and save messages at the message screen. Note: the message screen is not accessible if the controller is set in logoff mode.

Access the message screen from the home screen by doing one of the following:

- Press **Messages** and select **New,** or
- Press **Current Messages** and select **Edit it.**

Software Menu Map

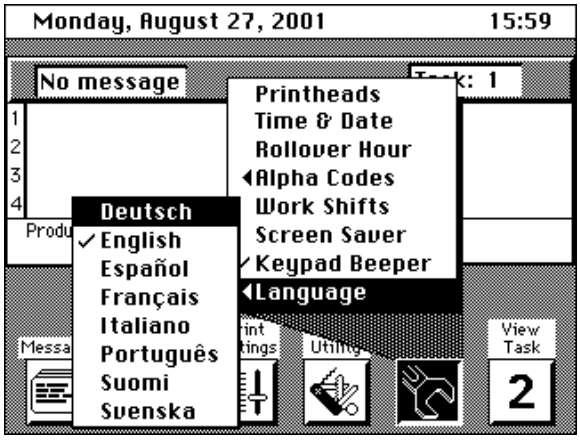


Controller Set Up

Changing the Language

You can display the controller screens in another language.

1) From the home screen, press **Set Up**.
2) Highlight **Language**, then press **Enter**. The language options are displayed.



3) Highlight the language you want, then press **Enter.** The screen displays the selected language.
4) Press **Set Up** to return to the home screen.

Note: Any previously-saved messages remain in the language in which they were created.

Turning the Keypad Beeper Off and On

Each time a key on the controller keypad is pressed, the controller beeps to signal that the key is responding correctly. The beeper feature can be turned on and off.

To turn the keypad beeper on and off:

1) From the home screen, press **Set Up**.
2) Highlight **Keypad Beeper**, then press **Enter**. A check mark next to the option indicates that the Beeper is on.
3) Press **Set Up** to close the menu.

Using the Screen Saver

Use the Screen Saver function to extend the life of the screen display backlight. If screen saver is on, the screen display will shut off whenever the keypad is inactive for approximately 10 minutes. To light the display again, press any key.

To turn the screen saver on and off:

1) From the home screen, press **Set Up**.
2) Highlight **Screen Saver**, then press **Enter**. A check mark next to the option indicates that the Screen Saver is on.
3) Press **Set Up** to close the menu.

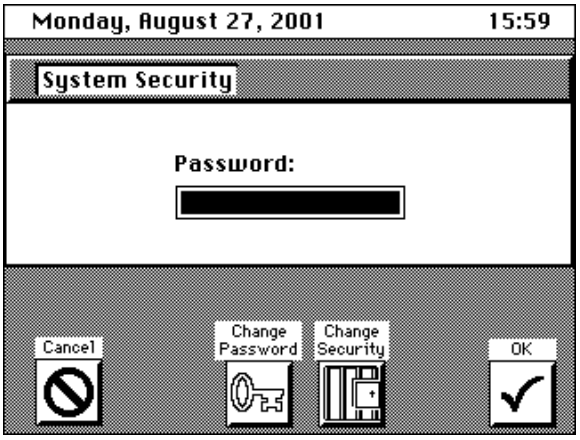
Setting Security

Note: The PatrionPlus system ships with the security setting turned off.

If you turn on the security, you can put the controller in logoff mode, limiting user access to basic functions such as viewing and starting a message, and purging a printhead. To access all software functions while security is turned on, a password is required.

Turning Security On or Off

1) From the home screen, press **Utility**.
2) Highlight **Security**, then press **Enter**. The System Security screen is displayed.



3) Enter the password, then press **OK**. The password is highlighted.

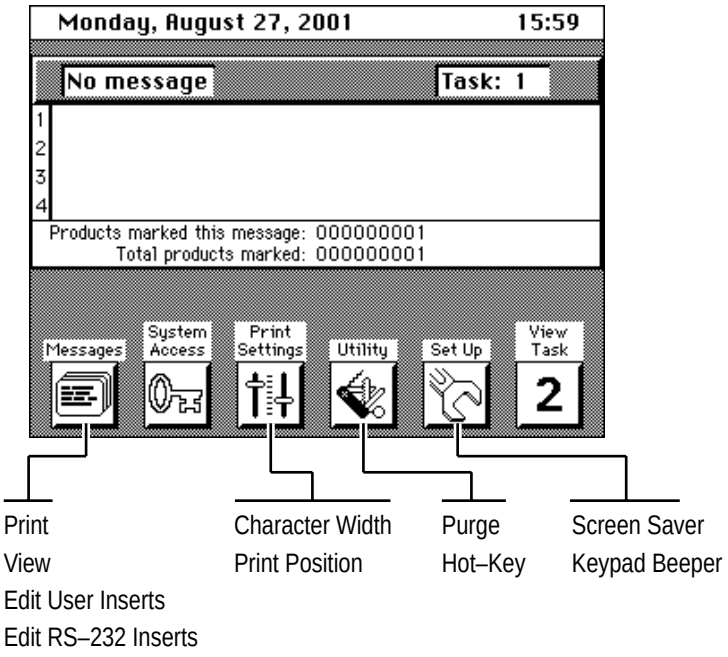
Note: Your controller ships with "Marsh" as the password.

4) Press **Change Security**. The System Security status is displayed.
5) Press **On** or **Off** to change the status. If you pressed **On**, a message "Logoff to activate security" is displayed.
6) Press **OK** to return to the home screen.

Putting the Controller in Logoff Mode

Once security has been turned on, your system can be put in a logoff mode to limit user access to basic functions such as viewing a message, starting a message, and purging a printhead. To return to standard operating mode with access to all functions a password is required.

1) From the home screen, press **Utility**.
2) Highlight **Logoff**, then press **Enter**. On the home screen the Current Message button is replaced with a System Access button to indicate the system is in logoff mode. The functions shown below are the only functions available in the logoff mode.



Accessing All Functions While Security is Enabled

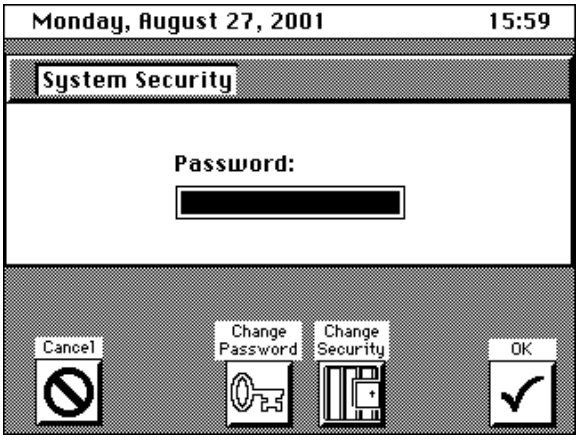
To access all system functions while in the logoff mode:

1) Press **System Access**.
2) Type in the password, then press **OK**.

Changing the Password

Your controller ships with "Marsh" as the password.

1) From the home screen, press **Utility**.
2) Highlight **Security**, then press **Enter**. The System Security screen is displayed.



3) Enter the password, then press **OK**. The password is highlighted.
4) Press **Change Password**.
5) Enter the new password in the "New Password" field, then press **Enter** to move to the next field.
6) Enter the new password in the "Verify New Password" field, then press **Enter**.
7) A message appears verifying that the password has changed.
8) Press **OK** to return to the home screen.

Printhead Configuration

Dual Tasking

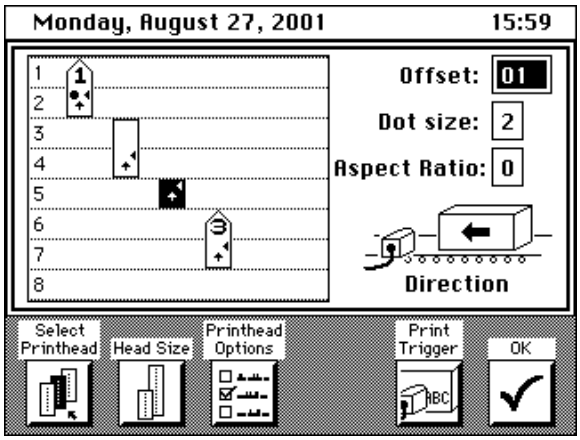
Note: Custom Fonts and logos for HR Series printheads are not available on Task 2.

If you are dual tasking, you will need to configure the printheads for each task.

From the home screen, press **View Task** to switch between tasks before setting up your printheads.

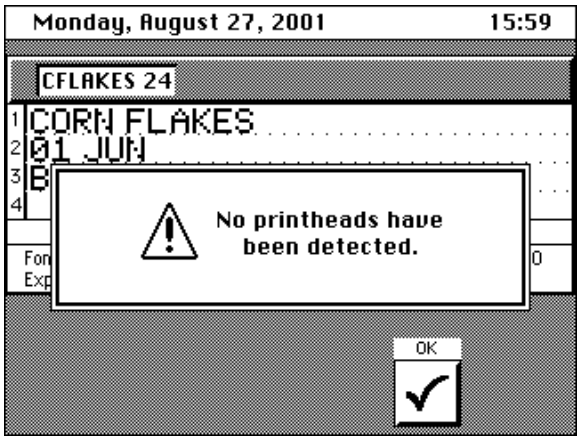
Printhead Setup

1) From the home screen, press **Set Up**.
2) Highlight **Printheads**, then press **Enter**. The Printhead Setup screen is displayed.

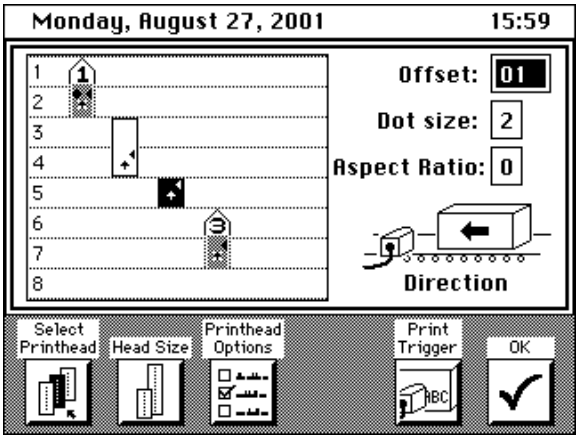


The printhead icons appear from left to right in the order of the printhead DIP switch settings. (See "Setting Printhead DIP Switches in VJ Printheads" on page 3-7.)

The Printhead Setup screen displays setup information for only those printheads connected to the controller. If there are no printheads connected to the controller, a warning is displayed.



If the Printhead Setup screen is displayed while HR Series printheads are warming up, the printhead icons appear grayed out until the printhead has warmed up and the Printhead Setup screen is exited and re-entered.



All VJ printhead icons appear as VJ7 printheads until they are designated as VJ16 printheads. To designate a VJ16 printhead:

a. Press **Select Printhead** as often as necessary to highlight the printhead icon you want. The printhead LED will be flashing.

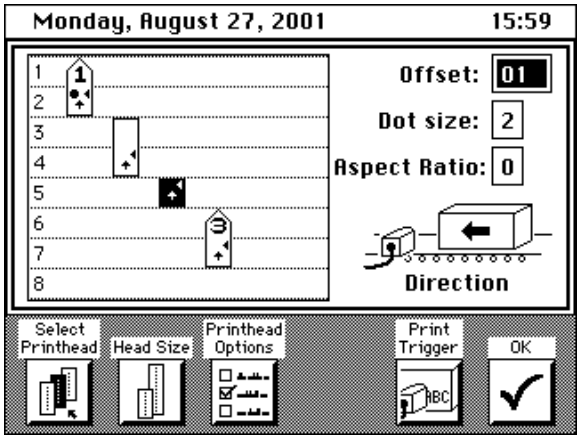
b. Press **Head Size** and select **VJ16**.

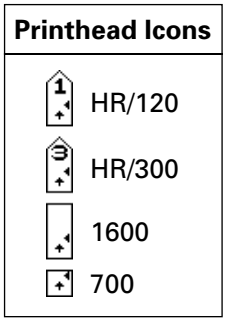
c. Press **Head Size** again to return to the setup screen.

Configuring Printheads

1) Press **Select Printhead** as many times as necessary to highlight the printhead you want to configure. The LED on the back of the selected printhead will flash amber.
2) Use the up and down arrow keys to move the selected printhead to the printline position you want. To avoid print problems, do not overlap printlines with when using a combination of HR and VJ printheads.
3) Use the left or right arrow key to change the print direction if necessary. The arrow on the printhead icon and the Direction arrow both indicate the conveyor direction.

   Note: If you are printing the same message on both sizes of a product, and place both printheads on the same print line, the position of the message on the product may not be the same. For accurate message positioning, duplicate the message on another print line and move one of the printheads to the other print line. Adjust each message separately for proper positioning.





4) Press **Enter** to move between the Offset Value, Dot Size and Aspect Ratio fields if you want to adjust those settings. (See details below.) You may need to further adjust the offset value, dot size or aspect ratio after creating and printing a test message, to obtain proper placement and alignment of your message elements.

Offset Value

Determine the offset value for the printhead (see the table below), then enter that number in the offset field. The offset value will be applied to all messages that are printed with the printhead Be sure to adjust the offset value anytime you move a printhead.

Printhead	Procedure
VJ Series	Measure the distance from the photocell to the master printhead nozzle. Divide the distance by 0.8 if measured in inches, or 2 if measured in centimeters.
HR Series	Measure the distance from the photocell to the printhead orifices in inches.

Dot Size

Use the dot size setting to control the darkness of your print. The higher the number, the darker the print.

Printhead	Available Dot Sizes
VJ Series	0 - 9
HR Series	1 - 4

Aspect Ratio

If you are printing a message using both HR Series and VJ printheads, the width of the elements on each line may differ with the printhead type. Adjust the aspect ratio for each printhead individually if necessary, to achieve consistency in font width.

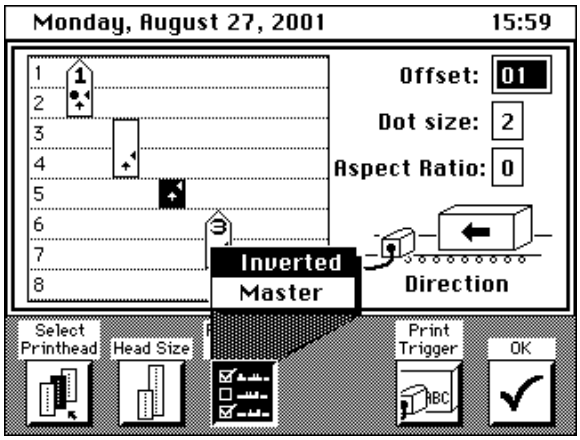
Zero (0) has been set as the default for VJ/HR Combo software.

Controller Software	Aspect Ratio	
	VJ Printheads	HR Series Printheads
VJ/HR Combo	1 to 9 (narrow to wide) 0 = widest setting for compatibility of printhead types	0 to 9 (narrow to wide)
VJ Printheads Only	0 to 9 (wide to narrow)	Not applicable.
HR Printheads Only	Not applicable.	0 to 9 (narrow to wide)

Specifying Inverted Print

Note: Inverted print means the entire message will print upside down and the characters reversed.

1) At the printhead setup screen, press **Select Printhead** as many times as necessary until the printhead you want is highlighted. The LED on the printhead flashes amber.
2) Press **Printhead Options**. A menu is displayed.



3) Highlight **Inverted**, then press **Enter**. A check mark next to "Inverted" indicates the message will print inverted.
4) Press **Printhead Options** again to return to the Printhead Setup screen.

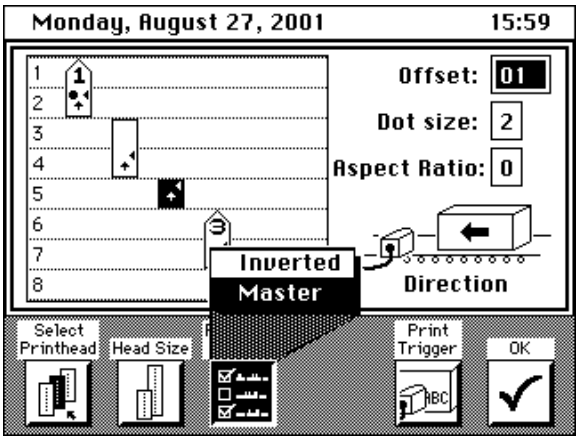
Designating a Master Printhead

The master printhead controls the amount of time between print cycles. When selecting the master printhead, note the following:

- The last printhead to finish printing should be designated as the master printhead.
- Select the master printhead before creating or editing a message. When you save the message, the master printhead selection will be saved with that message.
- A dot on the printhead icon indicates the master printhead.

To change the master printhead designation:

1) At the printhead setup screen, press **Select Printhead** as many times as necessary until the printhead you want to designate as the master printhead is highlighted.
2) Press **Printhead Options**. A menu is displayed.



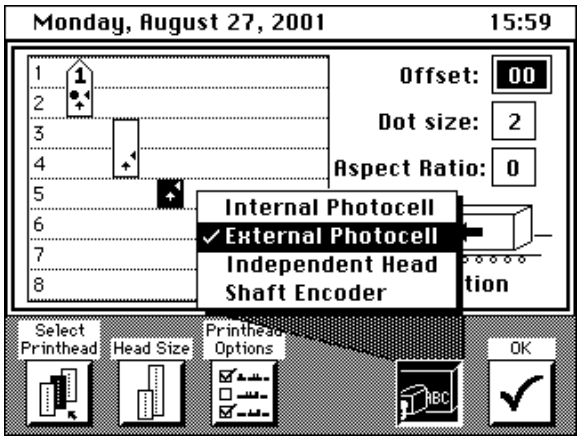
3) Highlight **Master**, then press **Enter**. A check mark next to "Master" indicates that this printhead is now the master printhead, and a dot will appear on the printhead icon.
4) Press **Printhead Options** again to return to the Printhead Setup screen.

Setting the Print Trigger

The photocell associated with the master printhead triggers the print cycle to begin. Select the type of photocell for your master printhead.

Note: If you are using VJ and HR printheads on the same task, internal VJ printhead photocells cannot be used.

1) At the printhead setup screen, press **Print Trigger**. A menu is displayed with the current print trigger checked.



2) Change the trigger if necessary.

   a. Highlight the trigger you want, then press **Enter**. A check mark indicates that the option has been selected.

   b. Press **Print Trigger** again to return to the printhead setup screen.

3) Press **OK** to return to the home screen.

Note: An independent VJ printhead can act as its own print trigger. (For more information see "Independent Printhead Kit" on Page 2-30.)

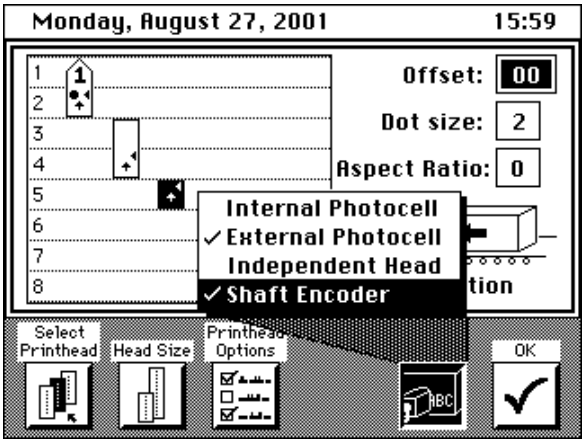
Adding a Shaft Encoder to the Printhead Configuration

A shaft encoder allows your system to:

- Start and stop printing to coordinate with your production needs, such as when your conveyor stops and starts.
- Vary printing speed to match your conveyor speed, while providing consistent print column widths.

To add a shaft encoder to the printhead configuration:

1) At the printhead setup screen, press **Print Trigger**. A menu is displayed.



2) Highlight **Shaft Encoder**, then press **Enter**. A check mark indicates that the option has been selected.
3) Press **Print Trigger** again to return to the printhead setup screen.
4) Press **OK** to return to the home screen.

Note: If a shaft encoder is not yet installed but the shaft encoder option is selected, the system will not print.

A shaft encoder cannot be used with an Independent printhead. (For more information see "Independent Printhead Kit" on Page 2-30.)

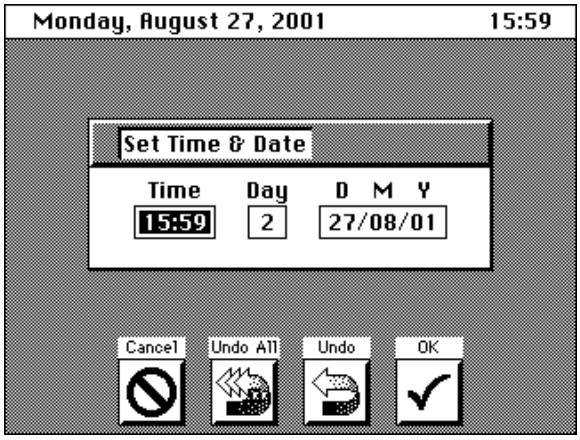
System Set Up

Setting the Time and Date

Note: If you enter invalid information the software will not allow you to proceed. Enter the information in the appropriate format, or press Cancel to exit the screen.

This procedure allows you to set the current time, day, and date in your controller. Time and date codes in your messages will be based on the information entered at this screen.

1) From the home screen, press **Set Up**.
2) Highlight **Time & Date,** then press **Enter**. The Set Time & Date screen is displayed.



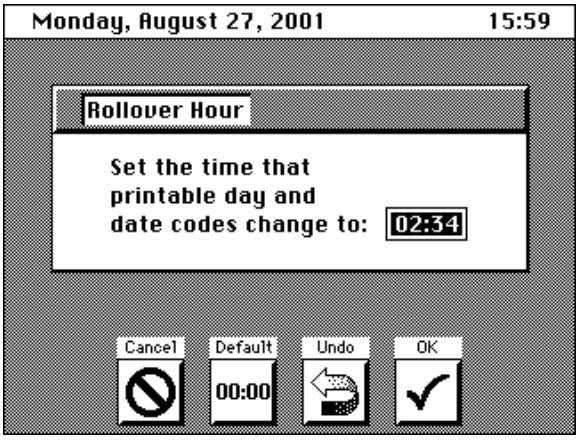
3) Use the arrow keys to highlight each field and enter the appropriate information.
   - Time - Use a 24-hour format. (Example: 13:00 indicates 1 p.m.)
   - Day - Enter the number that corresponds to the day of the week. (Example: Sunday=1, Monday=2, and so on.)
   - D M Y - Enter a two-digit date, month, and year.
4) Press **Enter**.
5) Verify the date and time at the top of the screen.
6) If correct, press **OK** to save the settings and return to the home screen.

Setting the Rollover Hour

Note: If you enter invalid information the software will not allow you to proceed. Enter the information in the appropriate format, or press Cancel to exit the screen.

This procedure sets the time of day at which the day and date codes in your messages will rollover.

1) From the home screen, press **Set Up**.
2) Highlight **Rollover Hour**, then press **Enter**. The Rollover Hour screen is displayed.



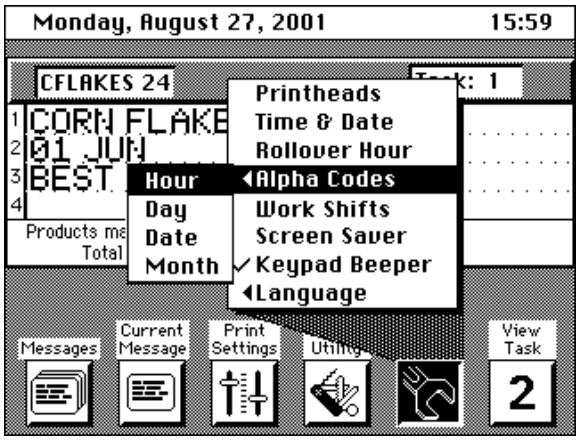
3) Enter a rollover time based on a 24-hour clock. (Example: 13:00 indicates 1 p.m.) To select midnight (00:00) press **Default**.
4) Press **OK** to save the setting and return to the home screen.

Setting the Alpha Codes

The following procedures allow you to set hour, day, date, and month codes that can be included in a message. If the number of characters in a code varies be sure to allow extra space between message elements to prevent overlapping elements.

Alpha Code	Characters Allowed	Default Code
Hour	up to two (I and O are not allowed.)	1 character; A.....Z
Day	up to four (I and O are not allowed.)	3 characters; all upper case SUN.....SAT
Date	up to two (I and O are not allowed)	1 or 2 characters; A.....Z correspond to dates 1-26; AA.....GG correspond to dates 27-31
Month	up to four	3 digits; all upper case JAN.....DEC

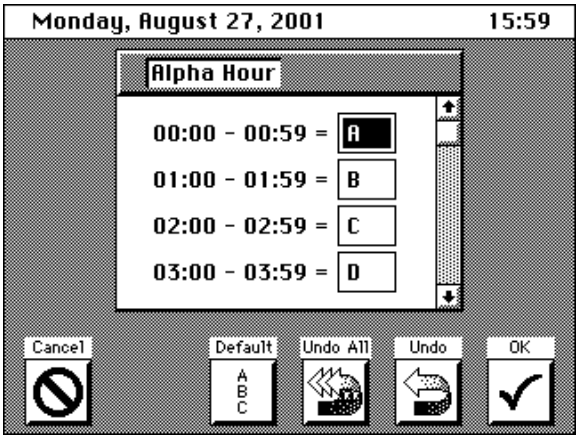
1) From the home screen, press **Set Up**.
2) Highlight **Alpha Codes**, then press **Enter**. The Alpha Codes are displayed.



Alpha Code	Go to
Hour	Page 4-20
Day	Page 4-21
Date	Page 4-22
Month	Page 4-23

Alpha Hour

1) From the home screen, press **Set Up**.
2) Highlight **Alpha Codes**, then press **Enter**.
3) Highlight **Hour**, then press **Enter**. The Alpha Hour screen is displayed.



4) Do one of the following:
   - Highlight the field you want, and type the new code (up to two characters). Do not press the space bar. The system will not recognize spaces.

   or

   - Press **Default**. The system assigns an alphabetical code to match your specified time. The character **A** is assigned to the first hour of the day, **B** is assigned to the next hour, and so on. The letters **I** and **O** are not used.

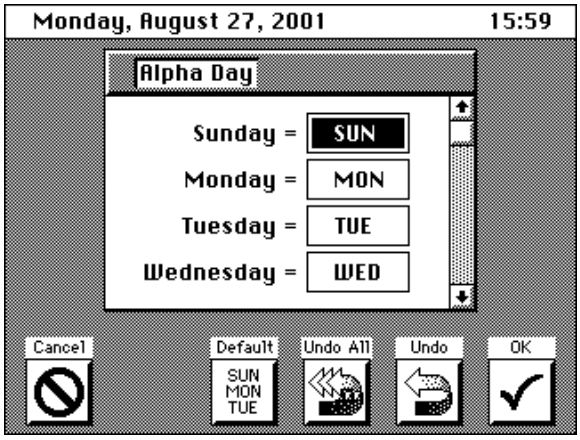
Notes:

If you use a two-character alpha hour code, be sure to edit the codes prior to creating messages.

If you use both one and two-character alpha hour codes, create your message with a two-character code first to avoid losing characters in your message.

Alpha Day

1) From the home screen, press **Set Up**.
2) Highlight **Alpha Codes**, press **Enter**.
3) Highlight **Day**, then press **Enter**. The Alpha Day screen is displayed.



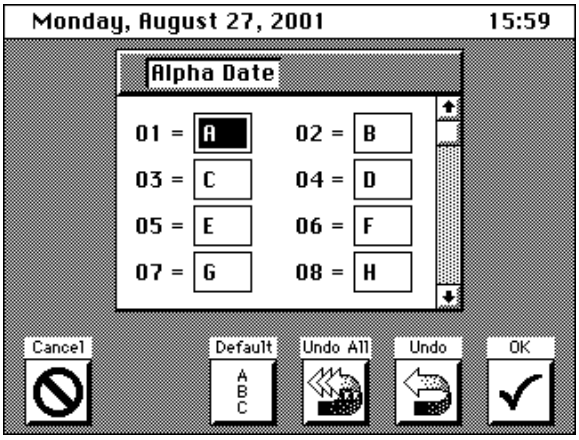
4) Do one of the following:
   - Highlight the field you want, and type the new code (up to four characters). Do not press the space bar. The system will not recognize spaces.

   or

   - Press **Default**. The system assigns a three-character code to each field (all upper case letters).

Alpha Date

1) From the home screen, press **Set Up**.
2) Highlight **Alpha Codes**, then press **Enter**.
3) Highlight **Date**, then press **Enter**. The Alpha Date screen is displayed.



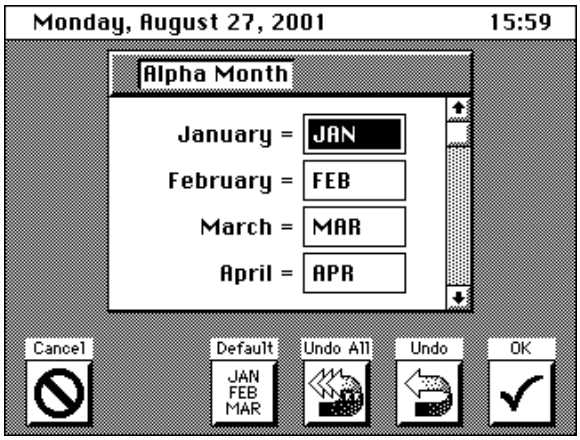
4) Do one of the following:
   - Highlight the field you want and type the new code (up to two characters). Do not press the space bar. The system will not recognize spaces.

   or

   - Press **Default**. The system assigns the character **A** to the first day of the month, **B** to the second day, and so on through the alphabet. The characters **AA** are assigned to the 27th day, **BB** to the 28th day, and so on through **EE**. The letters **I** and **O** are not used.

Alpha Month

1) From the home screen, press **Set Up**.
2) Highlight **Alpha Code**, then press **Enter**.
3) Highlight **Month**, then press **Enter**. The Alpha Month screen is displayed.



4) Do one of the following:

   - Highlight the field you want and type the new code (up to four characters). Do not press the space bar. The system will not recognize spaces.

   or

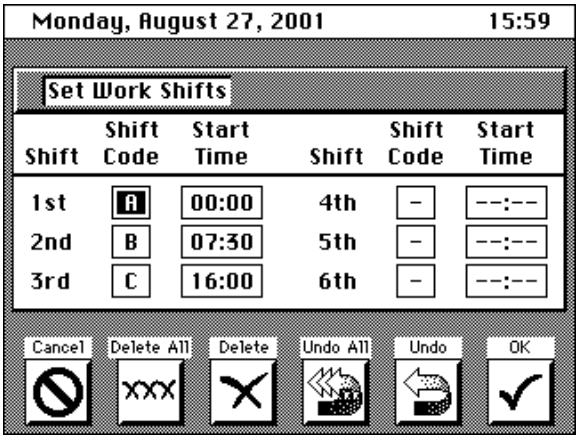
   - Press **Default**. The system assigns a three-character code to each field (all upper case letters).

Setting the Work Shifts

Note: If you enter invalid information the software will not allow you to proceed. Enter the information in the appropriate format, or press Cancel to exit the screen.

This procedure allows you to assign shift codes and start times for each shift (up to six shifts) based on a 24-hour clock.

1) From the home screen, press **Set Up**.
2) Highlight **Work Shifts**, then press **Enter**. The Set Work Shifts screen is displayed.

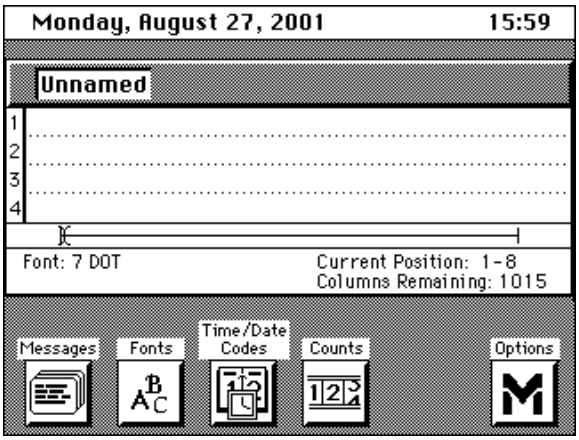


3) Enter a shift code and a start time (in 24-hour format) for each shift. If you make a mistake, press one of the Undo or Delete buttons, then enter the correct information.

Note: If you press Delete, both the shift code and the start time for that shift will be deleted.

Creating a Message

1) Review your printhead configuration.
   a. From the home screen, press **Set Up**.
   b. Highlight **Printheads**, then press **Enter**.
   c. Note the type of printhead on each print line. Make sure the last printhead to finish printing for this message, has been selected as the master printhead. (See "Designating a Master Printhead" on page 4-14.)
   d. When finished viewing, press **OK**.
2) From the home screen, press **Messages**.
3) Highlight **New**, then press **Enter**. A new message screen is displayed.



The **Current Position** and **Columns Remaining** numbers in the message screen tell you the position of the cursor. Use the numbers to help you position your message elements.

4) Add up to 64 message elements. If you exceed the memory limit, a memory full warning will appear. Make sure the vertical position of each message element matches the printhead configuration.
5) Preview the message element placement. (See Page 4-43.)
6) Save the message. (See Page 4-44.)
7) Verify the message setup. (See Page 4-45.)

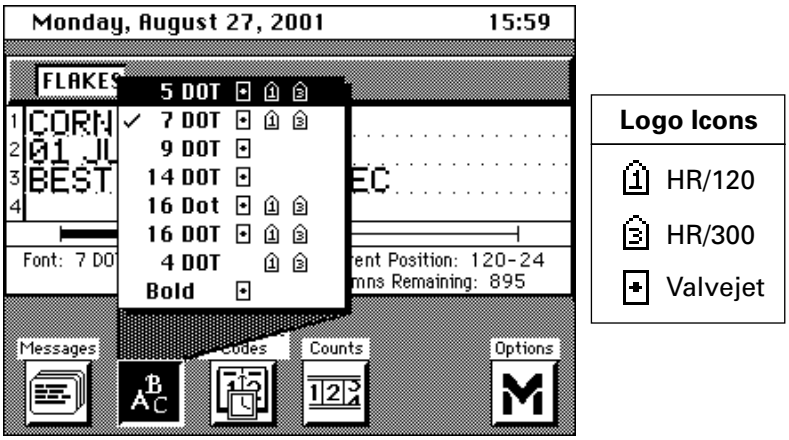
Note: You can view only four print lines at a time; use the arrow keys on your controller keypad to view the remaining lines.

Selecting a Font

You can select the font for a new element, or change the font of an existing element. To change the font of an existing element, select and highlight the element before selecting the font.

- The 4 DOT font is not available if you are using HR/120 printheads with a serial number before 29750 3200 016.
- If you are using Custom Fonts with HR Series printheads, you must select Bold along with the font layout you want. (16 DOT, 7 DOT, 5 DOT, or 4 DOT)
- See the font samples in the Specifications section for the type of printhead you are using.

1) At the message screen, press **Fonts**. A list of fonts and the printheads that use the fonts, are displayed.



2) Select a font, then press **Enter**.
3) Press **Esc**. The selected font is applied to the element.

Selecting the Bold Option

VJ Printheads

Note: Bold is only available for 7 DOT, 16 DOT, and 16 Dot VJ fonts.

You can apply bold to a new element or to an existing element. To apply bold to an existing element, select and highlight the element before choosing bold.

HR Series Printheads

Note: If you are using Custom Fonts with HR Series printheads, you must select Bold in addition to the font layout (16 DOT, 7 DOT, 5 DOT, 4 DOT). If you do not select bold, the standard PatrionPlus font will be used.

If you are using HR Series printheads, you cannot apply the bold option to text to achieve darker print.

1) At the message screen, press **Fonts**.
2) Select **Bold**, then press **Enter**. A check mark indicates that the option has been selected.
3) Press **Esc.** The bold feature is applied.

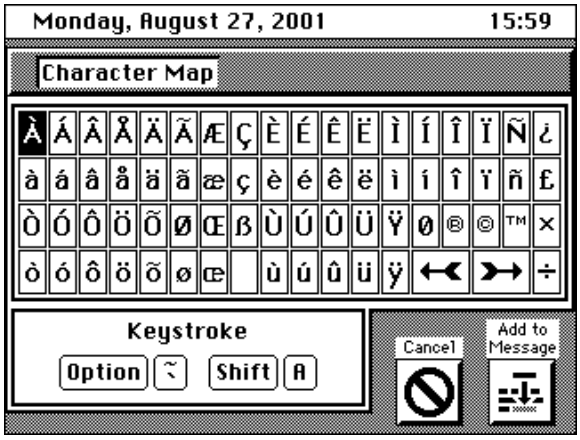
Adding or Editing Text

1) Select a font. (See Page 4-26.)
2) At the message screen, place the cursor in the message where the text will be added, or select and highlight the text you want to edit.
3) Enter your text. If you make a mistake, press the delete key to erase the text.

Note: Do not use the space bar on the keypad to position elements in the message. Use the arrow keys to position elements. (See "Moving an Element" on page 4-52.)

Adding a Special Character

1) At the message screen, place the cursor where the element will be added.
2) Select a font. (See Page 4-26.)
3) Press **Options**.
4) Highlight **Character Map**, then press **Enter**. The Character Map screen is displayed.



5) Use the arrow keys to select the character you want.

Note: If you are using VJ printheads, or HR/120 printheads with a serial number before 29750 3200 016, and select the 5 dot font, you can only print the left and right arrows and the British pound sign from the character map. All other characters will show up as regular letters...A, E, U, etc.

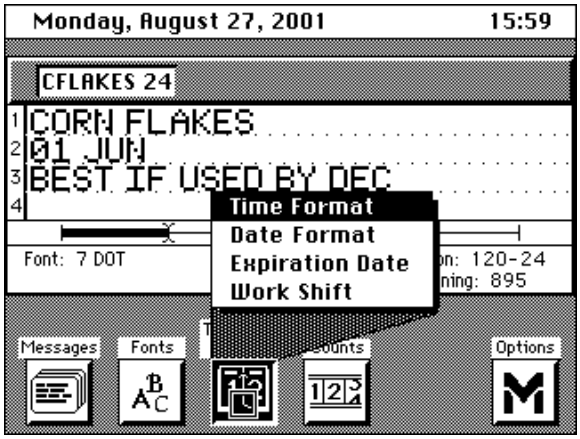
6) Press **Add to Message** to add the element to your message.

Adding or Editing a Time, Date, Expiration, or Work Shift Code

The following procedures allow you to select the format you want to use for your time, date, and expiration date, and insert them into a message. You can also insert a work shift into a message.

Perform the following for all codes:

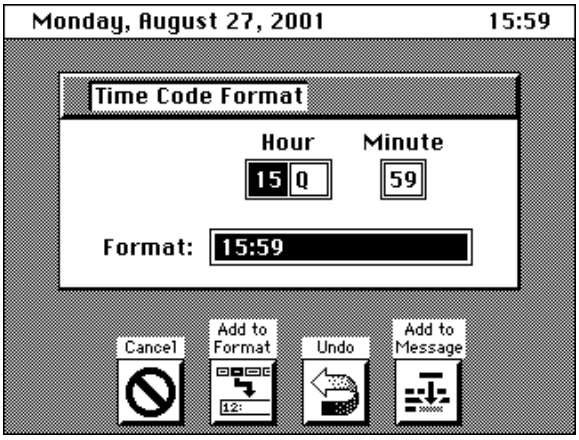
1) Select a font. (See Page 4-26.)
2) At the message screen, place the cursor in the message where the element will be added, or select and highlight the element you want to edit.
3) Press **Time/Date Codes**. A menu is displayed.



Procedure	Go to
Time Code Format	Page 4-30
Date Code Format	Page 4-31
Expiration Date	Page 4-32
Work Shift Code	Page 4-33

Time Code Format

1) Highlight **Time Format**, then press **Enter**. The Time Code Format screen is displayed. The Format field indicates the current or default time.



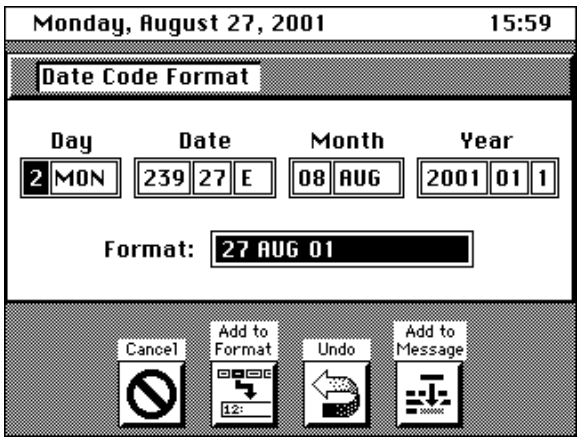
2) If the time code is displayed the way you want it to appear in your message, press **Add to Message**. The new time code is displayed in the message.

3) If you want to change the format, use the arrow keys to highlight the field you want, then press **Add to Format**. Use the space bar to add spaces between items, or the text keys to add other characters. Be sure to highlight the fields in the order you want them to appear in your message.

4) When finished, press **Add to Message**. The new time code is displayed in the message.

Date Code Format

1) Highlight **Date Format**, then press **Enter**. The Date Code Format screen is displayed. The Format field indicates the current or default date.



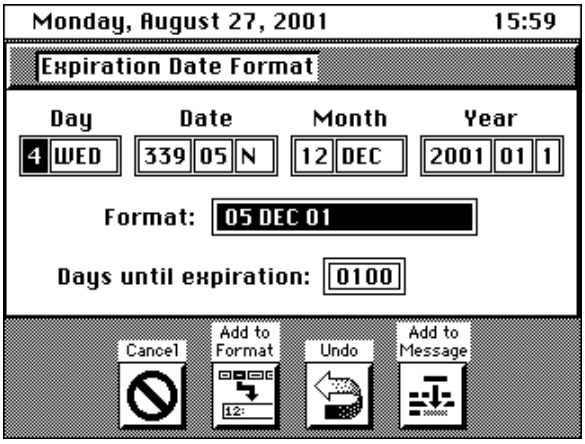
2) If the date code is displayed the way you want it to appear in your message, press **Add to Message**. The new date code is displayed in the message.

3) If you want to change the format, use the arrow keys to highlight the field you want, then press **Add to Format**. Use the space bar to add space between items, or the text keys to add other characters. Be sure to highlight the fields in the order you want them to appear in your message.

4) When finished, press **Add to Message**. The new date code is displayed in the message.

Expiration Date

1) Highlight **Expiration Date**, then press **Enter**. The Expiration Date Format screen is displayed. The Format field indicates the current or default expiration date.



2) If the expiration date format is displayed the way you want it to appear in your message, and the days until expiration number are correct, press **Add to Message**. The new expiration date code is displayed in the message.

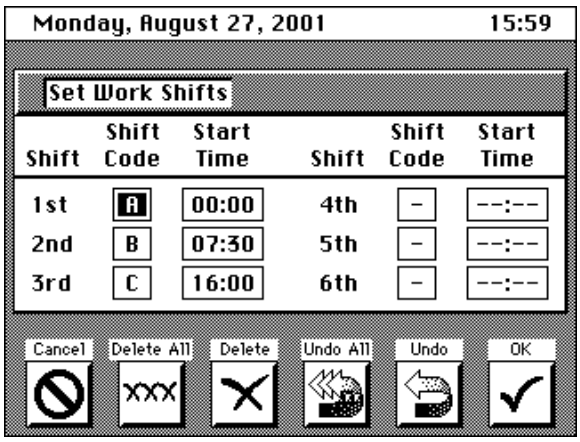
3) If you want to change the format, use the arrow keys to highlight the field you want, then press **Add to Format**. Use the space bar to add space between items, or the text keys to add other characters. Be sure to highlight the fields in the order you want them to appear in your message.

4) Press **Enter** to highlight the Days Until Expiration field. Enter a new number if you want.

5) When finished, press **Add to Message**. The new expiration date code is displayed in the message.

Work Shift Code

Highlight **Work Shift**, then press **Enter**. The applicable work shift (based on the system clock) is added to the message.



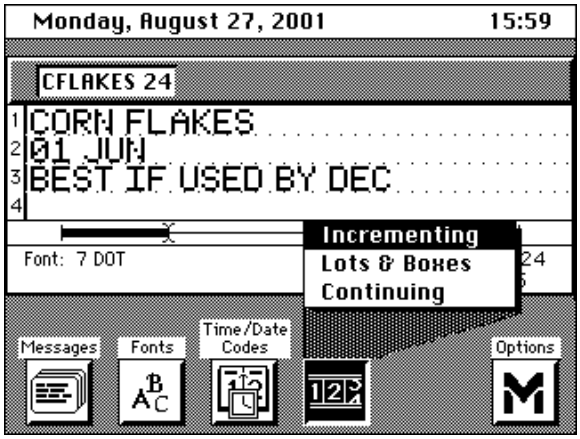
Adding or Editing a Product Count

The following types of counts can be added into your messages.

Count	Description
Incrementing	A printable count of the number of times the selected message has printed.
Lots & Boxes	A printable count of lots and boxes. The box count resets and the lot count increments when specified numbers are reached.
Continuing	A printable count of the total number of all messages printed.

Perform the following for all counts:

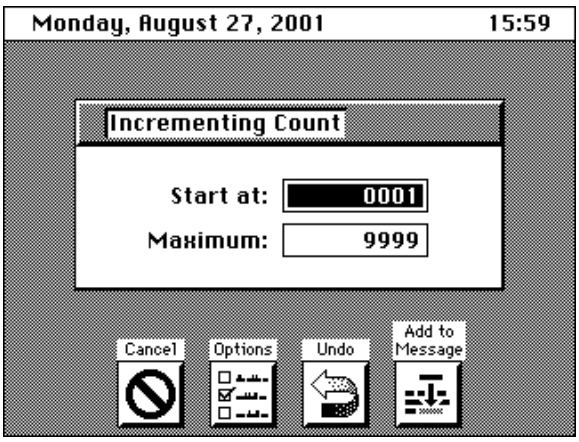
1) Select a font. (See Page 4-26.)
2) At the message screen, place the cursor in the message where the element will be added, or select and highlight the count you want to edit.
3) Press **Counts**. A menu is displayed.



Procedure	Go to
Incrementing Count	Page 4-35
Lots & Boxes	Page 4-36
Continuing Count	Page 4-38

Incrementing Count

1) Highlight **Incrementing**, then press **Enter**. The Incrementing Count screen is displayed.



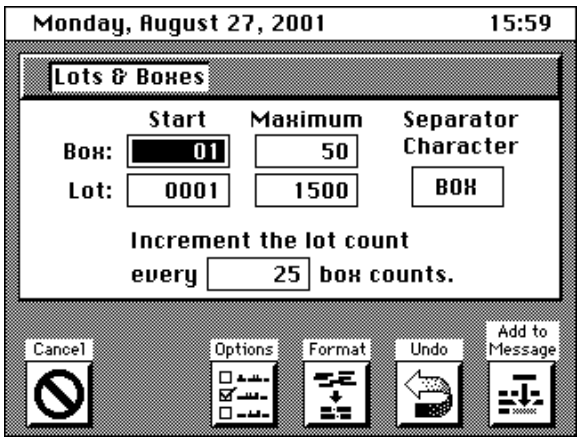
2) Enter the Start At and Maximum count numbers (up to nine digits).
3) Press **Options**.
4) Select **Reset** or **Prompt**, then press **Enter**. A check mark indicates the option has been selected.

Option	Description
Reset	Resets the incrementing count to the original Start At number every time the message is selected to print.
Prompt	The system asks you if you want to reset the incrementing count before printing the message.

5) Press **Options** again to return to the incrementing count screen.
6) Press **Add to Message** to add the element to your message.

Lots & Boxes

1) Highlight **Lots & Boxes**, then press **Enter**. The Lots & Boxes screen is displayed.

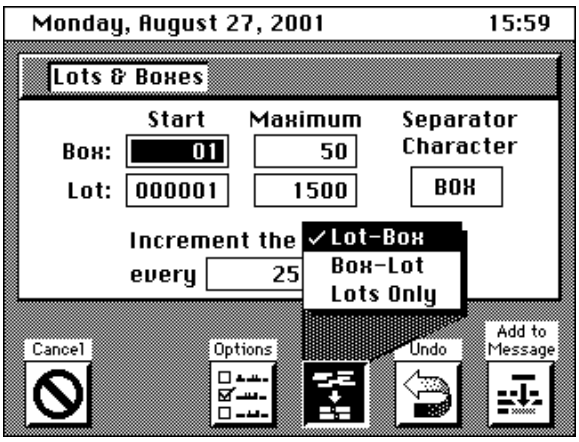


2) Enter the Start and Maximum numbers for the box and lot counts. When the maximum number is reached the counts will start over. Box counts may contain up to six digits. Lots counts may contain up to four digits.
3) Enter the Separator Characters (up to five) that will separate the box and lot counts. Use the space bar to add spaces.
4) Enter the Increment number for the lot count.
5) Press **Options**.
6) Select **Reset** or **Prompt**, then press **Enter**.

Option	Description
Reset	Resets the incrementing count to the original Start At number every time the message is selected to print.
Prompt	The system asks you if you want to reset the incrementing count before printing the message.

7) Press **Options** again to return to the lots and boxes screen.

8) Press **Format**. A menu is displayed.



9) Highlight the format you want, then press **Enter**. A check mark indicates the item has been selected.

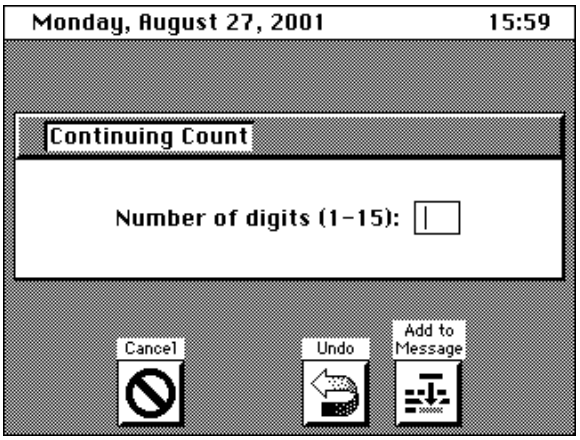
10) Press **Format** again to return to the lots and boxes screen.

11) Press **Add to Message** to add the element to your message.

Continuing Count

Note: Continuing count does not reset when a message is selected to print.

1) Highlight **Continuing Count**, then press **Enter**. The Continuing Count screen is displayed.

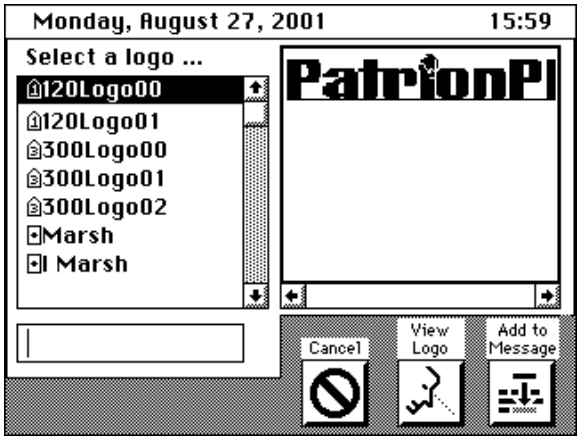


2) Enter the number of continuing count digits (up to 15) that you want to appear in the message.
3) Press **Add to Message** to add the element to your message.

Adding a Logo

A message can include up to five different logos if printing with a VJ Series printhead, or four if printing with an HR Series printhead.

1) At the message screen, place the cursor in the message where the element will be added.
2) Press **Options**.
3) Highlight **Logos**, then press **Enter**. The logo selection screen is displayed.



Logo Icons

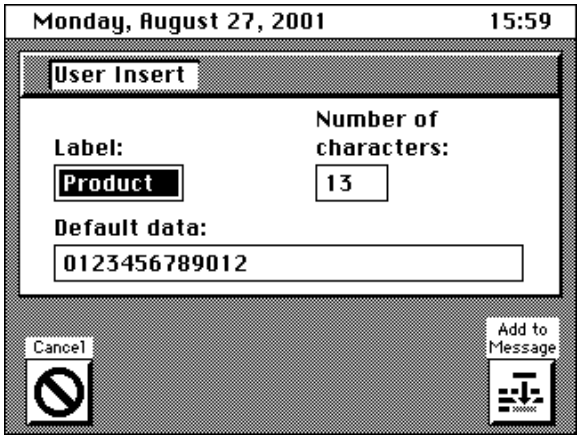
- HR/120
- HR/300
- Valvejet

4) Highlight the logo you want. Make sure it is the correct type for the printhead.
5) Press **View Logo** to display the logo.
6) Press **Add to Message** to add the element to the message.

Adding a User Insert

A message can contain up to eight user inserts.

1) At the message screen, place the cursor in the message where the element will be added.
2) Select a font. (See Page 4-26.)
3) Press **Options**.
4) Highlight **User Insert**, then press **Enter**. The User Insert screen is displayed.



5) Enter the label, number of characters, and default data information.

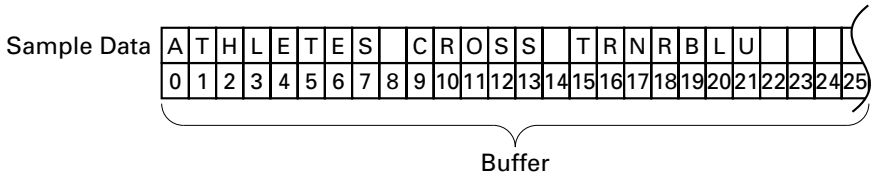
Information Fields	Description
Label	A title for the user insert that is displayed when an operator starts printing the message.
Number of Characters	The total number of characters required for the insert. With this number, the software designates a place in the controller's memory for the insert data. (For a UCC/EAN-128 bar code, you set this number after you select AI 00 or AI 01.)
Default Data	Default data is added to the message you are creating to represent the user insert. The default data also designates the total amount of space allowed for the insert. Different letters occupy different amounts of space. For example, i's occupy less space than W's. (All numbers use the same space.) If the default data does not reserve enough space in the message, the last characters of the insert might not print. It is recommended that you enter all W's as the Default data to reserve the maximum amount of space. Make sure the number of W's in the Default data field matches your entry in the Number of Characters field.

6) Press **Add to Message** to add the element to the message.

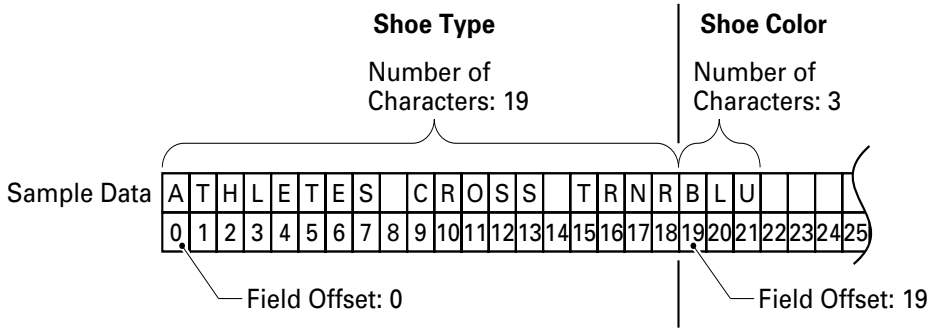
Adding an RS-232 Insert

When you are using an external device (such as a scale, scanner, or PLC) to send text to your controller, you need RS-232 inserts. When printing, RS-232 inserts will automatically update with the data sent from the external device. (Make sure your external device is connected to the controller. (See "Optional External Devices" on page 3-26.)

When an external device sends RS-232 commands and data to the controller, the controller places the RS-232 data into a buffer. For example, a shoe manufacturer may have a packaging line with an external device sending 22 characters where the first 19 are the name of a shoe (Athletes Cross Trnr, Elite Runner, Wimbledon Tennis, etc.) and the last three are the color (Blu, Brn, Red, etc.). With some sample data, the shoe manufacturer's buffer might appear as follows:



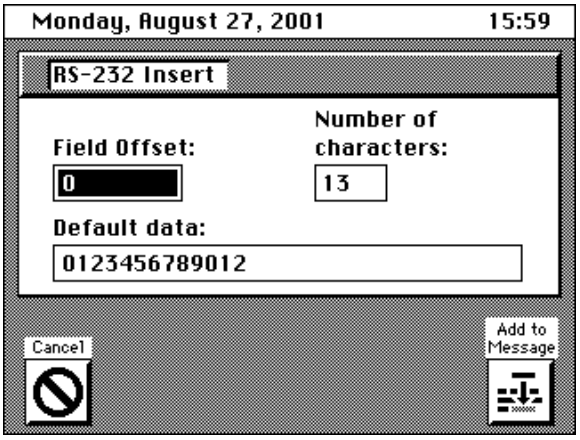
When you create RS-232 inserts, you specify which characters of the buffer you want in each field. You therefore specify a buffer starting point (or field offset), and you specify the total number of characters to use. For example, if you want to print the type of shoe in one RS-232 insert and the color in another, the RS-232 inserts would be defined as follows:



A message can contain up to eight user inserts. For more information on RS-232 inserts, see Appendix C.

1) At the message screen, place the cursor in the message where the element will be added.
2) Select a font. (See Page 4-26.)
3) Press **Options**. A menu is displayed.

4) Highlight **RS-232 Insert**, then press **Enter**. The RS-232 Insert screen is displayed.



5) Highlight each field and enter the appropriate information.

Information Fields	Description
Field Offset	Given a string of characters from an external device, the field offset determines where the element begins.
Number of Characters	Given a string of characters from an external device, the number of characters indicates how many characters apply to the element.
Default Data	The default data is added to the message you are creating to represent the RS-232 insert. The default data also designates the total amount of space allowed for the insert. If the default data does not reserve enough space in the message, the last characters of the insert might not print. Different letters can occupy different amounts of space. For example, in 16 Dot font i's occupy less space than W's. (All numbers use the same space.) It is recommended that you enter all W's as the Default data to reserve the maximum amount of space. Make sure the number of W's in the Default data field matches your entry in the Number of Characters field.

6) Press **Add to Message** to add the element to the message.

Adding a Bar Code

See "Bar Codes" on page 4-59 for information on adding a bar code into a message.

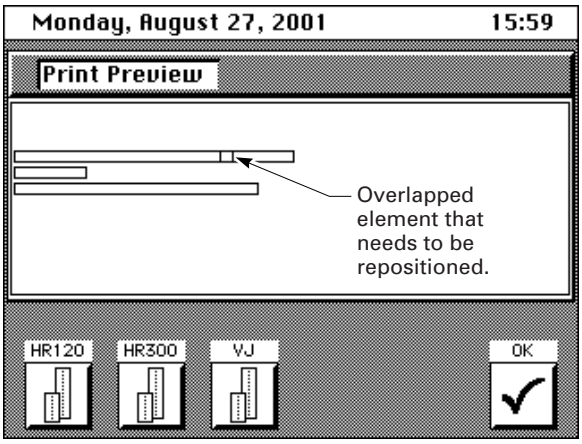
Print Preview

Note: Print Preview is not available if you are using VJ only software.

At the Print Preview screen you can view the placement of elements in a message and reposition elements that will be printed with HR Series printheads. Elements that will be printed with VJ printheads can only be repositioned at the message screen. The Print Preview screen does not show the actual elements, but displays outlines to show element placement.

Note: Make sure no elements are selected in the message screen.

1) From the message screen, press **Messages**.
2) Highlight **Print Preview**, then press **Enter**. The Print Preview screen is displayed.



3) Press HR120, HR300, or VJ (depending on the type of printhead you are using) to view placement of elements.

   VJ Printheads

   Press **OK** to return to the message screen, and reposition any elements if necessary.

   HR Printheads

   a. Use the tab key to select any element that needs to be repositioned. The element will be turn solid black when it is selected.

   b. Using the arrow keys, move the selected element left or right. You cannot move elements up or down. Note there is no undo function.

   c. Press **OK** to return to the message screen.

4) Save your message.

Saving a Message

Save a newly created message, or a message that you have edited.

1) From the message screen, press **Messages**.
2) Highlight **Save**, then press **Enter**. The existing messages screen is displayed.

3) Save your message.
   - For a new message, enter a name (up to 10 characters). Press **OK**. The new name is added to the list of existing messages and the message screen is displayed.
   - For an existing message, press **OK** then press **Replace**. The edited message is saved and the message screen is displayed.
4) Press **Esc** to return to the home screen.

Verifying Message Setup

After saving a message, you will need to verify the proper placement of your message on the product.

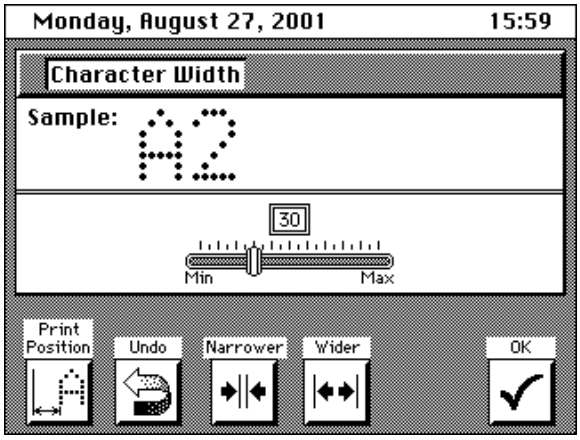
1) Print the message. (See “Printing a Message” on page 4-54.)
2) Check for proper placement of the message on the product.
3) If necessary, adjust the print position. (See Page 4-47.)
4) If proper placement cannot be achieved by adjusting the print position, change the character width. (See Page 4-46.)
5) If necessary, adjust the print position again.
6) If proper placement still cannot be achieved, reposition the message elements. (See “Moving an Element” on page 4-52.)

If you are using HR Series printheads, and are unable to achieve proper placement after performing the above procedures, you may need to adjust the aspect ratio at the printhead setup screen. (See “Aspect Ratio” on page 4-12.)

Changing the Character Width

Changing the character width only affects the message that is currently displayed at the home screen. If you are using a shaft encoder and HR Series printheads, minor character width adjustments (less than 16 increments) will have not have any affect on character width.

1) From the home screen, press **Print Settings**. The Character Width screen is displayed.



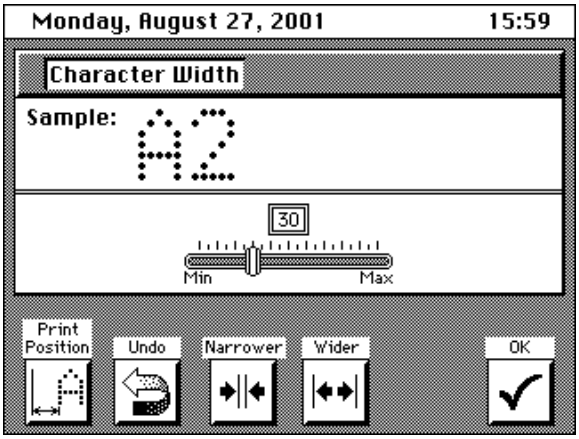
2) Change the character width.
   - To decrease or increase by one, press **Narrower** or **Wider**.
   - To decrease or increase in multiples of ten, press **Shift-Narrower** or **Shift-Wider**.
   - To return to the original character width, press **Undo**.
3) Press **OK** to save your changes and return to the home screen.

Adjusting the Print Position

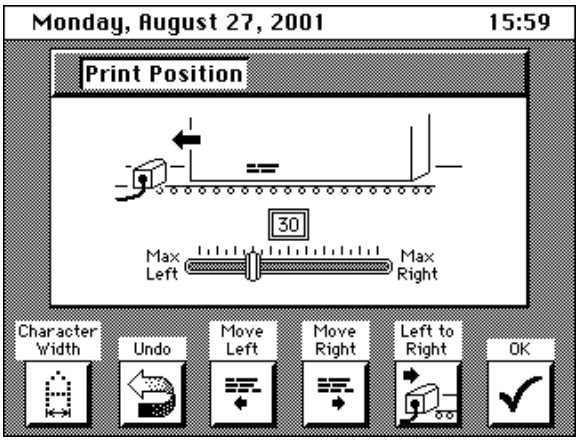
Adjusting the print position changes the horizontal placement of the entire message on your product. Only the message currently displayed on the home screen will be affected.

Note: The print position setting is intended to make make minor horizontal shifts in print placement. Make sure your printhead offset has been set accurately before adjusting the print position. (See "Offset Value" on page 4-12.)

1) From the home screen, press **Print Settings**. The Character Width screen is displayed.



2) Press **Print Position**. The Print Position screen is displayed.



3) Press **Left to Right** to set the conveyor direction for the printhead. View the conveyor from behind the printhead to determine direction.

4) Change the print position.

   - To move left or right one space, press **Move Left** or **Move Right**.
   - To move left or right ten spaces, press **Shift-Move Left** or **Shift-Move Right**.
   - To return to the original print position, press **Undo**.

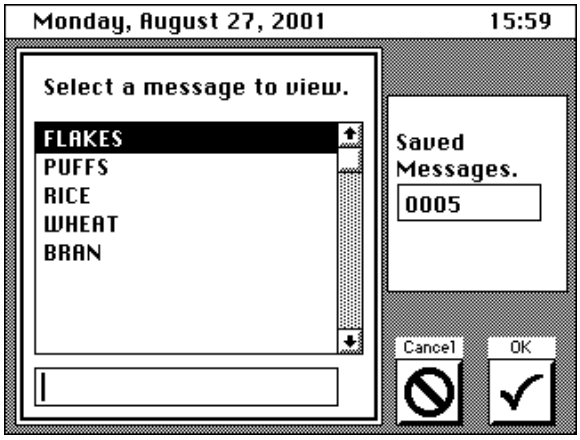
5) Press **OK** to save your changes and return to the home screen.

Message Options

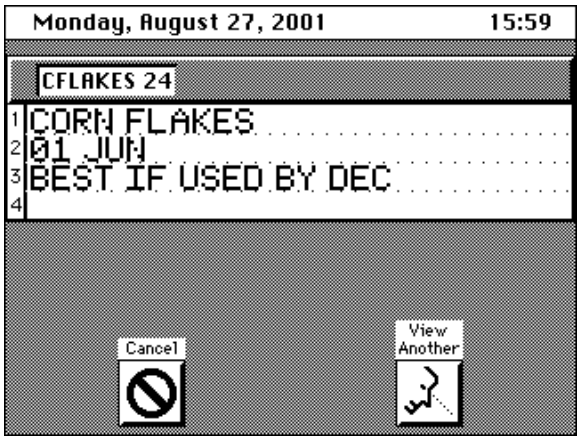
Viewing a Saved Message

You can view saved messages at any time.

1) From the home screen, press **Messages**.
2) Highlight **View**, then press **Enter**. The message selection screen is displayed.



3) Highlight the message you want.
4) Press **OK**. The selected message is displayed.



Note: You can view only the first four lines of the message; scrolling is not possible.

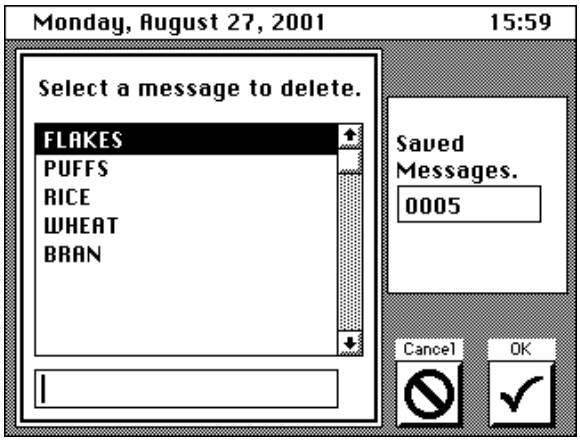
5) To view a different saved message, press **View Another**.
6) To close the view screen, press **Cancel**.

Deleting a Message

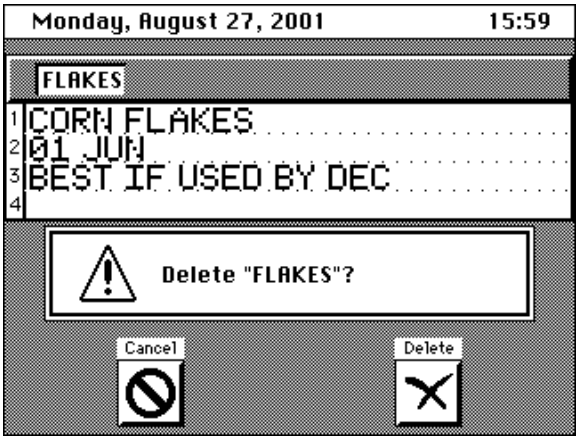
You can delete saved messages from the home screen or from the message screen. You can also delete unsaved messages from the message screen. Delete any unused messages. Extra messages can cause delays when loading a message to print.

From the Home Screen

1) Press **Messages**.
2) Highlight **Delete**, then press **Enter**. The message selection screen is displayed.



3) Highlight the message you want.
4) Press **OK**. The selected message is displayed.



5) Press **Delete**. The message is deleted and the home screen is displayed.

From the Message Screen

1) From the Message screen, press **Messages**.
2) Highlight **Delete**, then press **Enter**.
3) Press **Delete** to delete the current message.

Reverting in a Message

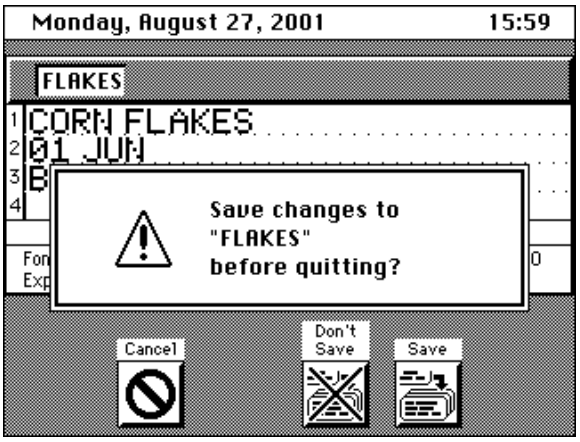
The reverting option deletes any unsaved changes you have made in a message, and returns the message to the way it was last saved.

1) From the message screen, press **Messages**.
2) Highlight **Revert**, then press **Enter**.
3) Press **OK** to delete any unsaved changes in the message.

Quitting a Message

Selecting Quit from the Messages menu allows you to exit the message screen.

1) From the message screen, press **Messages**.
2) Highlight **Quit**, then press **Enter**.
3) If you have unsaved changes in your message a prompt will appear, asking if you want to save the changes. Press **Don't Save** or **Save**.

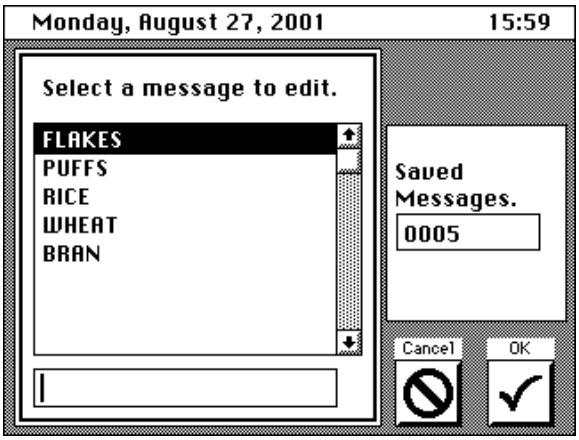


Editing a Message

Opening a Message to Edit

Perform the following if you are editing messages that are not currently printing. If you want to edit the currently printing message see "Editing the Currently Printing Message" on page 4-56.

1) Review your printhead configuration.
   a. From the home screen, press **Set Up**.
   b. Highlight **Printheads**, then press **Enter**.
   c. Note the type of printhead on each print line. Make sure the last printhead to finish printing for this message, has been selected as the master printhead. (See "Designating a Master Printhead" on page 4-14.)
   d. When finished viewing, press **OK**.
2) From the home screen, press **Messages**.
3) Highlight **Edit**, then press **Enter**. A message selection screen is displayed.



4) Highlight the message you want edit.
5) Press **OK**. The message is displayed. Make sure the position of each message element matches the printhead configuration.
6) Edit the message as necessary.
7) Preview the message element placement. (See Page 4-43.)
8) Save the message. (See Page 4-44.)
9) Verify the message setup. (See Page 4-45.)

Note: You can view only four print lines at a time; use the arrow keys to view the remaining lines.

Adding an Element

You can add new elements to an existing message. To add specific elements see the "Creating A Message" section, pages 4-27 through 4-43

Selecting and Highlighting an Element

1) Use the arrow keys to place the cursor next to the element. The element will be selected. (A box appears around the element.)
2) Press **Ctrl** and **Enter** to highlight the element. The element can now be moved or deleted.

Editing an Element

1) From the Message Screen, select and highlight the element you want to edit.
2) Follow the appropriate procedures for the element you want to edit.
   - See “Adding or Editing Text” on page 4-27.
   - See “Adding or Editing a Time, Date, Expiration, or Work Shift Code” on page 4-29.
   - See “Adding or Editing a Product Count” on page 4-34.

Moving an Element

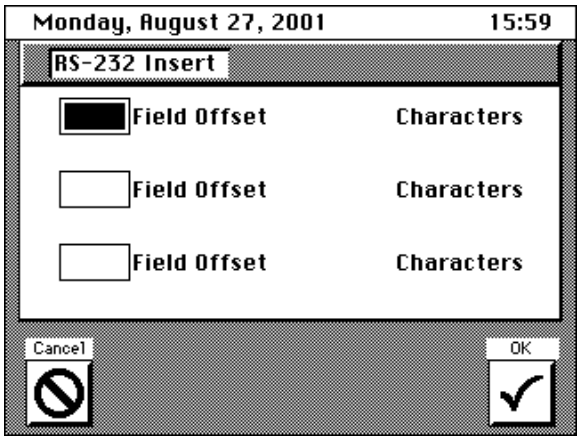
1) Select and highlight the element.
2) Press the arrow keys to move the element.
3) Press **Ctrl** and **Enter** again to remove the highlight.
4) Move the cursor away from the element to deselect the element.

Deleting an Element

1) Select and highlight the element.
2) Press the delete key. The element is deleted.

Viewing RS-232 Inserts and Changing Offsets

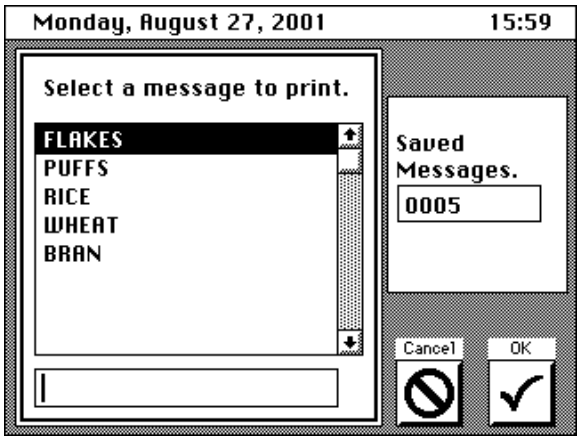
1) From the message screen, press **Options**.
2) Highlight **View RS-232 Inserts**, then press **Enter**. The RS-232 Insert screen is displayed.



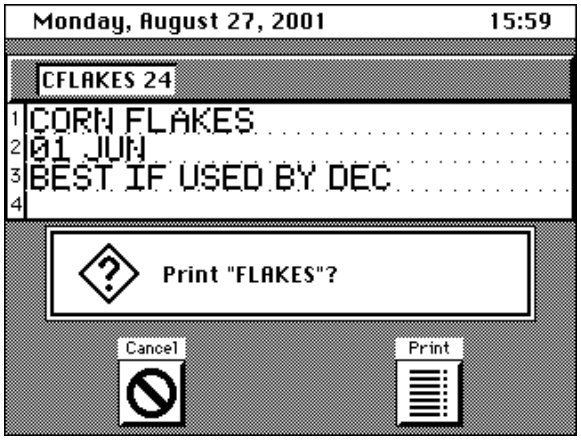
3) Make field offset changes if necessary. Do not exceed 288 characters.
4) Press **OK** to return to the message screen.

Printing a Message

1) From the home screen, press **Messages**.
2) Highlight **Print**, then press **Enter**. A message selection screen is displayed.



3) Highlight the message you want, then press **OK**. The selected message and print-confirmation prompt are displayed.



4) Press **Print**. One or more of the following prompts may appear. Respond to them appropriately.

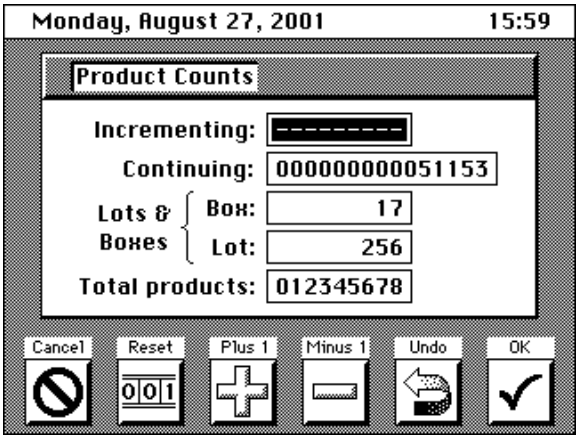
Prompt	Action
Reset Lots & Boxes?	Press **Reset** or **Prompt**. (See Page 4-36 for more information on lot and box counts.)
Reset Incrementing Count?	Press **Reset** or **Prompt**. (See Page 4-35 for more information on incrementing counts.)
Edit User Inserts?	Press **Edit** or **Don't Edit**. (See Page 4-57 for more information on editing user inserts.)

5) The message will print when the photocell is triggered. (The print key must be green.)
6) To stop printing, press the print key; the key turns red.

Adjusting Product Counts While Printing

- **Incrementing** and **Lots and Boxes** count changes will only affect the currently selected message.
- **Continuing** count changes will affect all messages that contain the continuing count.
- **Total products** is not a printable count and cannot be added to a message.

1) From the home screen, press **Current Message**.
2) Highlight **Adjust Counts**, then press **Enter**. The Product Counts screen is displayed.



3) For each count that you want to change, highlight the field and do one of the following:
   - Enter a new count, or
   - Press **Reset** to reset the field to the starting number, or
   - Press **Plus 1** or **Minus 1** to adjust the field by one count.
4) Press **OK** to save your changes and return to the home screen.

Editing the Currently Printing Message

Any changes made to a message that is currently printing will take effect immediately.

1) From the home screen, press **Current Message**.
2) Highlight **Edit It**, then press **Enter**. The currently printing message is displayed.
3) Edit message elements as necessary. (See Page 4-56.)
4) Save the message. (See Page 4-44.)
5) Press **Esc** to return to the home screen.

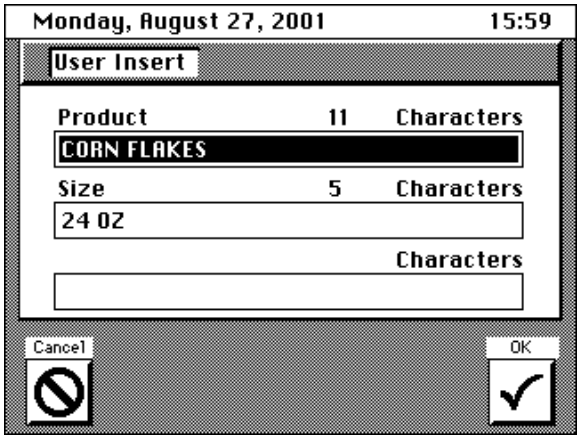
Editing User Inserts

Before Printing a Message

Select the message with the user insert to be printed. (Perform steps 1 through 4 for "Printing a Message" on page 4-54.)

While Printing a Message

1) From the home screen, press **Current Message**.
2) Highlight **Edit User Inserts**, then press **Enter**. The User Insert screen is displayed.



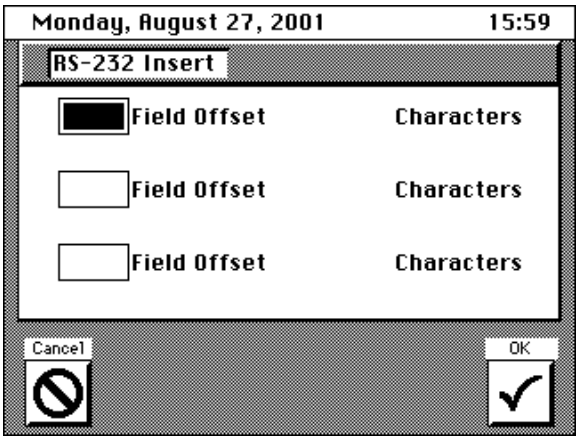
3) Edit the inserts as needed, then press **OK**.

Note: Only three inserts are displayed; use the down arrow key to see additional inserts.

Editing RS-232 Inserts and Changing Offsets

You can change the field offset for RS-232 inserts while a message is printing.

1) From the home screen, press **Current Message**.
2) Highlight **Edit RS-232 Inserts**, then press **Enter**. The RS-232 Insert screen is displayed.



3) Make field offset changes if necessary. Do not exceed 288 characters.
4) Press **OK** to save the changes and return to the home screen.

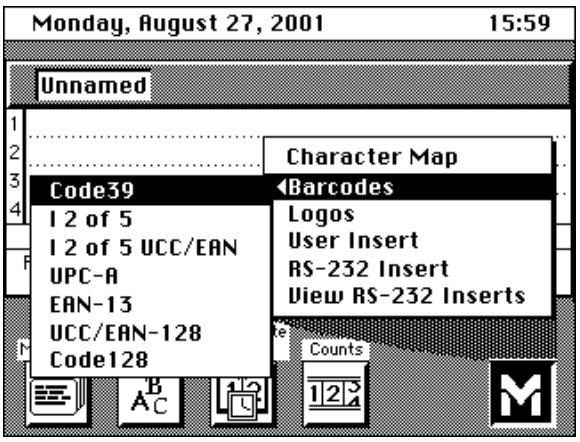
Bar Codes

Building a Bar Code

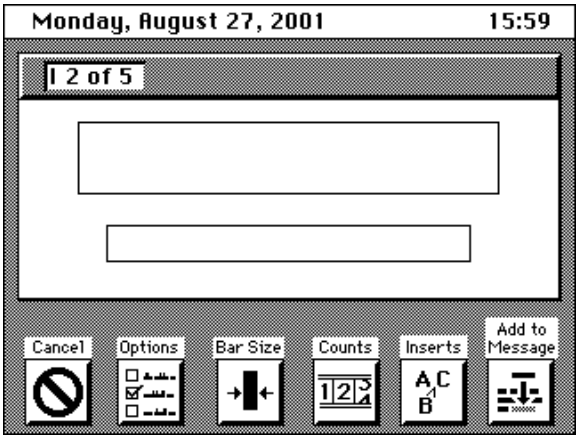
- VJ Printheads – Print only Code 39 and I 2 of 5 bar codes.
- HR/120 Printheads – Print all bar codes, but not to industry specification standards.
- HR/300 Printheads – Print all bar codes to industry specification standards.

Bar Code	Description
Code 39	Uses a maximum of 22 alpha characters and/or numeric digits. Available Options: Check Char, Asterisk, Human Readable Default Mag. Sizes: 62.5%, 70%, 80%, and 100% Allows counts and inserts.
I 2 of 5	Uses a maximum of 22 numeric digits. The digit count must be an even number. Available Options: Check Char, Human Readable, Bearer Bar, Horiz Bearer Bar Default Mag Sizes: 62.5%, 70%, 80%, and 100%; interleaved Allows counts and inserts.
I 2 of 5 UCC/EAN	Uses 13 numeric digits. Available Options: Human Readable, Bearer Bar, Horiz Bearer Bar Default Mag Sizes: 62.5%, 70%, 80%, and 100% Allows inserts.
UPC-A	Uses 12 numeric digits. No Options. Default Mag Sizes: 100% and small Allows inserts.
EAN-13	Uses 13 numeric digits. No Options. Default Mag Sizes: 100% and small Allows inserts.
UCC/EAN-128	Uses a maximum of 4 AIs totaling not more than 48 characters. Available Options: Human Readable Default Mag Sizes: 100% and small Selected AIs determine allowable data.
Code 128	Uses a maximum of 22 alpha characters and/or numeric digits. Available Options: Human Readable Default Mag Sizes: 100% and small Allows counts and inserts.

1) From the message screen, press **Options**.
2) Highlight **Barcodes**, then press **Enter**. A list of available bar codes is displayed.

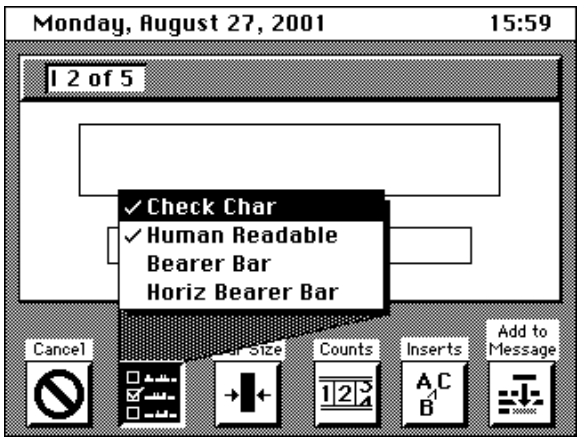


3) Highlight the bar code you want, then press **Enter**. The Bar Code Data screen is displayed. (I 2 of 5 is shown here, others are similar.)



4) Select the bar code options you want. (UPC-A and EAN-13 do not have options.)

   a. Press **Options**. A menu is displayed.



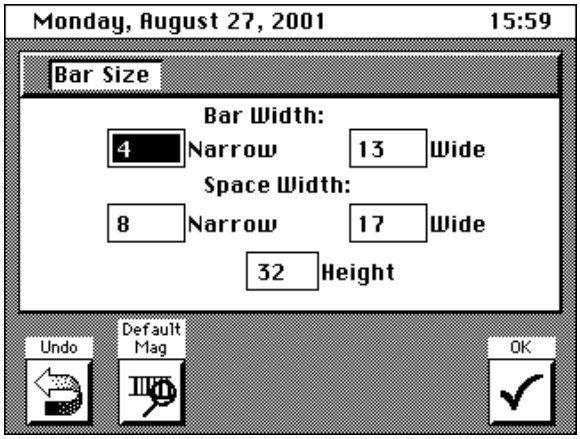
   b. One by one, highlight each option you want, and press **Enter**. A check mark indicates that the option has been selected.

Bar Code Options	Description
Check Char	The checksum for the bar code to verify its integrity.
Asterisk	A star-shaped symbol.
Human Readable	Text below or data contained in the bar code that can be read by humans.
Bearer Bar	A thick bar that goes around and encloses the entire bar code.
Horiz Bearer Bar	A bearer bar without the vertical side enclosures (saves ink).

5) Press Options again to return to the bar code data screen.

6) Set the bar size.

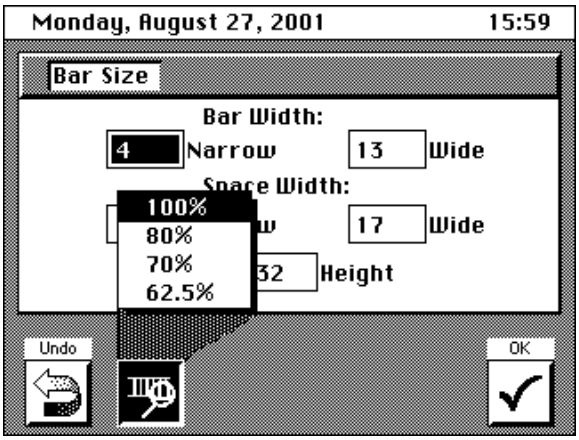
   a. Press **Bar Size**. The Bar Size screen is displayed. (I 2 of 5 is shown here, others are similar.)



b. Enter the appropriate widths and heights for your bar code.

or

c. Press **Default Mag**. A menu is displayed.



- Select one of the default size settings, then press **Enter**. A check mark indicates the item has been selected.
- Press **Default Mag** again to return to the bar size screen.

7) Press **OK** to return to the bar code data screen.

8) If you are building a UCC/EAN-128 bar code go to "Building a UCC/EAN-128 Bar Code" on page 4-65. For all other bar codes continue with step 9.

9) Add your data into the bar code.

The data you enter will depend on the type of bar code type you have selected. (See the table on page 4-59 for specific bar code data requirements.)

Make sure the bar code options and bar size are set before adding any data into the bar code.

a. Use the keypad to type in the text or numbers you need to build the bar code.

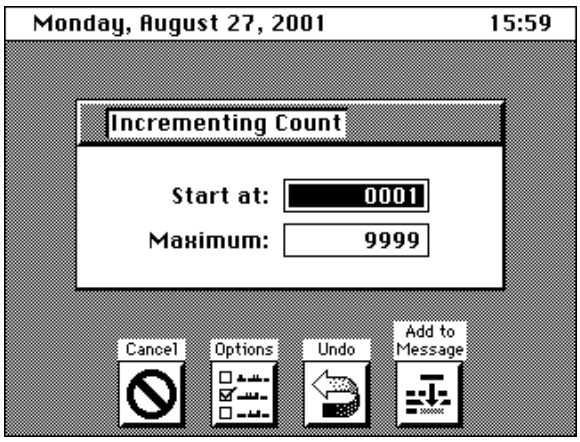
or

b. Use the function keys to add counts or inserts into the bar code. (See "Adding a Count Into a Bar Code" on page 4-63 and "Adding an Insert Into a Bar Code" on page 4-64.)

c. Press **Add to Message** to add the bar code into the message.

Adding a Count Into a Bar Code

1) From the bar code screen, press **Counts**. The Incrementing Count screen is displayed.

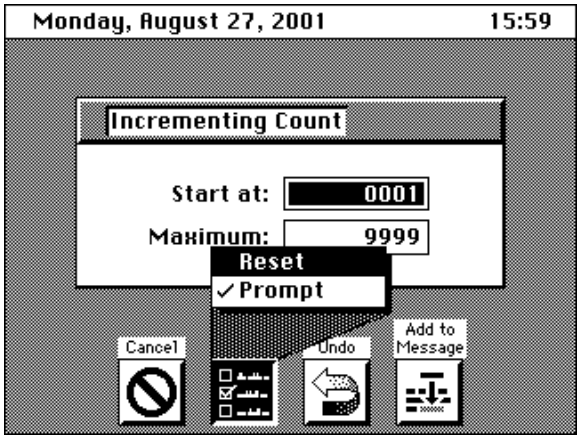


2) Enter the appropriate numbers in the Start at and Maximum fields.

Field	Description
Start At	Specify the number at which incrementing count begins (maximum of 9 digits).
Maximum	Specify number at which incrementing count ends.

3) Press **Options** and select **Reset** or **Prompt**.

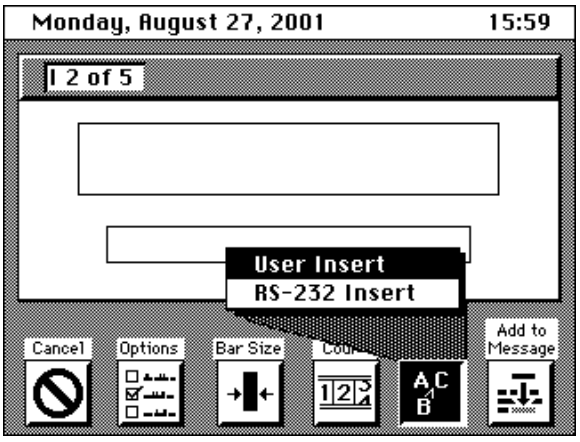
Option	Description
Reset	Resets the incrementing count to the original Start At number every time the message is selected to print.
Prompt	The system asks you if you want to reset the incrementing count before printing the message.



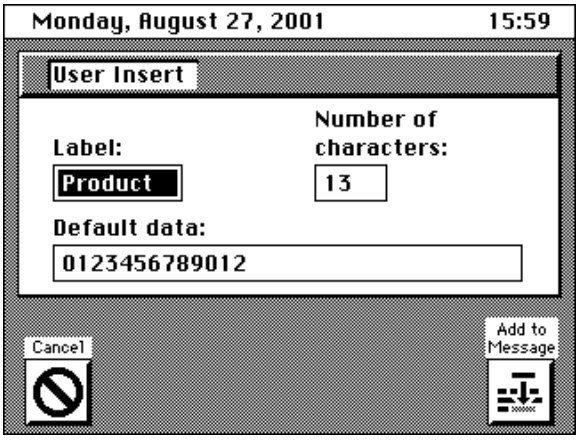
4) Press **Add to Message** to add the count to the bar code.

Adding an Insert Into a Bar Code

1) From a bar code data screen press **Inserts**. A menu is displayed.



2) Highlight either **User Insert** or **RS-232 Insert**, then press **Enter**. The User Insert or the RS-232 Insert screen is displayed. (The User Insert screen is shown here. The RS-232 Insert screen is similar.)



3) Enter the appropriate information in the fields. (See "Adding a User Insert" on page 4-40 and "Adding an RS-232 Insert" on page 4-41 for more information.)

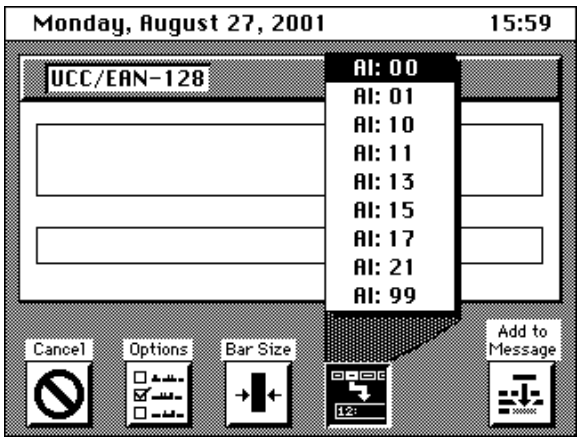
4) Press **Add to Message** to add the insert to the bar code.

Building a UCC/EAN-128 Bar Code

You must select Application Identifiers (AIs) to build a UCC/EAN-128 bar code. A bar code can include up to four AIs that total no more than 48 characters. An AI can only be used one time in a bar code.

Make sure the bar code options and bar size are set before adding any data into the bar code.

1) From a UCC/EAN-128 bar code data screen, press **AIs**. A list of AIs is displayed.



2) One by one, select each AI that you want to use to build the bar code, and enter the appropriate data. (See the chart on the next page for more information on AI data.)

3) When finished building the bar code, press **Add to Message**.

AI	Description
AI 00	Serial shipping container code. Maximum 17 alpha characters or numeric digits. Enter manually or use the Insert function. (See “Adding an Insert Into a Bar Code” on page 4-64.)
AI 01	Shipping container code. Maximum 13 numeric digits. Enter manually or use the Insert function. (See “Adding an Insert Into a Bar Code” on page 4-64.)
AI 10	Shipping container code. Maximum 20 alpha characters or numeric digits. Enter manually or use the Time/Date Codes, Counts or Insert functions. (See “Time Code Format” on page 4-30.) (See “Date Code Format” on page 4-31.) (See “Adding a Count Into a Bar Code” on page 4-63.) (See “Adding an Insert Into a Bar Code” on page 4-64.)
AI 11, 13, 15, 17	Date AIs. Maximum 4 numeric digits; The date will increment by the number you entered, and will be displayed in the following format: Year / Month / Day Example: Today’s date—Monday, January 14, 2002 Number entered: 0001 Human readable will display: 02 / 01 / 15
AI 21	Incrementing count code. Maximum 9 digits in each field. (See “Adding a Count Into a Bar Code” on page 4-63.)
AI 99	Variable data code. Maximum 20 alpha characters or numeric digits. Enter manually or use the Insert function. (See “Adding an Insert Into a Bar Code” on page 4-64.)

Advanced Features

Keypad Shortcuts

The following key combinations may be used to move the cursor on your message screen. The message screen contains eight print lines with eight rows on each printline and 1,015 columns.

To Move Outside of Message Elements	Keys to Press
Up or Down 4 Rows	Up or Down Arrows
Up or Down 8 Rows	Shift + Up or Down Arrows
Up or down 1 Row	Ctrl + Up or Down Arrows
Right or Left 4 Columns	Right or Left Arrows
Right or Left 32 Columns	Shift + Right or Left Arrows
Right or Left 1 Column	Ctrl + Right or Left Arrow

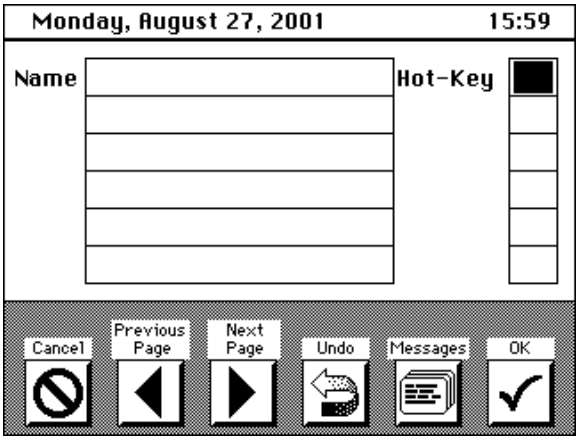
To Move	Keys to Press
Within an Element: Right or left 8 characters	Shift + Right or Left Arrows
In a Message: From one element to another	Ctrl + Right, Left, Up, or Down Arrows
In a Menu Screen: From the first to the last field	Ctrl + Right, Left, Up, or Down Arrows
In a Menu Screen: Four fields	Shift + Right, Left, Up, or Down Arrows

Hot-Keys

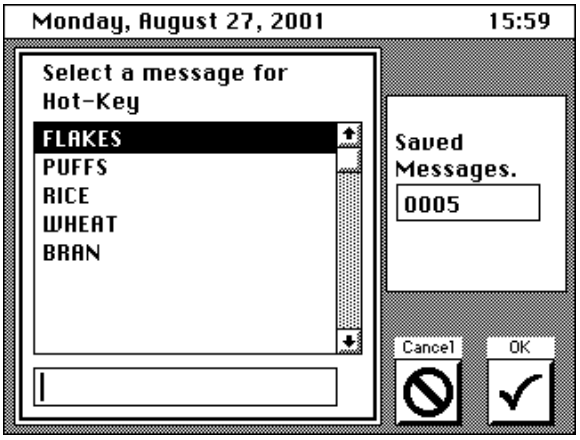
Set up Hot-Keys for messages that you print frequently. Hot-Keys allow you to select and print a message by pressing only one key. Up to 12 Hot-Keys can be set up for each task.

Setting up Hot-Keys

1) Press **Utility**.
2) Highlight **Hot-Key**, then press **Enter**. The Hot-Key setup screen is displayed.



3) Type in a Hot-Key; it can be any keypad key.
4) Press **Messages**. The Select a Message for Hot-Key screen is displayed.

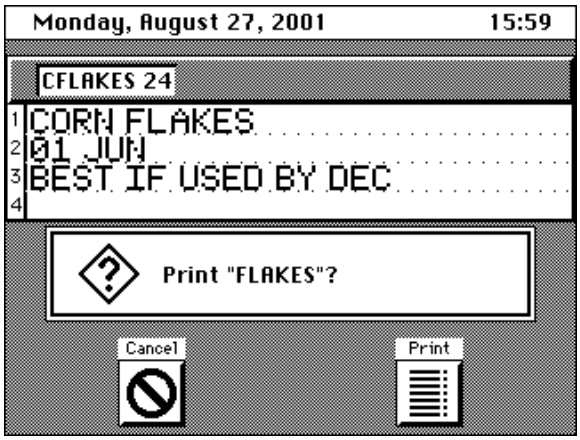


5) Highlight the message you want.
6) Press **OK**.
7) Press **OK** again to return to the home screen.

Using a Hot-Key

From the home screen, press the Hot-Key for the message you want to print. The message and the print confirmation are displayed.

- Press **Print** to print the message, or
- Press **Cancel** to select another message.



ML8 Emulation

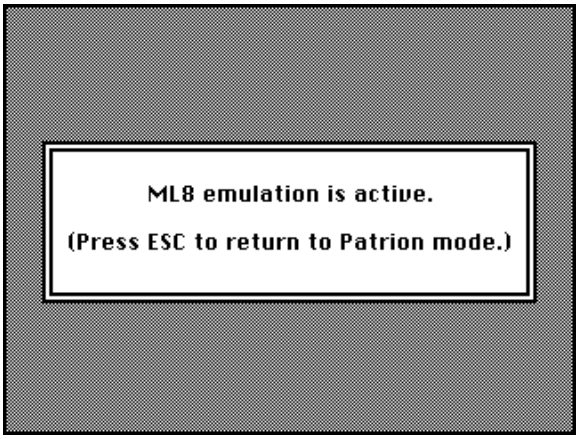
Note: The ML8 emulation function is not available if you are using HR Series printheads.

The ML8 Emulation option allows you to operate the PatrionPlus system using a Keyboard Input Device (KID) or other external device that communicates via an RS-232 interface. (See Appendix A for the interface commands.)

When using ML8 Emulation mode note the following:

- Messages created with the PatrionPlus controller cannot be viewed or printed using the KID.
- Only 7 DOT and 16 DOT fonts are available for messages created with a KID.
- Any messages created in ML8 emulation mode will be saved in Task 1.

1) Install the KID or other external device. (See "Optional External Devices" on page 3-26.)
2) From the home screen on the controller, press **Utility**.
3) Highlight **ML8 Emulation**, then press **Enter**. The system transfers control of the PatrionPlus to the device and displays the Emulation Active screen.



Using an External Device

You can operate the PatrionPlus system (outside of ML8 emulation) using a Keyboard Input Device (KID) or other external device that communicates via an RS-232 interface.

Note: To avoid interface problems, it is recommended that you use upper case letters and/or numbers when naming your messages if you are using a KID.

1) Install the KID or other external device. (See "Optional External Devices" on page 3-26.)
2) Make sure the controller is at the home screen.
3) On the external device, press **CTRL** + **T** to select a message. The device displays MSG =.
4) Type the name of the message you want to print.
5) Press **CTRL** + **M**.
6) The selected message is displayed on the home screen and is ready to print.

Note: "CTRL T" disables the print function. "CTRL M" activates the print function. If you are dual tasking, "CTRL T" affects only the current task.

Accessing DOS

To back up and restore files, you must first access DOS. Windows cannot be running. To exit Windows and access DOS from Windows version 3.X or from Windows 95 or later, follow the instructions below.

From Windows version 3.X:

1) Save and close all open files.
2) From Program Manager, select **File**.
3) Select **Exit Windows**.
4) At the prompt "This will end your windows session," select **OK**. You are now in DOS.

Note: To re-access Windows, Type WIN at the DOS prompt and press Enter to go to Windows.

From Windows 95 or later:

1) Save and close all open files.
2) From the task bar, select **Start**.
3) From the pop-up menu, select **Shutdown**.
4) Select **Restart the Computer in MS-DOS Mode?**
5) Select **Yes**.
6) The prompt will ask if you want to continue; select **Yes**. The system restarts your computer in MS-DOS mode, and you are now in DOS.

Note: To re-access Windows 95, Type WIN at the DOS prompt and press Enter to go to Windows.

Backing up PH Setup, Messages, and Logos to a Computer

Note: HR Series logos cannot be backed up using the Backup option.

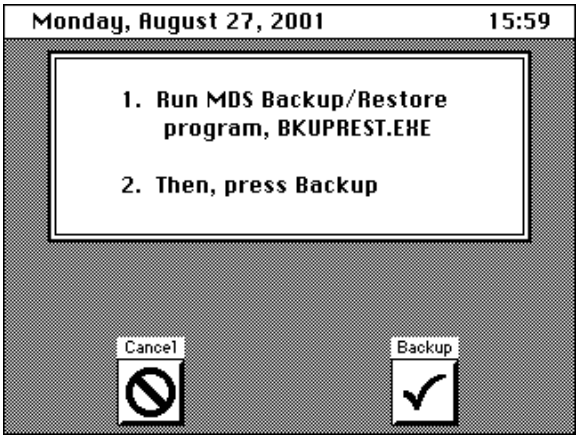
The Backup option allows you to store messages, VJ logos and printhead setup information on a computer for backup or duplication purposes. Follow the instructions below closely to know when to work from the controller and when to work from the computer.

Note: Be sure to shut down the computer, and unplug the controller before connecting any cables.

To connect your computer to the controller, use a standard RS-232 cable. Plug the 25-pin connector into the controller. Plug the other end (depending on your computer, either a 25-pin or 9-pin connector) into the serial port on your computer.

1) From the computer, access DOS with Windows not running. (See "Accessing DOS" on page 4-72.)
2) From the controller, press **Utility**. A menu is displayed.
3) Highlight **Backup**, then press **Enter**. A menu is displayed.

4) Highlight either **PH Setup**, **Messages**, or **Logos**, then press **Enter**. The system prompts you to run the Marsh Backup/Restore program, BKUPREST, on your computer.



From the computer:

5) Insert the backup/restore program disk into the floppy drive. (See the Parts List for ordering information or contact your local distributor.) You may run the program from here or copy the program onto a another drive.

6) At the DOS prompt, type BKUPREST, then press **Enter**. The system displays the program name and version number.

7) At the Select Backup (B) or Restore (R) prompt, type **B**, then press **Enter**.

Note: Press Ctrl C at any time to stop the Backup/Restore Program.

8) Type in 1 or 2 for the appropriate Com Port, then press **Enter**. If it is valid, the system will display the address. If it is not, the system will say Com Port Not Found. If not found, enter a different Com Port.

9) Type in the file name (you may also specify the drive and the directory), then press **Enter**. The message is displayed.

From the controller:

10) Press **Backup**.

11) Press **Backup** or **Enter**. The controller displays the number of backed up files. The computer will check the files received and then display File Verification Successful or File Verification Failed. If failed, redo the backup procedures.

Note: To exit without backing up the files, press Cancel.

Restoring PH Setup, Messages, and Logos

Use the Restore option to copy backed up printhead setup, message, or VJ logo files from a personal computer to either the controller that the files were copied from or to one or more other controllers. To restore files, you must first access DOS (see "Accessing DOS" on page 4-72). Follow the instructions below closely to know when to work from the controller and when to work from the computer.

Note: Be sure to shut down the computer, and unplug the controller before connecting any cables.

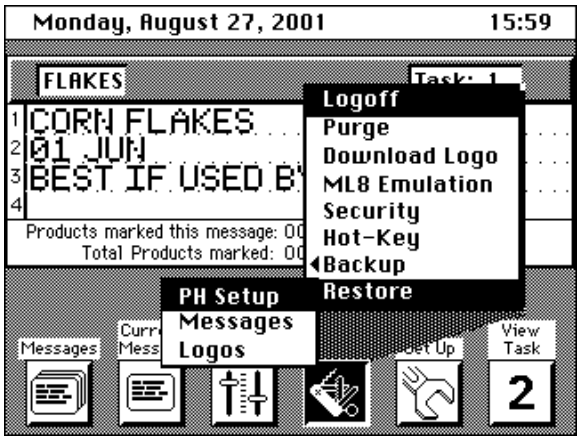
To connect your computer to the controller, use a standard RS-232 cable. Plug the 25 pin male D-type connector into the controller. Plug the other end (depending on your computer, either a 25 or 9 pin female D-type connector) into the serial port on your computer.

From the computer:

1) Access DOS with Windows not running.

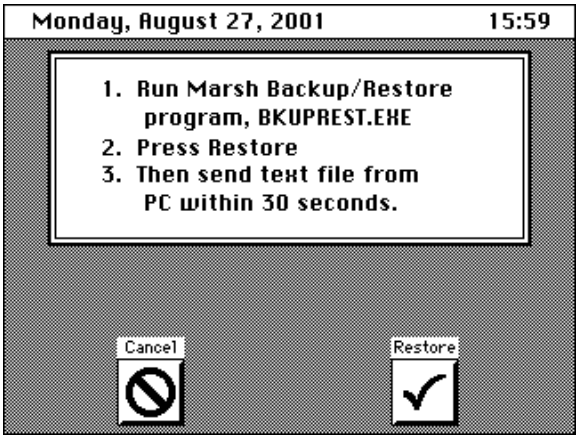
From the controller:

2) Press **Utility**. A menu is displayed.



3) Highlight **Restore**, then press **Enter**.

4) Highlight either **PH Setup**, **Messages**, or **Logos**, then press **Enter**. The system prompts you to run the Marsh Backup/Restore program, BKUPREST, on your computer.



From the computer:

5) Insert the backup/restore program disk into the floppy drive. (See the Parts List for ordering information or contact your local distributor.) You may run the program from here or copy the program onto a another drive.

6) At DOS prompt, type BKUPREST, then press **Enter**. The system displays the program name and version number.

7) At the Select Backup (B) or Restore (R) prompt, type R, then press **Enter**.

Note: Press Ctrl C at any time to stop the Backup/Restore Program.

8) Type in 1 or 2 for the appropriate Com Port, then press **Enter**. If it is valid, the system will display the address. If it is not, the system will say Com Port Not Found. If not found, enter a different Com Port.

9) Type in the file name. You may also specify the drive and the directory, then press **Enter** (only one time). The message is displayed.

From the controller:

10) Press **Enter** on the computer to Send Text File. Press **Restore**.

Note: To exit without restoring the files, press Cancel.

11) Within 30 seconds, press **Enter** on the computer to send the text file. The controller shows the number of files restored. This number indicates whether or not your restore was complete. If your restore was not complete, repeat the restore procedures.

Creating and Downloading a Logo

HR Series Printheads

HR Series logos require the use of Keymaster software for downloading. (To order see the Parts List.) Create and download logos according to the procedures in your Keymaster Software Manual.

VJ Printheads

1) Create your logo in a paint or graphics program on a computer and save it as a PCX file. The maximum logo size is 32 pixels high and 128 pixels wide.
2) Connect your controller to the computer using the 25-pin, RS-232 ports.
3) Configure your computer for downloading. (Follow the appropriate procedure below for your computer operating system.)

Computer Operating Systems Prior to Windows® 95:

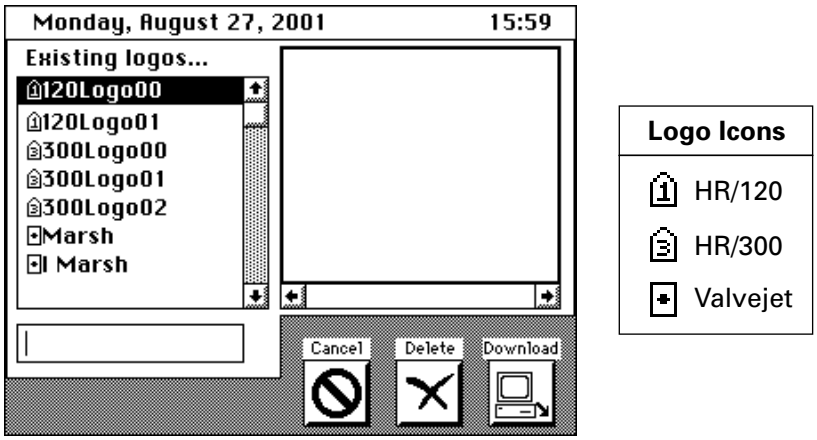
1) From the Windows® desktop, click **Accessories**.
2) Click **Terminal**.
3) Click **Settings**.
4) Click **Communications**.
5) Select the following flow control parameters:
   - Baud Rate: 9600
   - Data Bits: 8
   - Stop Bits: 2
   - Parity: None
   - Flow Control: None
6) Click **OK**.
7) From Transfers menu, select **Send Binary File**.
8) Select the PCX file you want.
9) Click **OK**.
10) Go to "Downloading to the Controller (VJ Printhead Logos only)" on page 4-79.

Computer Operating System Windows® 95 or Later:

1) From the Windows® desktop, click the Start button.
2) Select **Programs**.
3) Select **Accessories**.
4) Select **Hyper Terminal**.
5) Double-click the Hypertrm.exe icon.
6) Enter an appropriate name and select an icon for this session.
7) Click **OK**; the Phone Number dialog box is displayed.
8) In Connect using field, select **Direct to COM1** (or COM2) and click **OK**; the COM1 (or COM2) Properties dialog box is displayed.
9) Select the following flow control parameters:
   - Bits per second: 9600
   - Data bits: 8
   - Parity: None
   - Stop bits: 2
   - Flow control: None
10) Click **OK**.
11) From the Transfer menu, select **Send File**.
12) Enter the name of the PCX file.
13) In the Protocol field, select **Xmodem**.
14) Click **Send**.
15) Go to "Downloading to the Controller (VJ Printhead Logos only)" on page 4-79.

Downloading to the Controller (VJ Printhead Logos only)

1) From the controller home screen, press **Utility**.
2) Highlight Download Logo, then press **Enter**. The Existing Logos screen is displayed.



3) Type the name of the logo to be downloaded from the computer in the field located beneath the Existing Logos field.
4) Press **Download**. The logo will be downloaded from the computer, and, when finished, will be listed under Existing Logos and shown on screen.

Notes:

If your logo does not download:

- ***You may have chosen the wrong com port; select a different com port.***
- ***Verify that the communication cable is wired (pinned) correctly.***
- ***The logo may exceed the number of print lines available.***

5-Maintenance

Table of Contents

System Startup

Follow the procedures below each time you start up your PatrionPlus System.

1) Make sure all power cables and data line connections are secure.
2) Plug in your controller and printhead power supply.

VJ Series Printheads

1) Check your ink supply.
2) Hold CleanWipes under the printhead nozzles, and clean by spraying solvent on the front nozzle block.
3) Purge the printheads. (See "Purging a VJ Printhead" on page 5-3.)

HR Series Printheads

Note: Use CleanWipes to service HR Series Printheads. Always keep CleanWipes sealed in their plastic bag.

1) Make sure there is ink in the ink bottles.
2) Allow the printhead to warm up for approximately five minutes. During warm up, lightly purge the printhead. (See "Light purge" on page 5-5.) The LED on the back of the printhead flashes orange and green during warm-up, and turns green when operating temperature has been reached.
3) Check for debris on the front of the printhead and use SprayAway to clean if necessary.

Photocell

Clean your photocell with a clean, lint-free cloth at least once per shift, or more frequently in dirty environments.

VJ Printhead Maintenance

Periodic maintenance should be performed at least once per shift, or more frequently if necessary in harsh environments. For optimal performance, keep printhead nozzles free of debris at all times.

1) Hold CleanWipes under the printhead nozzles, and clean by spraying solvent on the front nozzle block.
2) Purge the printheads. (See "Purging a VJ Printhead" on page 5-3.)

Downward Printing with VJ Series Printheads

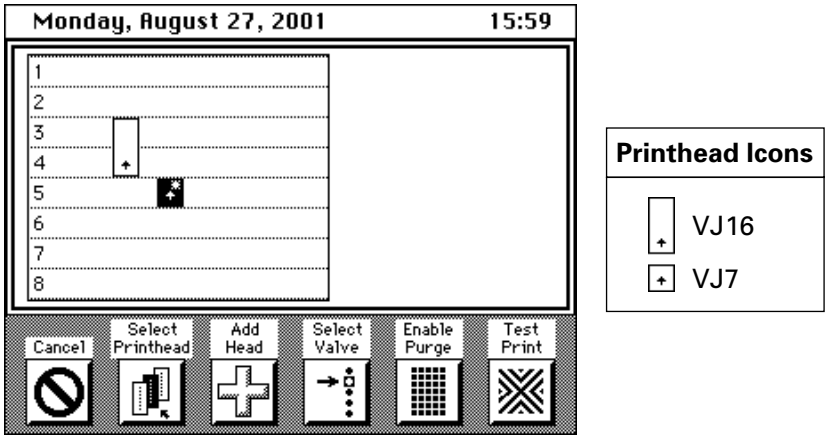
In addition to the normal maintenance, printheads that are printing downward should be purged at least once per shift. Turn the printhead to a horizontal position for purging.

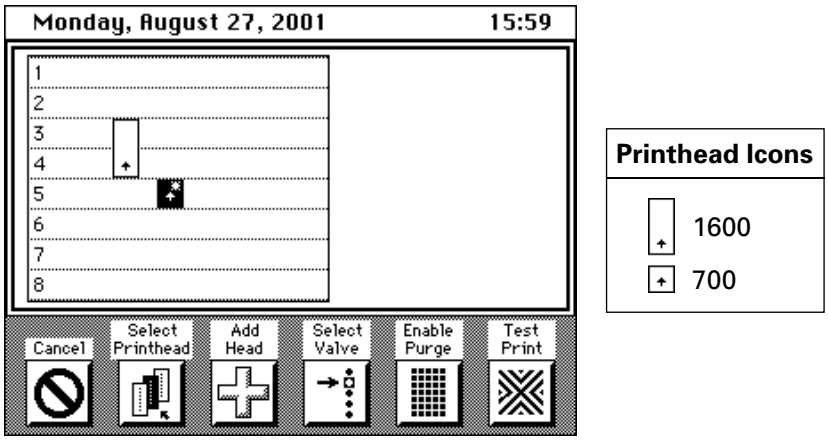
Purging a VJ Printhead

Perform this procedure each time you start up a printhead, or more frequently if necessary in harsh environments.

If print quality declines, purge the printhead to improve print quality. If your message is consistently missing a dot, purge the nozzle that corresponds to the missing dot.

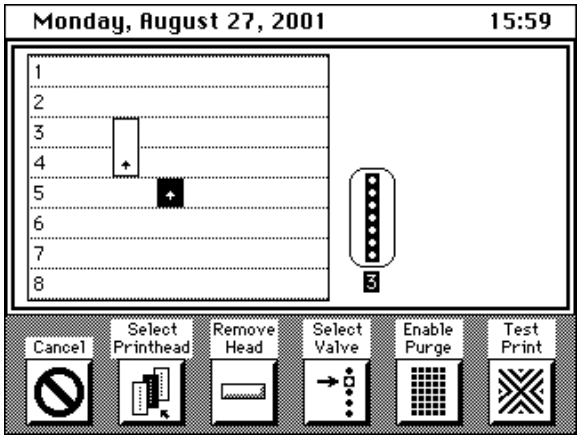
1) Place a waste container in front of the printhead you are purging.
2) From the home screen, press **Utility**.
3) Select **Purge**. The printhead selection screen is displayed.





4) Press **Select Printhead** until the desired printhead icon is highlighted. An asterisk on the icon indicates that the printhead is currently selected. The LED on the back of the selected printhead flashes green.

5) Press **Add Head**. You can select up to eight printheads to be purged. The printhead icon will remain highlighted, and the Add Head key changes to Remove Head.



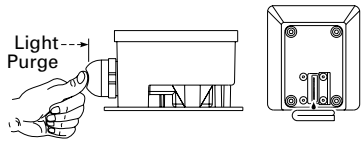
If you want to purge a specific valve, press **Select Valve**.

6) Press **Enable Purge**. To begin purging, block the photocell. The printhead LED flashes red while purging.
7) To stop purging, unblock the photocell and press **Stop Purge**.
8) Print the test print:
   a. Press **Test Print**. The LED on the selected printhead flashes orange and green.
   b. Pass a card or box in front of the printhead. The test print should look like the pattern on the test print key.
   c. To stop the test, press **Stop Test**.

HR Printhead Maintenance

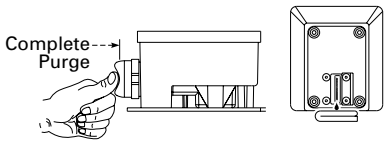
Note: Use CleanWipes to service HR Series Printheads. Always keep CleanWipes sealed in their plastic bag.

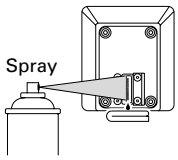
Daily Maintenance

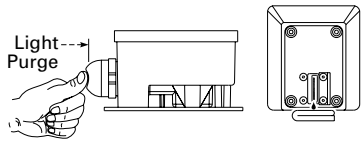


1) Light purge
   a. Partially press the ink system purge bulb until a small amount of ink runs down the orifices. Hold CleanWipes under the orifices to absorb the ink.
   b. Print multiple test messages to verify print quality. If print quality is good no further action is necessary. If print quality is not acceptable, continue with step 1 in the Weekly Maintenance procedure below.

Weekly Maintenance

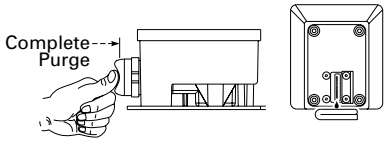


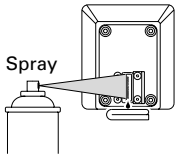


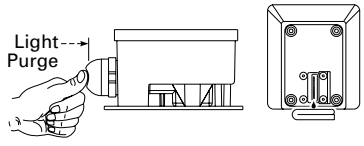


1) Complete purge.
   a. Completely press the purge bulb so that ink streams down the orifices. Hold CleanWipes under the orifices to absorb the ink.
   b. Print multiple test messages to verify print quality. If print quality is good no further action is necessary. If print quality is not acceptable, continue with step 2.
2) Spray orifices.
   a. Spray the orifices with SprayAway. Hold CleanWipes under the orifices to absorb the spray. Do not spray SprayAway directly at the orifice array. Spray only at approximately a 45 degree angle relative to the front of the printhead, toward the rub block. If you spray directly at the printhead orifices you will need to do another complete purge.
   b. Perform a light purge.

Clearing Clogged Orifices







1) Complete purge.
   a. Completely press the purge bulb so that ink streams down the orifices. Hold CleanWipes under the orifices to absorb the ink.
2) Spray orifices.
   a. Spray the orifices with SprayAway. Hold CleanWipes under the orifices to absorb the spray. Do not spray SprayAway directly at the orifice array. Spray only at approximately a 45 degree angle relative to the front of the printhead, toward the rub block. If you spray directly at the printhead orifices you will need to do another complete purge.
   b. Perform a light purge.
   c. Print multiple test messages to verify print quality. If acceptable print quality is not achieved, see the Troubleshooting section of your HR Series technical manual, or contact technical support.

System Shutdown Guidelines

Follow the proper shutdown procedures below for the type of printhead and ink you are using.

VJ Series Printheads (Porous Ink)

Length of Shutdown	Procedure
Less than two weeks	Unplug the controller. No further actions are required.
Two weeks or more	1. Purge the printheads with porous solvent. 2. Unplug the controller and all printhead power supplies. (Do not remove built-up ink from the printhead nozzle block; the ink prevents contaminants from getting into the nozzles.)

VJ Series Printheads (Non-Porous Ink)

Length of Shutdown	Procedure
Less than three days	Unplug the controller. No further actions are required.
Three days or more	1. Purge the printheads with non-porous solvent. 2. Unplug the controller and all printhead power supplies. (Do not remove built-up ink from the printhead nozzle block; the ink prevents contaminants from getting into the nozzles.)

HR Series Printheads (Series 2000 Ink)

Length of Shutdown	Procedure
Less than two weeks	Unplug the controller. No further actions are required.
Two weeks or more	1. Unplug the controller and all printhead power supplies. 2. Disconnect the ink line from the printheads. 3. Cover the printhead orifices with CleanWipes and secure the CleanWipes in place.

6-Troubleshooting

Table of Contents

Introduction

This section outlines problems you may have with your PatrionPlus controller and printheads, and suggests potential solutions.

- For VJ Series printheads, see page 6-3.
- For HR Series printheads, see your HR Series Technical Manual.
- For controller or print problems that are common to both types of printheads, see page 6-10.

To avoid print and equipment problems, follow the procedures outlined in the Installation and Maintenance sections. For your ink system, refer to your ink system technical manual.

Note: Only qualified personnel should service the controller, printheads, or ink system.

Replacement parts are available for your PatrionPlus controller and printheads (refer to the Parts List).

If you need more assistance than provided in this section, please call your local distributor or Technical Support. Technical Support is available 24 hours a day, 7 days a week, 365 days a year.

Technical Support:

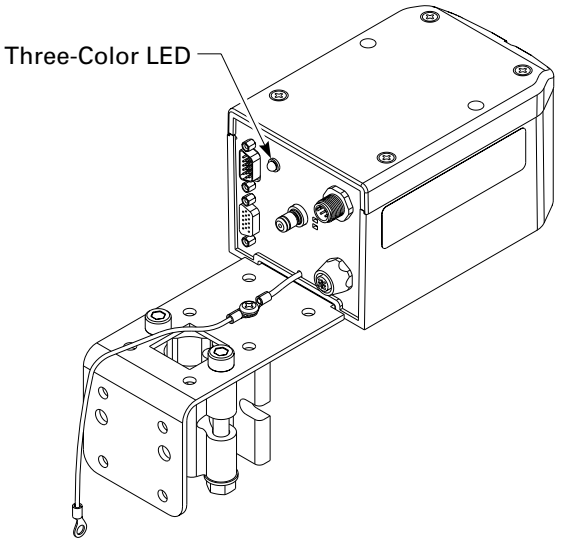
U.S. and Canada	(800) 851-3441
International	(618) 234-9093
FAX	(618) 234-1265
E-mail	Blvl.TechSupport@videojet.com

Monitoring VJ Printhead Status

The back of VJ printheads includes an external, three-color LED. The LED provides status information and can be helpful during the troubleshooting process.

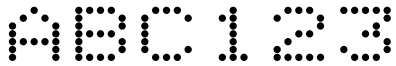
LED Color(s)	Indication
Solid Green	The printhead is configured properly and is ready to print.
Solid Amber	The printhead is not communicating with the controller. (If the LED is solid Amber, make sure all cable connections are secure. If the printhead is still not printing, see "Message won't print." on page 6-6.)
Solid Red	The printhead is printing.
Flashing Green	The printhead is ready to be purged.
Flashing Amber	The printhead is selected in the printhead setup screen.
Flashing Red	The printhead is purging.

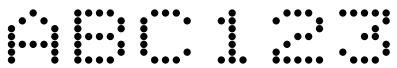
Figure 6A: LED Status

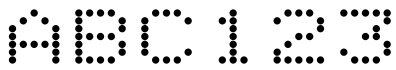
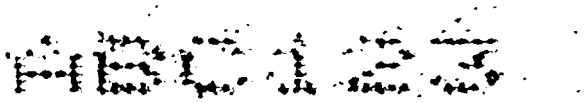


Print Quality Problems for VJ Series Printheads Only

The following are problems you may encounter with your VJ Series printheads. For HR Series printhead problems, see your HR Series Technical Manual. Also provided are print quality samples for comparison. Work your way down the list of possible causes and solutions until your problem is resolved.

Problem (VJ Printheads Only)	Possible Cause	Solutions
Good Quality Print 		
Dots are Missing 		
Dots are missing.	There is debris in the nozzles.	1. Clean the nozzles with solvent. 2. Backflush the nozzles. (See "Backflushing a Nozzle" on page 6-15.) 3. Check print quality. If it has not improved, replace the contaminated nozzle block. (See "Replacing a VJ Printhead Nozzle Block" on page 7-7.)
	A valve is contaminated and not able to operate properly.	1. Backflush the valves. (See "Backflushing a Valve" on page 6-20.) 2. Check print quality. If it has not improved, replace the contaminated valve. (See "Replacing a VJ Printhead Nozzle Block" on page 7-7.)
	A valve driver chip is defective.	Replace the valve driver chip. (See "Replacing a Valve Driver Chip" on page 7-14.)

Problem (VJ Printheads Only)	Possible Cause	Solutions
Good Quality Print 		
Dots are Large and Run Together 		
Dots are large and run together.	The dot size is set too high.	Select a smaller dot size. (See "Printhead Configuration" on page 4-9.)
	There is solvent in the ink.	Purge the printheads. (See "Purging a VJ Printhead" on page 5-3.)

Problem (VJ Printheads Only)	Possible Cause	Solutions
Good Quality Print 		
Dots have Splatters and Tails, are Inconsistent in Size, or are Missing 		
Dots have splatters and tails, are inconsistent in size, or are missing.	There is air in the valve.	Purge the printhead. (See "Purging a VJ Printhead" on page 5-3.)
	There is debris in the nozzle orifice.	1. Spray the nozzles with solvent. 2. Backflush the nozzles. (See "Backflushing a Nozzle" on page 6-15.) 3. Check print quality. If it has not improved, replace the contaminated nozzle block. (See "Replacing a VJ Printhead Nozzle Block" on page 7-7.)
	The printhead is too far away from the product.	Reconfigure the printhead location. (See "Establishing Locations" on page 3-3.)
	A valve is contaminated and not able to operate properly.	1. Backflush the valves. (See "Backflushing a Valve" on page 6-20.) 2. Check print quality. If it has not improved, replace the contaminated valve. (See "Replacing a VJ Printhead Valve" on page 7-10.)
	There is air in the system.	Purge the printhead. (See "Purging a VJ Printhead" on page 5-3.) **Note:** If you have made changes to the ink system that could cause air in the line, you may need to purge the ink system. See your ink system technical manual.

Problem (VJ Printheads Only)	Possible Cause	Solutions
Message won't print.	The nozzles are clogged.	1. Spray the nozzles with solvent. 2. Backflush the nozzles. (See "Backflushing a Nozzle" on page 6-15.) 3. Check print quality. If it has not improved, replace the contaminated nozzle block. (See "Replacing a VJ Printhead Nozzle Block" on page 7-7.)
	The printheads are set to Purge or Test. (If the printhead is set to Purge, the printhead LED will flash green.)	Trigger the photocell(s) to see if a test pattern or a purge prints. If so, reset the system to print the message. (See "Purging a VJ Printhead" on page 5-3.)
	The printed circuit board (PCB) is malfunctioning.	Replace the printhead CPU board. (See "Replacing a Printhead CPU Board" on page 7-24.)
	Independent Printhead: The connection between the internal photocell and the printhead driver board is loose. (If the connection is loose, the printhead LED will stay green.)	Disconnect the internal photocell board from the printhead driver board and then firmly reconnect it.
Message is not printing on every box (skips boxes consistently or randomly.)	*Independent Printhead:* The connection between the internal photocell and the printhead driver board is loose.	Disconnect the internal photocell board from the printhead driver board and then firmly reconnect it.
Message won't fit in the allotted space.	*Independent Printhead:* One of the internal photocell board sensors is defective.	Replace the internal photocell board.
Photocell is not functioning.	*Independent Printhead:* The connection between the internal photocell and the printhead driver board is loose.	Disconnect the internal photocell board from the printhead driver board and then firmly reconnect it.
	Independent Printhead: The photocell is defective.	Replace the photocell.

Printing Problems

Problem (VJ and HR Series Printheads)	Possible Cause	Solutions
Message won't print.	Printing key is set to OFF. (If the printing key is off, the printhead LED will not turn red when the photocell is broken.)	Press the Printing key.
	The system has run out of ink. (If the system is out of ink, the printhead LED will turn red when the photocell is tripped, and then go back to green.)	Replace the ink container. See your ink system technical manual for details.
	The data line between the controller and the printhead is loose. (If the data cable is loose, the printhead LED will be solid amber.)	Make sure both ends of each cable are well fastened to the connectors on the controller and the printheads.
	There is no message loaded to print. (If no message is loaded, the printhead LED doesn't change.)	Set the controller to print a message. (See "Printing a Message" on page 4-54.)
	The printhead configuration has not been set.	Configure the printheads. (See "Printhead Configuration" on page 4-9.)
	If you are dual-tasking, the Task 2 Key is not installed.	Install the Task 2 Key on the back of your controller. (See "Task 2 Key Installation for Dual Tasking" on page 3-22.)
	The master printhead is malfunctioning.	Designate a different printhead as the master. If there still is no print, the original master printhead is not malfunctioning. (See "Designating a Master Printhead" on page 4-14.)
	There is a shaft encoder in the setup but it is not connected to the controller. (If the shaft encoder is not connected to the controller, but the controller is configured for one, the LED will turn red when the photocell is tripped, and will stay red.)	1. Connect the shaft encoder and make sure it is activated. (See "Adding a Shaft Encoder to the Printhead Configuration" on page 4-16.) OR 2. Configure the system so that no shaft encoder is used. (See "Adding a Shaft Encoder to the Printhead Configuration" on page 4-16.)

Problem (VJ and HR Series Printheads)	Possible Cause	Solutions
	Box to be printed is out of the photocell sensory range. (If the box is out of photocell range, the photocell LED will not change color when the box passes it.)	Adjust the photocell so that it is closer to the box.
	Photocell is not connected to the controller. (If the photocell isn't connected, the printhead and photocell LEDs won't change when a box passes infront of the photocell.)	Connect the photocell and make sure it is activated. (See "Setting the Print Trigger" on page 4-15.)
	Internal photocell is selected.	Select external photocell.
	The photocell is defective	Replace the photocell.
	The message is set to print on lines that have no printheads assigned. (If the message is on a line with no printhead assigned to it, the printhead LED will turn red when the photocell is tripped, and then go back to green.)	1. Edit the message so that the lines of print are set appropriately for the printhead configuration (i.e., the message is typed on the same lines that the printheads will print). OR 2. Reconfigure the printhead setup so that the lines in the message will print. (See "Printhead Configuration" on page 4-9.)
	If applicable, shaft encoder or its adapter cable is defective.	Perform continuity check; if necessary, replace shaft encoder adapter cable or entire shaft encoder.
You are dual-tasking, but the View Task function key will not switch between tasks.	The Task 2 Key has been removed.	Install the Task 2 Key. (See "Task 2 Key Installation for Dual Tasking" on page 3-22.)
Message is not printing on every box (skips boxes consistently or randomly).	Box is just at or below the photocell sensors.	Lower the photocell.
Message is missing lines.	Line speed is not constant.	Perform continuity check; if necessary, replace shaft encoder adapter cable or shaft encoder.

Problem (VJ and HR Series Printheads)	Possible Cause	Solutions
	The message is typed on different lines than those configured to print. (If the message is typed on different lines, the printhead LED will turn red when the photocell is broken, and then return to green, but will not print.)	1. Edit the message so that the lines of print are set appropriately for the printhead configuration (i.e., the message is typed on the same lines that the printheads will print). OR 1. Reconfigure the printhead setup so that the lines in the message will print. (See "Printhead Configuration" on page 4-9.)
Message won't fit in the allotted space.	The print position is set incorrectly.	Reset the position where the message prints. (See "Adjusting the Print Position" on page 4-47.)
	The characters are too wide.	Reset the character width so that the message prints in narrower characters. (See "Changing the Character Width" on page 4-46.)
	The font is too large.	Edit the message so that it prints in a smaller font. (See "Selecting a Font" on page 4-26.)
Message won't fit in the allotted space.	The message is too long.	Shorten the message. (See "Editing a Message" on page 4-51.)
Message is printing backwards.	The printhead setup is incorrect.	Change the printhead setup so that the printheads are set for the correct direction. (See "Printhead Configuration" on page 4-9.)
Some message elements are printing more than once or not at all.	Master printhead designation is incorrect.	Designate the last printhead to finish printing as the master printhead.
Task 2 has stopped printing.	The Task 2 Key has been removed.	Install the Task 2 Key. (See "Task 2 Key Installation for Dual Tasking" on page 3-22.)

General Problems

Problem (VJ and HR Series Printheads)	Possible Cause	Solutions
The controller won't start.	The power cord isn't plugged in.	Plug in the power cord (check the controller and the AC ends).
	The AC outlet doesn't work.	Use a different AC outlet.
	Controller power supply fuse is bad (open).	Replace the controller power supply fuse.
	If the printing LED is lit (either red or green), the problem is in the display.	See "Display Problems" on page 6-13.
	The controller printed circuit board (PCB) is malfunctioning.	Replace the controller PCB.
	The controller PCB battery is low.	Replace the controller PCB battery. (See "Replacing the Controller PCB Battery" on page 7-6.)
The controller operation is erratic (display garbled, incorrect system parameters, etc.).	The system parameters are corrupt.	Turn the system power off and back on immediately. Check the system activity; if it has not returned to normal, perform an "Escape–Power Up" as follows: ***CAUTION: This procedure deletes the current message in the print buffer.*** 1. While holding down the Esc key, plug the controller back into the power source. 2. When the system comes back up and the home screen is displayed, release the Esc key. This resets all system parameters without affecting stored messages (resets the default time, date, character width, product delay, printhead configuration, and message in the print buffer).
The controller loses memory and/or the clock needs resetting when power is shut off.	The controller PCB battery is low.	Replace the controller PCB battery. (See "Replacing the Controller PCB Battery" on page 7-6.)

Problem (VJ and HR Series Printheads)	Possible Cause	Solutions
The photocell is not functioning.	Controller is not receiving power.	Check controller power supply and power cable.
	Photocell is defective.	Replace the photocell.
The printhead LED does not light up.	Printhead LED is defective.	Replace printhead LED. (See "Replacing the Printhead LED" on page 7-22.)

Keypad Problems

Problem (VJ and HR Series Printheads)	Possible Cause	Solutions
One button on the keypad won't work.	Keypad is malfunctioning.	Apply even pressure to the keypad button and rub until beeping stops.
	One or both ribbon cables between the keypad and the printed circuit board (PCB) are disconnected.	Check both ends of the keypad ribbon cables to ensure that they are well fastened to the connectors.
A section of buttons on the keypad won't work.	Keypad is malfunctioning.	1. Apply even pressure to the keypad button and rub until beeping stops. 2. Replace the controller housing assembly top. 3. Replace the controller PCB.
The entire keypad won't work.	One or both ribbon cables between the keypad and the printed circuit board (PCB) are disconnected.	Check both ends of the keypad ribbon cables to ensure that they are well fastened to the connectors.
	Power cord is not plugged in.	Plug in the power cord. Check both the controller end and the AC end.
	Controller functions have locked up.	Unplug the controller from its power source. While holding down the Esc key, plug the controller back into the power source. When the system comes back up and the homescreen is displayed, release the Esc key.
	Printed circuit board (PCB) is malfunctioning.	Replace the controller PCB.

Display Problems

Problem (VJ and HR Series Printheads)	Possible Cause	Solutions
The display appears garbled.	The cable from the display to the printed circuit board (PCB) isn't connected.	Make sure that both ends of the cable between the display and the PCB are securely connected.
	Controller functions are locked up.	Unplug the controller from its power source. While holding down the Esc key, plug the controller back into the power source. When the system comes back up and the homescreen is displayed, release the Esc key.
	The cable is damaged.	Replace the cable.
	The display is damaged.	Replace the display.
	The PCB is damaged.	Replace the controller PCB.
The display is blank.	The controller is not powered on.	Plug in power cord.
	The screen saver is on.	Press the shift key to activate the display light.
	The contrast is too high or too low.	Adjust the contrast with the contrast arrow keys on the keypad.
	The display cable between the display and the PCB is disconnected.	Check both ends of the harness to ensure that they are well fastened to the connectors on the display and the PCB.
	The display cable between the display and the PCB is damaged.	Replace the display.
	The display light is damaged.	Replace the display.
	The PCB is damaged.	Replace the controller PCB.

LED Problems

Problem (VJ and HR Series Printheads)	Possible Cause	Solutions
One or both colors of the printing LED won't light.	Controller is not powered on.	Plug in power cord. Check both the controller end and the AC end.
	The keypad button corresponding to the LED is broken.	Make sure the keypad beeper is turned on. (See "Turning the Keypad Beeper Off and On" on page 4-5.) Press the corresponding key for the LED. If it does not beep, the keypad button is broken; replace the controller housing assembly top.
	The printed circuit board (PCB) is malfunctioning.	Replace the controller PCB.
The caps-lock LED won't light.	Power cord is not powered on.	Plug in power cord. Check both the controller end and the AC end.
	The printed circuit board (PCB) is malfunctioning.	Replace the controller PCB.

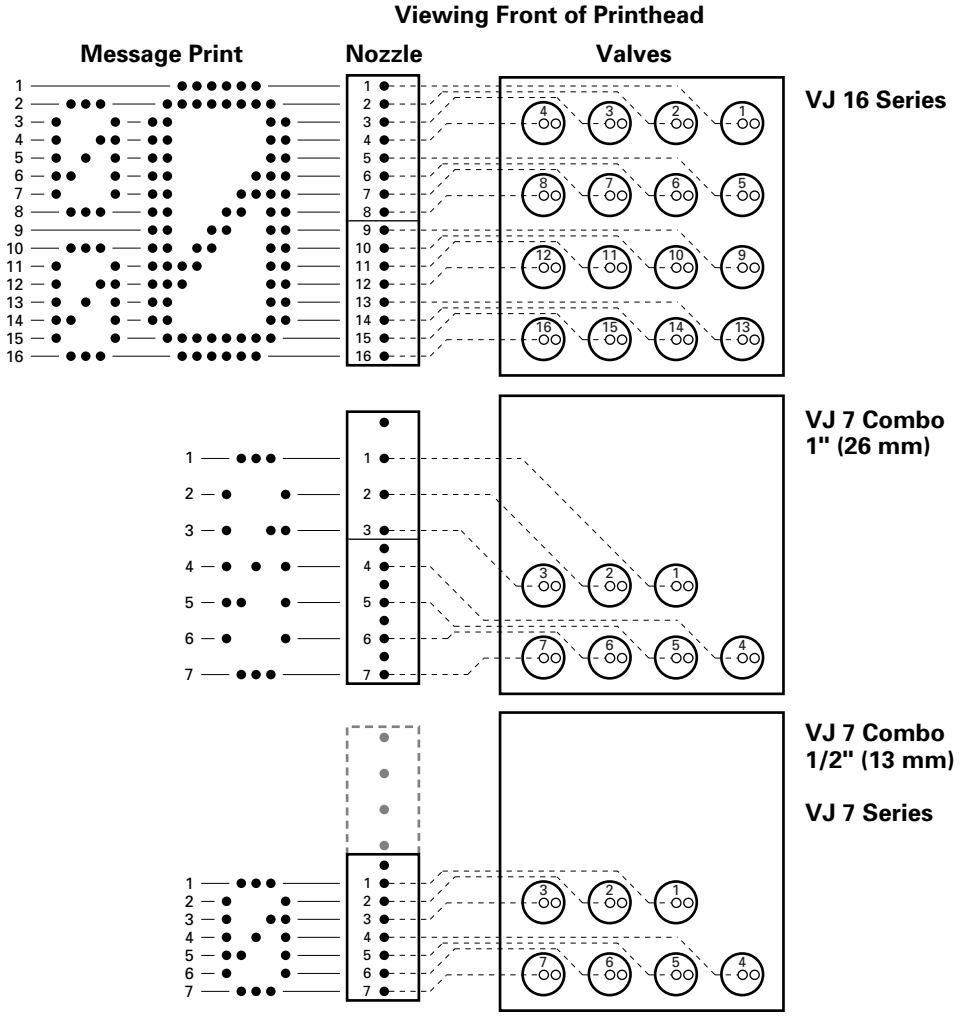
Backflushing a Nozzle

Missing dots in messages can be caused by contaminents lodged in printhead nozzles, or improperly seated valve mechanisms. Backflushing a printhead nozzle or valve can remove contaminates or reseat the valve.

Note: This procedure requires the use of a Backflush Kit. To order see the "Parts List."

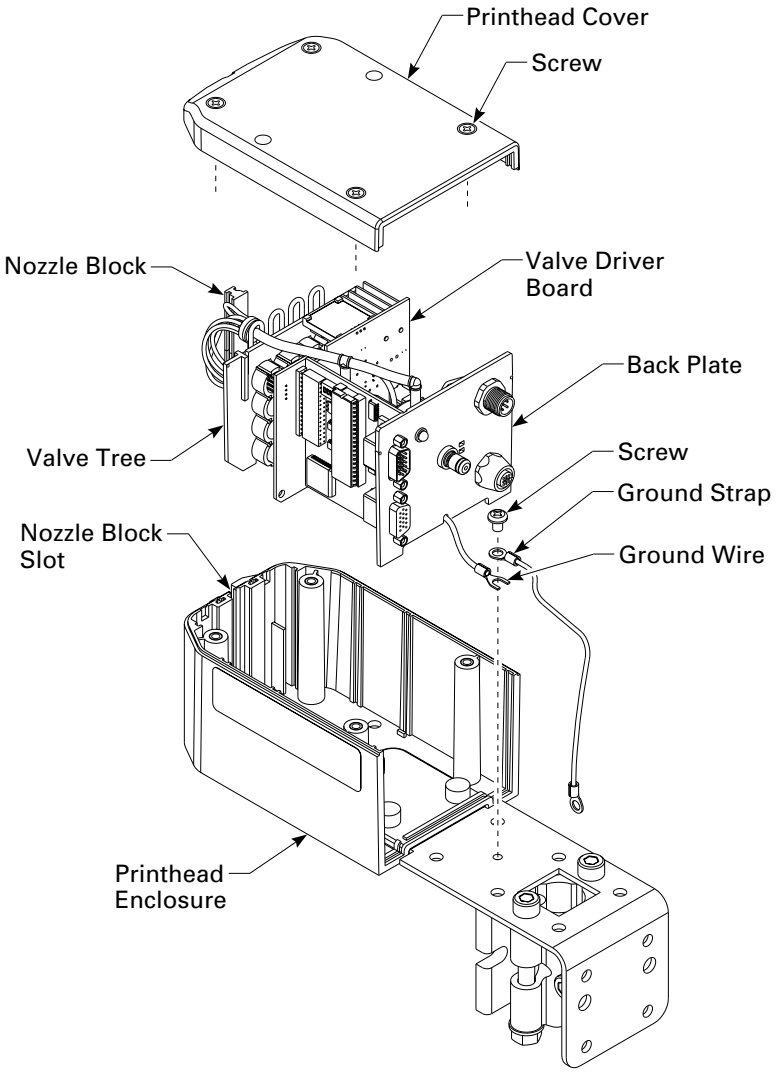
1) From a print sample determine which nozzle or valve you will need to backflush. (See Figure 6B.)
2) Unplug the controller and the printhead power supply.

Figure 6B: Relationship Between Print Sample, Nozzle, and Valves



3) Disconnect the ink line, data lines and power supply cables from the printhead.
4) Remove the ground wire. (See Figure 6C.)
5) Remove the printhead enclosure.
6) Remove the printhead assembly from the case. (Nozzle blocks must be removed with the printhead assembly.) Take care not to stress the ink lines.
7) From your Backflush Kit, obtain the large syringe (60cc).
8) Cut 3/8" (0.95 cm) of ink tubing and attach it to the large syringe.

Figure 6C: Removing the Printhead Assembly



9) Backflush a nozzle as follows:

Note: Backflush only one nozzle at a time.

a. Disconnect the outlet tubing from the valve that corresponds to the nozzle you want to backflush. (See Figure 6B.) Direct the tubing into a collection container.

b. Fill the syringe with solvent – porous or non-porous, as applicable.

c. Press the tubing against the nozzle to be backflushed, and depress the plunger to force solvent through the nozzle.

d. Reconnect the outlet tubing to the valve.

e. Repeat the above steps for additional nozzles.

10) Reinstall the printhead assembly in the printhead case, and reconnect the ground wire.

11) Reconnect the ink line, data lines, and power supply cables to the printhead.

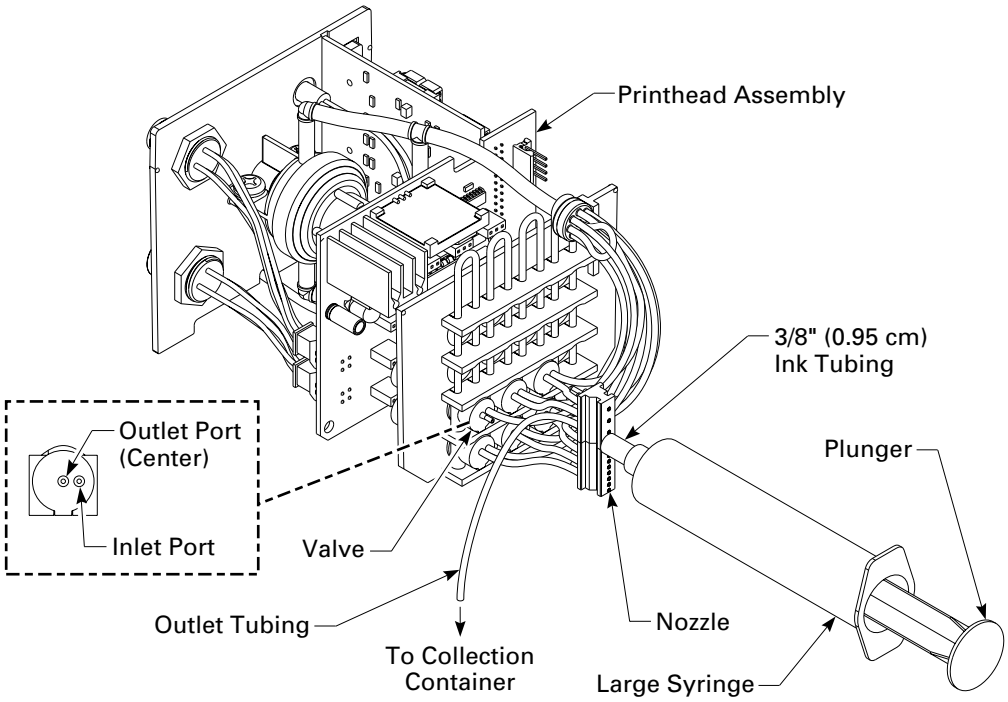
12) Plug in the printhead power supply and the controller.

13) Purge the printhead, then run a test print. (See "Purging a VJ Printhead" on page 5-3.)

14) Was good quality print achieved?

- Yes, reinstall the printhead cover and resume normal operations.
- No, repeat the backflushing procedure. If good quality print is still not attained go to double backflushing a nozzle.

Figure 6D: Backflushing a Nozzle



Double Backflushing a Nozzle

Perform this procedure only if you were unsuccessful in achieving good quality print by backflushing a nozzle. Double backflushing uses two syringes to create a vacuum effect to remove any contaminents lodged in the nozzle.

Note: This procedure requires the use of a Backflush Kit. To order see the "Parts List."

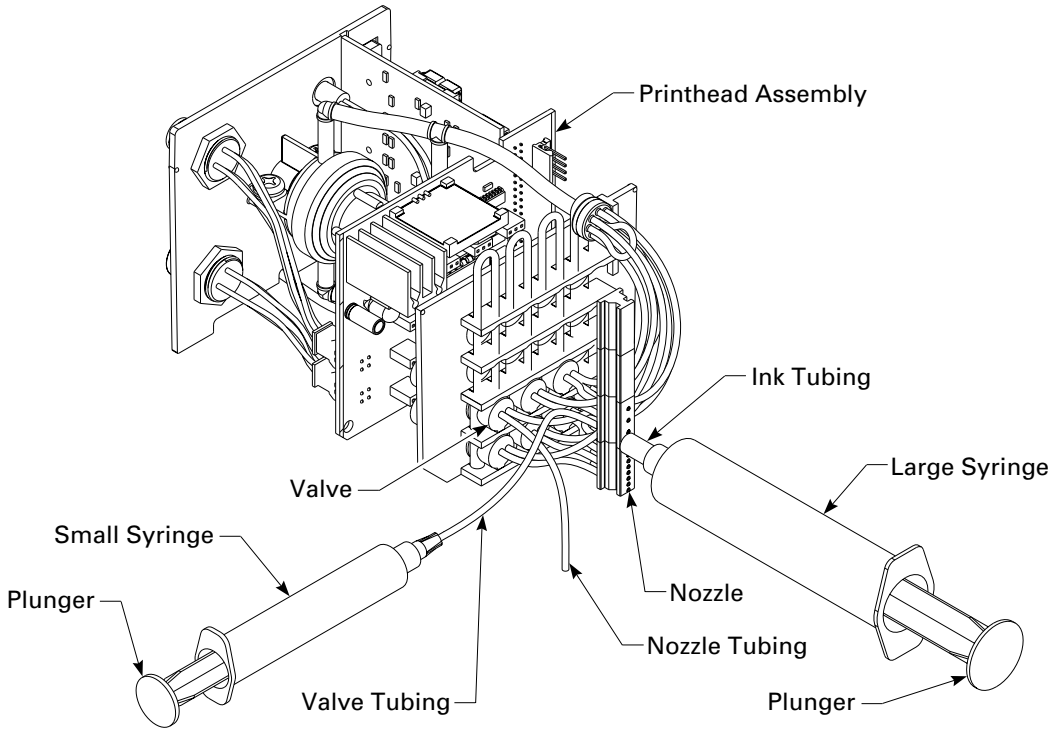
1) Unplug the controller and the printhead power supply.
2) Disconnect the ink line, data lines and power supply cables from the printhead.
3) Remove the ground wire. (See Figure 6E.)
4) Remove the printhead enclosure.
5) Remove the printhead assembly from the case. Note: Nozzle blocks must be removed with the printhead assembly. Take care not to stress the ink lines.
6) From your Backflush Kit, obtain the small and the large syringe.
7) Cut 6" (15.2 cm) of valve tubing and attach to the small syringe.
8) Cut 3/8" (0.95 cm) of ink tubing and attach to the large syringe.
9) Double backflush a nozzle as follows:

   Note: Double backflush only one nozzle at a time.

   a. Disconnect the outlet tubing from the nozzle you want to backflush; Direct the tubing into a collection container.
   b. Depress the small syringe plunger all the way in, and connect to the back of the nozzle to be backflushed. (The syringe should be empty.)
   c. Fill the large syringe with solvent – porous or non-porous, as applicable.
   d. Press the tubing against the front of the nozzle to be backflushed.
   e. Depress the plunger of the large syringe while pulling the plunger of the small syringe.
   f. Remove the large syringe.
   g. Carefully disconnect the small syringe.
   h. Reconnect the outlet tubing to the nozzle.
   i. Repeat the above steps for additional nozzles.

10) Reinstall the printhead assembly in the printhead case, and reconnect the ground wire.
11) Reconnect the ink line, data lines and power supply cables to the printhead.
12) Plug in the printhead power supply.
13) Plug in the controller.
14) Purge the printhead, then run a test print. (See "Purging a VJ Printhead" on page 5-3.)
15) Was good quality print achieved?
    - Yes, reinstall the printhead cover and resume normal operations.
    - No, repeat the double backflushing procedure. If good quality print is still not attained, go to "Backflushing a Valve" on page 6-20.

Figure 6E: Double Backflushing a Nozzle



Backflushing a Valve

Perform this procedure only if you were unsuccessful in achieving good quality print by backflushing or double backflushing a nozzle, or if ink is seeping from the nozzles. Backflushing forces solvent into a valve's outlet port and out its inlet port.

Note: This procedure requires the use of a Backflush Kit. To order see the "Parts List."

Note: Before backflushing, check the inlet and outlet tubing to make sure there are no contaminents lodged in the tubing.

1) Unplug the controller and the printhead power supply.
2) Disconnect the ink line, data lines and power supply cables from the printhead.
3) Remove the ground wire.
4) Remove the printhead enclosure.
5) Remove the printhead assembly from the case. Note: Nozzle blocks must be removed with the printhead assembly. Take care not to stress the ink lines.
6) From your Backflush Kit, obtain the small syringe.
7) Cut a 6" (15.2 cm) piece of valve tubing and connect it to the syringe.
8) Cut a second 6" (15.2 cm) piece of valve tubing.
9) Backflush a valve as follows:

   Note: Backflush only one valve at a time.

   Note: As you perform the next step, make sure to point the tubing away from yourself and have a cloth handy to absorb ink.

   a. Disconnect the inlet tubing from the inlet port and direct into a collection container. (See Figure 6F.)

      Note: Do not disconnect the tubing from the manifold.

   b. Connect the second piece of 6" (15.2 cm) tubing to the inlet port and direct the other end into a collection container.
   c. Disconnect the outlet tubing from the outlet port.
   d. Fill the syringe with solvent – porous or non-porous, as applicable.
   e. Connect the syringe tubing to the outlet port.
   f. Reconnect the data lines and power supply cables to the printhead.
   g. Plug in the controller and the printhead power supply.
   h. Set the controller to purge only the valve you are backflushing. (See your printhead technical manual for purging instructions.)
   i. Block the photocell.
   j. Depress the plunger to force solvent into the outlet port and out the inlet port.
   k. Unblock the photocell and cancel the purge.
   l. Unplug the controller and printhead power supply.

m. Disconnect the data lines and power supply cable from the printhead.

n. Disconnect the syringe tubing from the outlet port.

o. Reconnect the outlet tubing to the outlet port.

p. Disconnect the valve tubing from the inlet port.

q. Reconnect the inlet tubing to the inlet port.

r. Repeat the above steps as necessary for additional valves.

10) Reinstall the printhead assembly in the printhead enclosure, and reconnect the ground wire.

11) Reconnect the ink line, data lines and power supply cables to the printhead.

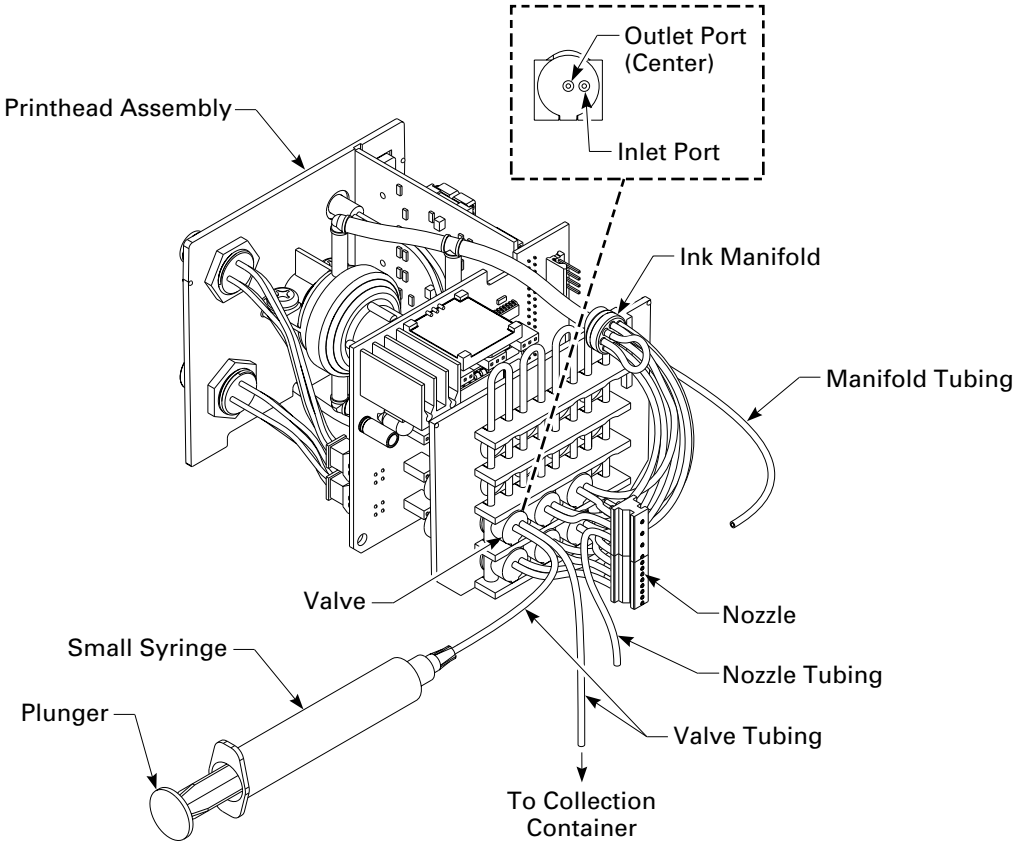
12) Plug in the printhead power supply and the controller.

13) Purge the printhead, then run a test print. (See "Purging a VJ Printhead" on page 5-3.)

14) Was good quality print achieved?

- Yes, reinstall the printhead cover and resume normal operations.
- No, repeat the valve backflushing procedure. If good quality print is still not attained, see "Replacing a VJ Printhead Valve" on page 7-10.

Figure 6F: Backflushing a Valve



7-Repair

Table of Contents

Introduction

This section provides repair procedures for your PatrionPlus controller and VJ printheads. Replacement parts are available. (To order, see the Parts List.) For HR Series printheads, see your HR Series Technical Manual. If you need further assistance, please call your local distributor or Technical Support. Technical Support is available 24 hours a day, 7 days a week.

Technical Support:

U.S. and Canada	(800) 851-3441
International	(618) 234-9093
FAX	(618) 234-1265
E-mail	Blvl_TechSupport@videojet.com

Removing the Controller Top

Several repair procedures in this section require that you remove the top of the controller. Use the following steps to remove the controller top. This procedure is not repeated in the remaining sections; refer back to this procedure as needed.

1) Disconnect all cables, including the power cord, from the back of the controller.

   CAUTION: To avoid electrical shock or damage to equipment, be sure that the power cord is unplugged.

2) Remove the eight screws from the bottom of the controller. (See Figure 7A.)
3) Partially lift and rotate the controller top. (See Figure 7B.)

   CAUTION: Electronic components can be damaged by electrostatic discharge. To prevent damage, wear a grounded wrist strap when handling electronic components.

4) Disconnect all kep ribbon cables from the PCB. (See Figure 7C.)
5) Continue rotating the controller top to access the parts.

Figure 7A: Removing the Controller Screws

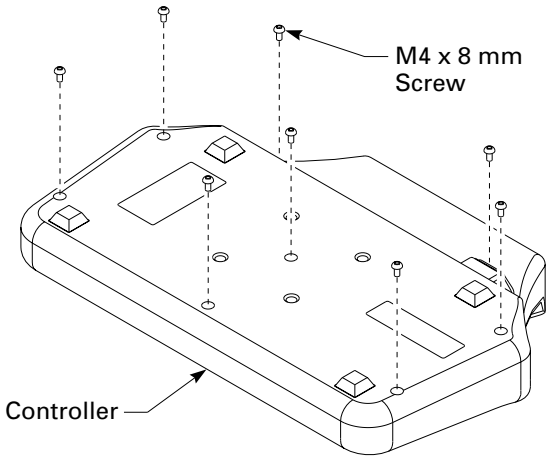
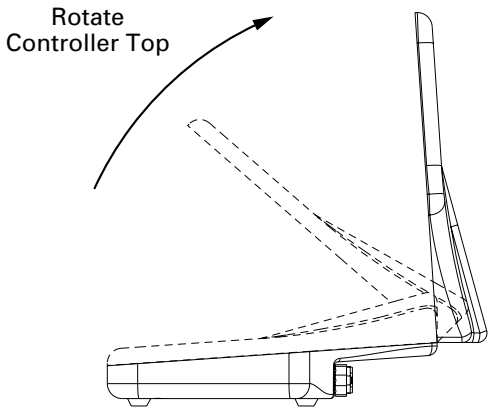
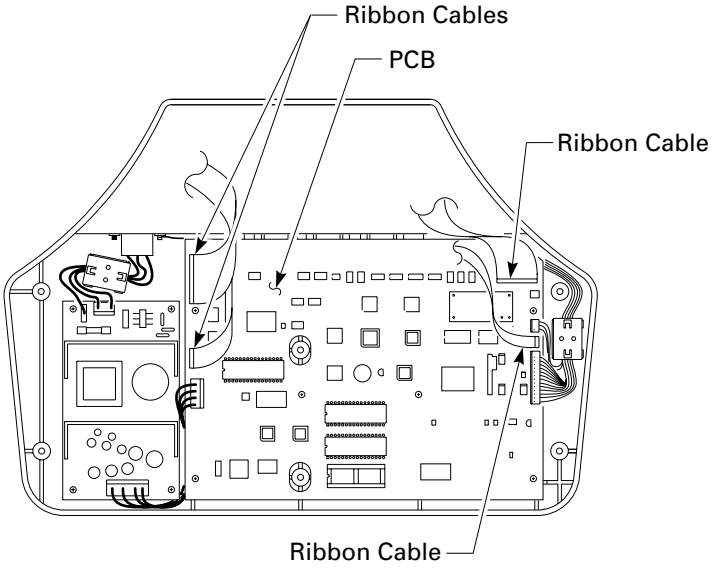


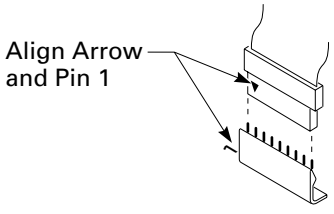
Figure 7B: Removing the Controller Top



Side View of Controller

Figure 7C: Removing the Keypad Ribbon Cables





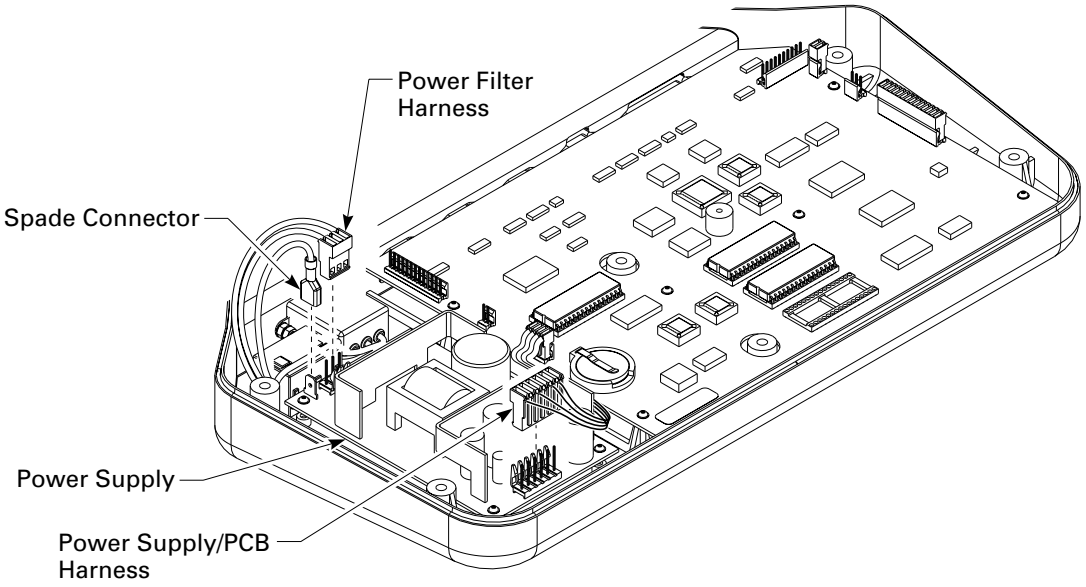
Proper Ribbon Cable Connection

Replacing the Internal Power Supply

To replace the internal power supply, refer to Figures 7D and 7E and follow these steps:

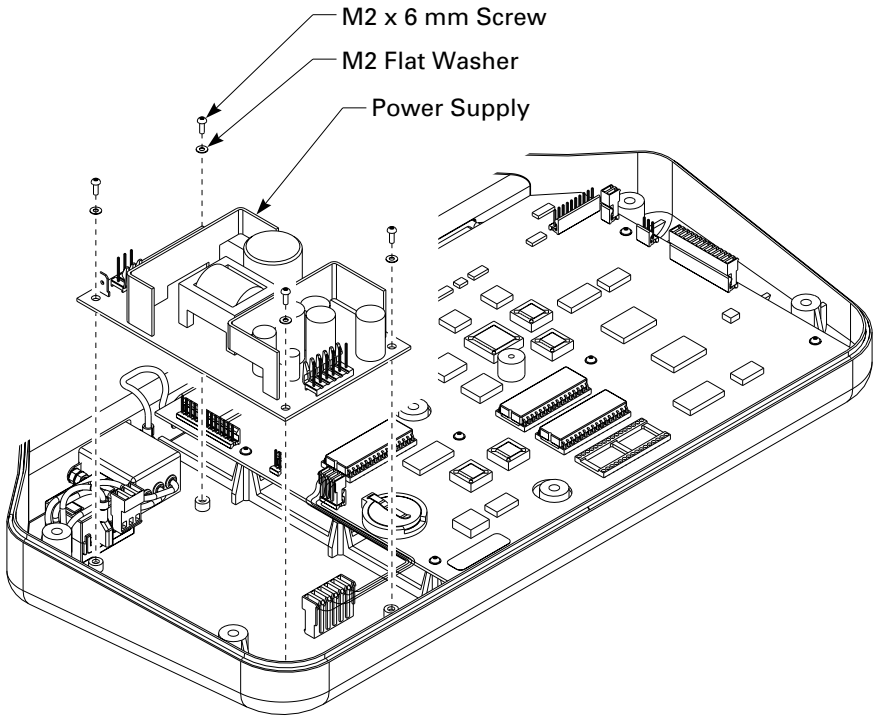
1) Remove the controller top. See "Removing the Controller Top" on page 7-2.
2) Disconnect the power supply/PCB harness from the power supply.
3) Disconnect the power filter harness and spade connector from the power supply.

Figure 7D: Disconnecting the Internal Power Supply



4) Remove the four screws and washers that attach the power supply to the inside of the controller. (See Figure 7E.)
5) Remove the power supply from the controller.
6) Insert the new power supply into the space in the bottom of the controller.
7) Replace the washers and screws to secure the power supply in the controller.
8) Connect the power filter harness and spade connector to the power supply. (See Figure 7E.)
9) Connect the power supply/PCB harness to the power supply.
10) Reassemble the controller.

Figure 7E: Removing the Internal Power Supply



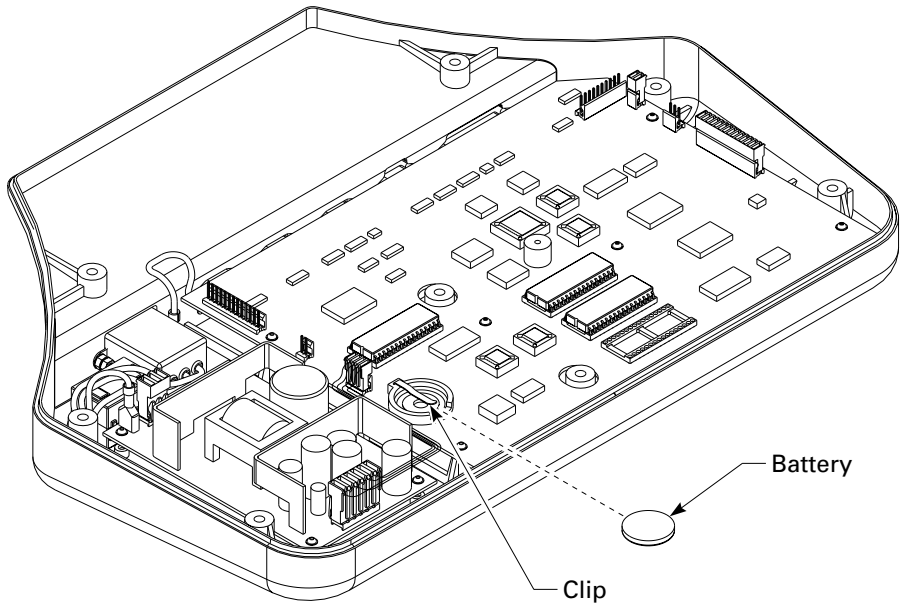
Replacing the Controller PCB Battery

To remove the battery from the controller PCB, refer to Figure 7F and follow these steps:

CAUTION: Be sure to position the battery correctly to avoid damaging it. Replace the battery only with an equivalent battery (see the Parts List). Dispose of used batteries according to local regulations.

1) Remove the controller top. See "Removing the Controller Top" on page 7-2.
2) Lift the front of the battery up while pushing the back of the battery forward until it comes out of its clip. (See Figure 7F.)
3) Insert the new battery under the clip and push it down and into place.
4) Reassemble the controller.

Figure 7F: Controller PCB Battery

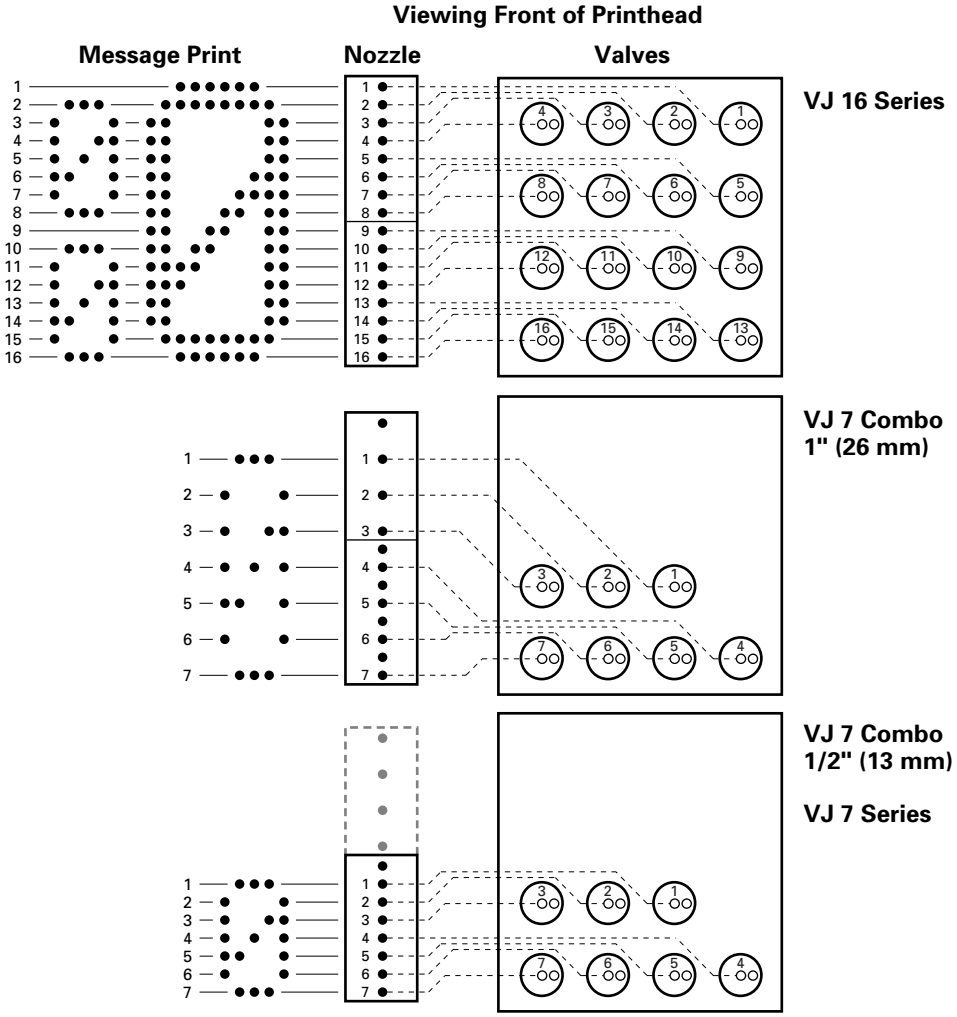


Replacing a VJ Printhead Nozzle Block

To replace a nozzle assembly, follow the directions below:

1) Purge the printhead.
2) Run a print sample while the printhead is in the "purge" mode.
3) Check the print sample to locate the clogged nozzle. The clogged nozzle will be the dot(s) that did not print or are of poor quality.
4) Starting with the top dot and working down, count the dots of the sample; the problem nozzle will correspond with the problem dot. (See Figure 7G.)
5) Exit the purge mode on the controller.

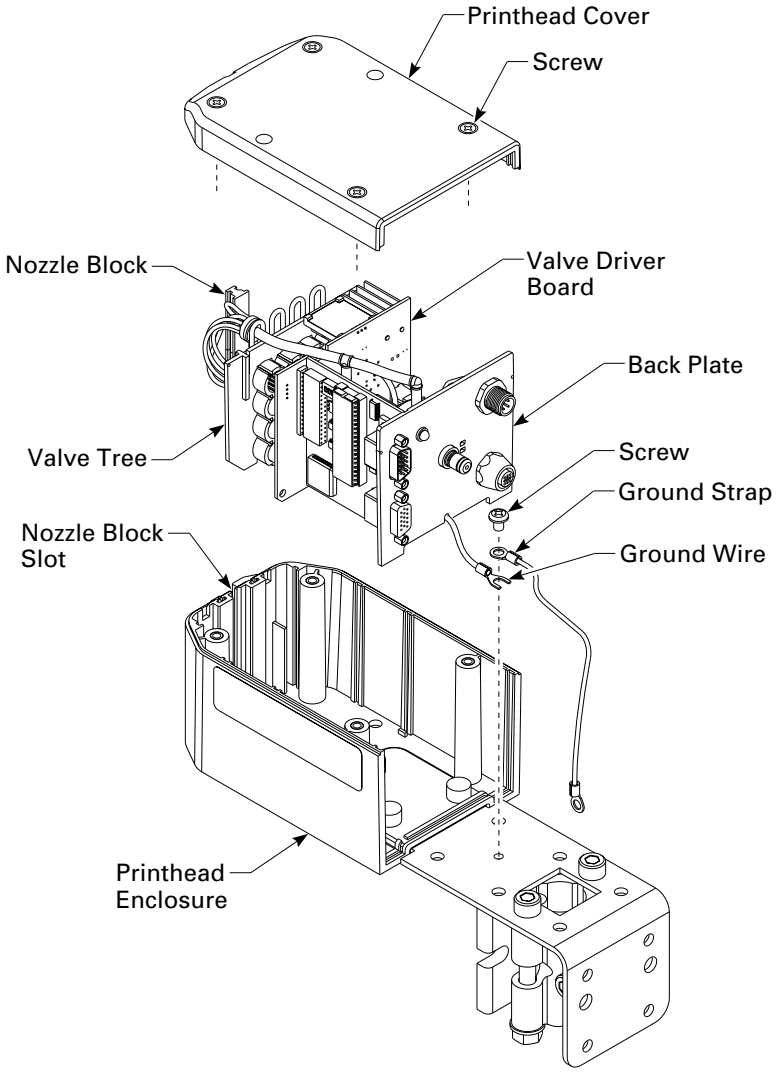
Figure 7G: Valve to Nozzle Configuration



6) Turn off the printhead power supply.
7) Disconnect the power cables, data lines, and the ink line from the back of the printhead.
8) Remove the screw securing the printhead ground wire to the printhead bracket. (See Figure 7H.)
9) Loosen the four screws on the printhead cover.
10) Remove the printhead cover.
11) Remove the printhead assembly from the printhead enclosure.

Note: Nozzle blocks must be removed with the printhead assembly. Be careful not to stress the ink lines when removing the printhead assembly.

Figure 7H: Removing the Printhead Assembly



12) Carefully remove the first valve tubing and reconnect it to the new nozzle assembly. (See Figure 7I.) Remove and reconnect the remaining valve tubings, one at a time in the appropriate sequence.

Note: Each nozzle block is keyed and will only fit into a slot one way.

13) Ensure the ink tubes are connected to the corresponding nozzle.

14) Replace the printhead assembly in the bottom enclosure, being careful to line up the back plate, valve driver board, and valve holder. Simultaneously install the nozzle blocks into the front slot.

15) Turn on the printhead power supply.

16) Purge the printhead. (See "Purging a VJ Printhead" on page 5-3.)

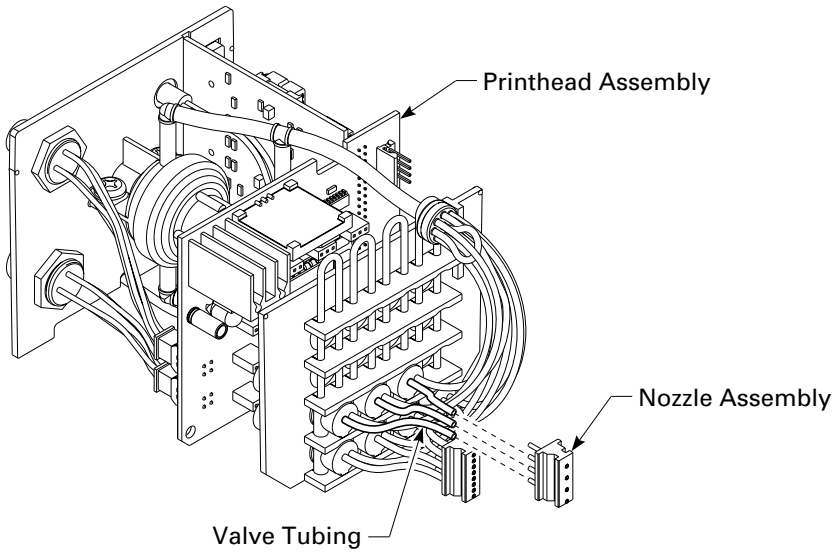
17) Run several print samples to ensure the debris has been removed.

18) If the problem is corrected, replace the printhead cover and tighten the four screws.

19) Secure the printhead ground wire to the printhead bracket with the screw.

20) If the problem remains after several purges and print samples, it may be necessary to replace a valve. (See "Replacing a VJ Printhead Valve" on page 7-10.)

Figure 7I: Replacing a Nozzle Assembly



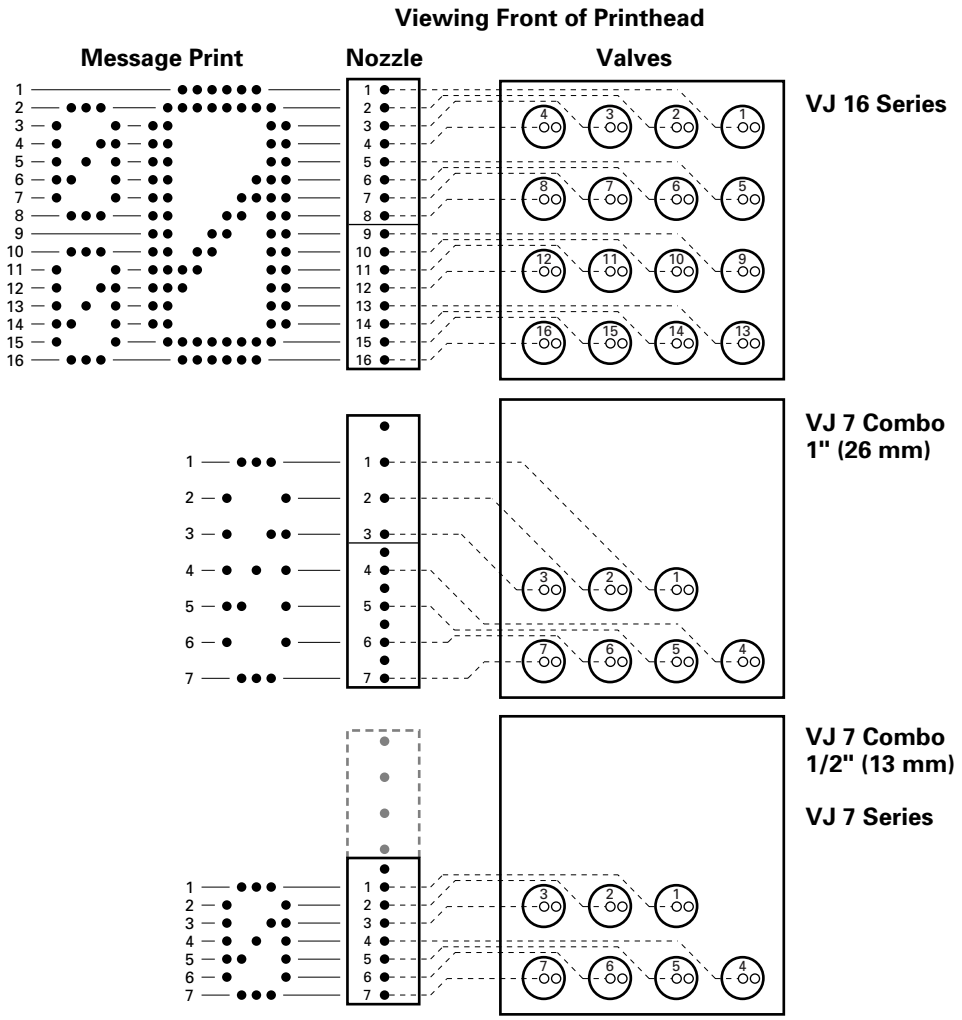
Replacing a VJ Printhead Valve

If after backflushing a valve your print quality does not improve, it may be necessary to replace a valve. To replace a valve follow the directions below:

1) Purge the printhead. (See "Purging a VJ Printhead" on page 5-3.)
2) Run a print sample while the printhead is in the "purge" mode.
3) Check the print sample to locate the problem valve. The problem valve is indicated by either the missing or poor quality dot(s) on the print sample.
4) Starting with the top dot of the print sample and working down, count the dots of the sample; the problem valve will correspond with the problem dot (see Figure 7J);

   OR, using an ohm meter, check the coil resistance of each valve. The resistance should be at 24 ohms, +/-1. Any valves that do not fall within this range must be replaced.
5) Exit the purge mode on the controller.

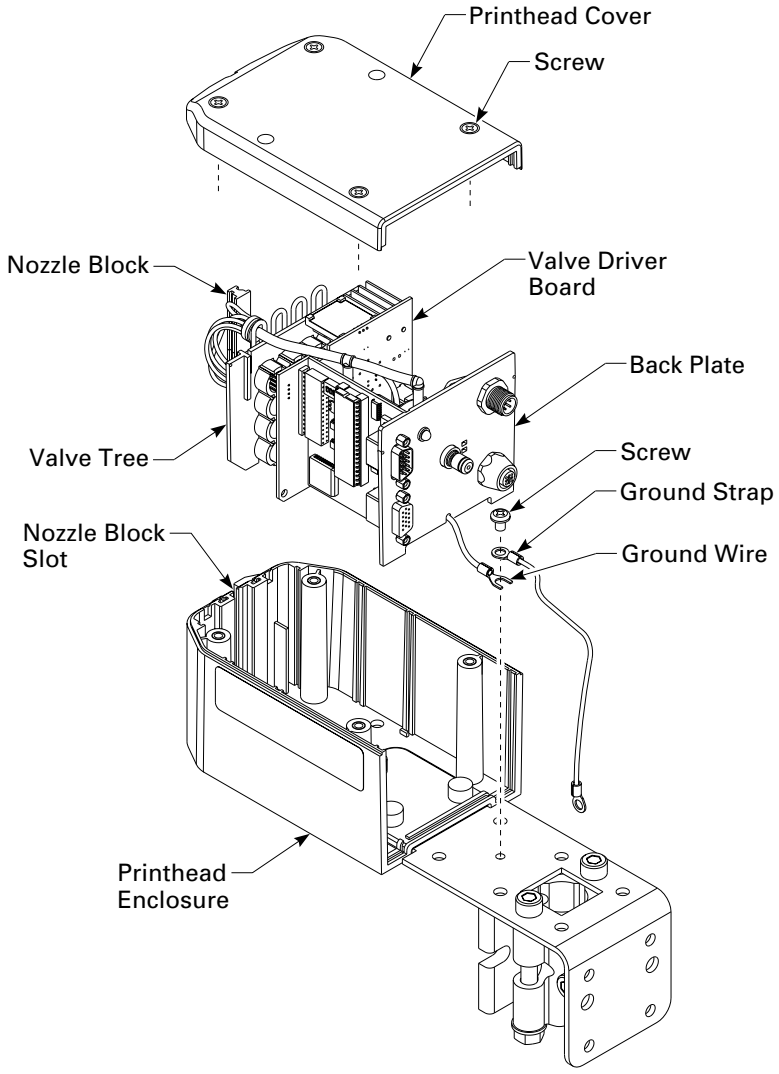
Figure 7J: Valve to Nozzle Configuration



6) Turn off the printhead power supply.
7) Disconnect the power cables, data lines, and the ink line from the back of the printhead.
8) Remove the screw securing the printhead ground wire to the printhead bracket. (See Figure 7K.)
9) Loosen the four screws on the printhead cover.
10) Remove the printhead cover.
11) Remove the printhead assembly from the printhead enclosure.

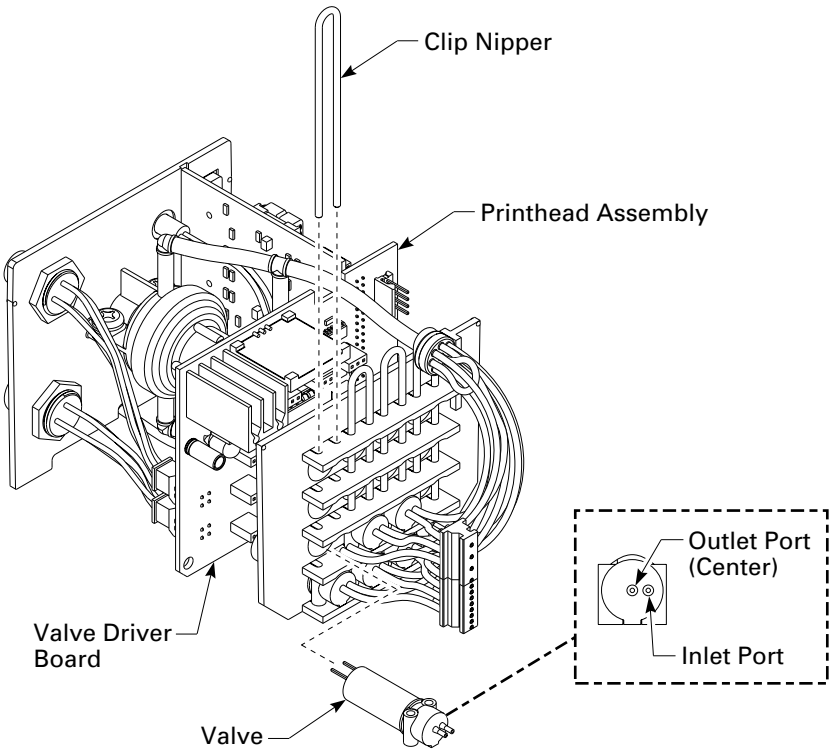
Note: Nozzle blocks must be removed with the printhead assembly. Be careful not to stress the ink lines when removing the printhead assembly.

Figure 7K: Removing the Printhead Assembly



12) Disconnect both pieces of tubing from the defective valve. (See Figure 7L.)
13) Remove the valve clip nipper.
14) Remove the defective valve from the valve driver board.
15) Plug in the new valve to the valve driver board.

Figure 7L: Replacing a Valve



16) Connect the tubing from the manifold to the off-center port on the valve.
17) Connect the tubing from the nozzle to the center port on the valve.
18) Replace the valve clip nipper.
19) Replace the printhead assembly in the bottom enclosure, being careful to line up the back plate, valve driver board, and valve holder. Simultaneously install the nozzle blocks into the front slot.
20) Replace the printhead cover.
21) Tighten the four screws on the top of the printhead cover.
22) Secure the printhead ground wire to the printhead bracket with the screw.
23) Turn on the printhead power supply.
24) Purge the printhead. (See “Purging a VJ Printhead” on page 5-3.)
25) Run several print samples to ensure the debris has been completely removed.
26) If the problem is corrected, place the printhead cover on the printhead enclosure and tighten the four screws on the cover.
27) If the problem remains after several purges and print samples, it may be necessary to replace the valve driver chip. (See “Replacing a Valve Driver Chip” on page 7-14.)

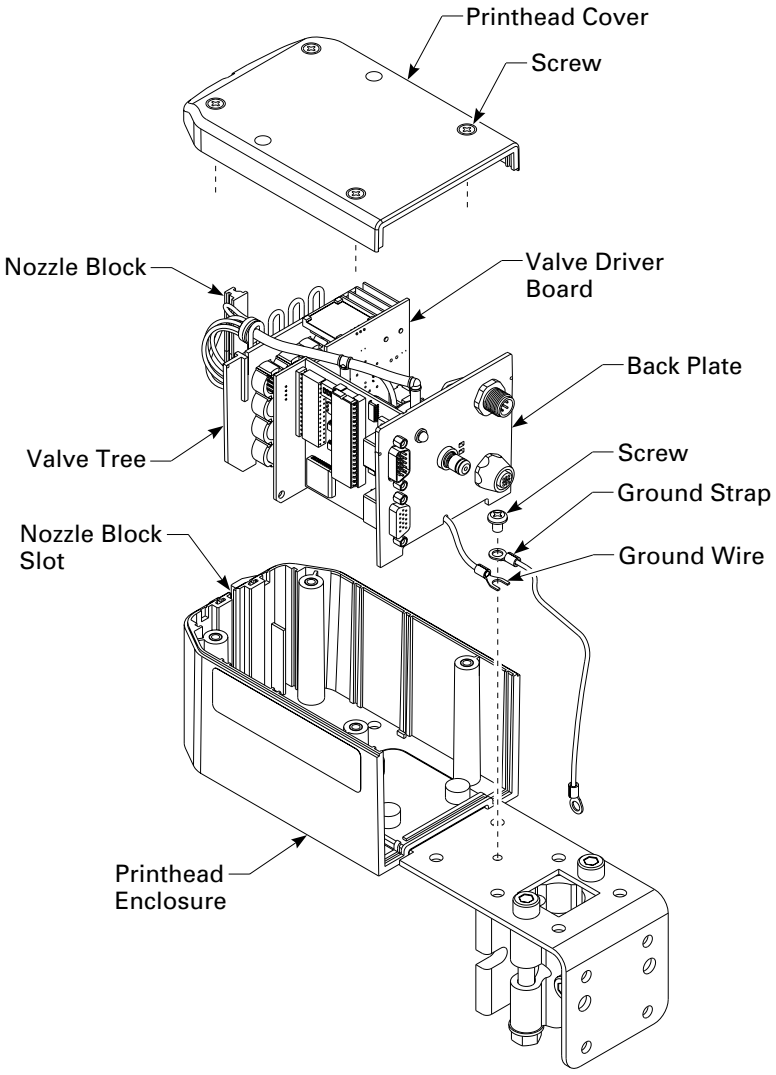
Replacing a Valve Driver Chip

If after replacing a valve the printhead does not function, it may be necessary to replace a driver chip. To replace a driver chip:

1) Turn off the printhead power supply.
2) Disconnect the power cables, data lines, and the ink line from the back of the printhead.
3) Remove the screw securing the printhead ground wire to the printhead bracket. (See Figure 7M.)
4) Loosen the four screws on the printhead cover.
5) Remove the printhead cover.
6) Remove the printhead assembly from the printhead enclosure.

Note: Nozzle blocks must be removed with the printhead assembly. Be careful not to stress the ink lines when removing the printhead assembly.

Figure 7M: Removing the Printhead Assembly



7) Separate the valve tree from the driver board. (See Figure 7N.)
8) Locate and remove the driver chip(s) that corresponds with the problem valve. (See Figure 7O.)

Driver Chip	Valves
U4	V1, V2, V3, V4
U3	V5, V6, V7, V8
U2	V9, V10, V11, V12
U1	V13, V14, V15, V16

9) Place the new driver chip into the appropriate location. (See Figure 7O.)
10) Replace the valve tree.
11) Replace the printhead assembly into the printhead enclosure.
12) Replace the printhead cover.
13) Tighten the four screws on the printhead cover.
14) Secure the printhead ground wire to the printhead bracket with the screw.
15) Reconnect the ink line, data lines, and power cables to the back of the printhead.
16) Turn on the printhead power supply.

Figure 7N: Removing the Valve Tree

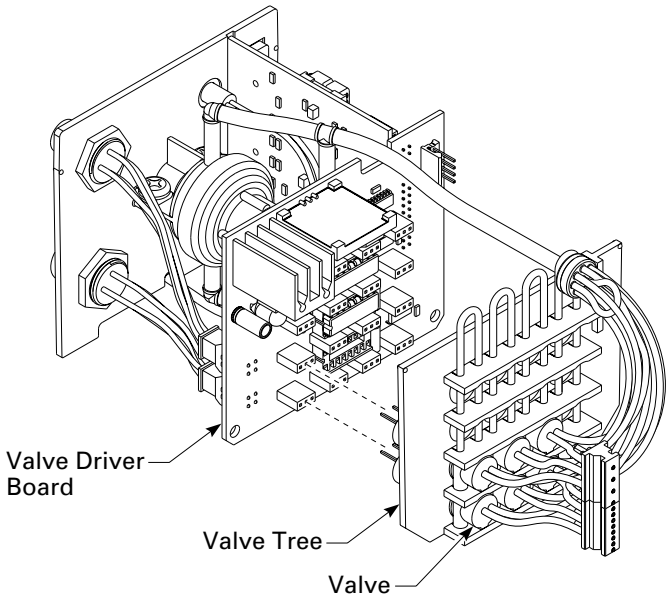
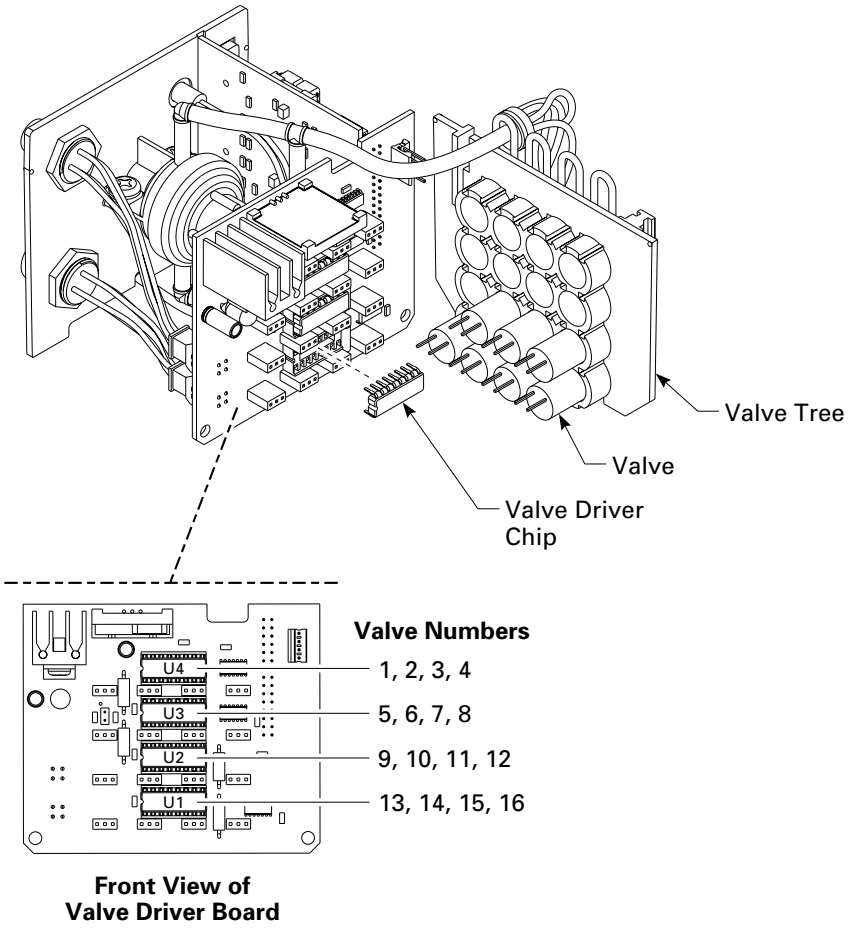


Figure 7O: Replacing a Valve Driver Chip



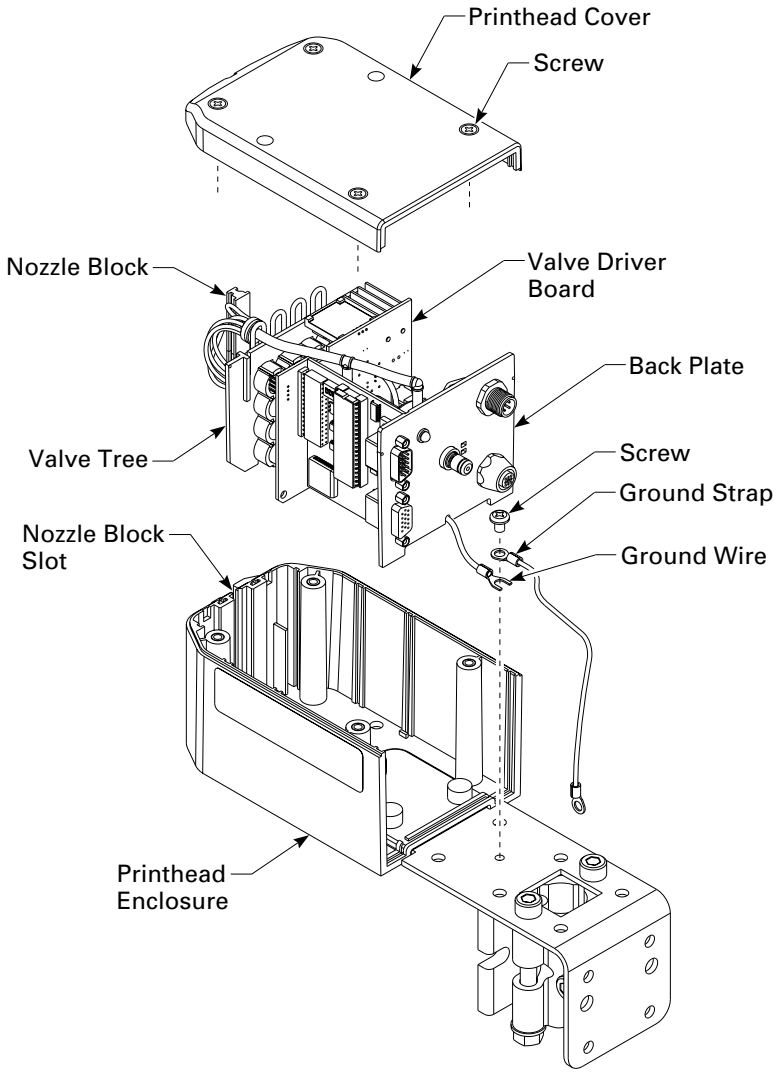
Replacing the Valve Driver Board

To remove the valve driver board from the printhead, follow these steps:

1) Turn off the printhead power supply.
2) Disconnect the power cables, data lines, and the ink line from the back of the printhead.
3) Remove the screw securing the printhead ground wire to the printhead bracket. (See Figure 7P.)
4) Loosen the four screws on the printhead cover.
5) Remove the printhead cover.
6) Remove the printhead assembly from the printhead enclosure.

Note: Nozzle blocks must be removed with the printhead assembly. Be careful not to stress the ink lines when removing the printhead assembly.

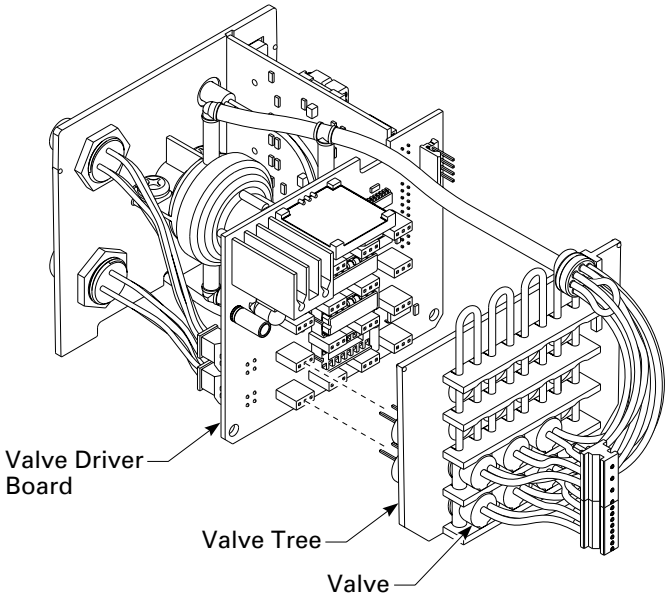
Figure 7P: Removing the Printhead Assembly



7) Set the printhead assembly on a clean, flat surface.

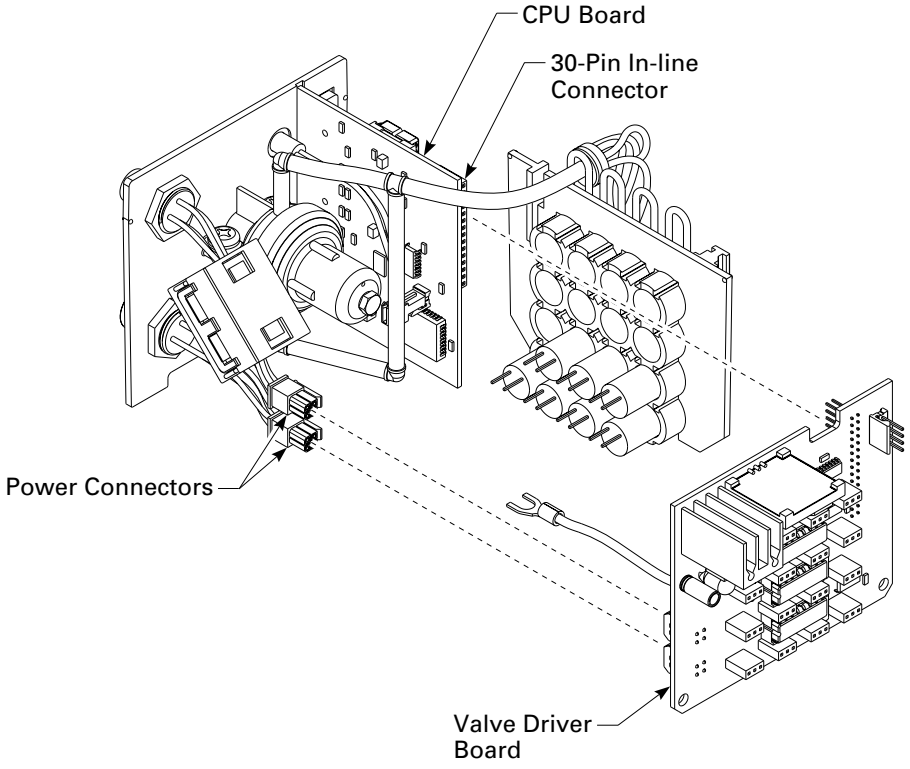
8) Using a gentle, rocking motion, pull the valve tree holder back to separate the valve from the valve driver board. (See Figure 7Q.)

Figure 7Q: Removing the Valve Tree



9) Disconnect the power connectors from the valve driver board. (See Figure 7R.)
10) Disconnect the valve driver board from the CPU board at the 30-pin in-line connector.
11) Carefully align the new valve driver board connector with the CPU board connector and push together.
12) Connect the power connectors to the valve driver board.
13) Use the valve tree to align the valve pins with the connectors on the valve driver board. Once aligned, push the valves to seat them in the connectors.
14) Inspect the valve driver board to ensure that all valve pins are connected; if they are not, repeat step 13.
15) Replace the printhead assembly into the printhead enclosure.
16) Replace the printhead cover.
17) Tighten the four screws on the printhead cover.
18) Secure the printhead ground wire to the printhead bracket with the screw.
19) Reconnect the ink line, data lines, and power cables to the back of the printhead.
20) Turn on the printhead power supply.

Figure 7R: Replacing the Valve Driver Board



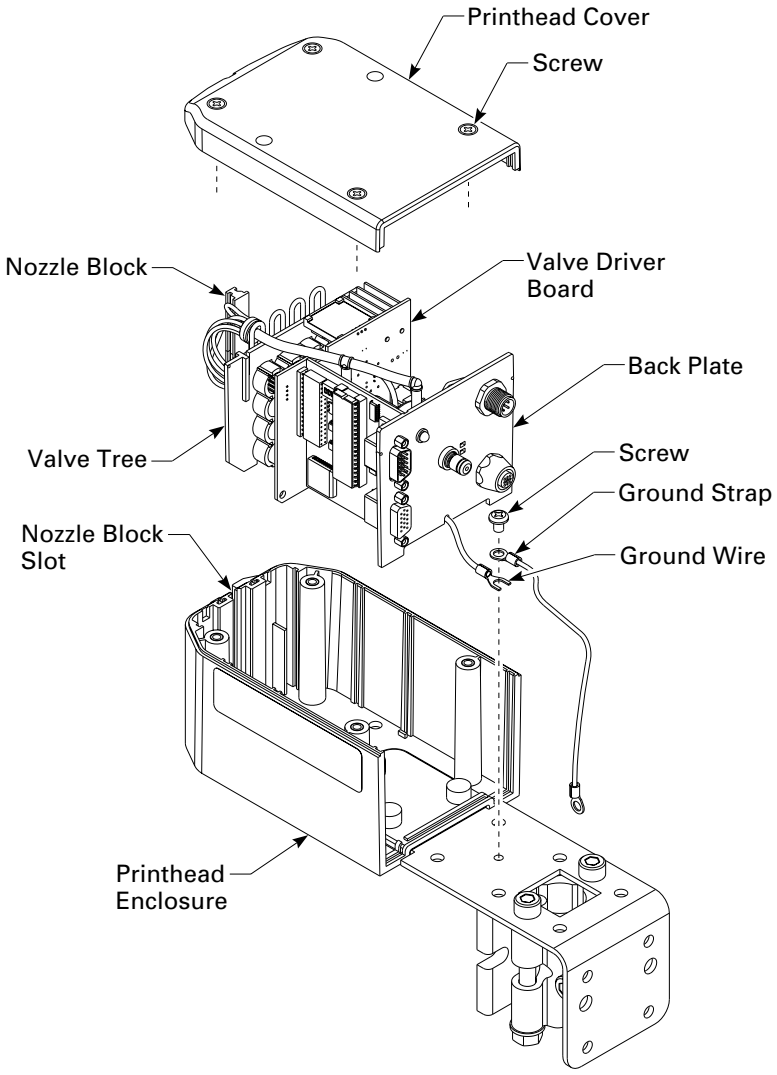
Replacing the Regulator

If ink is leaking from the regulator inside of the printhead, the regulator may be cracked and should be replaced. To replace the regulator:

1) Turn off the printhead power supply.
2) Disconnect the power cables, data lines, and the ink line from the back of the printhead.
3) Remove the screw securing the printhead ground wire to the printhead bracket. (See Figure 7S.)
4) Loosen the four screws on the printhead cover.
5) Remove the printhead cover.
6) Remove the printhead assembly from the printhead enclosure.

Note: Nozzle blocks must be removed with the printhead assembly. Be careful not to stress the ink lines when removing the printhead assembly.

Figure 7S: Removing the Printhead Assembly

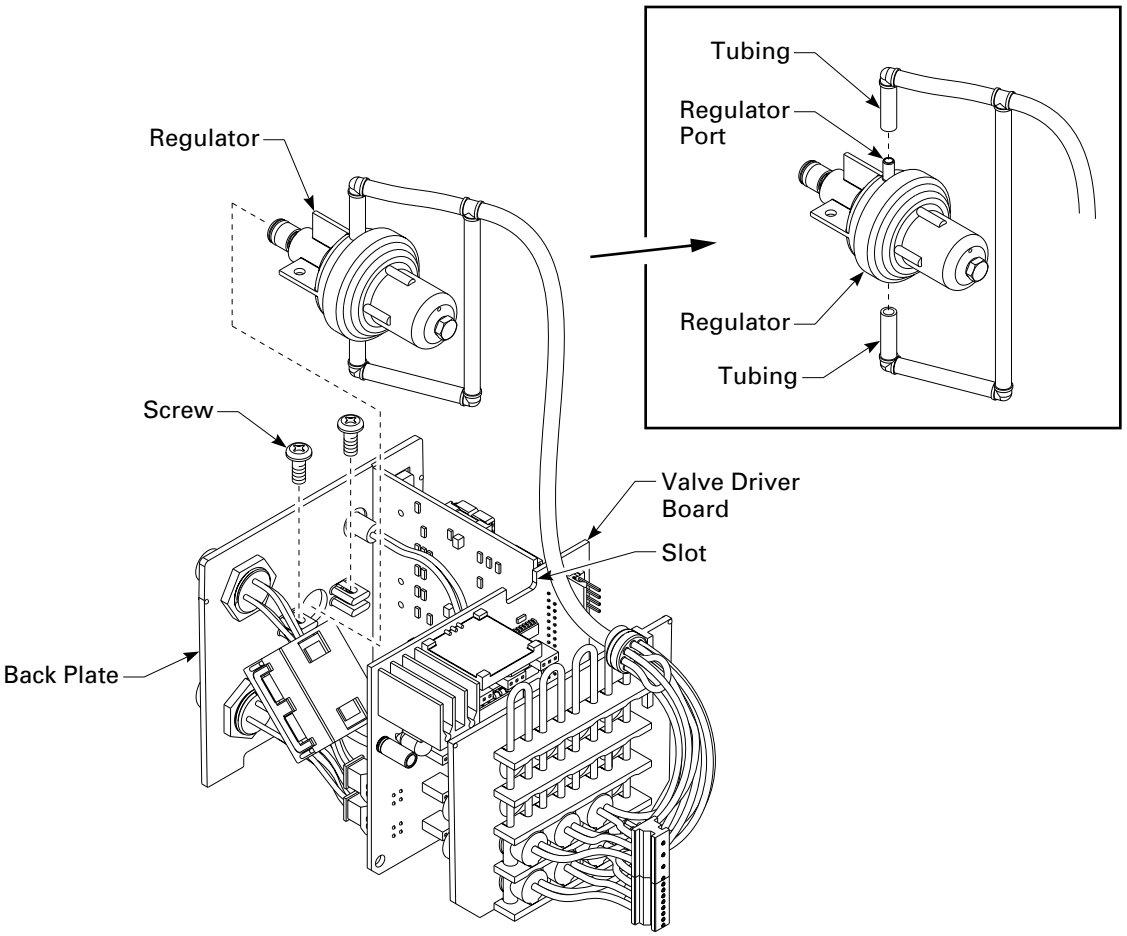


7) Unscrew the two regulator screws and remove the regulator.

CAUTION: Pressure may be present.

8) Remove the tubing from the defective regulator. (See Figure 7T.)
9) Using fingers, carefully slide the tubing onto the regulator ports of the new regulator.
10) Position the new regulator through the opening in the back plate.
11) Replace the two regulator screws.
12) Replace the printhead assembly into the printhead enclosure.
13) Replace the printhead cover.
14) Tighten the four screws on the printhead cover.
15) Secure the printhead ground wire to the printhead bracket with the screw.
16) Reconnect the ink line, data lines, and power cables to the back of the printhead.
17) Turn on the printhead power supply.

Figure 7T: Replacing the Regulator



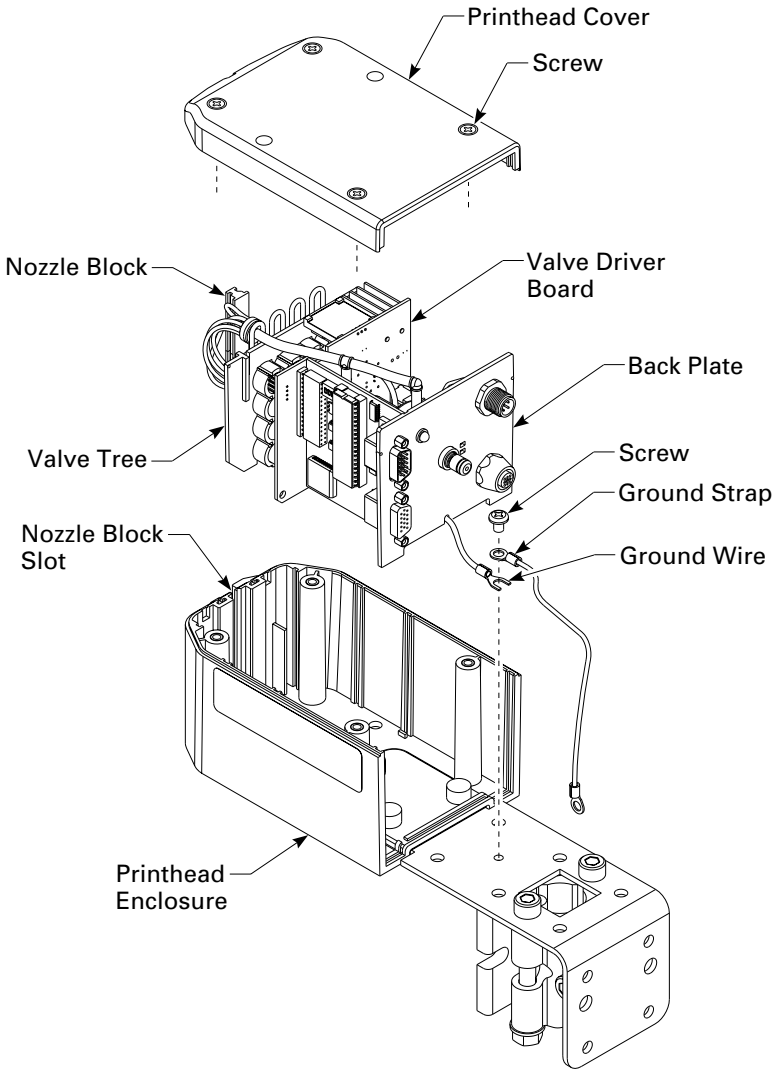
Replacing the Printhead LED

If the printhead LED does not light up and appears to be defective, you can replace it.

1) Turn off the printhead power supply.
2) Disconnect the power cables, data lines, and the ink line from the back of the printhead.
3) Remove the screw securing the printhead ground wire to the printhead bracket. (See Figure 7U.)
4) Loosen the four screws on the printhead cover.
5) Remove the printhead cover.
6) Remove the printhead assembly from the printhead enclosure.

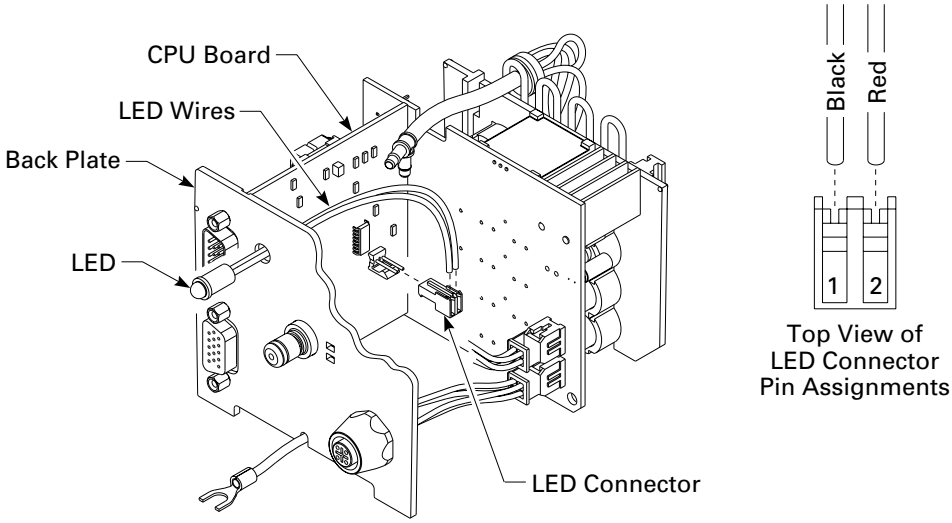
Note: Nozzle blocks must be removed with the printhead assembly. Be careful not to stress the ink lines when removing the printhead assembly.

Figure 7U: Removing the Printhead Assembly



7) Disconnect the LED connector from the CPU board. (See Figure 7V.)
8) Remove the connector from the LED wires.
9) Remove the LED and wires through the back plate.
10) Install the new LED and the wires through the back plate.
11) Install the connector onto the LED wires.
12) Place the new LED connector in the appropriate location on the CPU board. (See Figure 7V.)
13) Replace the printhead assembly into the printhead enclosure.
14) Replace the printhead cover.
15) Tighten the four screws on the printhead cover.
16) Secure the printhead ground wire to the printhead bracket with the screw.
17) Reconnect the ink line, data lines, and power cables to the back of the printhead.
18) Turn on the printhead power supply.

Figure 7V: Replacing the LED



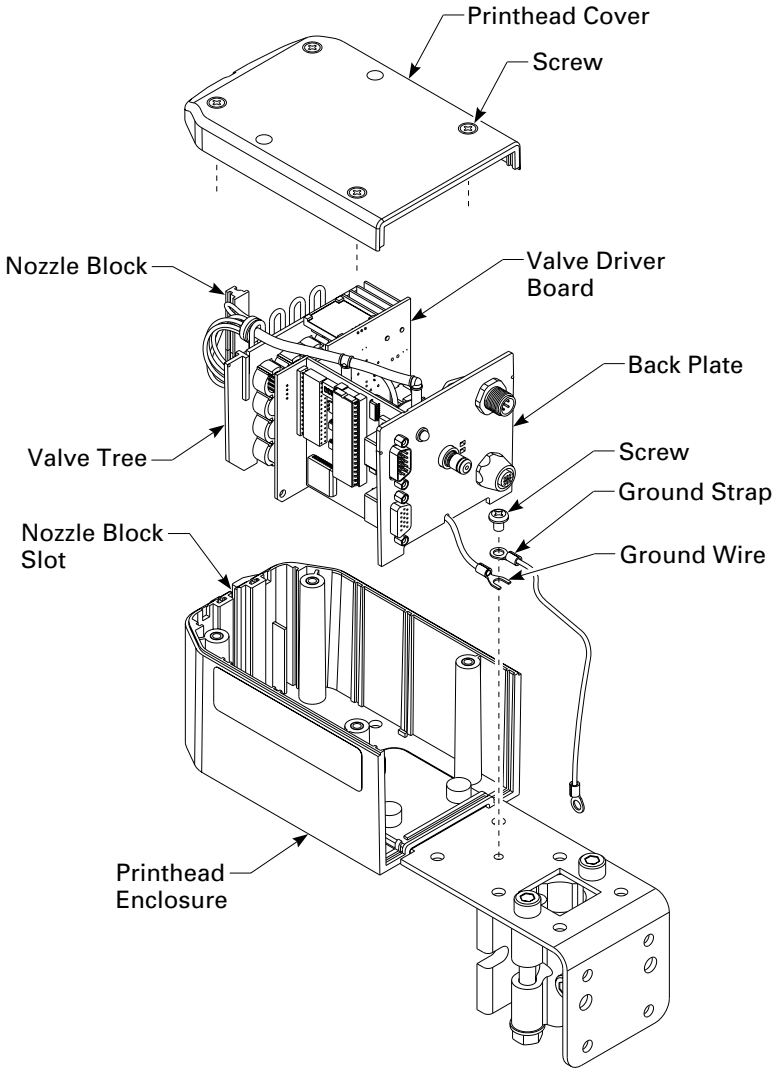
Note: Some components have been removed for illustration purposes.

Replacing a Printhead CPU Board

1) Turn off the printhead power supply.
2) Disconnect the power cables, data lines, and the ink line from the back of the printhead.
3) Remove the screw securing the printhead ground wire to the printhead bracket. (See Figure 7W.)
4) Loosen the four screws on the printhead cover.
5) Remove the printhead cover.
6) Remove the printhead assembly from the printhead enclosure.

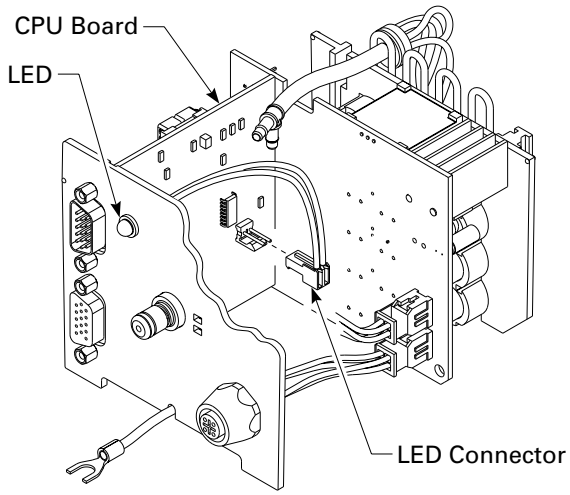
Note: Nozzle blocks must be removed with the printhead assembly. Be careful not to stress the ink lines when removing the printhead assembly.

Figure 7W: Removing the Printhead Assembly



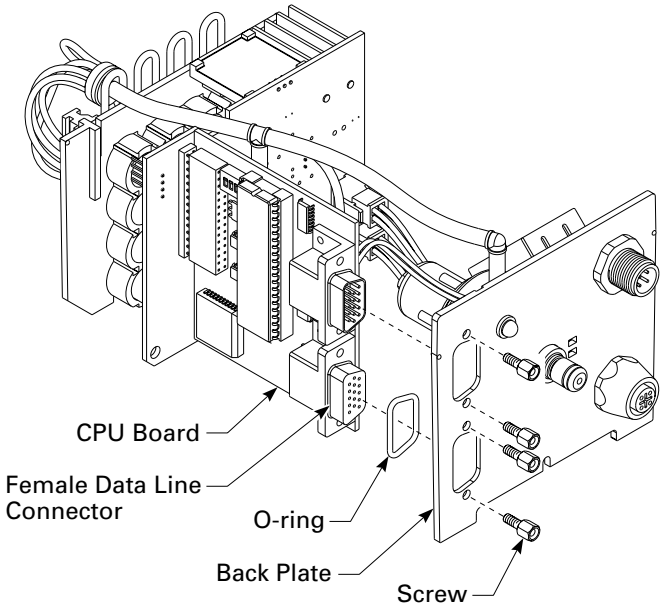
7) Set the printhead assembly on a clean, flat surface.
8) Disconnect the LED connector from the CPU board. (See Figure 7X.)
9) Remove the four screws holding the CPU board to the printhead back plate. (See Figure 7Y.)
10) Remove and retain the o-ring from the female data line connector.

Figure 7X: Removing the LED Connector



Note: Some components have been removed for illustration purposes.

Figure 7Y: Removing the Back Plate



11) Separate the CPU board from the valve driver board at the 30-pin in-line connector.

12) Carefully align the new CPU board connector with the valve driver board connector and push together. (See Figure 7Z.)

Note: Improper alignment of these boards will cause severe damage to the CPU board.

13) Install the retained o-ring on the new CPU board's female data line connector.

14) Slide the back plate back over the data line connectors and secure with the four screws removed earlier in this procedure.

15) Reconnect the LED connector.

Note: If more than one printhead is being used, be sure to set the printhead address for each printhead. See "Setting Printhead DIP Switches in VJ Printheads" on page 3-7.

16) Replace the printhead assembly into the printhead enclosure.

17) Replace the printhead cover.

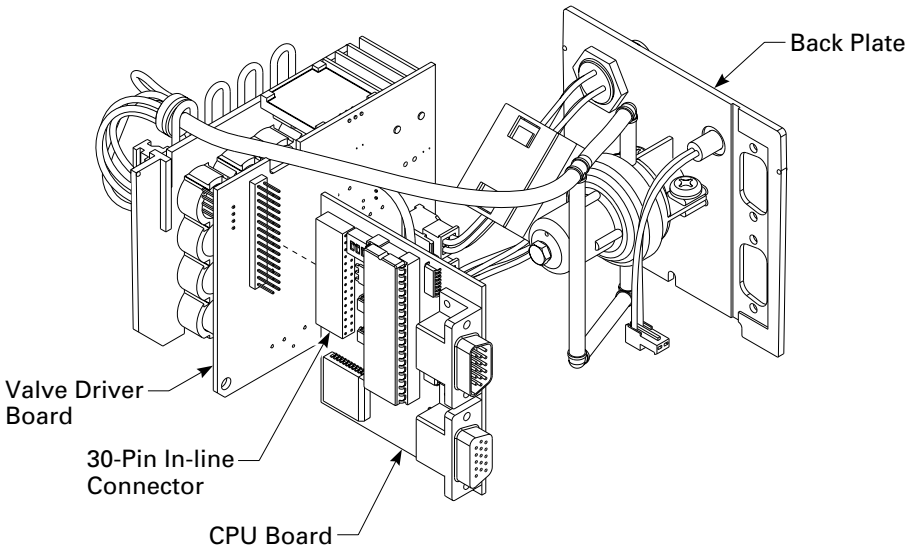
18) Tighten the four screws on the printhead cover.

19) Secure the printhead ground wire to the printhead bracket with the screw.

20) Reconnect the ink line, data lines, and power cables to the back of the printhead.

21) Turn on the printhead power supply.

Figure 7Z: Replacing the CPU Board



8-Parts List

Table of Contents

Parts List

Introduction

Use the Parts List to obtain whatever you might need to expand, upgrade, repair, or maintain your system. The Parts List includes exploded illustrations of system components with a textual parts listing. The illustrations and parts lists denote three categories of items:

- ○ Saleable Part. Items that you can obtain directly from your local distributor or Videojet Technologies Inc.
- ◇ Included with a Saleable Part. Items not available individually, but included with something else that is available through your local distributor or Videojet Technologies Inc.
- ▽ Nonsaleable – Contact your distributor. Items shown for reference purposes. Some of them – for example, the fasteners – can be obtained through local resources.

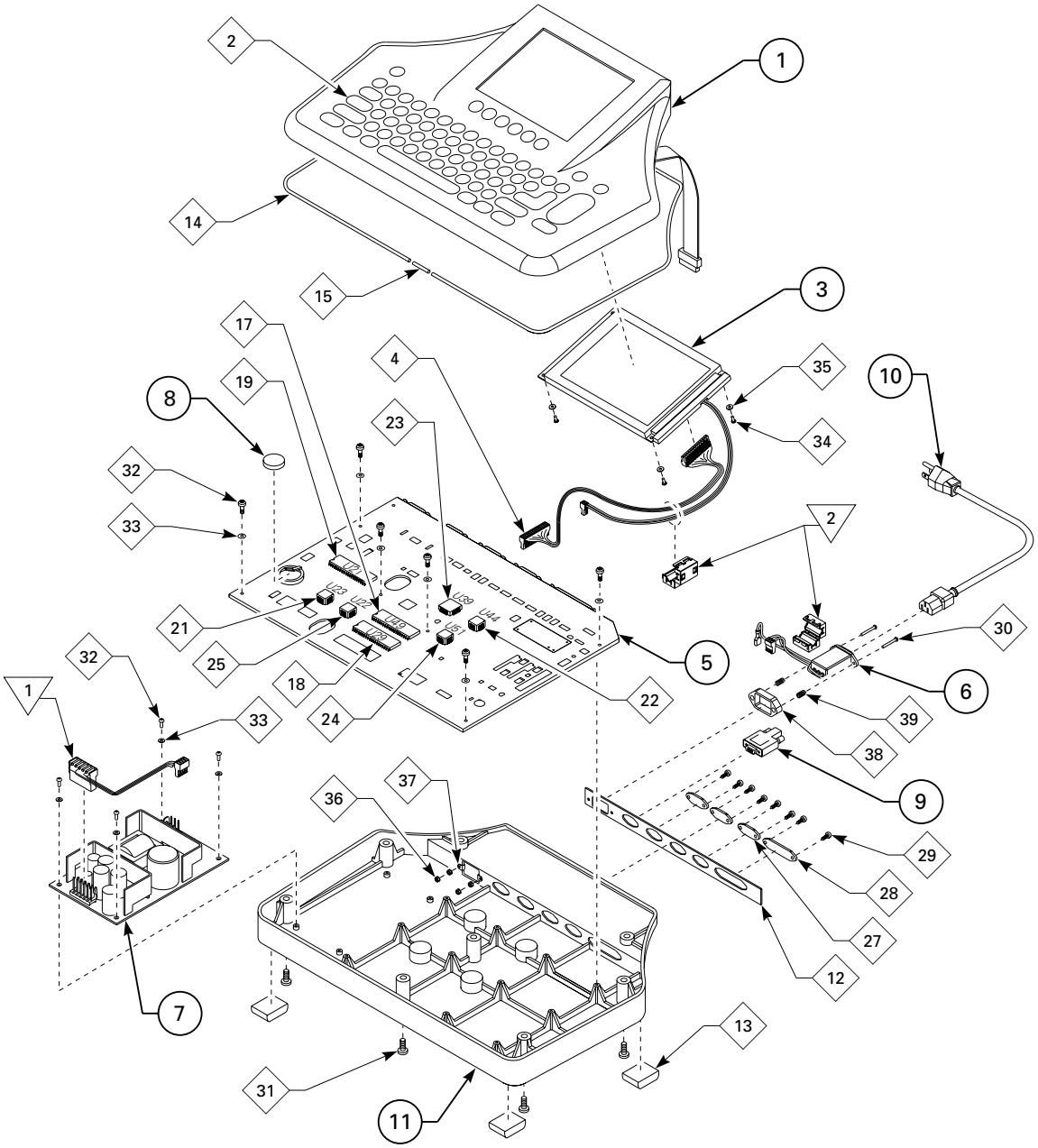
To place an order, provide your local distributor or Videojet Technologies Inc. with part numbers and quantities.

Parts List

Description	Part Number	Quantity per Package
PatrionPlus Controller with Printhead Power Supply	29902	1
○ 1. Enclosure, Top	RP21385	1
◇ 2. Keypad		1
○ 3. Display, LCD	RP32191	1
◇ 4. Harness, Display		1
○ 5. Board, Controller Printed Circuit Board (PCB)	RP25016	1
○ 6. Filter, Power	RP19825	1
○ 7. Power Supply, Internal	RP18710	1
○ 8. Battery	RP21601	1
○ 9. Terminator	RP21256	1
○ 10. Cord, Power U.S.	RPJ500-0043-001	1
○ 11. Enclosure, Bottom	RP21386	1
◇ 12. Gasket, Seal		1
◇ 13. Foot, Rubber		4
◇ 14. Gasket, Tubular		1
◇ 15. Tube, 18 AWG		1
○ 16. Software Kit, PatrionPlus Controller EPROM	31423	1
◇ 17. Software, User Interface		1
◇ 18. Software, Fonts		1
◇ 19. Software, Print Controller		1
○ 20. Software Kit, PatrionPlus Controller PLD	30735	1
◇ 21. Software, PCIO PLD		1
◇ 22. Software, INT PLD		1
◇ 23. Software, IO PLD		1
◇ 24. Software, MEM PLD		1
◇ 25. Software, PC MEM PLD		1
○ 26. Hardware Kit, PatrionPlus Controller	RP21434	1
◇ 27. Coverplate, Short		1
◇ 28. Coverplate, Long		2
◇ 29. Screw, Phillips Pan Head 4-40 x 1/4"		6
◇ 30. Screw, Phillips Pan Head M3 x 25 mm		2
◇ 31. Screw, Phillips Pan Head 4 mm x 8 mm		8
◇ 32. Screw, M2 x 6 mm		10
◇ 33. Washer, Flat M2		10
◇ 34. Screw, Phillips Pan Head 2-28 x 1/4"		4
◇ 35. Washer, Flat #2		4
◇ 36. Nut, Hex with External Lock Washer M3		2
◇ 37. Clip, Corcom		2

○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

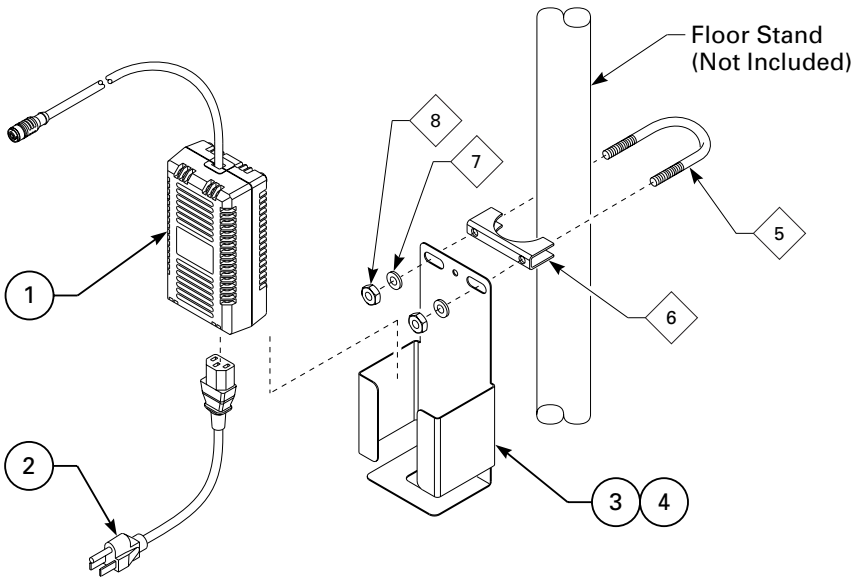
Description	Part Number	Quantity per Package
◇38. Spacer, Line Filter		2
◇39. Spring, Wire 1/4" x 1/2" x 0.032"		2
▽ 1. Harness, Power Supply/PCB		
▽ 2. Ferrite, Clamp-on		



○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

Parts List

Description	Part Number	Quantity per Package
Printhead Power Supply and Components		
○ 1. Power Supply, Printhead	29865	1
○ 2. Cord, Power U.S.	RPJ500-0043-001	1
○ 3. Bracket, Printhead Power Supply	26396	1
○ 4. Bracket, Printhead Power Supply Floor Stand	26235	1
◇ 5. U-Bolt, 3/8"-16 x 2		1
◇ 6. Bracket, Pipe U-Bolt		1
◇ 7. Washer, 21/32" x 13/32" x 1/32"		2
◇ 8. Nut, Hex 3/8"-16		2
○ 9. Cable, Printhead Power 0.5 m (not shown) Cable, Printhead Power 1 m (not shown) Cable, Printhead Power 2 m (not shown) Cable, Printhead Power 4 m (not shown)	27352 27353 29839 27354	1 1 1 1



○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

Description	Part Number	Quantity per Package
VJ 710 Printhead with Conveyor-Mounting Bracketry	29784	1
VJ 720 Printhead with Conveyor-Mounting Bracketry	29785	1
VJ 07Combo Printhead with Conveyor-Mounting Bracketry	29786	1
VJ 1620 Printhead with Conveyor-Mounting Bracketry	29787	1
VJ 1630 Printhead with Conveyor-Mounting Bracketry	29788	1
VJ 1650 Printhead with Conveyor-Mounting Bracketry	29789	1
○ 1. **710 Printhead**		
Nozzle Assembly, 0.066 x 7, 10 mm	RP21522	1
720 Printhead		
Nozzle Assembly, 0.126 x 7, 20 mm	RP21511	1
07Combo Printhead		
Nozzle Assembly, 0.084 x 8, 13 mm	RP21509	1
Nozzle Assembly, 0.168 x 4, 26 mm	RP21510	1
1620 Printhead		
Nozzle Assembly, 0.066 x 16, 20 mm	RP19275	1
1630 Printhead		
Nozzle Assembly, 0.084 x 8, 13 mm (Req. 2)	RP21509	1
1650 Printhead		
Nozzle Assembly, 0.126 x 7, 20 mm (Req. 2)	RP21511	1
○ 2. **710 Printhead**		
Nozzle Block, Blank Short (Req. 3)	RP12871	5
720 Printhead		
Nozzle Block, Blank Short	RP12871	5
Nozzle Block, Blank Long	RP18774	1
07Combo, 1620, 1630 Printheads		
Nozzle Block, Blank Short (Req. 2)	RP12871	5
1650 Printhead		
Nozzle Block, Blank Short	RP12871	5
○ 3. Tubing, Valve Printhead Vinyl	RPJ501-0030-004	As Required
○ 4. Manifold	RP19399	1
○ 5. Clip, Nipper	RP10025	5
○ 6. Board, PatrionPlus Printhead Driver	RP29812	1
○ 7. Regulator, Printhead	RP19274	1
○ 8. Tubing, 1/8" x 3/16"	RP29725	10 ft
○ 9. T-Fitting, 1/8" x 1/8" x 1/8"	RP23744	1
○ 10. Tubing, 1/8" x 1/4"	RP10162	As Required
○ 11. L-Fitting, 1/8" x 1/8"	RP29726	10
○ 12. O-Ring, 3/16" x 5/16" x 1/16"	RP18635	5
○ 13. T-Fitting	RP10081	1
○ 14. Fitting, Female	RPIJ-P949-1	1
○ 15. LED, PatrionPlus Printhead	RP21514	1
○ 16. Software, PatrionPlus Printhead Controller	RP26813	1
○ 17. Board, PatrionPlus Printhead CPU	RP25020	1

○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

Parts List

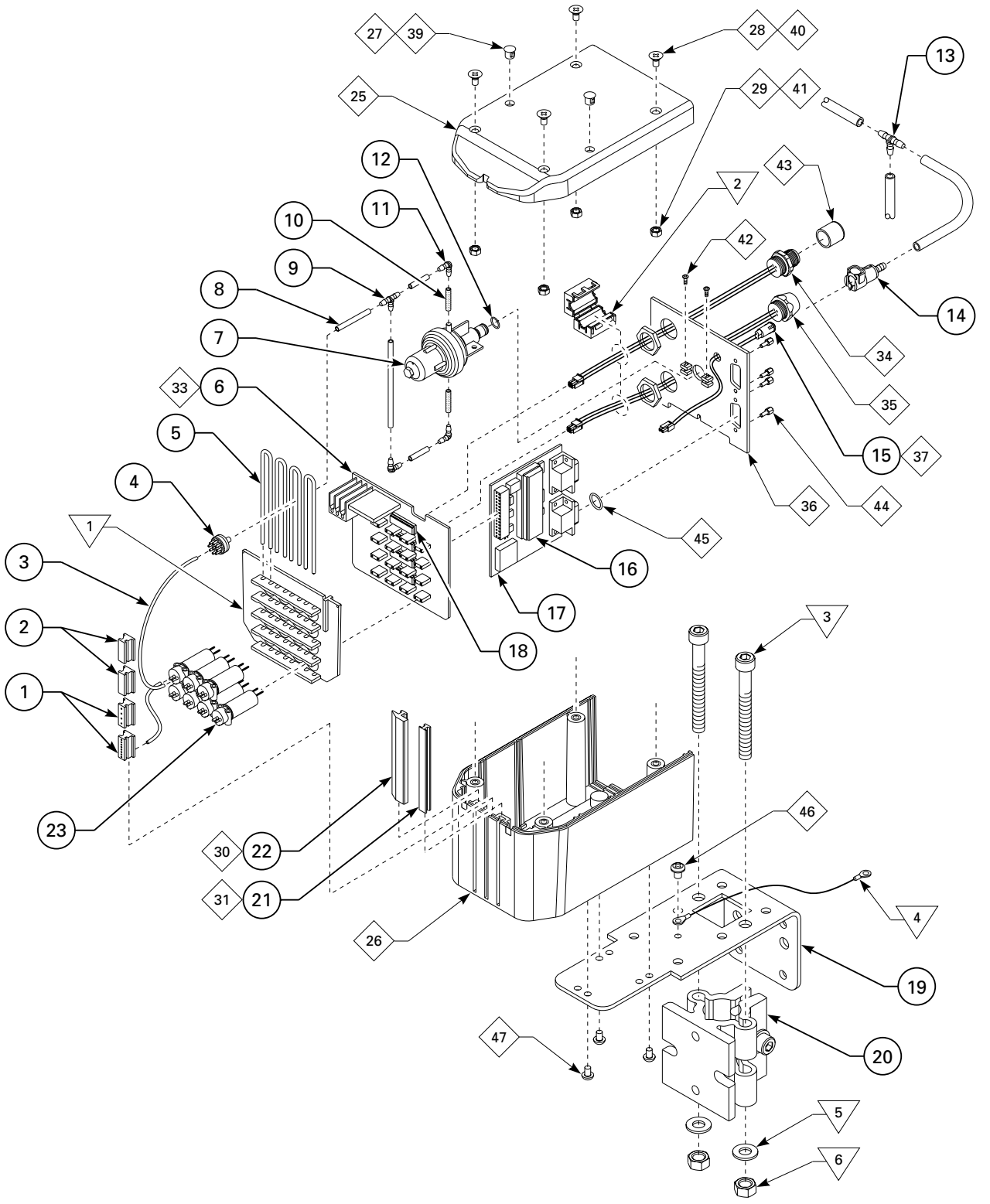
Description	Part Number	Quantity per Package
○ 18. IC, Quad Power Driver	RP28477	2
○ 19. Bracket, Printhead	RP19182	1
○ 20. Clamp, Parallel/Perpendicular Mounting	RP28800	1
○ 21. Strip, Filler	RP21872	1
○ 22. Strip, Rub Strip, Rub Stainless Steel (optional - ordered separately)	RP19386 27520	1 1
○ 23. Valve, 600LT 12V 600Hz Square Pin	RP27339	1
○ 24. Enclosure Kit, Printhead	RP30469	1
◇ 25. Housing, Printhead Top		1
◇ 26. Housing, Printhead Bottom		1
◇ 27. Plug, Plastic		2
◇ 28. Screw, Phillips Flat Head M4 x 20 mm		4
◇ 29. Nut, Elastic Lock 4 mm		4
◇ 30. Strip, Rub		1
◇ 31. Strip, Filler		1
○ 32. Upgrade Kit, Printhead Power Connector	RP31761	1
◇ 33. Board, PatrionPlus Printhead Driver		1
◇ 34. Connector, Panel Mount Male		1
◇ 35. Connector, Panel Mount Female		1
◇ 36. Plate, Cover Back		1
◇ 37. LED, Printhead		1
○ 38. Hardware Kit, PatrionPlus Printhead	RP21485	1
◇ 39. Plug, Plastic		2
◇ 40. Screw, Phillips Flat Head M4 x 20 mm		4
◇ 41. Nut, Elastic Lock 4 mm		4
◇ 42. Screw, Phillips Pan Head 6-19 x 1/2"		2
◇ 43. Cap, Vinyl		1
◇ 44. Screw, Jack 3/16" Hex 4-40 x 1/4"		4
◇ 45. O-Ring, 3/8" x 1/2" x 1/16"		1
◇ 46. Screw, Phillips Pan Head Thread Rolling 10-32 x 1/4"		1
◇ 47. Screw, Philips Pan Head M4 x 8 mm		3
◇ 48. Cap, Connector (not shown)		1
◇ 49. Bolt, Hex Head M6 x 20 mm (not shown)		4
◇ 50. Nut, Elastic Lock M6 (not shown)		1
◇ 51. Washer, Split Lock 1/4" (not shown)		1
▽ 1. Holder, Valve		
▽ 2. Ferrite, Clamp-on		

○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

Description	Part Number	Quantity per Package
▽ 3. Screw, Socket Head Cap M8 x 1.25 x 75 mm		
▽ 4. Strap, Ground		
▽ 5. Washer, Flat M8		
▽ 6. Nut, Elastic Lock M8		

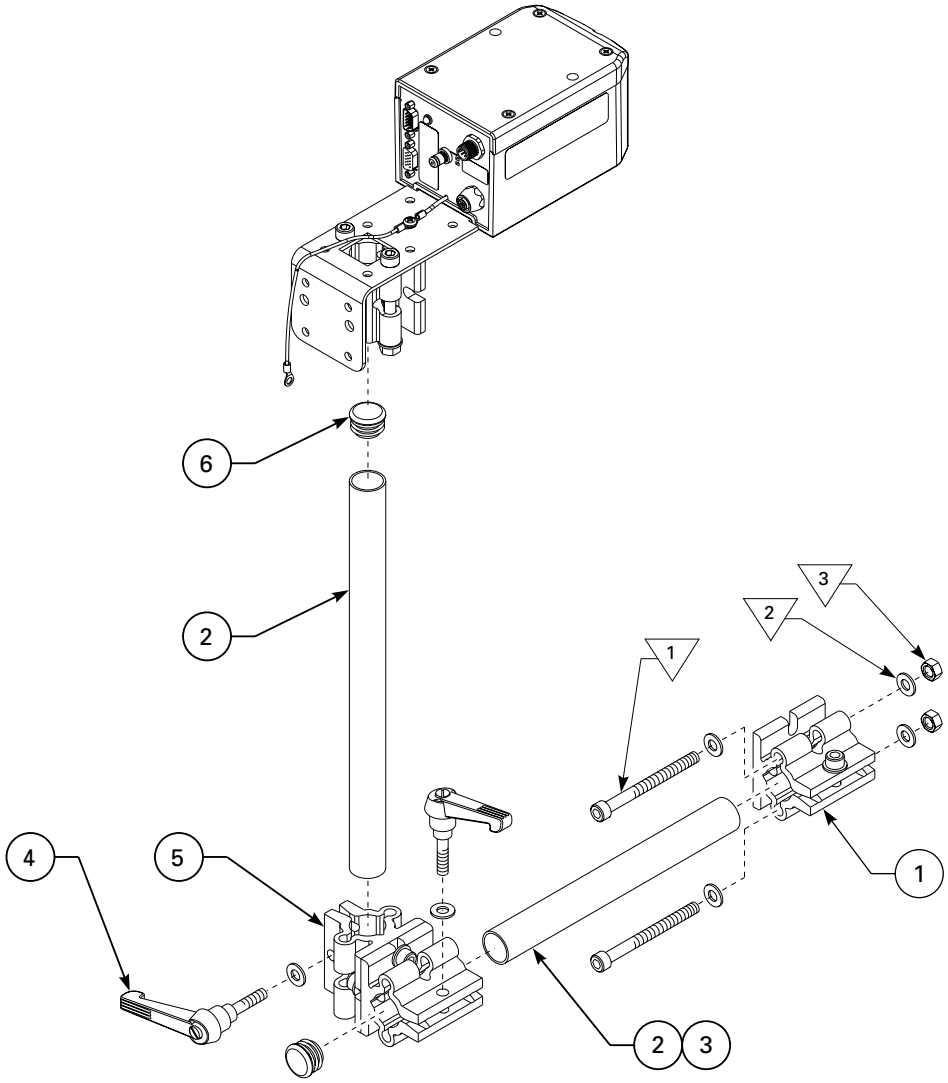
○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

Description	Part Number	Quantity per Package
VJ Series Printhead with Conveyor-Mounting Bracktery	See Previous List	1



○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

Description	Part Number	Quantity per Package
Conveyor-Mounting Bracketry		
○ 1. Clamp, Parallel/Perpendicular Mounting	RP28800	1
○ 2. Tubing, 1" x 15" (2.5 cm x 38.1 cm) Round Tubing, 1" x 9" (2.5 cm x 22.9 cm) Round	RP19160 RP19161	1 1
○ 3. Tubing, 1" x 15" (2.5 cm x 38.1 cm) Square (optional – ordered separately)	RP26014	1
○ 4. Handle, Ratchet	RP19321	1
○ 5. Clamp, Cross	RP28801	1
○ 6. Plug, 7/8" Pry Out	RP19757	5
▽ 1. Screw, Socket Head Cap M8 x 1.25 x 90mm		
▽ 2. Washer, Flat M8		
▽ 3. Nut, Elastic Lock M8		



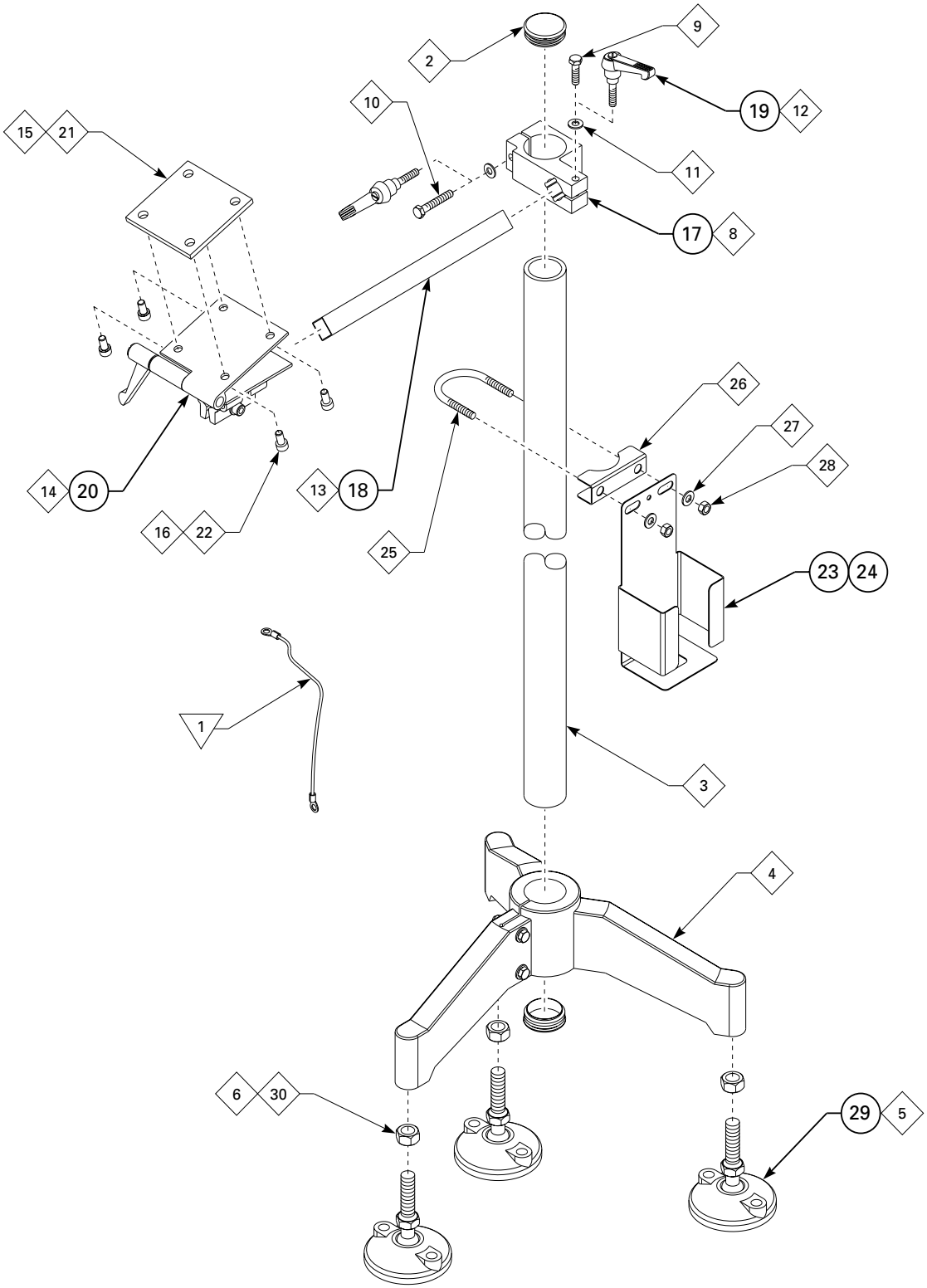
○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

Parts List

Description	Part Number	Quantity per Package
Floor Stand Bracketry - Controller	22773	1
○ 1. Floor Stand	18127	1
◇ 2. Plug, Pry Out 1.75"		2
◇ 3. Tubing, 1.9" x 60"		1
◇ 4. Base, Plastic Tripod		1
◇ 5. Foot, Tripod Mounting		3
◇ 6. Nut, Hex M16 x 2 mm		3
○ 7. Bracketry Kit, Floor Stand Controller	21812	1
◇ 8. Block, 2" x 1" (5 cm x 2.5 cm)		1
◇ 9. Screw, Hex Head M8 x 30 mm		1
◇ 10. Screw, Hex Head M8 x 50 mm		1
◇ 11. Washer, Flat M8		6
◇ 12. Handle, Ratchet		2
◇ 13. Tubing, 1" x 15" (2.5 cm x 38.1 cm)		1
◇ 14. Mount, Adjustable 1" (2.5 cm) Controller		1
◇ 15. Pad, Vibration		1
◇ 16. Screw, Socket Head Cap M8 x 16 mm		4
○ 17. Block, 2" x 1" (5 cm x 2.5 cm)	RP19789	1
○ 18. Tubing, 1" x 15" (2.5 cm x 38.1 cm)	RP26014	1
○ 19. Handle, Ratchet	RP19321	1
○ 20. Mount, Adjustable 1" (2.5 cm) Controller	RP30026	1
◇ 21. Pad, Vibration		1
◇ 22. Screw, Socket Head Cap M8 x 16 mm		4
○ 23. Bracket, Printhead Power Supply	26396	1
○ 24. Bracket, Printhead Power Supply Floor Stand	26235	1
◇ 25. U-Bolt, 3/8"-16 x 2		1
◇ 26. Bracket, Pipe U-Bolt		1
◇ 27. Washer, 21/32" x 13/32" x 1/32"		2
◇ 28. Nut, Hex 3/8"-16		2
○ 29. Foot, Tripod Mounting	30277	3
◇ 30. Nut, Hex M16 x 2 mm		3
▽ 1. Cable, Ground Strap		

○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

Description	Part Number	Quantity per Package
Floor Stand Bracketry - Controller	22773	1



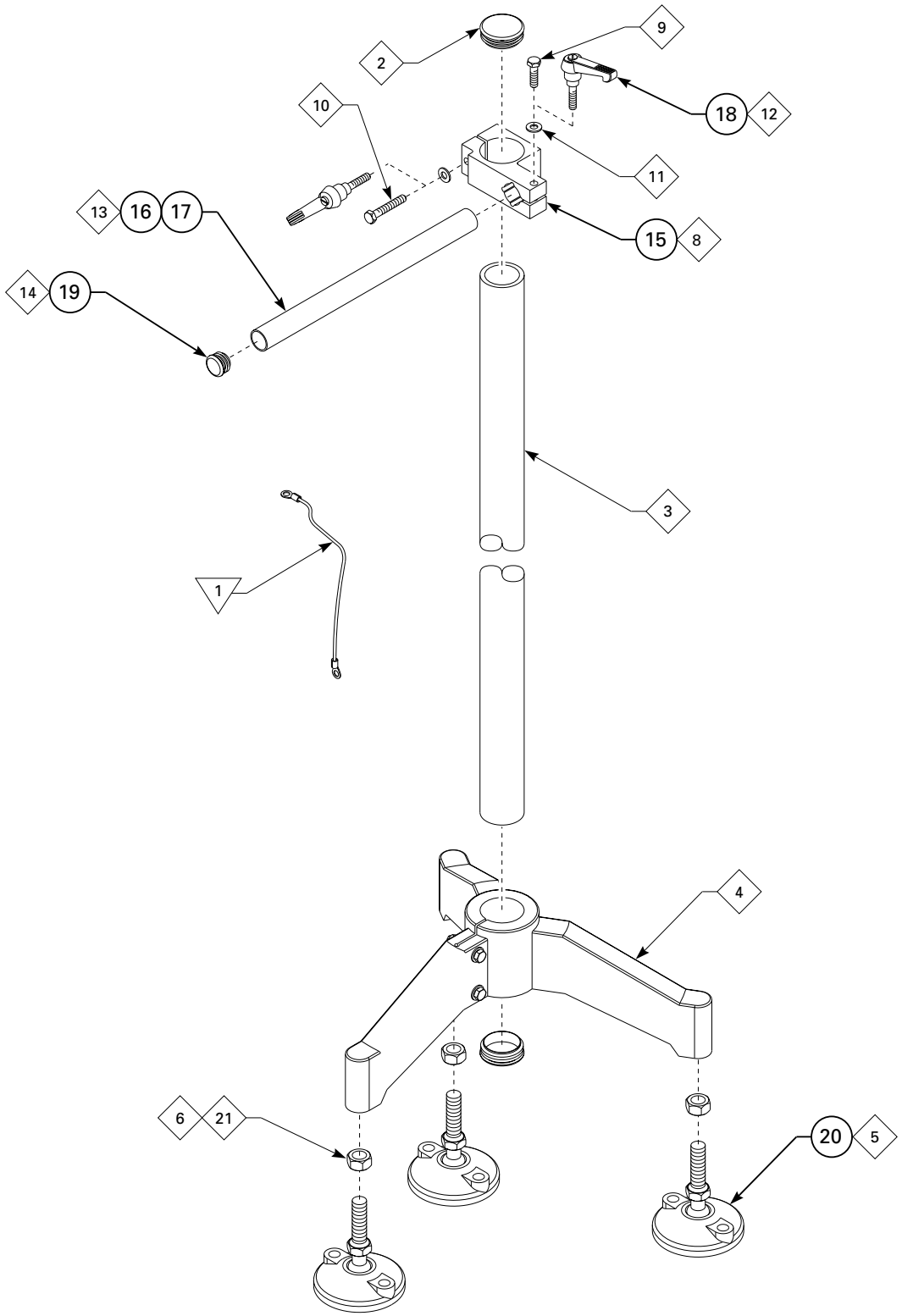
◯ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

Parts List

Description	Part Number	Quantity per Package
Floor Stand Bracketry - Printhead	18902	1
○ 1. Floor Stand	18127	1
◇ 2. Plug, Pry Out 1.75"		2
◇ 3. Tubing, 1.9" x 60"		1
◇ 4. Base, Plastic Tripod		1
◇ 5. Foot, Tripod Mounting		3
◇ 6. Nut, Hex M16 x 2 mm		3
○ 7. Bracketry Kit, Floor Stand Printhead	RP19965	1
◇ 8. Block, 2" x 1" (5 cm x 2.5 cm)		1
◇ 9. Screw, Hex Head M8 x 30 mm		1
◇ 10. Screw, Hex Head M8 x 50 mm		1
◇ 11. Washer, Flat M8		2
◇ 12. Handle, Ratchet		2
◇ 13. Tubing, 1" x 15" (2.5 cm x 38.1 cm)		1
◇ 14. Plug, Pry Out 7/8"		1
○ 15. Block, 2" x 1" (5 cm x 2.5 cm)	RP19789	1
○ 16. Tubing, 1" x 15" (2.5 cm x 38.1 cm) Round Tubing, 1" x 9" (2.5 cm x 22.9 cm) Round	RP19160 RP19161	1 1
○ 17. Tubing, 1" x 15" (2.5 cm x 38.1 cm) Square (optional – ordered separately)	RP26014	1
○ 18. Handle, Ratchet	RP19321	1
○ 19. Plug, Pry Out 7/8"	RP19757	5
○ 20. Foot, Tripod Mounting	30277	3
◇ 21. Nut, Hex M16 x 2 mm		3
▽ 1. Cable, Ground Strap		

○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

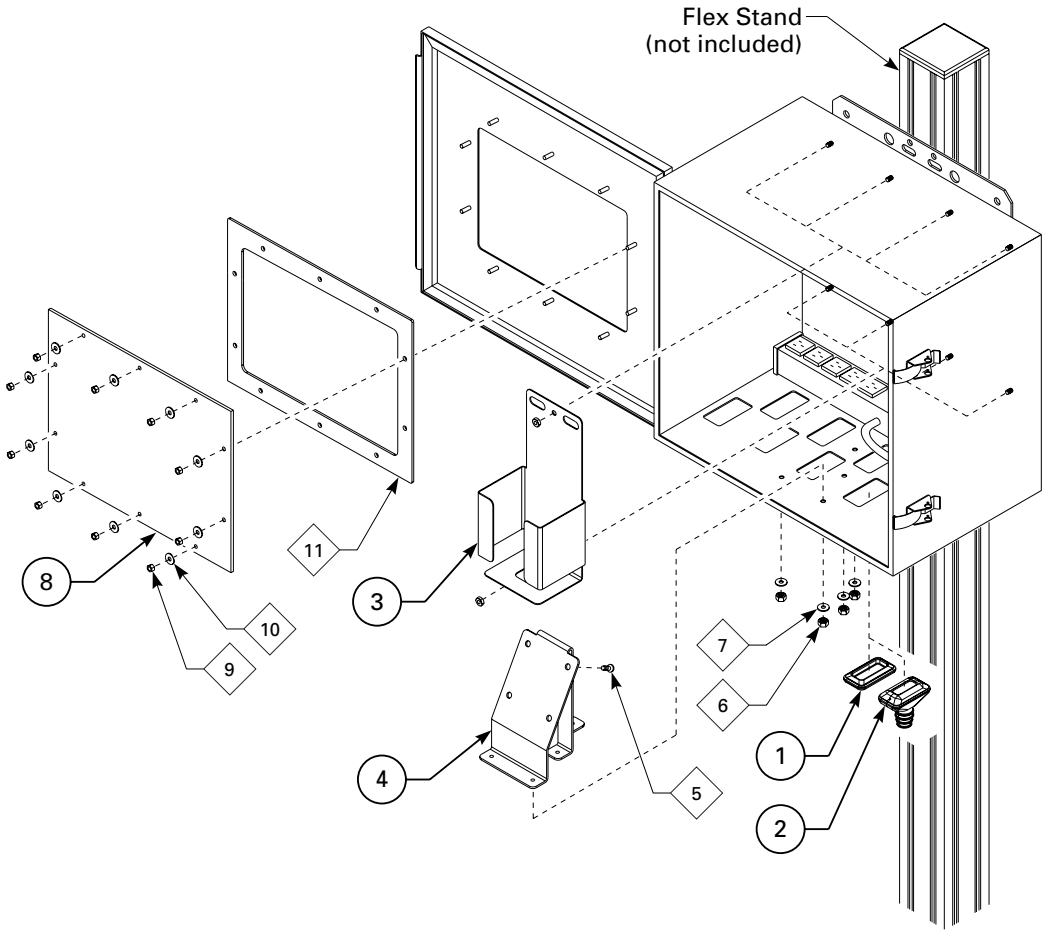
Description	Part Number	Quantity per Package
Floor Stand Bracketry - Printhead	18902	1



◯ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

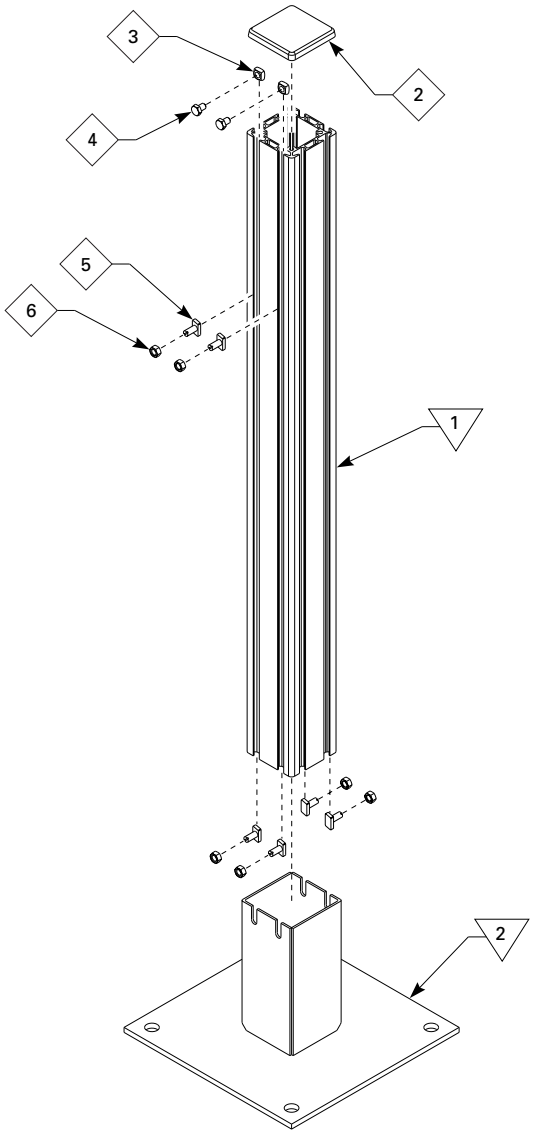
Parts List

Description	Part Number	Quantity per Package
NEMA Enclosure	21766	1
○ 1. Plug, NEMA Enclosure	RP25331	1
○ 2. Grommet, NEMA Cable	RP25332	1
○ 3. Bracket, Power Supply	26396	1
○ 4. Bracket, Controller	RP25683	1
◇ 5. Screw, Phillips Pan Head M8 x 16 mm		4
◇ 6. Nut, M5		4
◇ 7. Washer, Flat M5		4
○ 8. Window, Enclosure	RP21799	1
◇ 9. Nut, M5		10
◇ 10. Washer, Flat M5		10
◇ 11. Gasket, Window		1



○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

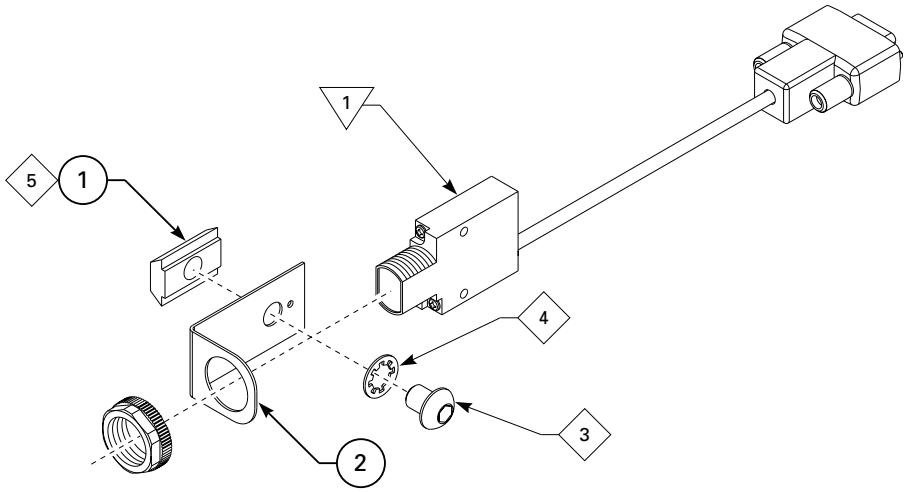
Description	Part Number	Quantity per Package
5' (1.5 m) Flex Stand	IJFLS13615	1
○ 1. Hardware Kit, Flex Stand (not shown)	RP13635	1
◇ 2. Cap, Flex Stand		1
◇ 3. Nut, Square M8 x 0.2"		12
◇ 4. Screw, Hex Head M8 x 12 mm		12
◇ 5. Bolt, T M8 x 17 mm		12
◇ 6. Nut, Elastic Lock M8		12
▽ 1. Beam, Flex Stand 3.3" x 3.3"		
▽ 2. Foot, Flex Stand		



○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

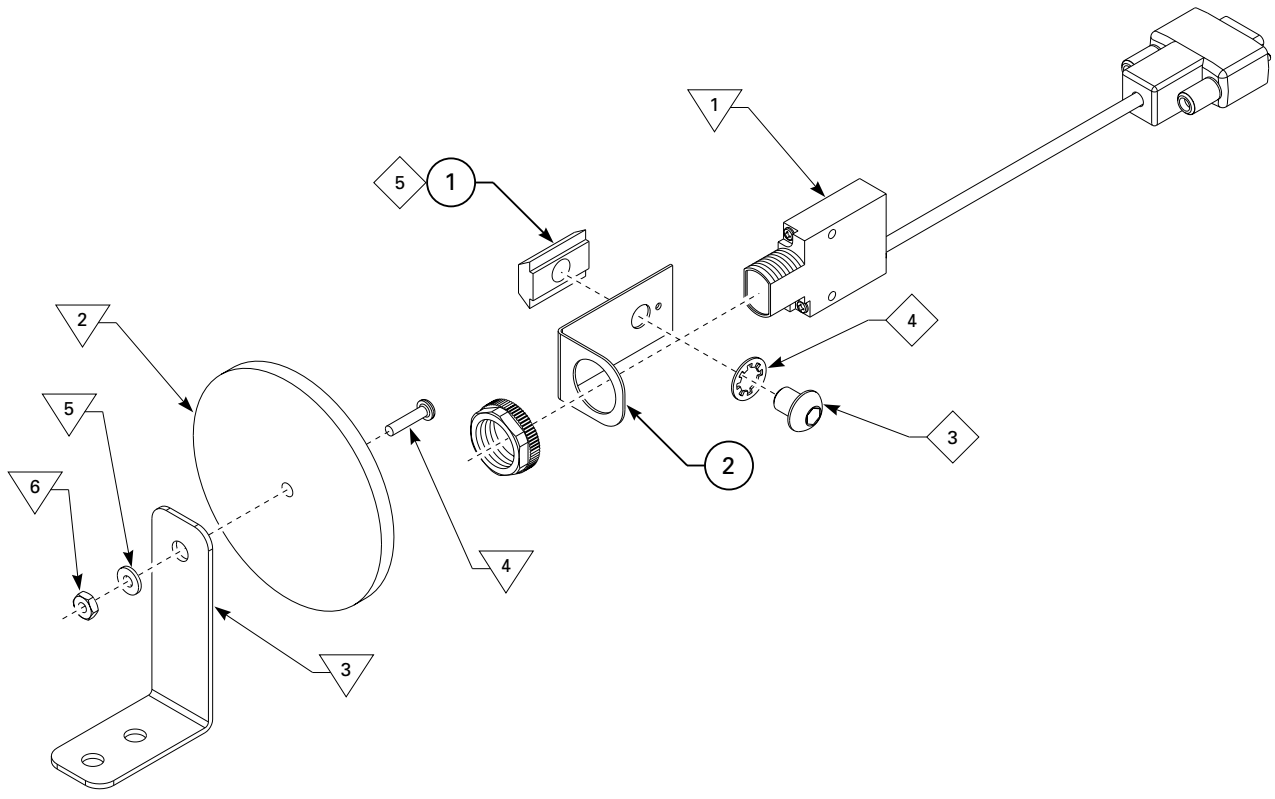
Parts List

Description	Part Number	Quantity per Package
10' (3 m) Diffuse Beam Photocell 12V	32116	1
40' (12 m) Diffuse Beam Photocell 12V	32117	1
100' (30 m) Diffuse Beam Photocell 12V	32118	1
○ 1. Nut, T-Slot M8	RP23792	10
○ 2. Bracket, Photocell	RPJ100-0160-001	1
◇ 3. Screw, Socket Button Head M8 x 10 mm		1
◇ 4. Washer, Internal Tooth Lock M8		1
◇ 5. Nut, T-Slot M8		1
◇ 6. Velcro (not shown)		1
▽ 1. Photocell, Diffuse Beam		



○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

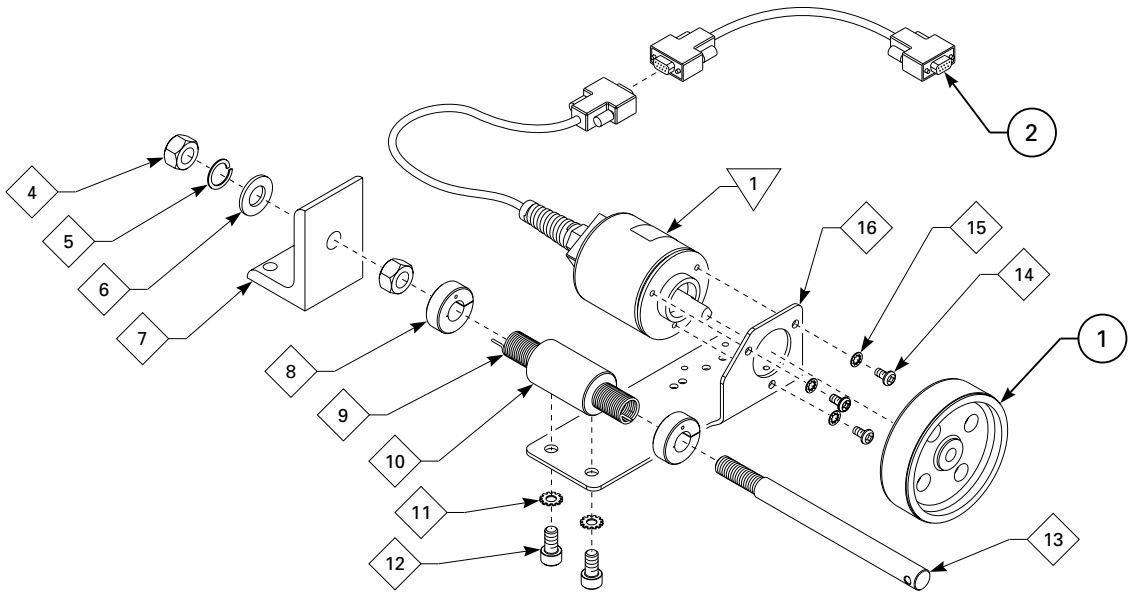
Description	Part Number	Quantity per Package
10' (3 m) Retroreflective Beam Photocell 12V	32119	1
40' (12 m) Retroreflective Beam Photocell 12V	32120	1
100' (30 m) Retroreflective Beam Photocell 12V	32121	1
○ 1. Nut, T-Slot M8	RP23792	10
○ 2. Bracket, Photocell	RPJ100-0160-001	1
◇ 3. Screw, Socket Button Head M8 x 10 mm		1
◇ 4. Washer, Internal Tooth Lock M8		1
◇ 5. Nut, T-Slot M8		1
◇ 6. Velcro (not shown)		1
▽ 1. Photocell, Retroreflective Beam		
▽ 2. Reflector		
▽ 3. Bracket, Reflector		
▽ 4. Screw, Phillips Pan Head 6-32 x 5/8"		
▽ 5. Washer, Flat #6		
▽ 6. Nut, Lock 6-32		



○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

Parts List

Description	Part Number	Quantity per Package
3600 Pulse Encoder	26344	1
○ 1. Wheel Assembly, Encoder	RP10555	1
○ 2. Cable, Encoder Extension 15' (4.6 m) Cable, Encoder Extension 50' (15.2 m) Cable, Encoder Extension 100' (30.5 m)	17520 26550 26551	1 1 1
○ 3. Bracket, Encoder (Adaptive)	RP23102	1
◇ 4. Nut, Hex M12		2
◇ 5. Washer, Split Lock M12		1
◇ 6. Washer, Flat M12		1
◇ 7. Bracket, Mounting Angle		1
◇ 8. Collar, Shaft		2
◇ 9. Spring, Torsion		1
◇ 10. Coupling, Shaft		1
◇ 11. Washer, External Lock M8		2
◇ 12. Screw, Socket Head Cap M8 x 10 mm		2
◇ 13. Spindle		1
◇ 14. Screw, Phillips Pan Head 10-32 x 3/8"		3
◇ 15. Washer, Internal Lock #10		3
◇ 16. Bracket, Mounting Encoder		1
◇ 17. Screw, Phillips Pan Head 6-32 x 3/8" (not shown)		4
◇ 18. Washer, Internal Lock #6 (not shown)		4
▽ 1. Encoder		



○ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

Description	Part Number	Quantity per Package
Other Components		
1. Cable, Printhead Data 3' (0.9 m) Cable, Printhead Data 6' (1.8 m) Cable, Printhead Data 10' (3.1 m) Cable, Printhead Data 15' (4.6 m) Cable, Printhead Data 25' (7.6 m)	25136 21767 21768 21769 22319	1 1 1 1 1
2. Splitter Box, Photocell/Encoder	32237	1
3. Key, PatrionPlus Task 2	27718	1
4. Printhead Kit, Independent	RP23718	1
5. Swingarm, PatrionPlus VJ Series Printhead	26650	1
6. Backflush Kit, Printhead	29774	1
7. Bottle Kit, PatrionPlus	21754	1
8. Connector, Ink Bottle	RP26110	1
9. Software, Keymaster	30738	1
10. Software, PatrionPlus VJ Only	31982	1
11. Software, PatrionPlus HR Only	31986	1
12. Software, Backup/Restore	27382	1
13. Device, Keyboard Input (KID 5)	17491	1
14. Reduran, Hand Cleaner 3.4fl oz (100 ml)	16073	1
15. Manual, PatrionPlus Technical	29669	1
16. Manual, HR Series Technical	30721	1
17. Manual, ADS Technical	26162	1
18. Manual, PatrionPlus Users	29933	1

◯ Saleable Part ◇ Included with a Saleable part ▽ Nonsaleable–Contact your distributor

Appendix A - KID 5

Commands for Operating the PatrionPlus Controller Using a Keyboard Input Device (KID 5)

Command	Use	Visual Response
CNTRL A	Use to load message from input buffer into print buffer and prepare the system to print. Printing begins when the photocell is blocked.	None
CNTRL B	Use to recall currently-printing message back to the display.	Currently-printing message scrolls on the display.
CNTRL C	Use to set system real-time clock. For each prompt, enter setting in format shown or line-feed through. • EXP=### (Expiration Date) • RL HR=##:## (Rollover Hour) • YEAR=## • MONTH=## • DAY=# • DATE=## • HOUR: ## • MIN:## (Time, in minutes)	Current settings displayed. At the end of the command, screen returns to *1* prompt.
CNTRL D	Use to clear input and print buffers. ***Note: Using CNTRL D stops print.***	At the end of the command, screen returns to *1* prompt.
CNTRL E	Use to clear the input and keep the current message printing. ***Note: This allows the second message to be created while the first message is printing.***	At the end of the command, screen returns to *1* prompt.
CNTRL F	Use to reset product counts	RST TOT displayed for 30 seconds. Screen then returns to *1* prompt.
CNTRL G	Use to display total product count.	TOT=<0000> (total count) displayed for 30 seconds. Screen then returns to *1* prompt.
CNTRL H	Use to move cursor back one space.	
CNTRL I	Use to move cursor forward one space.	
CNTRL J	Use to display next line. Same function as ,(line feed).	

Appendix A

Command	Use	Visual Response
CNTRL K	Use to set forward print delay, reverse print delay, dot size space filler and character width. For each prompt, enter the setting in format shown or line-feed through. • PD-1=## (Forward print delay) • PD-2=## (Reverse print delay) • DS=# (Dot size space filler)—Leave default at 0. ***Note: Use CNTRL Y to set dot size.*** • CW=## (Character width)	
CNTRL L	Use to print double-high or 16 x 10-dot characters. To create double-high characters: 1. Place cursor on even line in message. 2. Press Cntrl L. 3. Type the characters to be printed double-high. 4. Press Cntrl L again.	
CNTRL M	Use to perform same function as ø (carriage return).	
CNTRL N	Use to display the time for approximately five seconds.	The time is displayed for 5 seconds. Screen then returns to *1* prompt.
CNTRL P	Use to enable purge. Prompts: • TOT PH A/(N) (Total number of printheads to be purged)—Either enter A (purge all printheads) or enter the number of printheads to be purged. • PH=# (Printhead number)—If purging only specific printheads, enter a printhead number; repeat as needed to specify each printhead. • Purging. . . (System message during purge.)—To stop purge process, press any key. • Repeat? (Y/N) (Repeat purge)—To repeat entire purge process, enter Yes; to end purge process, enter No. • Reprgm? (Reprogram the purge routine?)—Enter Y (yes) to reset the program so that you can purge a different set of printhheads; enter N (no) to end the current routine.	If A is entered, purging begins. If a number is entered, a prompt for printhead numbers is displayed.
CNTRL S	Use to disable print cycle or to toggle the print trigger on or off (turns off photocell). Allows maintenance personnel to perform maintenance without the printhead firing or the incremental number system functioning.	When this function is toggled on, "pcl off" will be displayed, and no other function will respond until CNTRL-S is sent again.

Command	Use	Visual Response
CNTRL T	Use to save, edit, or print a message. Prompts: • LST=### (Displays the number of the last message saved, edited, or printed.)—Always line-feed through this prompt. • MSG=### Enter the number of the desired message. • P/S/E Enter either P (print), S (save), or E (edit). • WRT=### (Confirm save of displayed message)—If you specified S (save), enter Y (yes) to confirm the save of the displayed message; enter N (no) to cancel the save.	
CNTRL U	Use to specify printhead size, designated print line, print direction, and print line to print. Prompts: ***Note: The first number in the prompt refers to the specific printhead address.*** • PH Size=# Enter printhead size, either 1 (700) or 2 (1600 or HR Series). • MSG Lin=# Enter specific print line (1 through 8). • HD DIR=# Enter print direction, either F (forward) or R (reverse).	At the end of the command, screen returns to *1* prompt.
CNTRL V	Use to display current software version.	At the end of the command, screen returns to *1* prompt.
CNTRL X	Use to set individual print line delays. Prompts (repeat for each printhead): • XSP PL=## Enter specific print line. • QTY=## Enter number of spaces for delay. • XSP PL=## Either enter another specific print line or enter 0 (zero) to save and exit. **Important:** ***If you exit any other way than entering 0 (zero), your input will not be saved.***	At the end of the command, screen returns to *1* prompt.

Command	Use	Visual Response
CNTRL Y	Use to: • Display number of printheads currently connected to controller • Set print trigger • Select shaft encoder • Select individual printhead dot size • Designate a master printhead • Set aspect ratio Prompts (either enter setting in format shown, or line-feed through; prompts repeat for each printhead): • # OF HEADS=## (Displays number of printheads currently connected to controller.) • TRIG=E/I/S To set print trigger, enter either E (external PC), I (internal PC), or S (independent printhead operation). • SHAFT= Y/N To select shaft encoder, enter either Y (yes) or N (no). • 1 D.S.=# (References printhead address.)—Enter desired dot size, from 1 to 9. • 1 MASTER= *Y/N (References printhead address.) To designate this printhead as the master, enter Y (yes); otherwise, enter N (no). • 1 A.R.= # Enter desired aspect ratio, from 1 to 9.	

Command	Use	Visual Response
CNTRL Z	Use to access the following additional commands: ('R', 'T', 'S')=# Enter R to reset a printhead so that it can be reconfigured (see CNTRL Z R below for details). Enter T to run the print test pattern (see CNTRL Z T below for details). Enter S to enter 10 numbers on each print line (see CNTRL Z S below for details). • CNTRL Z R Use to reset a printhead so that it can be reconfigured. RSTHEAD=A/(N) Enter either A (reset all printheads) or the number of a specific printhead to be reset. • CNTRL Z T Use to run the print test pattern. You can designate the number of times (from 1 to 9) that the test pattern will print when a photocell is blocked once. • CNTRL Z S Use to enter 10 numbers on each print line (*1*, *2*, *3*, *4*, etc.). The 10 numbers correlate to the associated print line, i.e., line 1 prints 1111111111, line 2 prints 2222222222, etc. This aids in system set-up, printhead connector positioning, printhead positioning on the conveyor, print direction, and print quality. ***Note: Cancel this routine by pressing CNTRL D.*** • CNTRL Z U Use to reconfigure the printhead setup to the correct number of printheads if the controller has not initialized all printheads (for example, when new printheads are installed).	

Appendix B - Pin Outs

Figure BA: RS-232 Connector

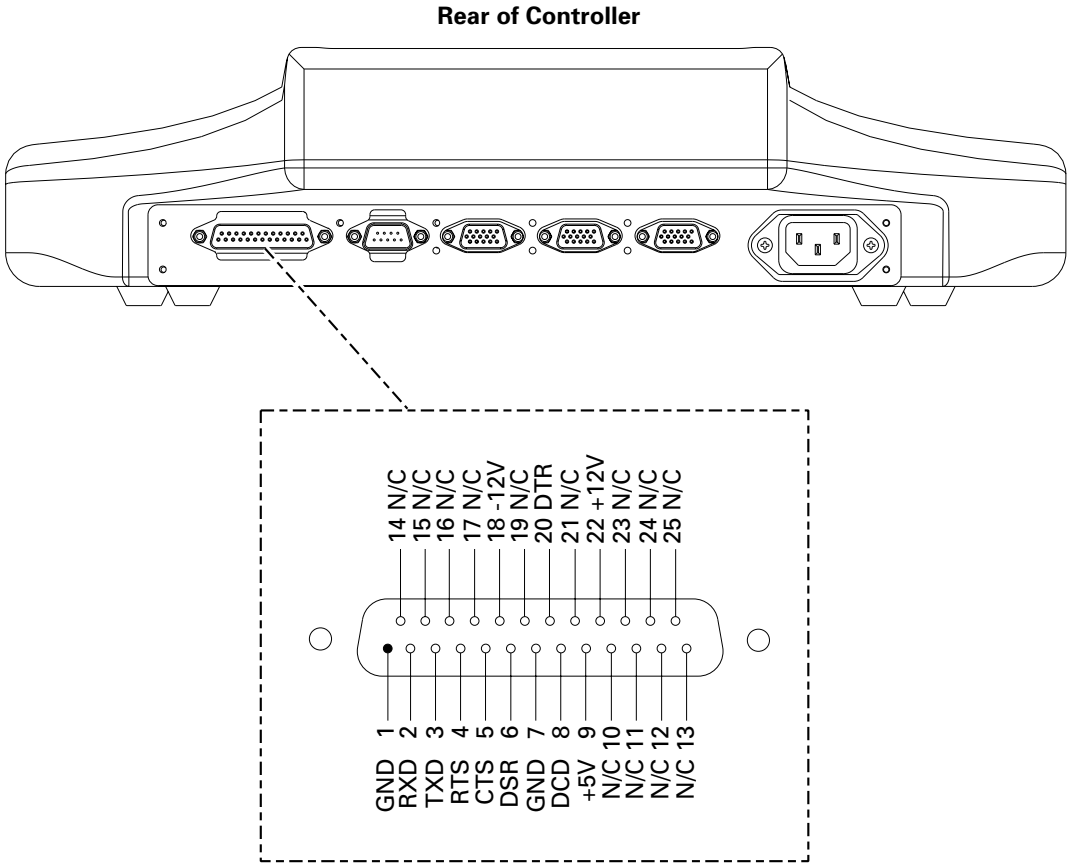


Figure BB: Task 2 Key Connector

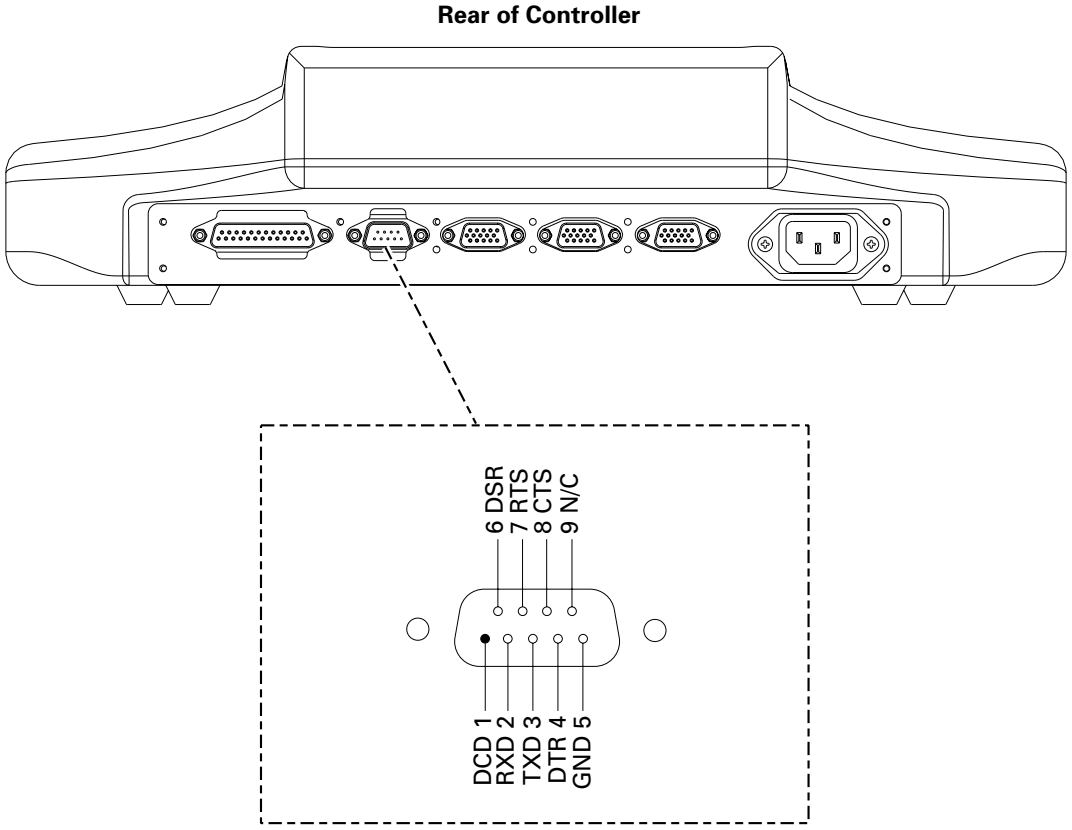


Figure BC: P.C./S.E. (Photocell/Shaft Encoder) Connector

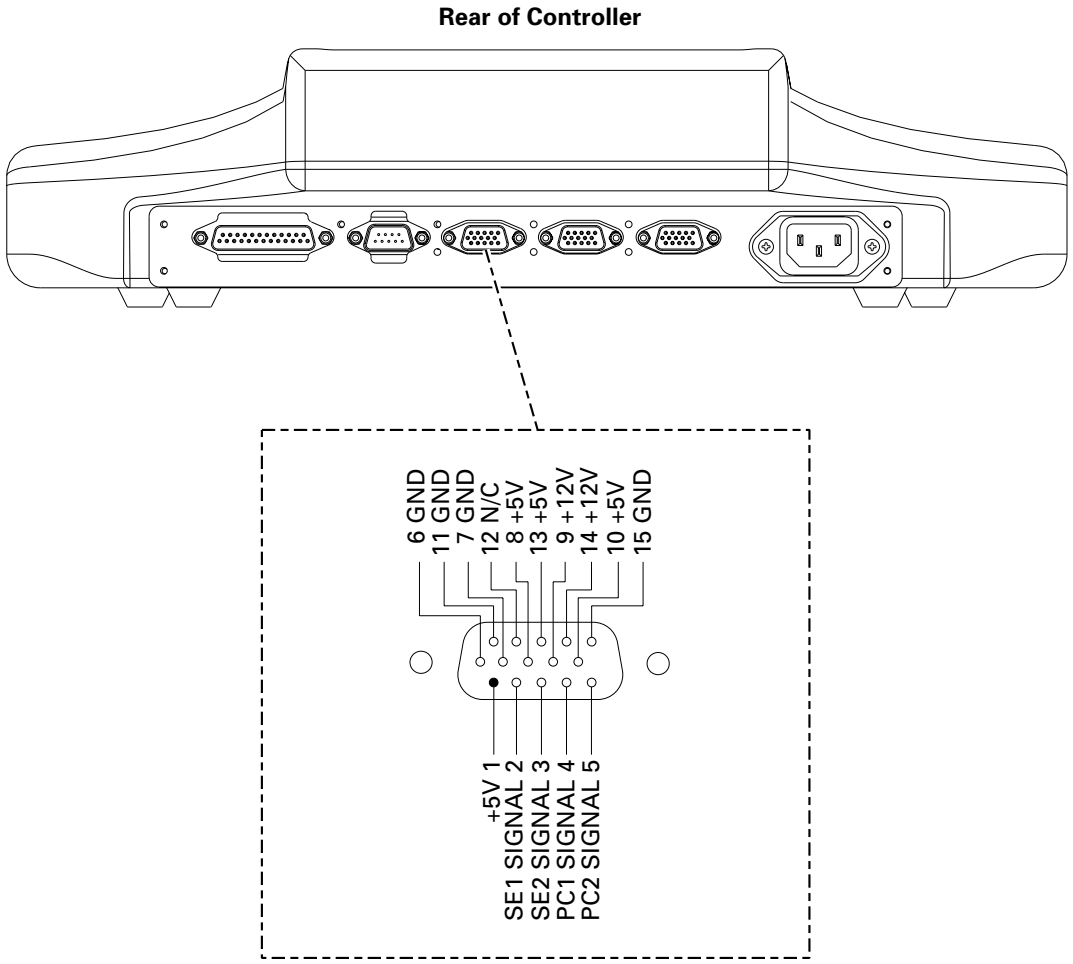


Figure BD: Printhead Connectors

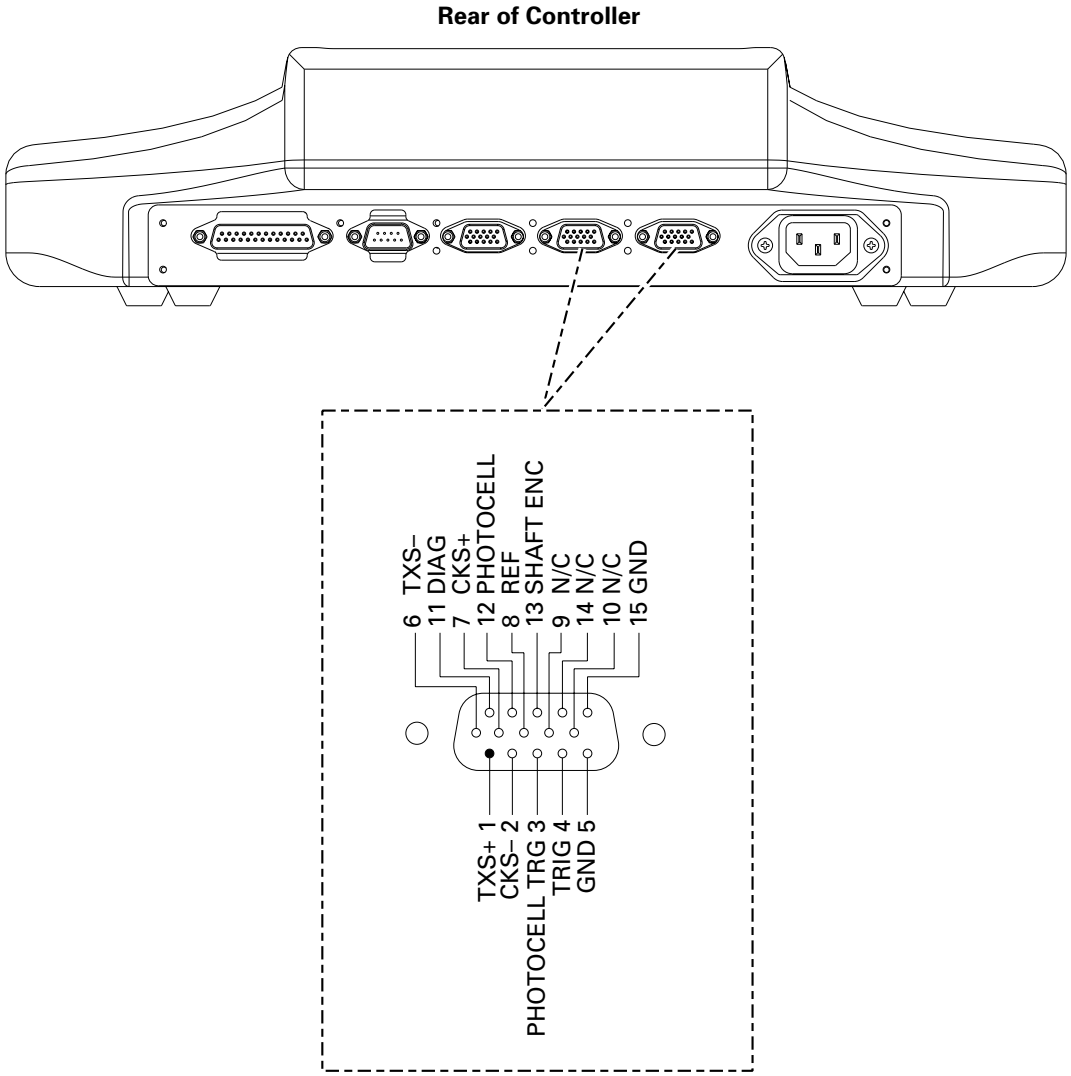
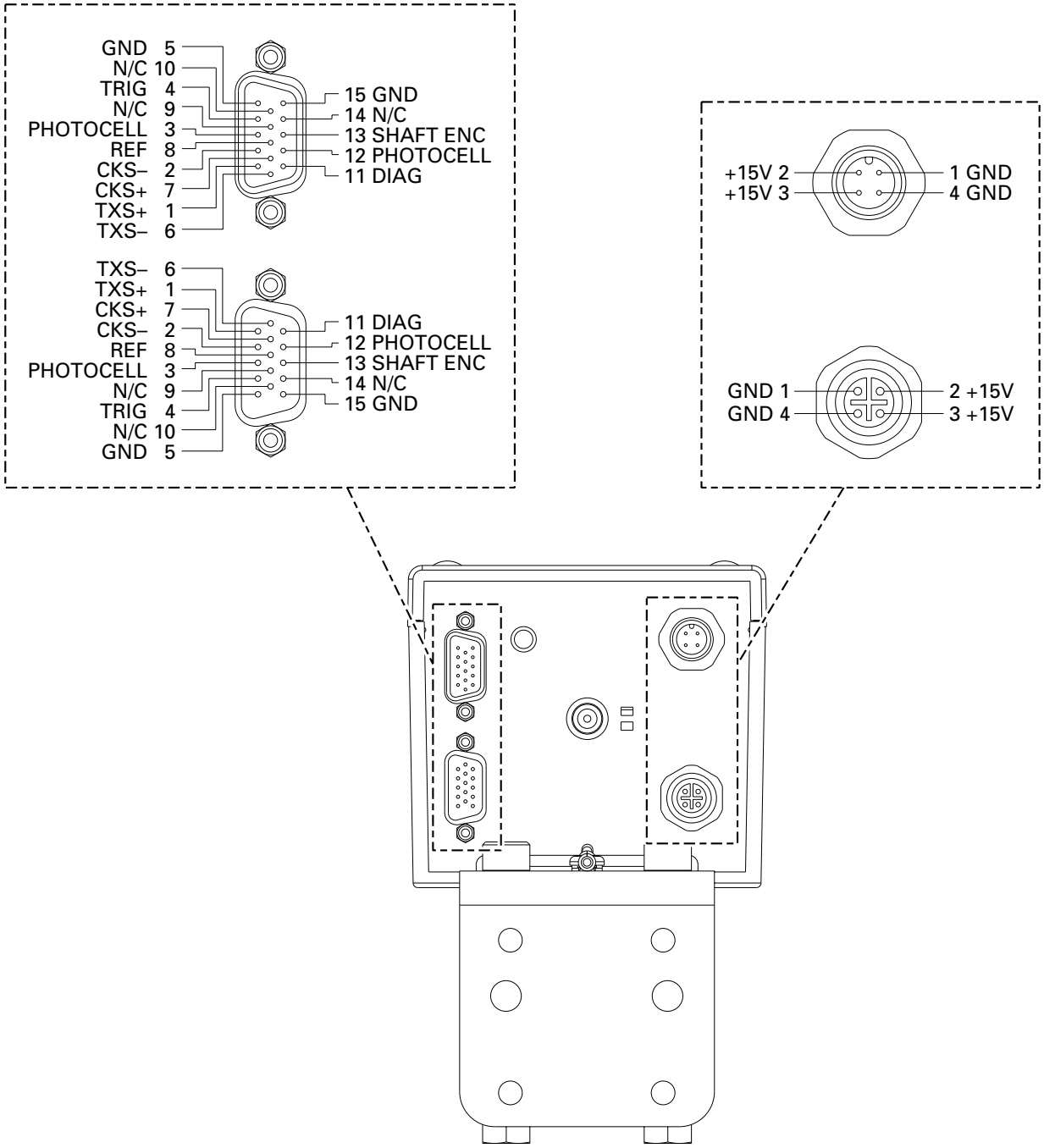


Figure BE: VJ Series Printhead Data and Power Connectors



Pin Outs

Figure BF: Splitter Box Connectors

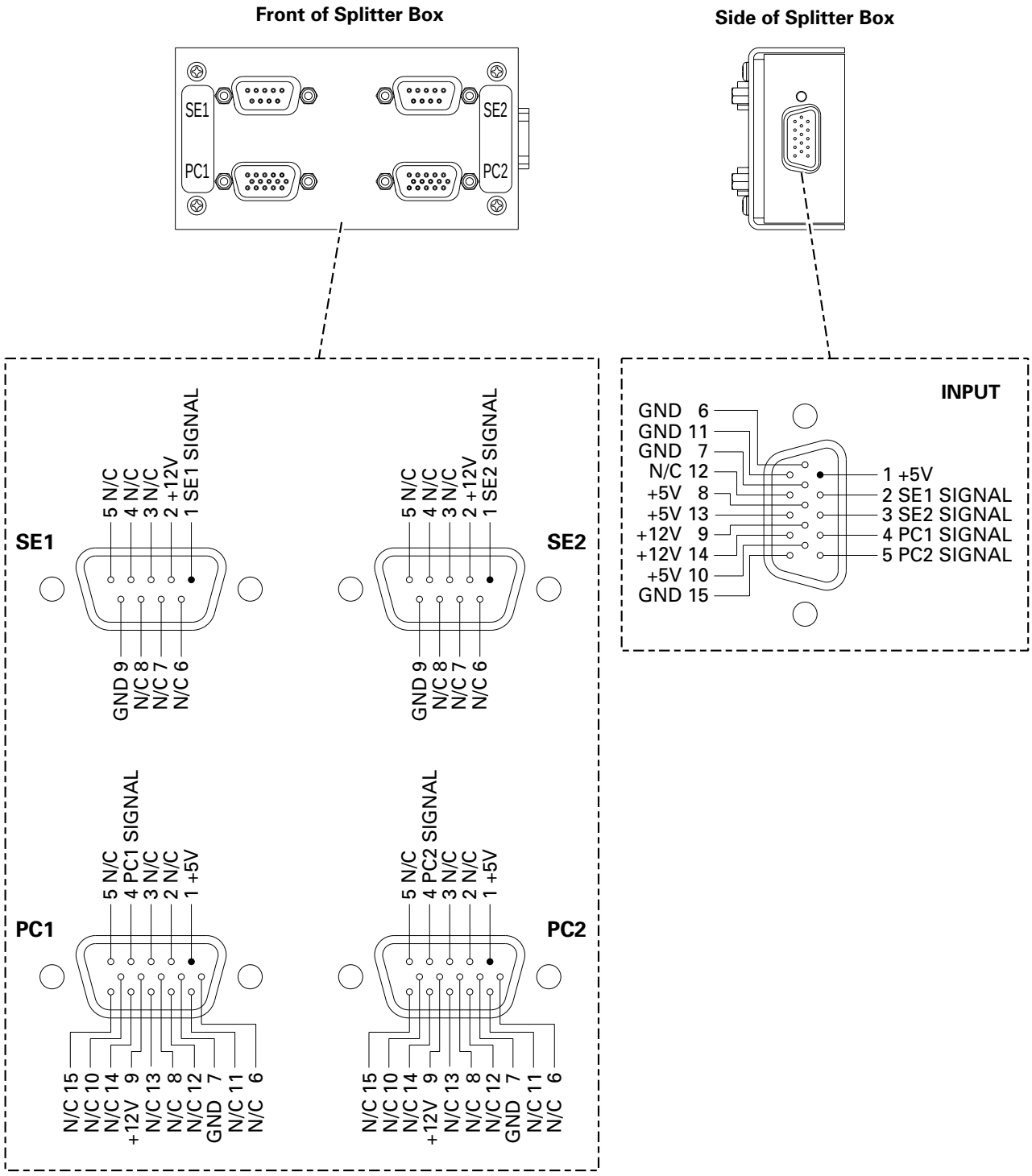


Figure BG: 12V Photocell

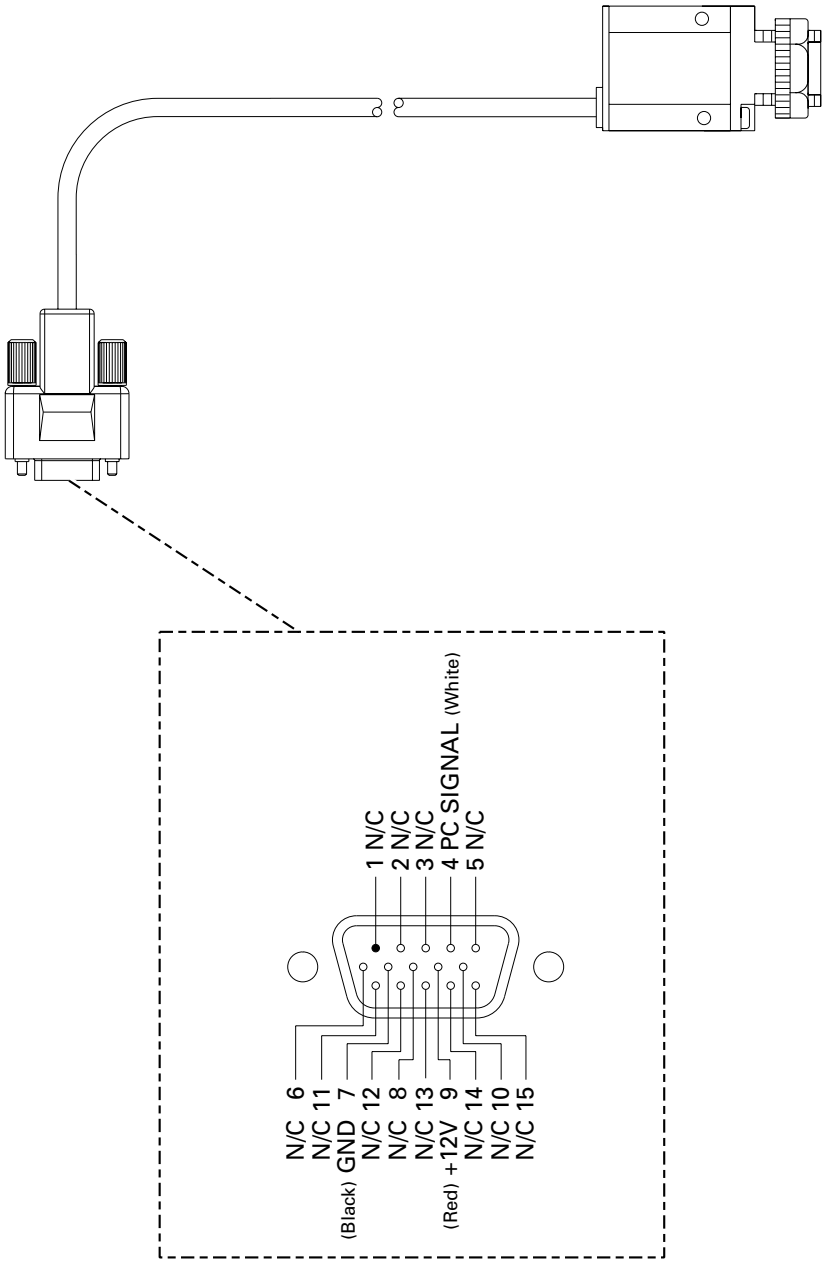
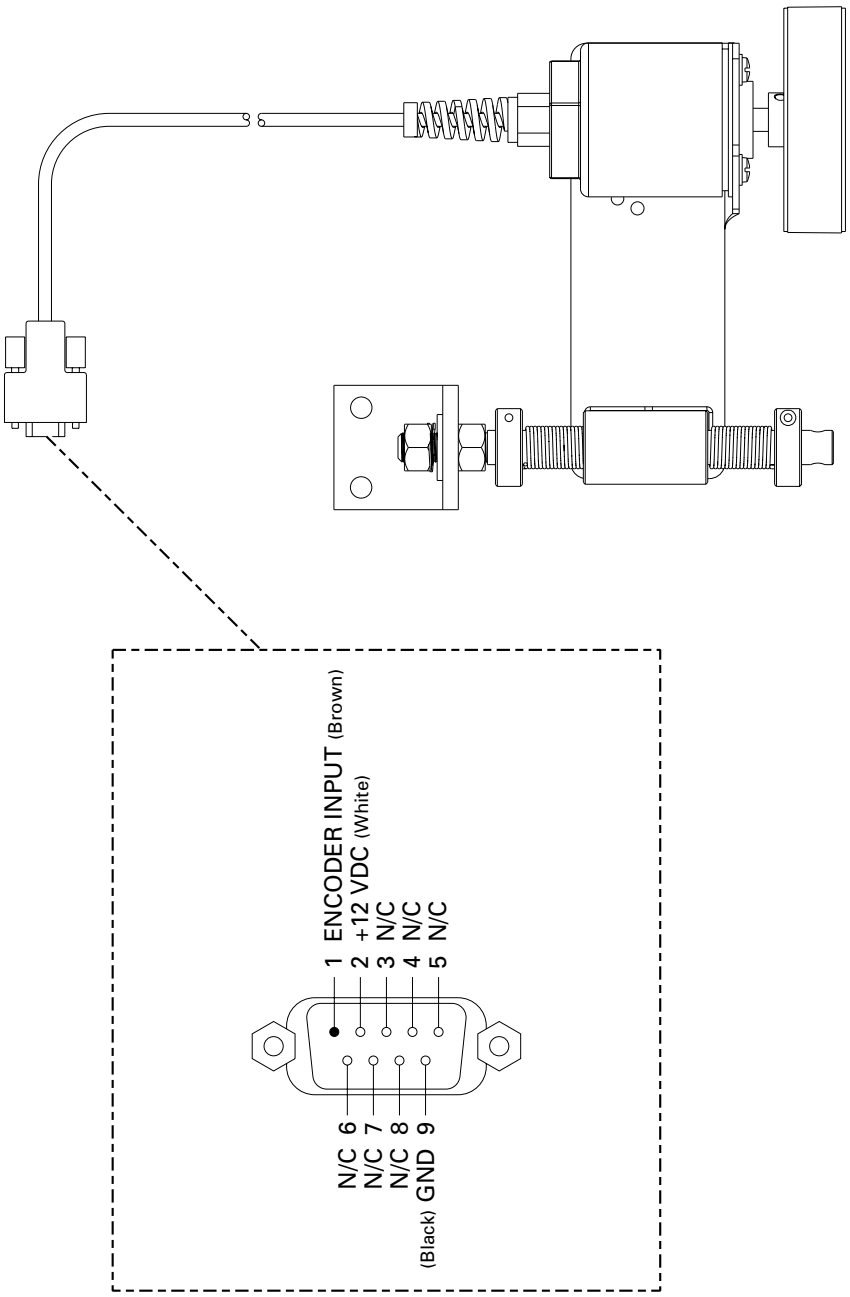


Figure BH: Encoder



Appendix C - RS-232

Introduction

This appendix contains detailed information for interfacing with your PatrionPlus system through an external device such as a scale, scanner, or PLC. With an external device, you can control and monitor the system as well as send data to update text in a message that you are printing.

For hardware setup instructions for an external device, see "Optional External Devices" on page 3-26.

Glossary

Following are some common interfacing terms:

Asynchronous — A communications channel in which no timing information is transferred between the DTE and the DCE.

Baud — Unit of measure representing the speed in bits per second (bps) that data is transmitted and received. The baud rate setting for two communicating devices must be the same.

bps — Bits per second. The number of binary digits (data bits) transferred per second.

Communications Protocol — Sets forth the rules for communication between two devices; for example, baud, parity, data bits, stop bits. Before either of the two devices can successfully communicate, each device must be configured in the same manner for each rule.

CR — Carriage return

CTS — Clear to Send

DCD — Data Carrier Detect

DCE — Data Communications Equipment. The equipment that provides the functions required to establish, maintain, and terminate a connection and to perform signal conversion and coding required for communication between data terminal equipment and data circuit. The DCE facilitates the communications of the data from its source to its destination and may or may not be an integral part of a computer. Your PatrionPlus controller is configured as DCE.

Driver — The transmitter of a binary digital signal.

DSR — Data Set Ready

DTE — Data Terminal Equipment. The equipment comprising the data source, the data sink, or both. Equipment usually comprising these functional units—control logic, buffer store, and one or more input or output devices or computers. DTE may also contain error control, synchronization, and station identification capability.

Essentially, the DTE represents the ultimate source and destination of the data. Examples of DTEs are receive-only printers (data destination) and CRT/keyboard data terminals (either data source or destination).

DTR — Data Terminal Ready

Full-duplex — A communications channel that is capable of operating in both directions simultaneously. The range of data transmission rates supported is the same for both directions.

GND — Signal Ground

Half-duplex — A communications channel that is capable of operating in both directions but not simultaneously; that is, the direction of transmission is reversible. Both directions of a half-duplex channel support the same range of data-transmission rates.

Interface circuit — A circuit between the DTE and the DCE for the purpose of exchanging data and controlling or timing signals. A signal ground circuit provides a common reference point for these signals.

Interface point — The shared boundary in a physical connection where interface signals pass between equipment via electrical signals.

LF — Line Feed

Mark — Equivalent to a positive logic 1.

NC — Not Connected

Parallel transmission — A transmission mode that sends a number of bits simultaneously over separate lines (for example, eight bits over eight lines) to a printer. Usually unidirectional.

RI — Ring indicator

RS-232 — Interface between data terminal equipment and data communication equipment employing serial binary data interface. The RS-232 standard applies to serial binary communications between DCEs and DTEs in which the data rates are in the range from 0 to 20,000 bps. Thus 19.2 kbps is the highest common data rate for which RS-232 applies. Note that the RS-232 standard places a rule-of-thumb limitation of 50 feet on cable length. This limit can be exceeded if the specific environment is known and meets certain conditions. RS-232 also specifies voltage levels of -15V to -3V and +3V to +15V. Marsh equipment follows the RS-232 standard.

RTS — Request to Send

RXD — Receive Data

Serial transmission — The most common transmission mode. In serial information bits are sent sequentially on a single data channel. Your PatrionPlus controller transmits serially through the RS-232 port.

Simplex channel — A communications channel that is capable of operating in only one direction.

Space — Equivalent to a positive logic 0.

Synchronous — A communication channel in which timing information is transferred between the DTE and the DCE.

Terminator — The receiver of a binary digit signal.

TTL — Transistor Logic Level. TTL is a hardware definition of voltages.

TXD — Transmit Data

Cabling Requirements

When connecting an external device to the RS-232 connector on your PatrionPlus controller, you must use the correct cabling. If you do not, RS-232 communication will not be possible. The cabling that you need depends on the classification of your external device (DCE or DTE) and the gender and size of the RS-232 port on the device.

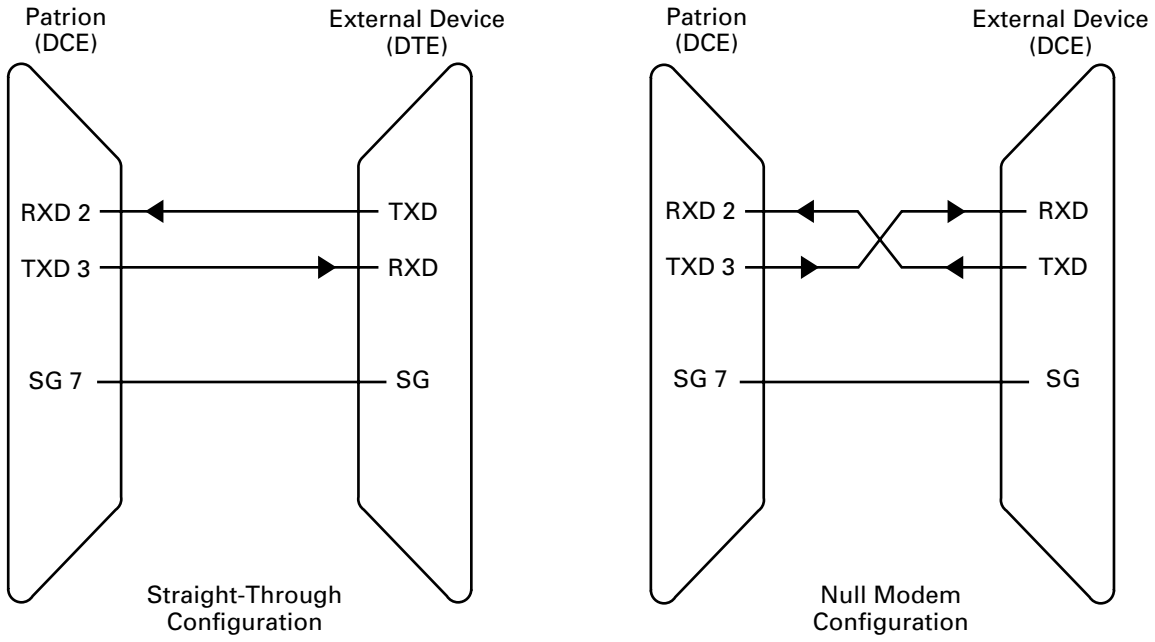
The PatrionPlus controller is classified as DCE (data communications equipment). DCE provides the functional requirements to establish, maintain, and terminate the connection with the device it is communicating with. DCE also sends information or commands properly coded for the receiving device.

DTE (data terminal equipment) typically receives information and commands from other devices, stores information, and controls yet other devices.

DCE and DTE equipment can easily communicate with each other. However, your PatrionPlus DCE can also communicate with other DCE equipment. Specific cabling is required for each possibility.

To determine your cabling requirements, first determine the classification of your external device (see the manufacturer's technical documentation). If you will be connecting to a DTE, use a "straight-through" cable. (See Figure CA.) If you will be connecting to another DCE, use a null modem. (Any prewired, off-the-shelf null modem is acceptable.) Lastly, make sure the cable is compatible—in size and gender—with the connector on the external device and on the PatrionPlus controller, which is a DB25 female connector.

Figure CA: RS-232 Communication "Lines" and Possible Configurations



Set-Up & System Configuration

Perform the following to interface with your system through an external device:

1) Make sure your external device is connected to the controller (see "Optional External Devices" on page 3-26).
2) If you will be printing RS-232 data in a message, make sure that you have created a message with an RS-232 insert field. (See "Adding an RS-232 Insert" on page 4-41.)

Commands, Keystrokes, & Responses from Your Controller

The PatrionPlus software accepts various commands to:

- Send data to the holding buffer
- Release the holding buffer

On the following pages is Table C1 and Table C2. Table C1 lists the commands that you can send to the controller, the required key strokes, and the response that you will receive from the controller. In Table C1, o represents a space. Table C2 lists "key stroke" or keyboard equivalents; for example, in ASCII and EBCDIC.

Table C1: Controller Commands

Command from the External Device	Keystroke	Response from PatrionPlus
Select message to be printed.	<Ctrl-T><message name> <Ctrl-M>	<Ctrl-M><Ctrl-J> MSG=<message name> <Ctrl-M><Ctrl-J> (successful) <Ctrl-M><Ctrl-J> MSG=<message name> <Ctrl-M><Ctrl-M> <Ctrl-J>NOo MESSAGE or <Ctrl-M><Ctrl-J> MSG=<message name> <Ctrl-M><Ctrl-M> <Ctrl-J>Nameo Tooo Long (unsucessful)
Send data to the holding buffer	<Ctrl-V><RS-232 data> <Ctrl-M>	<RS232 data><Ctrl-M><least significant byte of checksum> <Ctrl-M><Ctrl-J> (The checksum is the hex sum of RS232 data and <Ctrl-M>)
Release the holding buffer	<Ctrl-A>	<Ctrl-F><Ctrl-M><Ctrl-J> (successful) <Ctrl-U><Ctrl-M><Ctrl-J> (unsuccessful)

Command from the External Device	Keystroke	Response from PatrionPlus
Clear the holding buffer	<Ctrl-B>	BUFFERo CLEARED <Ctrl-M><Ctrl-J>
Abort <Ctrl-V> command	<Ctrl-D>	<Ctrl-D><Ctrl-U><Ctrl-M> <Ctrl-J> (aborted)
If no valid parameters *** follow <Ctrl-T> or <Ctrl-V>		<Ctrl-M><Ctrl-J> MSG=<***><Ctrl-M> <Ctrl-J>Timeout (for <Ctrl-T>) <Ctrl-M><Ctrl-J> CMDo Timeout (for <Ctrl-V>)
Switch to Patrion mode	<Ctrl-WP>	Patrionо Mode
Switch to ML8 mode	<Ctrl-WM>	ML8o Mode <Ctrl-M> <Ctrl-J>*1*
Switch to PM2000 mode	<Ctrl-W2>	Patrionо Modeo inо PM2000
Switch to task 1	<Ctrl-WA>	Taskо 1
Switch to task 2	<Ctrl-WB>	Taskо 2
Download software from PC	<Ctrl-X>	(Echo back)
When power on		<Ctrl-M><Ctrl-J>Patrion System
Print acknowledge		<Ctrl-P>o P<task>o <Ctrl-M> <Ctrl-J> (PM2000 mode) ***Note: <task> is 1 or 2.*** <Ctrl-F> (Patrion or ML8 mode)

ASCII, EBCDIC – Character Codes and Character Sets

Table C2: Character Codes

Control Codes	ASCII	EBCDIC	Hex	Octal	Dec
<Ctrl-@>	NUL	NUL	00	000	0
<Ctrl-A>	SOH	SOH	01	001	1
<Ctrl-B>	STX	STX	02	002	2
<Ctrl-C>	ETX	ETX	03	003	3
<Ctrl-D>	EOT	PF	04	004	4
<Ctrl-E>	ENO	HT	05	005	5
<Ctrl-F>	ACK	LC	06	006	6
<Ctrl-G>	BEL	DEL	07	007	7
<Ctrl-H>	BS		08	010	8
<Ctrl-I>	HT		09	011	9
<Ctrl-J>	LF	SMM	0A	012	10
<Ctrl-K>	VT	VT	0B	013	11
<Ctrl-L>	FF	FF	0C	014	12
<Ctrl-M>	CR	CR	0D	015	13
<Ctrl-N>	SO	SO	0E	016	14
<Ctrl-O>	SI	SI	0F	017	15
<Ctrl-P>	DLE	DLE	10	020	16
<Ctrl-Q>	DC1	DC1	11	021	17
<Ctrl-R>	DC2	DC2	12	022	18
<Ctrl-S>	DC3	TM	13	023	19
<Ctrl-T>	DC4	RES	14	024	20
<Ctrl-U>	NAK	NL	15	025	21
<Ctrl-V>	SYN	BS	16	026	22
<Ctrl-W>	ETB	IL	17	027	23
<Ctrl-X>	CAN	CAN	18	030	24
<Ctrl-Y>	EM	EM	19	031	25
<Ctrl-Z>	SUB	CC	1A	032	26

Control Codes	ASCII	EBCDIC	Hex	Octal	Dec
<Ctrl-[>	ESC	CU1	1B	033	27
<Ctrl-\>	FS	IFS	1C	034	28
<Ctrl-]>	GS	IGS	1D	035	29
<Ctrl-^>	RS	IRS	1E	036	30
<Ctrl-_>	US	IUS	1F	037	31
	SP	DS	20	040	32
	!	SOS	21	041	33
	"	FS	22	042	34
	#		23	043	35
	$	BYP	24	044	36
	%	LF	25	045	37
	&	ETB	26	046	38
	’	ESC	27	047	39
	(		28	050	40
	)		29	051	41
	*	SM	2A	052	42
	+	CU2	2B	053	43
	,		2C	054	44
	-	ENQ	2D	055	45
	.	ACK	2E	056	46
	/	BEL	2F	057	47
	0		30	060	48
	1		31	061	49
	2	SYN	32	062	50
	3		33	063	51
	4	PN	34	064	52
	5	RS	35	065	53
	6	UC	36	066	54
	7	EOT	37	067	55
	8		38	070	56
	9		39	071	57

Control Codes	ASCII	EBCDIC	Hex	Octal	Dec
	:		3A	072	58
	;	CU3	3B	073	59
	<	DC4	3C	074	60
	=	NAK	3D	075	61
	>		3E	076	62
	?	SUB	3F	077	63
	@	SP	40	100	64
	A		41	101	65
	B		42	102	66
	C		43	103	67
	D		44	104	68
	E		45	105	69
	F		46	106	70
	G		47	107	71
	H		48	110	72
	I		49	111	73
	J	‰	4A	112	74
	K	.	4B	113	75
	L	<	4C	114	76
	M	{	4D	115	77
	N	+	4E	116	78
	O	|	4F	117	79
	P	&	50	120	80
	Q		51	121	81
	R		52	122	82
	S		53	123	83
	T		54	124	84
	U		55	125	85
	V		56	126	86
	W		57	127	87
	X		58	130	88

Control Codes	ASCII	EBCDIC	Hex	Octal	Dec
	Y		59	131	89
	Z	!	5A	132	90
	[	$	5B	133	91
	\	*	5C	134	92
	]	)	5D	135	93
	^	;	5E	136	94
	_	~	5F	137	95
	‘		60	140	96
	a	/	61	141	97
	b		62	142	98
	c		63	143	99
	d		64	144	100
	e		65	145	101
	f		66	146	102
	g		67	147	103
	h		68	150	104
	i		69	151	105
	j		6A	152	106
	k	,	6B	153	107
	l	%	6C	154	108
	m	_	6D	155	109
	n	>	6E	156	110
	o	?	6F	157	111
	p		70	160	112
	q		71	161	113
	r		72	162	114
	s		73	163	115
	t		74	164	116
	u		75	165	117
	v		76	166	18
	w		77	167	119

Control Codes	ASCII	EBCDIC	Hex	Octal	Dec
	x		78	170	120
	y		79	171	121
	z	:	7A	172	122
	{	#	7B	173	123
	|	@	7C	174	124
	}	’	7D	175	125
	~	=	7E	176	126
DEL	˝	"	7F	177	127
The following entries are extended ASCII and correspond to characters in the character map.					
	€	a	80	200	128
	Œ		8C	201	129
	™	r	99	231	153
	Ÿ		9F	237	159
	¡		A1	241	161
	£	t	A3	243	163
	©	z	A9	251	169
	«		AB	253	171
	œ		AC	254	172
	®		AE	256	174
	0		B0	260	176
	»		BB	273	187
	¿		BF	277	191
	À		C0	300	192
	Á	A	C1	301	193
	Â	B	C2	302	194
	Ã	C	C3	303	195
	Ä	D	C4	304	196
	Å	E	C5	305	197
	Æ	F	C6	306	198
	Ç	G	C7	307	199

Control Codes	ASCII	EBCDIC	Hex	Octal	Dec
	È	H	C8	310	200
	É	I	C9	311	201
	Ê		CA	312	202
	Ë		CB	313	203
	Ì		CC	314	204
	Í		CD	315	205
	Î		CE	316	206
	Ï		CF	317	207
	Ñ	J	D1	321	209
	Ò	K	D2	322	210
	Ó	L	D3	323	211
	Ô	M	D4	324	212
	Õ	N	D5	325	213
	Ö	O	D6	326	214
	X	P	D7	327	215
	Ø	Q	D8	330	216
	Ù	R	D9	331	217
	Ú		DA	332	218
	Û		DB	333	219
	Ü		DC	334	220
	β		DF	337	223
	à		E0	340	224
	á		E1	341	225
	â	S	E2	342	226
	ã	T	E3	343	227
	ä	U	E4	344	228
	å	V	E5	345	229
	æ	W	E6	346	230
	ç	X	E7	347	231
	è	Y	E8	350	232
	é	Z	E9	351	233

Control Codes	ASCII	EBCDIC	Hex	Octal	Dec
	ê		EA	352	234
	ë		EB	353	235
	ì		EC	354	236
	í		ED	355	237
	î		EE	356	238
	ï		EF	357	239
	ñ		F1	361	241
	ò		F2	362	242
	ó		F3	363	243
	ô		F4	364	244
	õ		F5	365	245
	ö		F6	366	246
	÷		F7	367	247
	ø		F8	370	248
	ù		F9	371	249
	ú		FA	372	250
	û		FB	373	251
	ü		FC	374	252
	ÿ		FF	375	252

Glossary

24-hour time Represents the 24-hour clock. Format: HH:MM

Add Head Function Key In a purge printhead screen, allows you to add a highlighted printhead to the purge process.

Add to Format Function Key Where available, allows you to add a code element to an established format field.

Add to Message Function Key Where available, allows you to add a pre-set code element to a message.

Alpha Codes Option Set Up function that allows you to set codes for hour, day, date or month. Access by pressing the Set Up function key and selecting the Alpha Codes option from the resulting pop-up menu. Also see Alpha Hour, Alpha Day, Alpha Date, Alpha Month.

Alpha Date Alpha Codes option that allows you to assign an alpha code to each day of the month. Access by selecting Set Up/Alpha Codes/Alpha Date.

Alpha Day Alpha Codes option that allows you to assign alpha codes for each day of the week. Access by selecting Set Up/Alpha Codes/Alpha Day.

Alpha Hour Alpha Codes option that allows you to assign alpha codes to each hour of a 24-hour day. Access by selecting Set Up/Alpha Codes/Alpha Hour.

Alpha Month Alpha Codes option that allows you to assign an alpha code to each month of the year. Access by selecting Set Up/Alpha Codes/Alpha Month.

Alt Use the alt key to display or close the next available pop-up menu.

Arrow Keys Controller keypad keys that allow you to move the cursor up, down, left and right in message screens and menus.

Backspace/Delete Key Controller keypad key used to delete characters and elements during message creation or editing. Moves the cursor one character or element to the left while deleting that character or element.

Bold (boldface) Option Fonts option that allows you to select boldface type for VJ printheads, or custom fonts for HR Series printheads. Access by pressing the Fonts function key from a message screen and selecting the Bold option.

Box-Lot Option In the Lots & Boxes screen, this format option prints the box count before the lot count.

Cancel Function Key Exits the current screen without saving any new or changed information. Also see Esc key and Quit option.

Character Map Option Fonts option that allows you to view and optionally select accented and special-purpose characters for use in a message printed by VJ printheads. Access by pressing the Fonts function key from a message screen and selecting the Character map option.

Character Width Print Settings option that allows you to change the character width. Access by pressing the Print Settings function key. Also, when the Print Position screen is displayed, you can press the Character Width function key to access the Character Width screen.

Continuing Count The number of print cycles counted on the system, regardless of the number of messages printed. You can add a continuing count to a message by accessing the Counts function, Continuing option.

Contrast Key Controller keypad key used to either darken the screen display (down arrow) or lighten the display (up arrow).

Control Key (Ctrl) Used in conjunction with other keys to alter the function of the other keys. For example, when editing a message, press Ctrl + Enter to select a highlighted message element for changing, moving or deleting.

Controller PatrionPlus keypad and software used to drive the printheads. The controller system allows you to perform setup, message and utility functions.

Counts Function Messages function that allows you to specify incrementing, continuing, and lots/boxes counts. Accessed by pressing the Counts function key from a message screen. Also see incrementing count, continuing count, and lots and boxes count.

(Counts) Options Function Key From either an incrementing counts or lots & boxes screen, accesses a submenu of options that allow you to set the count to reset, prompt, or stop. Also see Reset option, Prompt option and Stop option.

Current Message Functions Allow you to make edits or product count adjustments to the message currently printing. Accessed by pressing the Current Message function key from the home screen.

Date Code Message code element that can be changed and added to a message by accessing the Time/Date Codes function. Also see Time/Date Codes function.

Default Function Key Instructs the system to automatically assign a standard, pre-programmed code.

Delete (Message) Option Messages function that allows you to delete any existing message. Access by pressing the Messages function key and selecting the Delete option from the resulting pop-up menu.

Don't Save Function Key The system displays a "save changes" prompt when you try to leave a message without saving your changes. The Don't Save function key is displayed to allow you to exit the message without saving your changes. Also see Save function key.

Dual-tasking Allows you to print two different messages on two production lines. (Task 2 Key required.)

Edit (Message) Option Messages function that allows you to edit an existing message. Access by pressing the Messages function key and selecting the Edit option from the resulting pop-up menu.

Edit It Option Current Message function that allows you to edit the currently-printing message (another way of accessing the edit mode). Access by pressing the Current Message function key while a message is printing and selecting the Edit it option from the resulting pop-up menu.

Element Any part of a message that contains unique, unifying characteristics (such as a date element). When an element is created, the system surrounds it with a box border that keeps the element characters together.

Selecting/Highlighting an Element. To move within a message element, you must first "select" it by moving the cursor to the element until you see the surrounding box border. To move, change, or delete a message element, you must first select it, and then "highlight" it by pressing Ctrl + Enter. The system darkens the element's background.

Enable Purge Function Key In a purge printhead screen, allows you to start the purge process.

Enter Keypad key used to select highlighted menu options, to commit commands within a function or field, and to move the cursor to the beginning of the next line during creation or editing of a message.

Esc Key (Escape) Keypad key that allows you to exit a screen without saving any new or changed information. Also see Cancel function key and Quit option.

Expiration Date Code Message code element that can be created, changed and added to a message by accessing the Time/Date Codes function. Also see Time/Date Codes function.

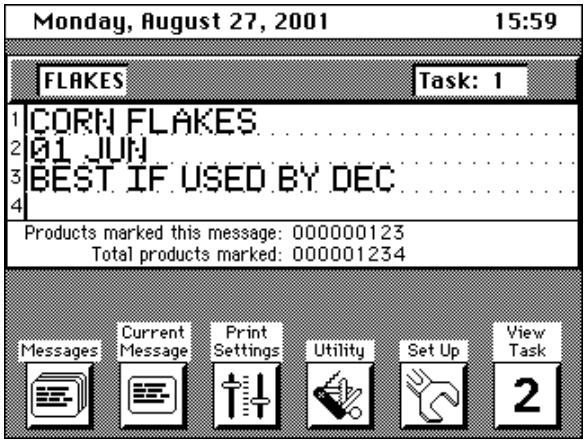
Field Box within a screen that displays a piece of function information. A field is usually active when you place the cursor in it. You can type or enter information in an active field.

Fonts Function Key Allows you to change the font for either a new or existing message. Access by pressing the Fonts function key in any message screen; then select the desired font option.

Function Key One of six keys located just under the controller screen. Each function key corresponds to an icon currently displayed on the screen. Depending on your current task, a function key allows you to either directly access the appropriate function screen or to access a pop-up menu where you can select a more specific option.

Home Screen The PatrionPlus system's main screen. Displayed whenever the system is first accessed or reset or when no functions are currently in used. Contains a message screen that displays the currently-printing message; if no message is printing, the message screen is blank.

Home Screen



Hot-Key Set up a Hot-Key for messages that you frequently print. A Hot-Key allows you to quickly start printing a message.

Incrementing Count A printable count of the number of times a specific message has been printed since the last time the count was reset. You can add an incrementing count to a message by accessing the Counts function, Incrementing option.

Inverted Print Message is printed upside down and backwards.

Key Each key on the controller keypad performs one or more functions. To enter a command or type a character, press a key only once; to repeat the key's function, press and hold the key.

Keypad Beeper Each time you press a key on the controller keypad, the controller beeps to signal that the key is responding correctly. You can turn the beeper feature on and off by selecting/deselecting the keypad beeper option.

Keystroke Combination Identifies two or more keys that, if pressed in combination, perform a special function. To perform a keystroke combination, press and hold the first key; then press the second key once. For example, to add a special character to a message, you might press Shift + A to add the special character.

Language Option Set Up function that allows you to change your screen display to show screen labels and messages in another language. Access by pressing the Set Up function key and selecting the Language option from the resulting pop-up menu.

Left to Right Function Key In a Print Position screen, sets the print position for the opposite direction.

Lot-Box Option In the Lots & Boxes screen, this format option prints the lot count before the box count.

Lots and Boxes Count A grouping of two incrementing counts, the box count and the lot count. You can add a lots and boxes count to a message by accessing the Counts function, Lots & Boxes option.

Lots and Boxes Format Options Determines the format in which the counts will appear in a message. Accessed by pressing the Format function key in a lots & boxes screen. Also see Lot-Box option, Box-Lot option, and Lot Only option.

Lot Only Option In the Lots & Boxes screen, this format option prints only the lot count.

Master Printhead Printhead designated to trigger each new print cycle. To designate a master printhead, select Set Up/Printhead Options/Master.

Message Element An individual item in a message, such as character strings, logos, counts, time and date codes, barcodes.

Message Functions Allow you to create, edit, view, print, and delete messages. Accessed by pressing the Messages function key from the home screen.

Message Screen Part of the controller screen that displays the message being created, edited, viewed, or printed.

Minus 1 Function Key In a Product Counts screen, adjusts a highlighted field down by one count.

ML8 Emulation Option Utility option that allows you to operate the PatrionPlus system using a Keyboard Input Device (KID). Access by pressing the Utility function key and selecting the ML8 Emulation option.

Move Left Function Key In the Print Position screen, used to place the printed message on the left edge of a box travelling to the left (press until the value is zero and the sliding bar is at maximum left). You can also use the Left Arrow key.

Move Right Function Key In the Print Position screen, used to place the printed message anywhere to the right of the box left edge.You can also use the Right Arrow key.

New (Message) Option Messages function that allows you to create a new message and add/change all desired message elements. Access by pressing the

MESSAGES function key and selecting the New option from the resulting pop-up menu.

OK Function Key Used to accept new or changed information.

On/Reset Key Controller keypad key that completely resets the controller. Used to delete all unsaved information and return to the home screen.

Options One or more items listed in a function's pop-up menu. Allows you to select a more specific function. For example, if you press the Set Up function key, you can select the Time & Date option from the resulting pop-up menu.

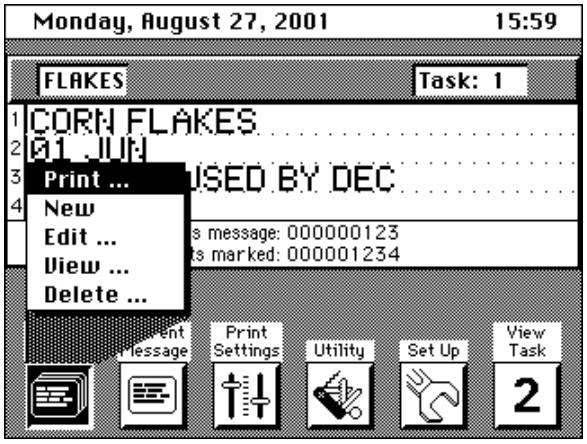
Photocell Triggers the master printhead.

Plus 1 Function Key In a Product Counts screen, adjusts a highlighted field up by one count.

Pop-up Menu Menu of additional options displayed from a function icon when you press the associated function key. To select an option from a pop-up menu, use the up and down arrow keys to highlight the desired option; then press the Enter key.

Hint: If three dots follow a menu option, such as "Print..." (see example below), more information is needed to complete the command. Therefore, when you select this type of option, another screen is displayed.

Sample Pop-Up Menu



Printheads Option Set Up function that allows you to set each printhead to a specific dot size, line and direction. Access by pressing the Set Up function key and selecting the Printheads option from the resulting pop-up menu.

Once you access this option, you can press the Printhead Options function key. The system displays a submenu of options that allow you to invert print or designate a master printhead.

Print Cycle The printing action, from the start of the message to the end of the message.

Print (Message) Option Messages function that allows you to print a saved message. Access by pressing the Messages function key and selecting the Print option from the resulting pop-up menu.

Print Position Function Key Allows you to adjust the print position. Access by first pressing the Print Settings function key and selecting the Character Width option. The system displays the Character Width screen, where you can press the Print Position function key.

Print Settings Functions Allow you to change the character width and print position. Accessed by pressing the Print Settings function key from the home screen.

Print Trigger Option Printheads option that allows you to specify either an internal or external photocell as the master printhead trigger. Access by pressing Set Up/Printheads/Print Trigger.

Printing Key Controller keypad key that allows you to stop a message from printing. If the key LED is green, you can press the key to stop printing. If the LED is red, you can press the key to begin printing.

Product Counts Option Current Message function that allows you to change product counts while a message is printing. Access by pressing the Current Message function key while a message is printing and selecting the Adjust Counts option from the resulting pop-up menu.

Prompt Option In either an incrementing count or lots & boxes count screen, this option causes the system to always displays the following prompt whenever the count reaches its maximum: Reset Lots & Boxes?". Accessed by pressing the Options function key and selecting the Prompt option. Also see Reset function key and Don't Reset function key.

Purge (printhead) Option Utility function that allows you to purge a VJ printhead. Access by pressing the Utility function key and selecting the Purge option.

Quit Option Messages function that allows you to leave a message without saving any new or changed information. Access by pressing the Messages function key and selecting the Quit option from the resulting pop-up menu. Also see Cancel function key and Esc key.

Remove Head Function Key In a purge printhead screen, allows you to remove a highlighted printhead from the purge process.

Reset Function Key In a Product Counts screen, resets the highlighted field to the starting number.

Reset Option In either an incrementing count or lots & boxes count screen, this option resets the count to the starting number after the message has been reloaded to print and printing begins again. Accessed by pressing the Options function key and selecting the Reset option.

Revert Option Messages function that allows you to cancel your current changes and redisplay the last saved version of the message. Typically used when the Undo function key is not available. Access by pressing the Messages function key and selecting the Revert option from the resulting pop-up menu.

Rollover Hour Option Set Up function that allows you to set the daily time that the printable day and date codes change. Access by pressing the Set Up function key and selecting the Rollover Hour option from the resulting pop-up menu.

Save Function Key The system displays a "save changes" prompt when you try to leave a message without saving your changes. The Save function key is displayed to allow you to save your changes. Also see Don't Save function key.

Save (Message) Option Messages function that allows you to save either a new or edited message. Access by pressing the Messages function key and selecting the Save option from the resulting pop-up menu.

Screen Controller display that allows you to use the PatrionPlus system. Depending on your current selections, the screen displays:

- The current day, date and time.
- Any message that you are creating, editing, viewing, printing or deleting.
- All available function keys and, if a function key is pressed, displays a menu of available options.
- Other information specific to your current task.

Screen Saver Controller feature that extends the life of the screen display backlight by shutting off the screen display whenever the keypad is inactive for approximately 10 minutes. To light the display again, press any key.

Screen Saver Option Set Up function that allows you to turn the screen saver feature on and off. Access by pressing the Set Up function key and selecting the Screen Saver option from the resulting pop-up menu.

Select Message Screen A screen that lists all saved messages available to print, edit, view, or delete. You can highlight the name of a message to select it, or you can type the name into the typing area.

Select Printhead Function Key In a purge printhead screen, allows you to select the printhead you want to purge.

Select Valve Function Key In a purge printhead screen, allows you to select one printhead valve for purging.

Set Up Functions Allow you to specify custom codes, set printhead configurations, and select convenient keypad settings. Accessed by pressing the Set Up function key from the home screen.

Shaft Encoder Option Printheads option that allows you to add a shaft encoder to the printhead configuration to time the print cycle (does not trigger the print cycle). Access by selecting Set Up/Printheads/Shaft Encoder.

Shift Key Used with the arrow keys to scroll four fields at a time (where applicable). Also used to type uppercase characters in a message.

Shut Down Option Utility function that allows you to shut down the controller without unplugging it. Access by pressing the Utility function key and selecting the Shut Down option.

Submenu Secondary menu displayed when you select a pop-up menu option that is followed by three dots (indicating additional options).

Task 2 Key Necessary for dual tasking. Installs on the back of your controller.

Test Print Function Key In a purge printhead screen, allows you to test a selected printhead.

Time and Date Function Set Up function that allows you to reset the current time, day and date. Access by pressing the Set Up function key and selecting the Time & Date option from the resulting pop-up menu.

Time Code Message code element that can be changed and added to a message by accessing the Time/Date Codes function. Also see Time/Date Codes function.

Time/Date Codes Function Messages function that allows you to add or change a time, date, expiration date or work shift code element for a message. Access by press the Time/Date Codes function key from a message screen.

Undo All Function Key Deletes all fields in a screen and replaces their values with the last saved values.

Undo Function Key Deletes the last value entered in an active field and replaces it with the last saved value.

Utility Functions Allow you to test and purge printheads, perform ML8 emulations, and shut down the controller system. Accessed by pressing the Utility function key on the home screen.

Version Key Displays the software version screen.

View (Message) Option Messages function that allows you to view any existing message. Access by pressing the Messages function key and selecting the View option from the resulting pop-up menu.

View Task Function Key Allows you to toggle between task 1 and task 2. If the Task 2 Key is not installed, the system will not toggle to task 2.

Work Shift Code Message code element that can be added to a message by accessing the Time/Date Codes function. Also see Time/Date Codes function.

Work Shifts Option Set Up function that allows you to assign shift codes and start times. Access by pressing the Set Up function key and selecting the Work Shifts option from the resulting pop-up menu.

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