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BK700 Portable Controller

BK700 Portable Controller User's Guide

Manual History

Version	Date	Description	ECO No.
1.0	16-Jan-01	Manual Released as 9101797.	-
2.0	16-Jul-04	Manual Released with updated controller changes.	555
2.1	22-Oct-04	Manual Released with updated controller changes.	666
2.2	18-Apr-05	Manual Released with updated FCB specification changes.	750

BK700 Portable Controller

Appendix A – Assembly Drawings

Appendix B – Electrical Drawings

Appendix C – Field Connection Board

Appendix D – Serial Communications

General Information

1.1   Introduction

The Buskro BK700 Portable Controller is a stand-alone ink-jet controller primarily designed to integrate Buskro's Inkjet technologies to other transport bases or finishing lines. The BK700 was also designed to connect to standard Buskro transport bases to operate as a complete turnkey inkjet system. In addition, the BK700 is a fully modular system designed to accommodate the Apollo, Atlas, Atlas-UVC, and Elite+ inkjet technologies by selecting the appropriate inkwell and printheads.

The BK700 consists of three main sub-systems:

1. The **controller cabinet** contains the main computer, power box (with power support for up to 4 inches of Apollo print), Field Connection Board (FCB), and an optional serial card. When purchased with a BK7IB base, a latching mechanism can be attached in order to secure the BK700 to the BK7IB (creating the BK765). The entire unit is mounted on a carriage (wheel-equipped stand). More information can be found in **Chapter 2.0**.

2. The **inkwell assembly** contains the technology specific components (i.e. for Apollo, Atlas, Atlas-UVC, and Elite+) such as the ink delivery system and its control electronics. The inkwell specified is dependent on the technology chosen. More information can be found in **Chapter 3.0**.

3. The **controller console** is the main user interface. It houses the main power switch, a computer reset button, the floppy and CD drives, a tray mounted keyboard, and the monitor.

The BK700 controllers are ordered as packages that include the following elements (**Figure 1-1**):

1. The standard BK700 controller with desired inkwell.

2. A photocue sensor and an encoder or encoder wheel assembly to enable printing.

3. A printhead support bridge(s).

4. The printhead(s) of choice (Apollo, Atlas, Atlas-UVC, and Elite+).

5. The optional communication package.

Figure 1-1: *BK700 package elements*

BK700 Controller

Photocue Sensor

Printhead Bridge

Buskro Printheads

Serial Communications Package (Optional)
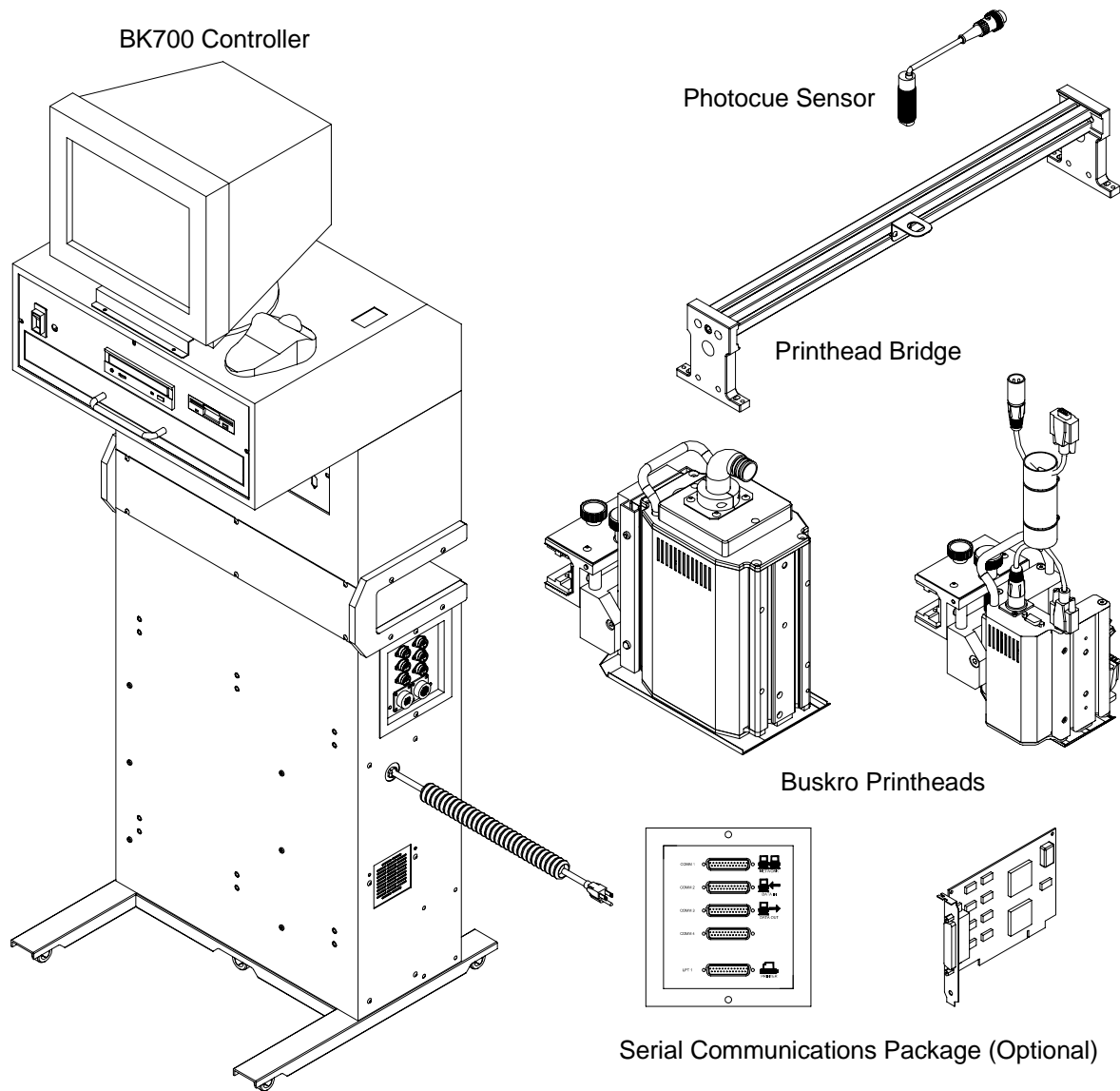
1.2   Features

1.2.1   Compose IQ

Compose IQ is the Windows based software included with all standard BK700 controllers. It is designed to control and monitor the printing process. Through Compose, the user can control the graphic layout and job setup, and monitor the job run progress in real time. The BK700 controller with Compose IQ features include:

- Easy layout tools in a Windows environment.
- Control up to eight external product handling equipment zones.
- Control up to eight inches of print.
- Open architecture for easy upgrading.
- 1:1 product to data ratio for system-wide integrity.
- Complete job audit reporting of current and archived production.
- Network and communication capability with external input devices.

The BK700 can also be purchased with an enhanced communication package, or in the case of OCR applications an OCR package. It is also possible to upgrade to these options at a later date. Selective controls can also be enabled for control of various machine elements. When the upgrade package is installed, the user can run in any desired mode. This includes standard, client, host, OCR, and selective. In order to implement selective controls, it is necessary to provide localized system controls with a PLC. ***Programming and implementation of the PLC functions is not included in the price of the upgrade package***. Additional information can be seen in Chapter 7.0.

1.2.2 Field Connection Board (FCB)

The Field Connection Board (FCB) is included in every BK700 Controller. This allows for a standard connection point for the input sensors to the controller. The main input sensors used by the controller include the photocue, encoder, jam, and cycle. The FCB also has a 17-pin output connector that can be use to integrate the output signals from the controller to the transport base. These output signals include the stacker signal, stop signal, and divert signal.

1.2.3 Serial Card

The BK700 Controller will accommodate a high-speed serial card that is required for all Compose IQ applications. This serial card is installed in the PCI slot on the motherboard, but the connectors are conveniently mounted on the side of the controller for easy access to the user.

1.2.4 Power Box

The Power Box comes standard with every BK700 and provides power to the FCB and includes four connections to power the Apollo printheads. As a result, Apollo printheads can be added to any BK700 controller in the field without worrying about installing an additional power supply.

1.2.5 Inkwell Assembly

The BK700 controller incorporates a modular design accommodating the inkwell to match the print technology. That is, for Apollo systems an Apollo inkwell is included, for an Elite+ system an Elite+ inkwell is included, and for an Atlas system an Atlas inkwell is included. Any one of these inkwells can be interchanged in the field should the customer decide to upgrade technologies.

1.2.6 Portability

The BK700 controller sits upon a carriage assembly with casters allowing for the unit to be easily moved from one system to another. When installed to a transport base, the low profile of the carriage assembly (2" high) permits the carriage to be rolled under the transport base allowing closer access to the keyboard and mouse from the front of the machine.

1.2.7 Controller Upgradeability

The modular design of the BK700 simplifies the task of upgrading systems quickly and cost effectively. The inkwells can be exchanged because they share the same physical dimensions and mounting configurations, computer components can be upgraded easily, and the Apollo printheads can be added to an Atlas, Atlas-UVC, or Elite+ controller without having to worry about additional power requirements for the Apollo printhead.

1.2.8 Combo Units

Any BK700 Atlas, Atlas-UVC, or Elite+ controller is capable of operating as a combination unit with the addition of the Apollo printheads. These printhead technologies can then be used simultaneously for the desired application or can serve as a valuable backup to reduce downtime in the case of a problem.

1.3   Specifications

Table 1-1: *BK700 Controller Specifications*

1.3.1 Physical			
	Overall Length	24.24"	616 mm
	Overall Height	69.00"	1753 mm
	Including monitor		
	Overall Width	21.75	552 mm
	Including inkwell		
	Weight	150 lbs	409 kg
1.3.2 Electrical Requirements			
	Line Voltage	115 or 200 or 230 VAC	
	Line Current	8 Amps (115 VAC) or 4 Amps (200/230 VAC)	
	Power	920 VA, maximum	
1.3.3 Operator Controls			
	Circuit-Breaker Switch	Main	
1.3.4 Computer Specifications (Minimum)			
	CPU	Pentium 4	
	Memory	256 MB DDR RAM	
	Hard Drive	10.0 GB, IDE Controller	
	Floppy Drive	1.44 MB, 3 ½"	
	CD-ROM	8X, IDE Controller	
	Video Display	800 x 600, 16-Bit Color	
	Keyboard	101 US	
	Mouse	Trackball	
	Operating System	Windows™ XP Professional	
	Imaging Software	Compose IQ	

1.4 System Drawings
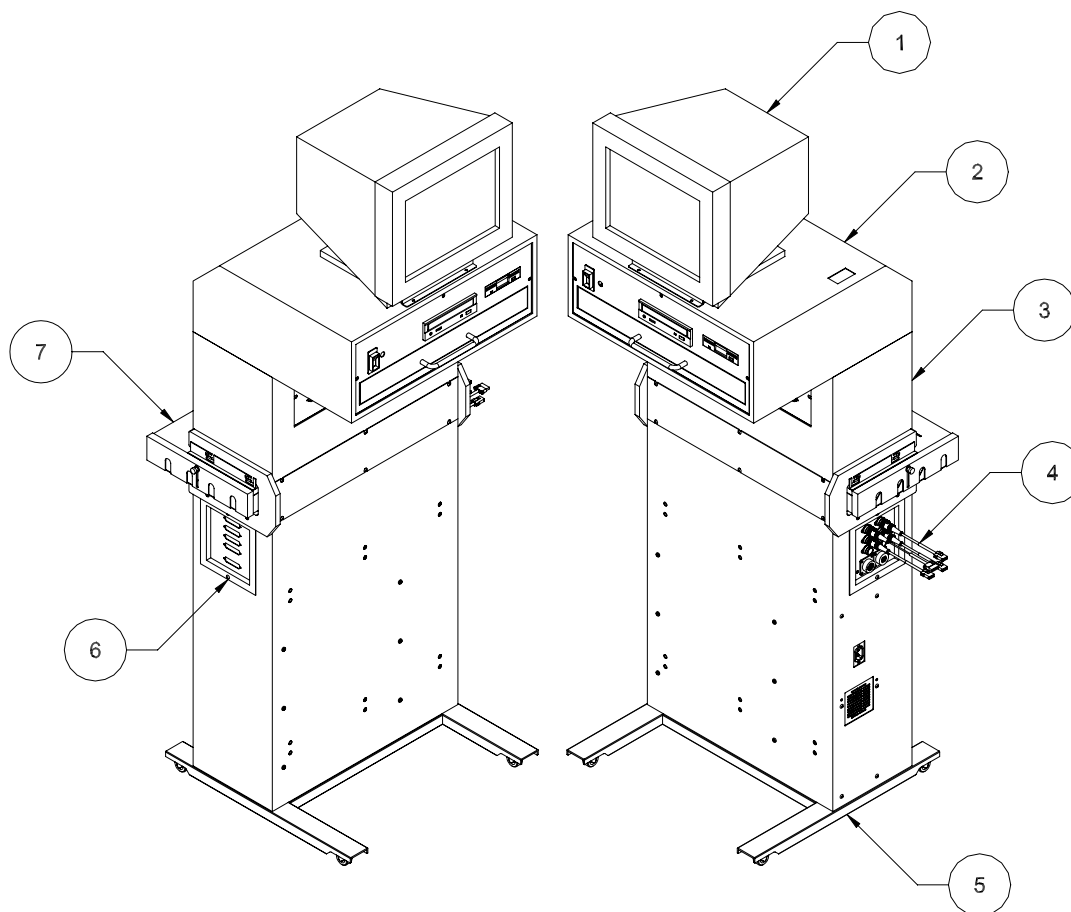
Table 1-2: *BK700 Features*

Item	Description	Reference
1	Computer Monitor	
2	Controller Console	
3	Controller Inkwell (Apollo, Atlas, Atlas-UVC, Elite+)	
4	Field Connection Board Assembly	
5	Controller Cabinet	
6	Serial Communication Interface	
7	HP Bulk Inkwell (Apollo only)	
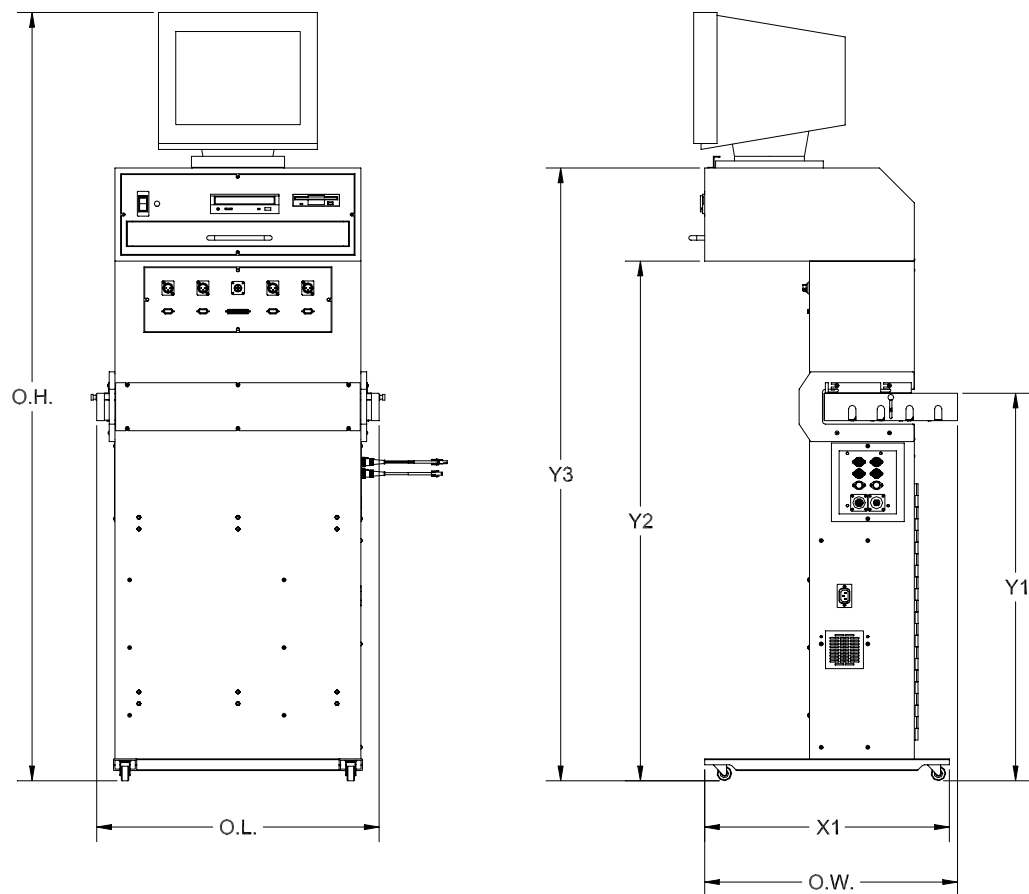
Table 1-3: *BK700 Controller dimensions*

Symbol	Description	Dimensions	
O.H.	Overall Height	69.00"	1753 mm
O.L.	Overall Length	24.25"	616 mm
O.W.	Overall Width	21.75"	553 mm
X1	Carriage Width	21.00"	534 mm
Y1	Inkwell Height	33.53"	852 mm
Y2	Controller Height (Bottom)	44.88"	1140 mm
Y3	Controller Height (Top)	52.88"	1343 mm

Controller Cabinet

2.1   Introduction

The controller cabinet is the heart of the BK700. In addition to a standard computer system, the controller cabinet includes the *Compose IQ* software, a power management system, a datapath card, a field connection board, and an optional serial card. In addition, the entire unit is equipped with casters to provide easy movement of the system from one transport base to another.

Figure 2-1: *Rear View of Controller Cabinet*
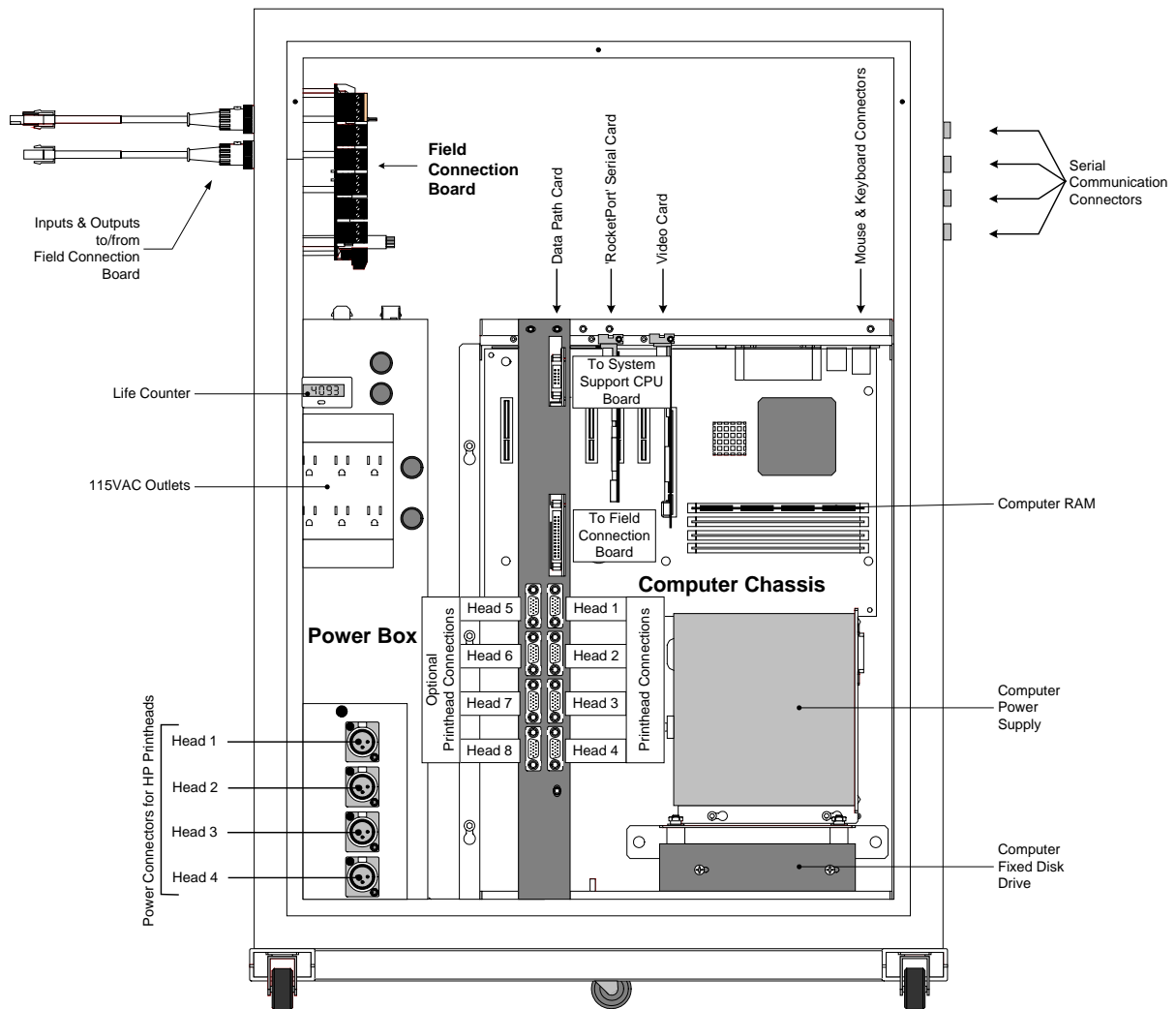
2.2   Field Connection Board

The Field Connection Board (FCB) serves as an interface and electrical isolation between the controller's internal circuitry and external equipment. The FCB has a number of inputs and outputs. The inputs mainly deal with sensor signals (jam detectors, photo sensors, a shaft encoder, and a cycle input) that are brought out on individual connectors on the connector panel associated with the FCB. They are also available as a group on a single input cable connector. The outputs are also brought out on a cable connector and provide relay contact outputs for such functions as a stop signal to the inkjet equipment, control of a stack function (to control the speed of a conveyor for stacking purposes), and a diverter.

When the BK700 controller is used with a standard Buskro base, all communications with the base are internal through a ribbon cable and the connections on FCB are not needed.

The external connections provide a more general interface to allow the BK700 to work with a variety of equipment that does not necessarily conform to Buskro's standards. The actual operation and connections to the board are discussed in detail in Appendix C.

2.3   Power Box

The Power Box (**Figure 2-1**) is the entrance point for all power used in the Controller. It contains a line filter, AC outlets, the Life Counter (indicating the total number of product items processed by the unit), and two DC power supplies. A schematic diagram and a layout of the interior of this box are found in Appendix B.

2.4   Serial Communications Connectors

The four serial communications connectors are part of the optional serial communications
(Enhanced) package, together with the "RocketPort" communications card. They are
standard RS-232 connectors in a DB-25 configuration. The communications package
links the BK700 to other computer equipment for expanded capabilities. The Rocketport
card is discussed in detail in Appendix D.

2.5   Computer

The computer (**Figure 2-1**) consists of a standard ATX computer chassis with power
supply, motherboard, RAM, hard drive, AGP video card, software, and the Data Path card
that provides all communication between the computer and the inkjet base. If the optional
serial communications package is installed, the "RocketPort" communications card (see
Appendix D) will be installed in PCI slot 1 or 2.

2.5.1   Datapath Card

The Datapath card connects to the motherboard through the PCI Bus and performs the
following functions:

- Interfaces to the Base Interface Board to receive sensor input from the base.
- Interfaces to the Base Interface board to control the base and conveyor.
- Provides a communication port for control and monitoring of the SSB.
- Receives configuration information from Compose IQ.
- Transmits status information to Compose IQ.
- Controls when the printhead is fired.
- Provides four head ports used to transfer image data to the printheads.
- With an expansion board, provides eight head ports.

An illustration of the Datapath card can be seen in **Figure 2-2**.

Figure 2-2: *Illustration of Datapath card*
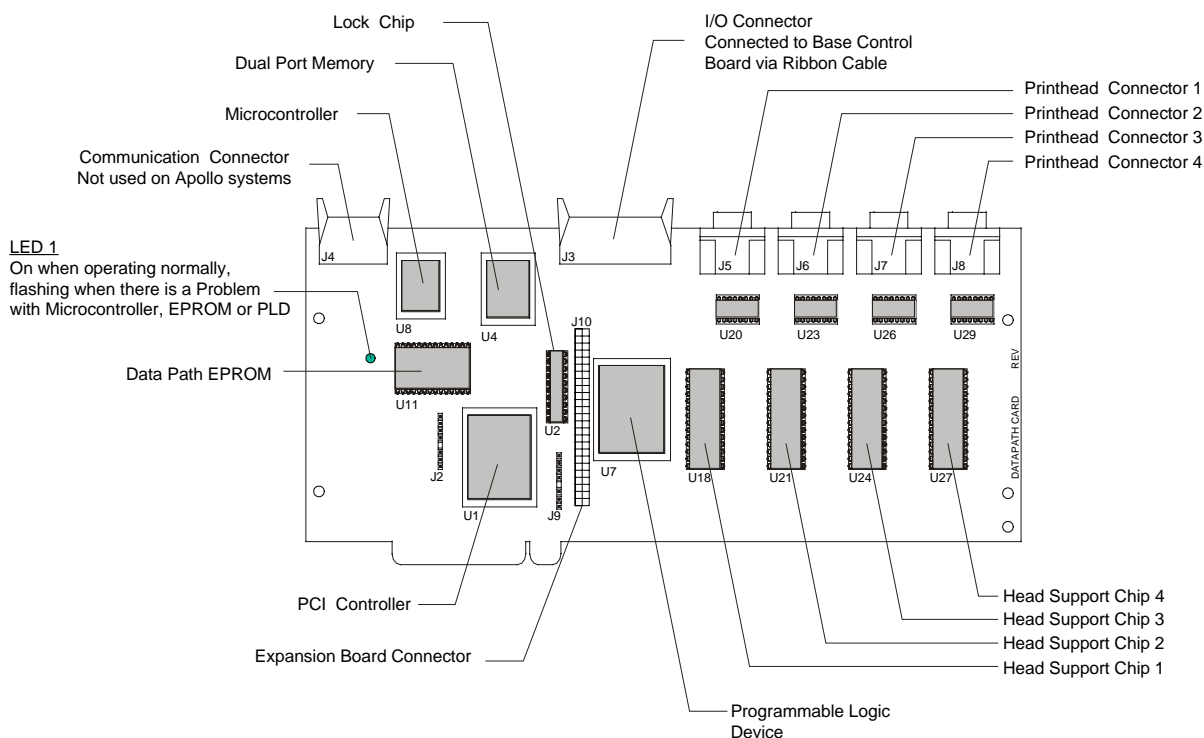
2.5.2 RocketPort Card

The RocketPort Card is a "smart" high-speed communications card. It is designed to plug into a PCI slot on the computer motherboard and has connectors for serial communications cables. The serial communications and the RocketPort Card are discussed in detail in Appendix D.

2.5.3 Keyboard & Mouse

In order for the operator to interface with the software, the BK700 provides a keyboard located in the keyboard drawer of the controller console and a stationary trackball. Other options, such as a regular mouse, a wireless mouse, pen mouse, touch pad or other pointing device may also be used, as long as they are compatible with Windows™.

Inkwell Assembly

3.1 Introduction

In order to satisfy a wide variety of industry needs, Buskro offers four main printing technologies for the BK700: Elite+, Apollo, Atlas, and Atlas-UVC. A brief description of the specifications of each print technology is found in **Table 3-1** while a list of applications can be found in **Table 3-2**.

Table 3-1: *Print technology description*

	Elite+/Elite+ DV	Apollo	Atlas/Atlas-DV	Atlas-UVC
Ink used	Wax-based	Water-based, HP cartridges or bulk ink	Monet, solvent-based	Renoir, UV Curable
Available Resolution	220, 330, 440 and 660 dpi horizontal x 256 dpi vertical (200 dpi Elite+ DV)	150, 200, 300, 400, 600 dpi horizontal x 600 dpi vertical.	110, 220, 330, 440 and 660 dpi horizontal x 256 dpi vertical (200 dpi Atlas-DV)	110, 220, 330, 440 and 660 dpi horizontal x 256 dpi vertical
Production Speed* (see footnote)	25,000 pph 330 dpi	20,000 pph 100 dpi 18,000 pph 200 dpi 14,000 pph 300 dpi	40,000 pph at 110 and 220 dpi	29,000 pph at 330 dpi (depends on cure rate)
Vertical print swath	1" or 2.55"	1" or 2" or 3"	1" or 2.55"	1"
Characteristics	Substrate independent. Instant dry with no external dryer needed. Near laser print quality. Colorful inks available. Clean, safe technology-nontoxic, nonflammable wax-based inks.	Safe, nontoxic and nonflammable water-based inks. Bulk ink available for mid to high volume applications. Spot color printing available.	Very low ink cost. Fast drying Monet inks for outstanding results on most glossy or coated stocks. High-resolution graphics on the fly. Reliable performance and reduced maintenance.	Prints on a wide variety of substrates with no solvent emissions. Fast curing UV ink that hardens instantly. Outstanding print quality.

Note: The pieces-per-hour figure depends on the size of the product. To give a more meaningful comparison, please be advised that the figures for a 1" printhead, #10 envelope with 5 lines of text and 1 line of barcode are as follows: Elite+ (330 dpi) = 25,000 pph; Apollo (300 dpi) = 14,000 pph; Atlas (330 dpi) = 39,200 pph.

Table 3-2: *Print technology applications*

|	Elite+/Elite+ DV	Apollo	Atlas/Atlas-DV	Atlas-UVC
Applications	Randomly selected, high-quality bitmap graphics. Inline applications, magazines, flats, books, etc. Interface with vision recognition systems for read and print, and selective control applications. Interface to high-speed graphic equipment. Printing on inserts and inside of folded pieces. Demographic selective custom printing inline and offline pieces. Cross check, auto reject and selective printing applications.	Interfaced with vision recognition systems. Creative, high-quality, multi-color promotional mailings. Outside envelope addressing and bar-coding. High-quality indicia and graphics. Cross check, auto reject and selective printing applications.	Print is permanent even on glossy stock. Will not smudge. Randomly selected, high-quality bitmap graphics Inline applications, magazines, flats, books, etc. Interface with vision recognition systems for read and print, and selective control applications. Interface to high-speed graphic equipment. Printing on inserts and inside of folded pieces. Demographic selective custom printing inline and offline pieces. Cross check, auto reject and selective printing applications.	Print is permanent even on glossy stock. Can print on coated stocks, plastic, and metal. Will not smudge once cured. Randomly selected, high-quality bitmap graphics Inline applications, magazines, flats, books, etc. Interface with vision recognition systems for read and print, and selective control applications. Interface to high-speed graphic equipment. Printing on inserts and inside of folded pieces. Demographic selective custom printing inline and offline pieces. Cross check, auto reject and selective printing applications.

3.2   Inkwell Integration

In most cases, the inkwell assembly contains the ink supply system, its control electronics, the printhead power, and vacuum requirements. Although each print technology requires a unique inkwell, they are physically integrated to the controller in the same way. This is because they share the same physical dimensions and mounting configuration. However, they differ internally and require different connections from the printheads to the inkwell (**Figure 3-1**).

3.2.1   Apollo Inkwell Integration

The Apollo controller inkwell is the simplest of the three inkwells supplied by Buskro. The end user is only required to connect the power cable and the data cable from each printhead to the faceplate of the inkwell. In the case of an integrated Buskro system (controller and base combinations such as the BK665, BK765, or BK776), the counter and I/O cable may need to be connected as well. Since the ink supply for Apollo printheads is supplied in the form of cartridges on the printhead itself, the Apollo controller inkwell does not contain an ink reservoir. However, a bulk ink HP reservoir can be utilized if desired by the end user. This allows for longer printing periods because it provides approximately six times the amount of ink relative to the standard 42 mL cartridge. For more information on the Apollo print technology, please consult the Apollo Printhead manual.

3.2.2   Elite+ Inkwell Integration

In order to integrate the Elite+ inkwell to the controller, a power cord at the bottom of the inkwell must be plugged into the controller power box. This provides power to the system support box and is routed internally. In addition, the end user must connect the umbilical as well as the lung and meniscus vacuum lines to the printhead. The end user must also activate the main power switch in order to print. For more information on the Elite+ print technology, please consult the Elite+ Printhead manual.

Figure 3-1: *Inkwell Integration*
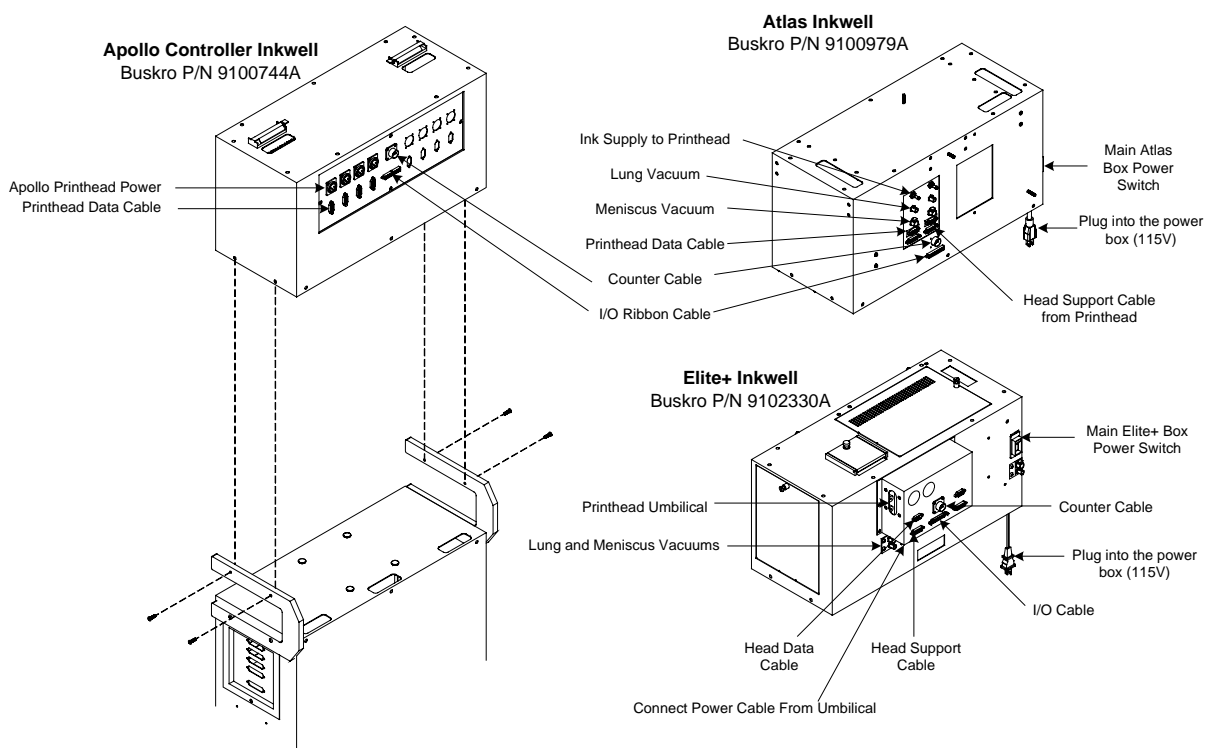
3.2.3 Atlas/Atlas-UVC Inkwell Integration

As with the Elite+ inkwell, the Atlas and Atlas-UVC inkwell also requires a 115V supply. As a result, a power cord at the bottom of the inkwell must be plugged into the controller power box. In addition, the end user must connect the ink supply line, head support cable, lung and meniscus vacuum lines, and the printhead data cable to the front of the inkwell. For more information on the Atlas or Atlas-UVC print technologies, please consult their individual manuals.

3.2.4 Combo systems

For added flexibility, Buskro offers the ability to combine print technologies on a single controller. By using an expansion board kit (BK-EXP-1), the Apollo print technology can be added to an existing Elite+, Atlas, or Atlas-UVC controller. This allows for the simultaneous use of two separate technologies with very different qualities and characteristics in one unit. It must be noted that the resolutions for the Apollo printhead changes when used in combination with Elite+, Atlas, or Atlas-UVC technologies. A standalone Apollo system has a horizontal resolution of 150, 200, 300, 400 and 600 DPI. When used in a combo system, the horizontal resolutions will be 110, 220, 330, 440, and 660 DPI.

Base Integration

4.1 Introduction

In addition to being designed as a stand-alone controller, the BK700 controller was also designed to work together with standard Buskro transport bases as a complete turnkey unit. In the case of the BK7IB base, the BK700 can also be mechanically latched. In addition, electrical cables must be connected between the BK700 and the base for the encoder, photocue, stack signal, jam switch, cycle, and stop relay signals.

4.2 Physical Mounting (BK765)

To connect the BK700 to the BK7IB base, a mechanical latching kit is required. Once together, the integrated transport base and controller is known as the BK765 Inkjet System. In order to connect the two systems, a latching kit must first be installed on the controller. This unit mates with the latching kit already installed on the BK7IB base. This can be seen in **Figure 4-1**.

Figure 4-1: *Latching mechanism of the BK765*

Latching Mechanism
on BK700 Controller

Latching Mechanism
on BK7IB Base
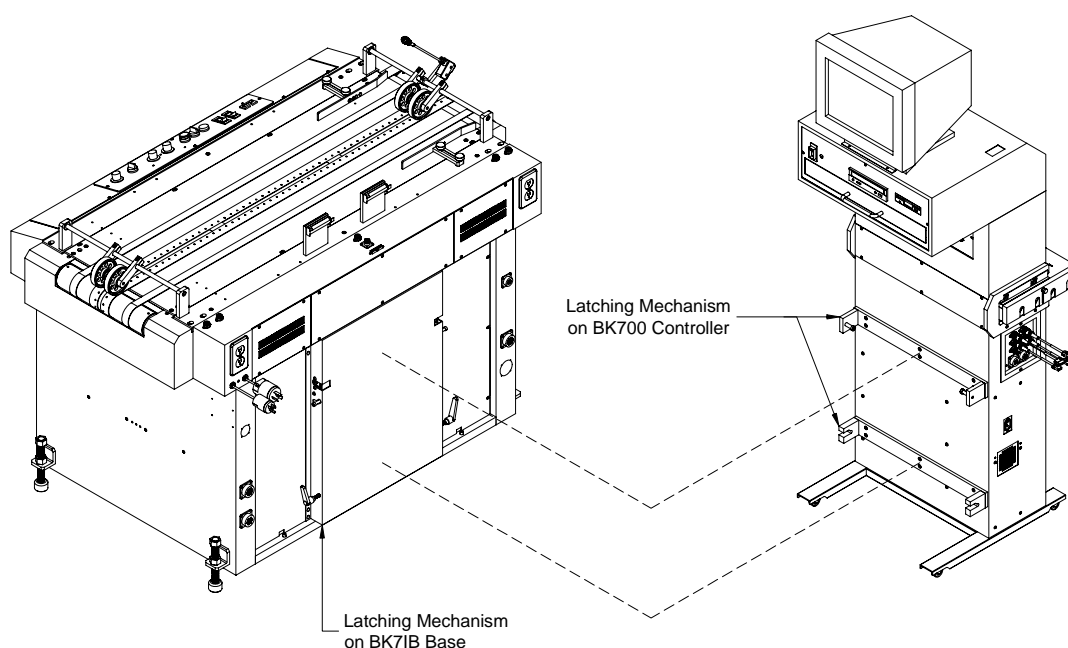
The latching design consists of two slam latches and two lever handles. When the controller is rolled into the BK7IB, the latching mechanism on the controller is locked in place by the slam latches on the base. The user then tightens the two lever handles to completely secure the controller to the base. In order to release the controller from the base, the user must loosen the two lever handles and activate the quick release levers for the slam latches.

4.3   Cable Connections

To electrically integrate the BK700 controller to a Buskro base, there are two options available. The recommended option (**Figure 4-2**) is to install an I/O ribbon cable from the I/O connector on the base to the I/O connector on the BK700 controller. Installing this cable will transmit the encoder, photocue, jam, cycle, stack, and stop signals from the base to the BK700 controller. The counter connector on the BK700 and the base must also be connected together.

Figure 4-2: *Electrical Integration*

Connect I/O Ribbon Cable and Counter to corresponding connectors on the inkwell
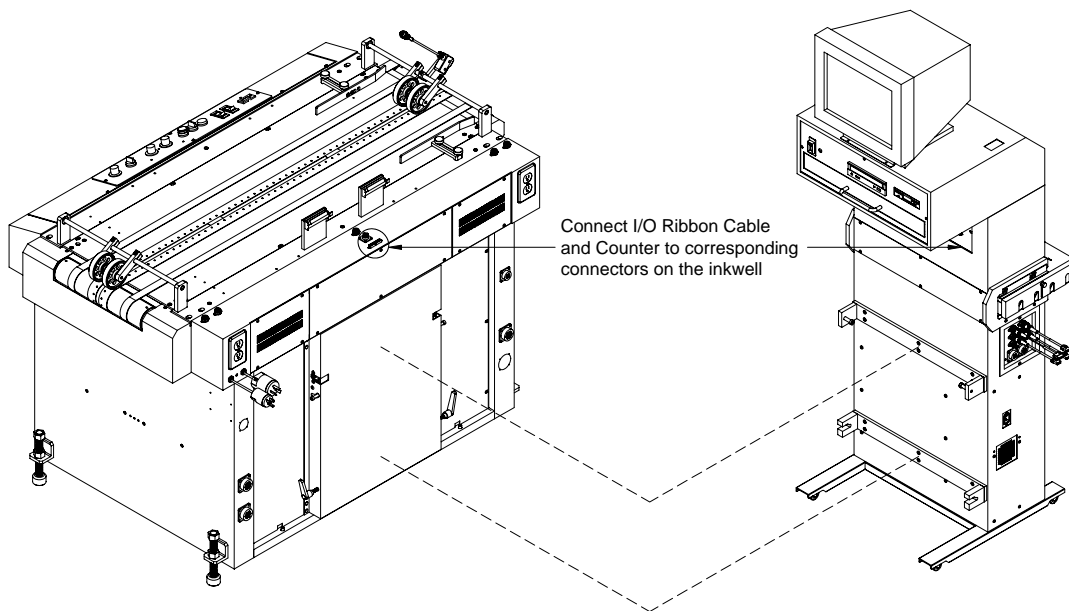
In order to use this option, the six-pin cable shown in **Figure 4-3** must be disconnected from the power box. It is normally connected from the power box to the Field Connection Board (FCB) in order to power the board. Once this cable is disconnected, an equivalent six-pin cable (pre-installed and internally routed in the BK700 controller) must be plugged into the same connector on the power box previously used by the Field Connection Cable.

Figure 4-3: *Field Connection Cable*
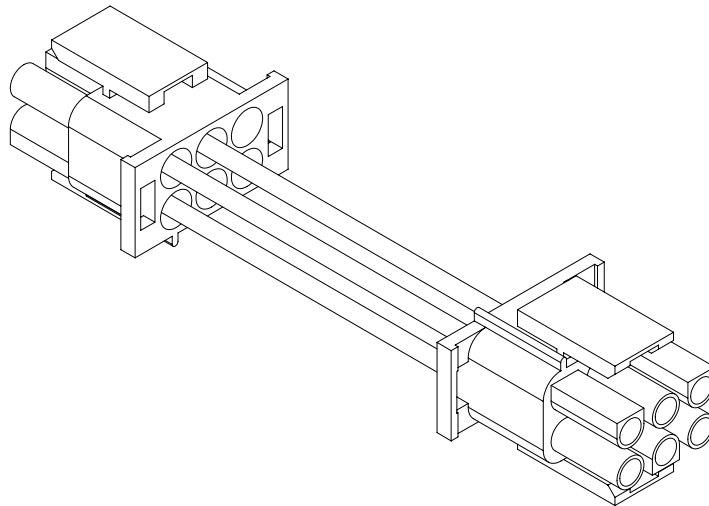
The second option is to use the FCB inputs and outputs to integrate the controller to the base. This method involves connecting individual cables from the encoder, photocue, jam, and cycle connectors on the FCB interface to the corresponding connectors on the base. Special wiring must be completed to integrate the stack signal and the stop signal, which makes this option undesirable compared to the previous option.

Finally, in both options, the BK700 can be powered by connecting the controller power cable into one of the 115V outlets on the rear of the BK7IB base.

System Options

5.1   Introduction

To make the BK700 Controller functional, an encoder must be ordered and integrated with the transport base. Each one of the options available has their advantages depending on the installation. A summary of each option can be found in **Table 5-1** while more detailed information is located in **Section 5.3** on page 5-3.

Table 5-1: *Encoder options*

Option	Encoder	DPI	Technology	Wheel Dia.	Part Number
A	6000 ppr	600	Apollo, 602 Elite	3.19"	BK-ENC-600W
B	6000 ppr	660	Apollo, Atlas, and Elite+	2.88"	BK-ENC-660W
C	Programmable	Depends on technology	All types	Not used	BK-ENC-PROG
D	Programmable	Depends on technology	All types	3.19"	BK-ENC-PROGW
E	6000 ppr	Depends on technology	All types	Not used	BK-ENC-STAN

Figure 5-1 below provides a top and front view of the encoder assembly (for all models) that can be used for reference to integrate the encoder wheel assembly onto another transport base. The assembly includes a friction wheel, arm, spring and an adjustable post that can be modified for different installations. If more information is required, please contact the factory for assistance.

Figure 5-1: *Encoder Wheel*
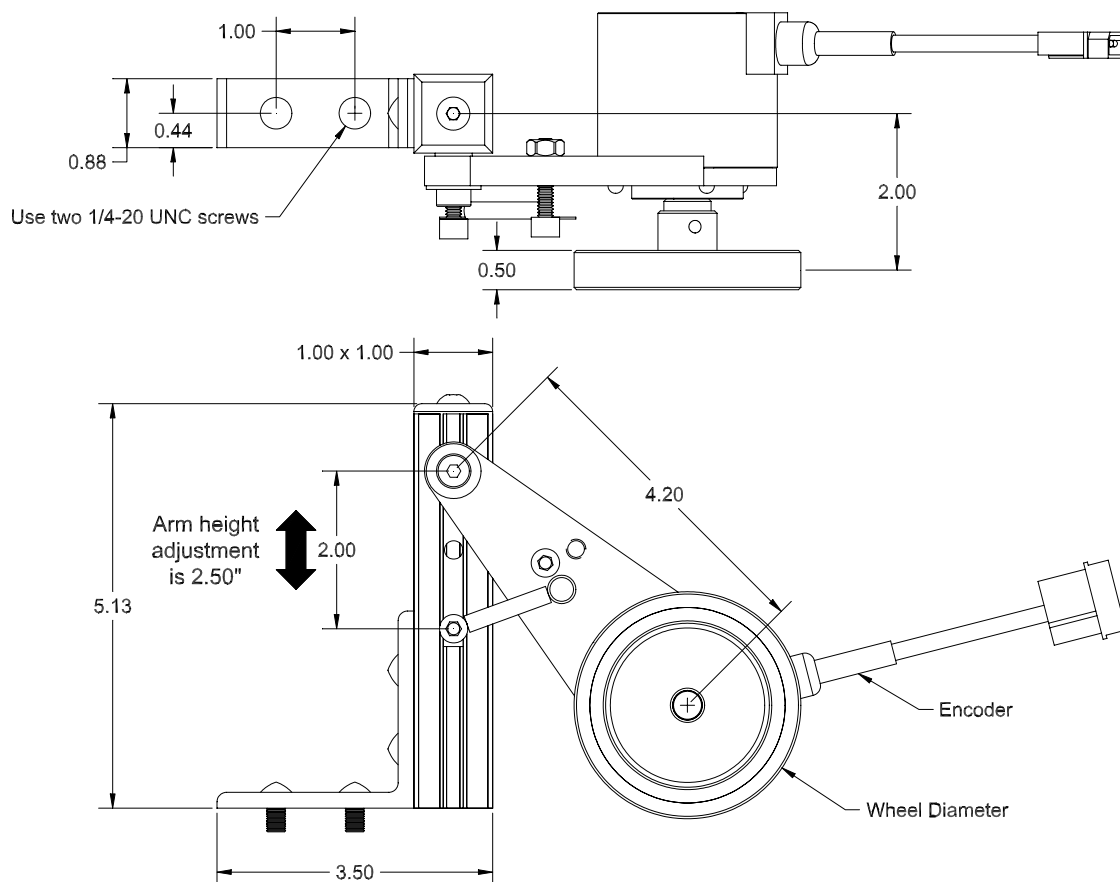
5.2   Dealer/Customer Responsibility

When ordering a BK700 controller, one of the encoder options *must* be chosen. In addition, it must be noted that the installing dealer/customer is responsible for mounting the encoder to the transport base on which the BK700 Controller is being installed. If an encoder wheel assembly is ordered, the wheel must be mounted where it contacts the surface of the transport belts. This is required in order to obtain proper readings of belt speeds. If an encoder is ordered separately, then a mounting location must be determined for the encoder.

5.3   Encoder Options

5.3.1   Option A - Encoder Wheel Assembly, 600 DPI

The encoder wheel assembly uses a friction wheel that contacts the surface of the transport belts. This option includes the standard 6000 ppr encoder, the encoder wheel, and the mounting hardware. This option can be ordered under part number BK-ENC-600W (previously 9101543A) and can be used with Apollo print technology, as well as older BK602 series Elite printheads. When this option is used, the base DPI setting in the setup tab within Compose must be set to 600 DPI.

5.3.2   Option B - Encoder Wheel Assembly, 660 DPI

This option is the same as Option A except it is designed for use with Atlas, Atlas-UVC, Elite+, and Apollo print technology. This option can be ordered under part number BK-ENC-660W (previously 9101685A). When this option is used, the base DPI setting in Compose must be set to 660 DPI.

5.3.3 Option C – Programmable Encoder

Unlike Options A and B, this option (BK-ENC-PROG – previously 9101705A) supplies the customer with the programmable encoder alone. As a result, the dealer/customer must mount the encoder to the transport base. The advantage with this option is that it can be used with any print technology. As a result, the base DPI setting in Compose depends on the technology used. The proper values are shown below:

Table 5-2: *Base DPI settings for Compose*

Print Technology	Base DPI Setting
Apollo	600 DPI or 660 DPI
Atlas	660 DPI
Atlas-UVC	660 DPI
Elite+	660 DPI
Elite-	600 DPI

Note:　The encoder will have to be programmed for the correct number of pulses to match the drive roller size. To program the encoder, a special programming unit is required. For more information on this programming unit, please contact the Buskro service department.

5.3.4 Option D – Encoder Wheel Assembly w/ Programmable Encoder

This option (BK-ENC-PROGW - previously 9101668A) is identical to Option A except the standard encoder is replaced with the programmable encoder. As a result, this option can be used with any print technology. In addition, it is also possible to use a reference point other than the transport belts such as the output roller or shaft. However, the encoder would have to be programmed for a specific number of pulses to compensate for the speed differences. As with Option C, the base DPI settings in Compose depend on the technology used and are shown in **Table 5-2**.

5.3.5 Option E – Standard Encoder (6000 ppr)

This option (BK-ENC-STAN – previously 9100188A) supplies the dealer/customer with the standard 6000 ppr encoder alone and can be used with any print technology. However, the drive rollers must be sized correctly and the encoder must be mounted directly to the driveshaft. This option can be chosen when mounting the BK700 controller to an existing Buskro transport base provided that the transport rollers and belts are matched correctly. Contact the service department for further details. In terms of the base DPI settings, this can be found in **Table 5-2**.

5.4   Printhead System Upgrade Options

As mentioned in **Section 1.2.8**, it is possible to add Apollo printheads to an existing Atlas, Atlas-UVC, and Elite+ controller. For Atlas or Atlas-UVC systems containing a single ink delivery module, a special package can be ordered to allow proper mounting of Apollo printheads. This will allow up to four inches of Apollo printing on top of the existing controller. This upgrade package is obtained by ordering BK-COMBO-AP1.

A standard Apollo controller is capable of supporting up to four inches of Apollo print. This print size is obtained through a combination of one, two and three inch printheads (BK791, BK792, and BK793 respectively). In order to connect up to eight inches of Apollo print, the BK-PS-AP700 package must be ordered.

> **Note:** Both the BK-COMBO-AP1 and BK-PS-AP700 require an expansion board.

Printhead Bridge

6.1   Introduction

The printhead bridge (BK79 series) is designed to accommodate the mounting and horizontal positioning of multiple printheads. The length of the bridge is dependent on the base to which it will be mounted. Standard rail lengths available are 18 and 22 inches. In addition, a 39-inch rail is also available which can be cut to size if custom lengths are required. If required, a photocue sensor can be mounted to any bridge. It is also possible to add a second rail (BK79BD) to mount printheads on either side of the bridge.

6.2   Specifications
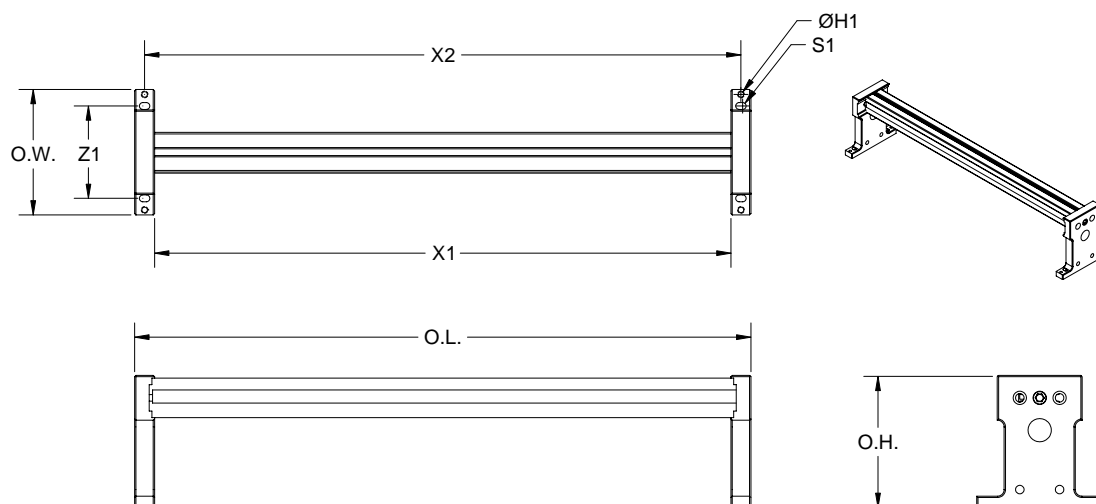
Table 6-1: *Bridge Dimensions (Single bridge shown – BK79B)*

Symbol	Description	Dimensions	
O.W.	Overall Width	4.75"	121 mm
O.H.	Overall Height	5.00"	127 mm
O.L.	Overall Length, 18" Rail	19.75"	502 mm
	Overall Length, 22" Rail	23.23"	590 mm
X1	Exposed rail length, 18" Rail	18.25	464 mm
	Exposed rail length, 22" Rail	21.73"	552 mm
X2	Mounting distance between feet, 18"	19.00"	483 mm
	Mounting distance between feet, 22"	22.48"	571 mm
Z1	Mounting slot distance	3.50"	89 mm
∅H1	Leveling screw thread	¼-20 UNC set screw (4)	
S1	Mounting slot	0.38" x 0.25" (4)	9.65 x 6.35 mm

Compose IQ

7.1 Introduction

The Compose IQ software is a built-in package capable of supporting systems applications in which machine control, data acquisition, print sequencing, and product tracking or a combination thereof may be required. Essentially, the software provides the following rudimentary tools:

- Product tracking and print sequencing
- Communication with reading devices or other controllers via the COM2 serial port
- Data output communication with other devices via COM3
- Machine control utilizing a PLC with communication via COM1
- Data acquisition and record retrieval in OCR mode

The software offers three distinct building blocks for the implementation of a system. This includes client (*slave*) mode, OCR mode, and selective device control supporting host mode (*master*) for data echo requirements. **Figure 7-1** below illustrates the different configurations:

Figure 7-1: *Block diagram of various models and the I/O devices required*
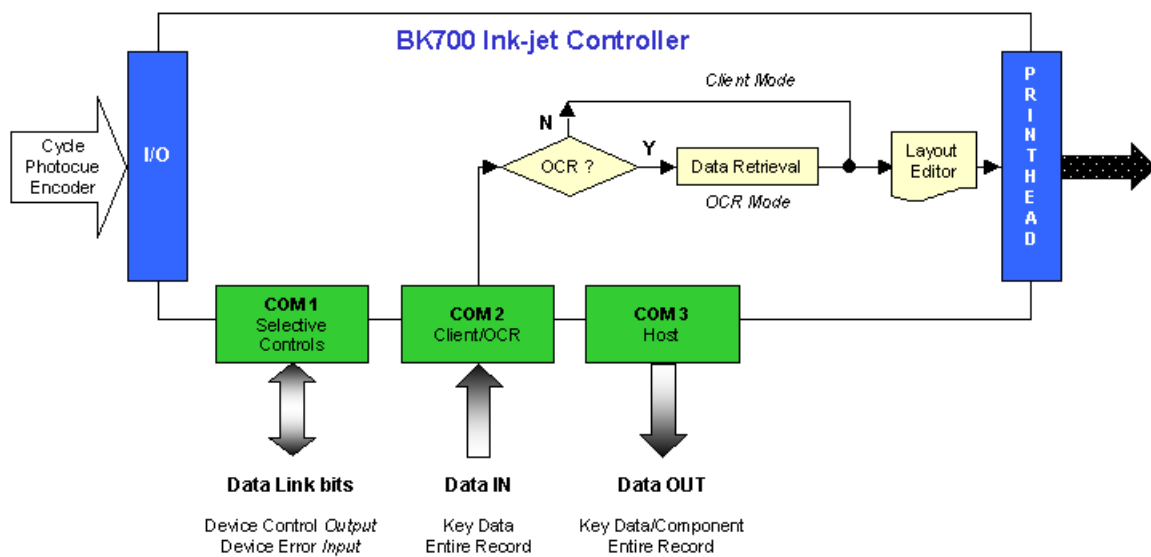
7.2   Host/Client Mode

7.2.1 Client Mode

Client mode permits the controller to accept data *directly* from another controller (device) via the serial COM2 port, and at the appropriate time, print out some or all of the data based on the image layout. A number of baud rates and physical definition tools are offered to tailor the controller to the physical delays of the system and provide a data communication link with a host controller (device).

7.2.2 Host Mode

Host mode provides a means whereby a portion or all of the printed record data is output on COM3 such that it can be acquired and used by a downstream controller/device. This capability allows for the creation of distributed systems in which a number of printers can be networked together and controlled by a host controller.

7.3   OCR Mode

The OCR mode functions in much the same way as the client mode with the addition of a lookup and data retrieval process occurring prior to image creation. This capability supports reading devices that send limited data via the serial COM2 port, representing a key that maps onto a defined component of the data file such that a search will find and retrieve the entire record corresponding to the key. As with the client mode, the resulting record's components are then printed out as defined by the image layout.

7.4 Selective Inserting Mode

Completing the suite of controller products is a selective device control operation. With this, individual records are sourced from the aforementioned applications or the resident database and subsequently queried prior to the printing operation. As a result, various upstream and downstream devices can be actuated via a PLC based on the contents of these records. Included with this is a data echo feature that outputs all or part of the printed record on the COM3 serial port for communication with other downstream client controllers. This creates a distributed network of printers.

PLC control and communication is enabled through the COM1 port where a number of virtual input/output points are transmitted and stored directly in the PLC for further processing. Using this type of system architecture, logical functions are performed by the generic printer controller with the PLC providing localized system customization to implement the instructions supplied by the controller.

7.5 Compose IQ Dongle

The Dongle performs much the same way as the Lock Chip. Except in the case of the Dongle it plugs into the USB port where the system will be programmed to enable the options of the specific technology. The Dongle is field-programmable so that options may be added without swapping Dongles. The Dongle requires drivers that are loaded with Compose V6.03 or later. In the Compose Help system the *driver* installation procedure is listed. The Dongle options combine with the Lock Chip options, so that we can send a Dongle to provide an upgrade to existing customers with Lock chips.

Assembly Drawings

Appendix **A**

List of Figures

List of Tables

Balloon Annotation and Parts Listing
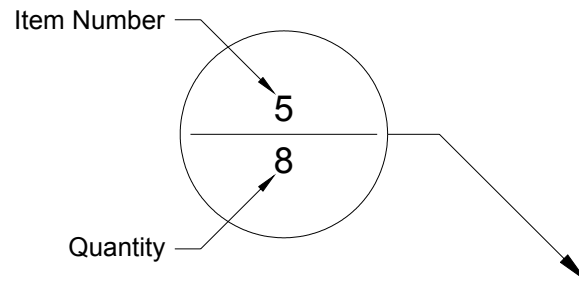
Item	Part Number	Quantity	Description	Reference
1				
2				

The following is a description of how to interpret the information in this section:

Item:

This column indicates the item number used for each unique part in an assembly drawing. It is matched with the top number in the balloon pointing at the associated part.

Part Number:

This column represents the Buskro part number.

Quantity:

This represents the total number of a given part in an assembly. It is matched with the bottom number in the balloon pointing at the associated part.

Description:

This column contains a brief description of the part.

Reference:

This column indicates the page location for sub-assemblies.

Figure A-1: *Atlas Controller (BKT700AU)*
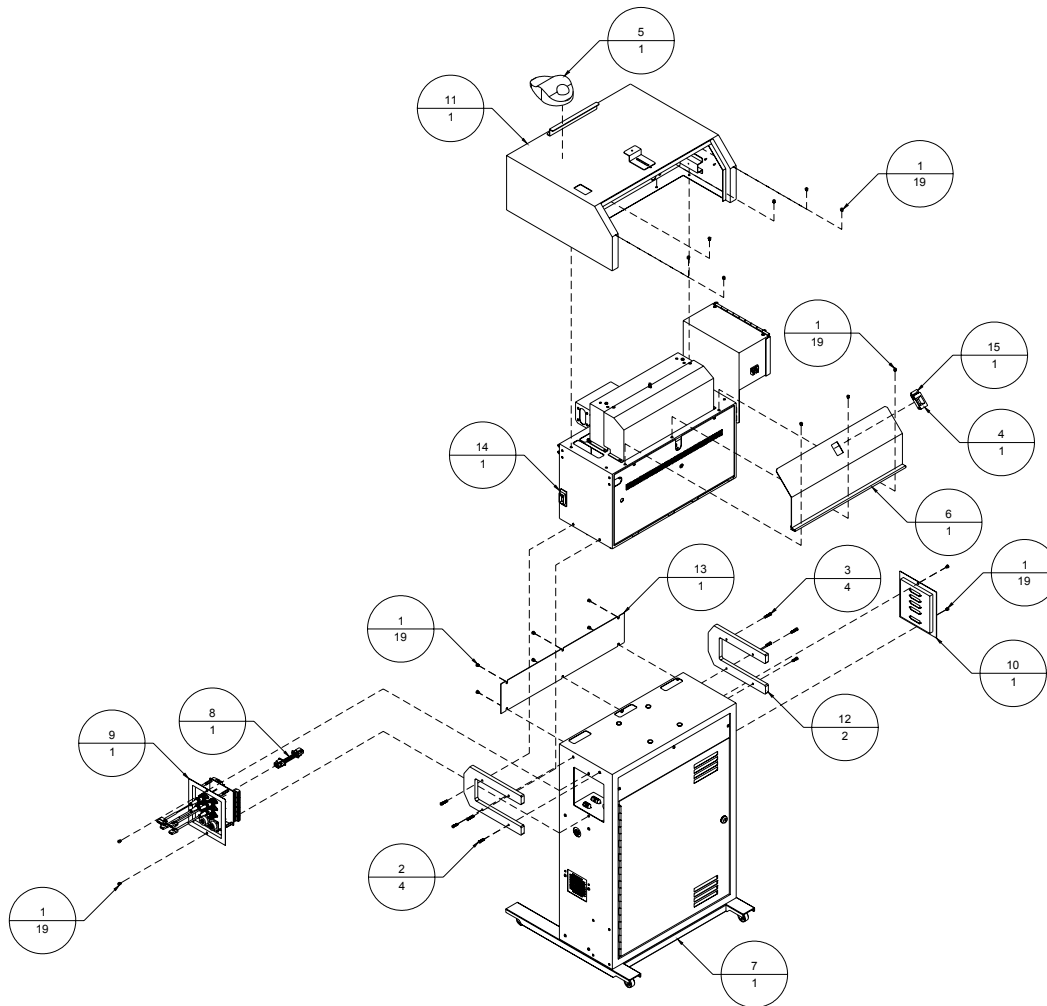
Table A-1: *Atlas Controller (BKT700AU)*

Item	Part Number	Quantity	Description	Reference
1	404510	19	Screw, BHCS, 10-32 UNF x ¼"	
2	404550	4	Screw, BHCS, 10-32 UNF x ¾"	
3	404570	4	Screw, BHCS, 10-32 UNF x 1"	
4	446000	1	Slide Latch – A3	
5	803305	1	Trackball Mouse	
6	9100169	1	Controller Rear Door	
7	9100704A	1	Offline Controller Cabinet Assembly	Page A-8
8	9100717A	1	Field Connection Cable	
9	9100721A	1	Connector Plate Assembly	Page A-11
10	9100734	1	Offline Controller Comtrol Plate	
11	9100738A	1	Offline Console Assembly	Page A-16
12	9100743	2	Offline Controller Inkwell Mount	
13	9100747	1	Offline Controller Front Cover	
14	9100979A	1	Inkwell, Single IDS, Monet	
15	9101644	1	Sponge Rubber, 1/4"x 3/8	

Figure A-2: *Elite+ Controller (BKT700EU)*
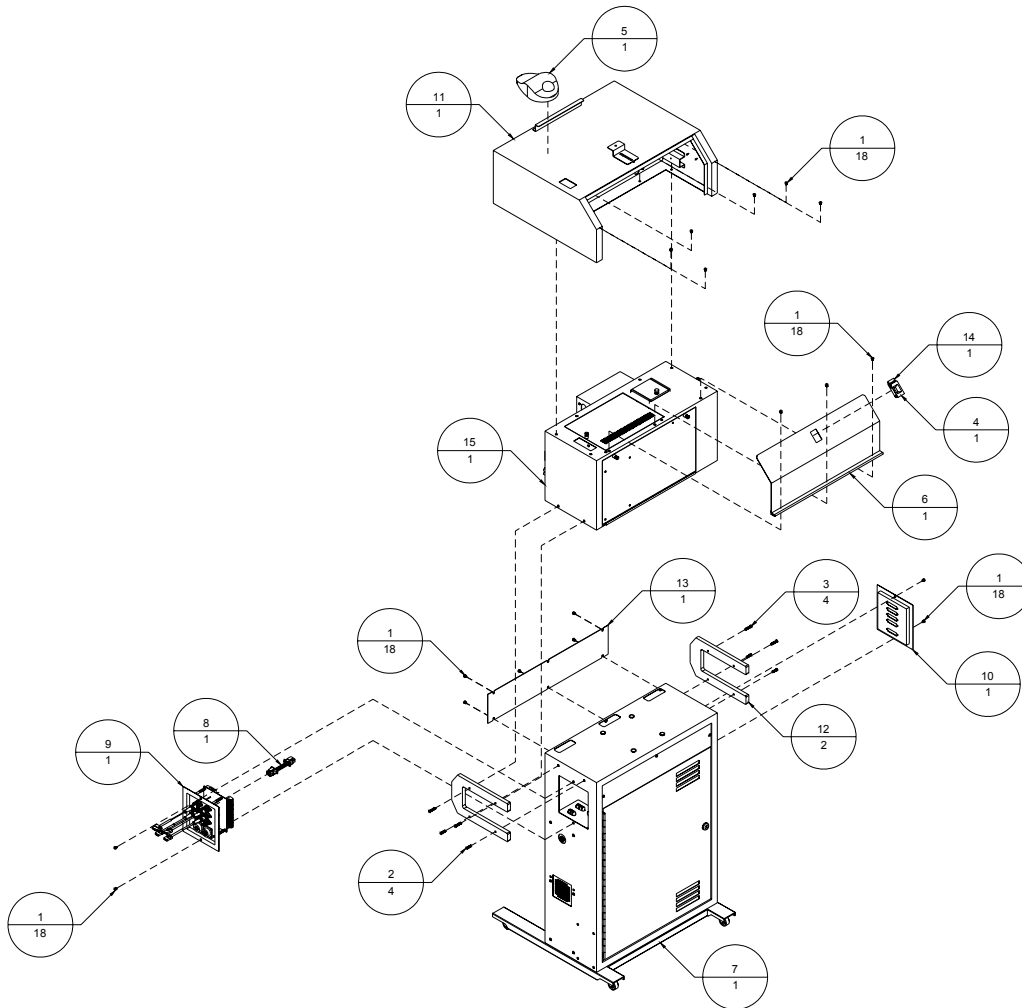
Table A-2: *Elite+ Controller (BKT700EU)*

Item	Part Number	Quantity	Description	Reference
1	404510	18	Screw, BHCS, 10-32 UNF x ¼"	
2	404550	4	Screw, BHCS, 10-32 UNF x ¾"	
3	404570	4	Screw, BHCS, 10-32 UNF x 1"	
4	446000	1	Slide Latch – A3	
5	803305	1	Trackball Mouse	
6	9100169	1	Controller Rear Door	
7	9100704A	1	Offline Controller Cabinet Assembly	Page A-8
8	9100717A	1	Field Connection Cable	
9	9100721A	1	Connector Plate Assembly	Page A-11
10	9100734	1	Offline Controller Comtrol Plate	
11	9100738A	1	Offline Console Assembly	Page A-16
12	9100743	2	Offline Controller Inkwell Mount	
13	9100747	1	Offline Controller Front Cover	
14	9101644	1	Sponge Rubber, 1/4"x 3/8	
15	9102330A	1	Inkwell Container, Elite+	

Figure A-3: *HP Controller (BKT700HU)*
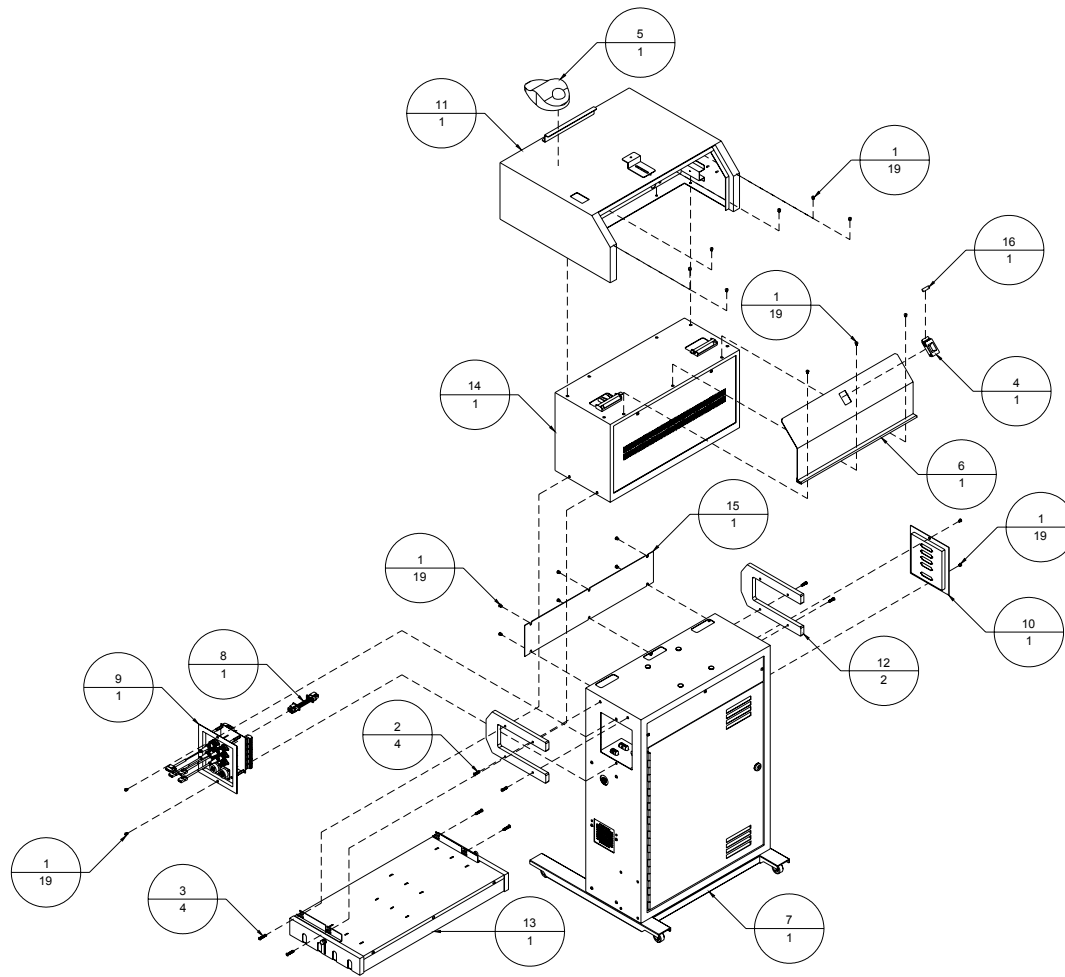
Table A-3: *HP Controller (BKT700HU)*

Item	Part Number	Quantity	Description	Reference
1	404510	19	Screw, BHCS, 10-32 UNF x ¼"	
2	404550	4	Screw, BHCS, 10-32 UNF x ¾"	
3	404570	4	Screw, BHCS, 10-32 UNF x 1"	
4	446000	1	Slide Latch – A3	
5	803305	1	Trackball Mouse	
6	9100169	1	Controller Rear Door	
7	9100704A	1	Offline Controller Cabinet Assembly	Page A-8
8	9100717A	1	Field Connection Cable	
9	9100721A	1	Connector Plate Assembly	Page A-11
10	9100734	1	Offline Controller Comtrol Plate	
11	9100738A	1	Offline Console Assembly	Page A-16
12	9100743	2	Offline Controller Inkwell Mount	
13	9100743A	1	Controller HP Reservoir Assembly	
14	9100744A	1	Offline Controller Inkwell Assembly	Page A-19
15	9100747	1	Offline Controller Front Cover	
16	9101644	1	Spronge Rubber, ¼ x 3/8"	

Figure A-4: *Atlas UVC Controller (BKT700UU)*
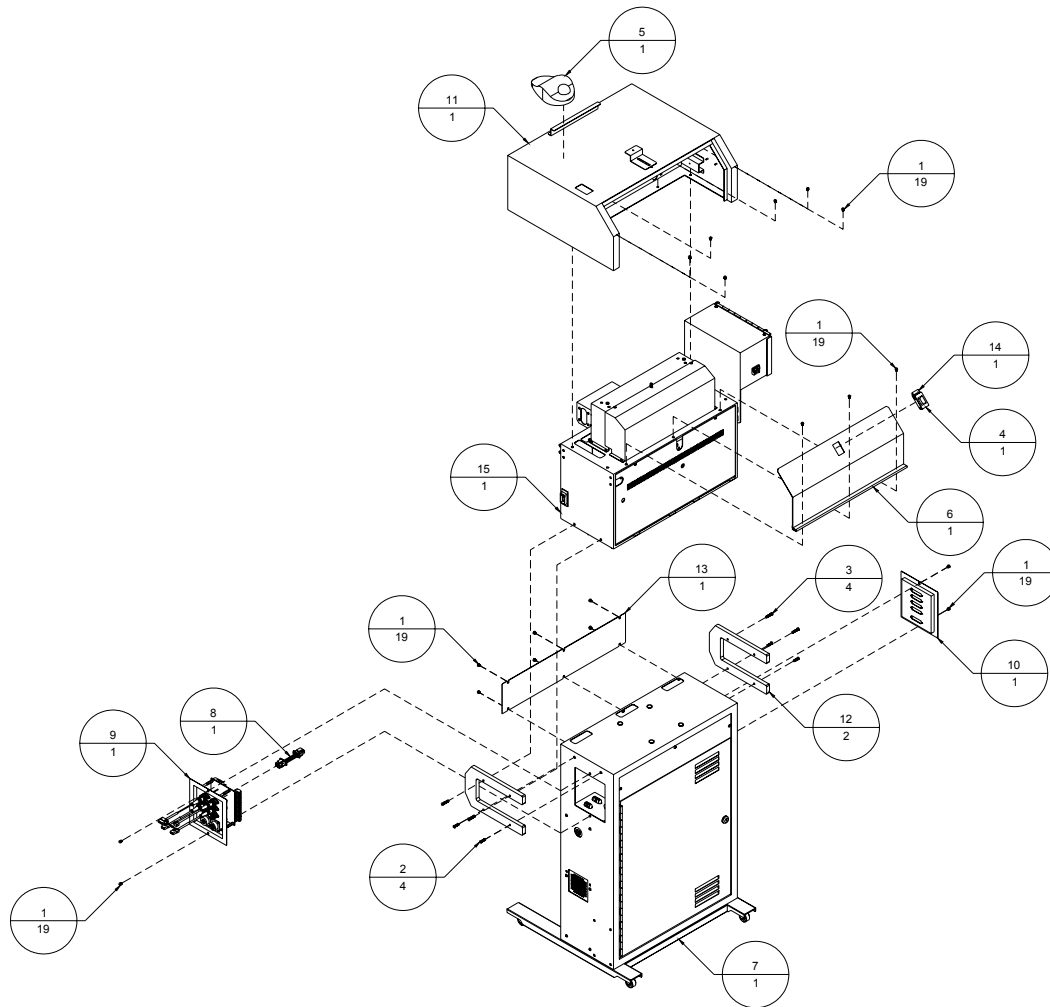
Table A-4: *Atlas UVC Controller (BKT700UU)*

Item	Part Number	Quantity	Description	Reference
1	404510	19	Screw, BHCS, 10-32 UNF x ¼"	
2	404550	4	Screw, BHCS, 10-32 UNF x ¾"	
3	404570	4	Screw, BHCS, 10-32 UNF x 1"	
4	446000	1	Slide Latch – A3	
5	803305	1	Trackball Mouse	
6	9100169	1	Controller Rear Door	
7	9100704A	1	Offline Controller Cabinet Assembly	Page A-8
8	9100717A	1	Field Connection Cable	
9	9100721A	1	Connector Plate Assembly	Page A-11
10	9100734	1	Offline Controller Comtrol Plate	
11	9100738A	1	Offline Console Assembly	Page A-16
12	9100743	2	Offline Controller Inkwell Mount	
13	9100747	1	Offline Controller Front Cover	
14	9101644	1	Sponge Rubber, 1/4"x 3/8	
15	IDS2	1	Inkwell, Single IDS, Renoir	

Figure A-5: *Printhead Bridge, Single (BK79B-XX)*
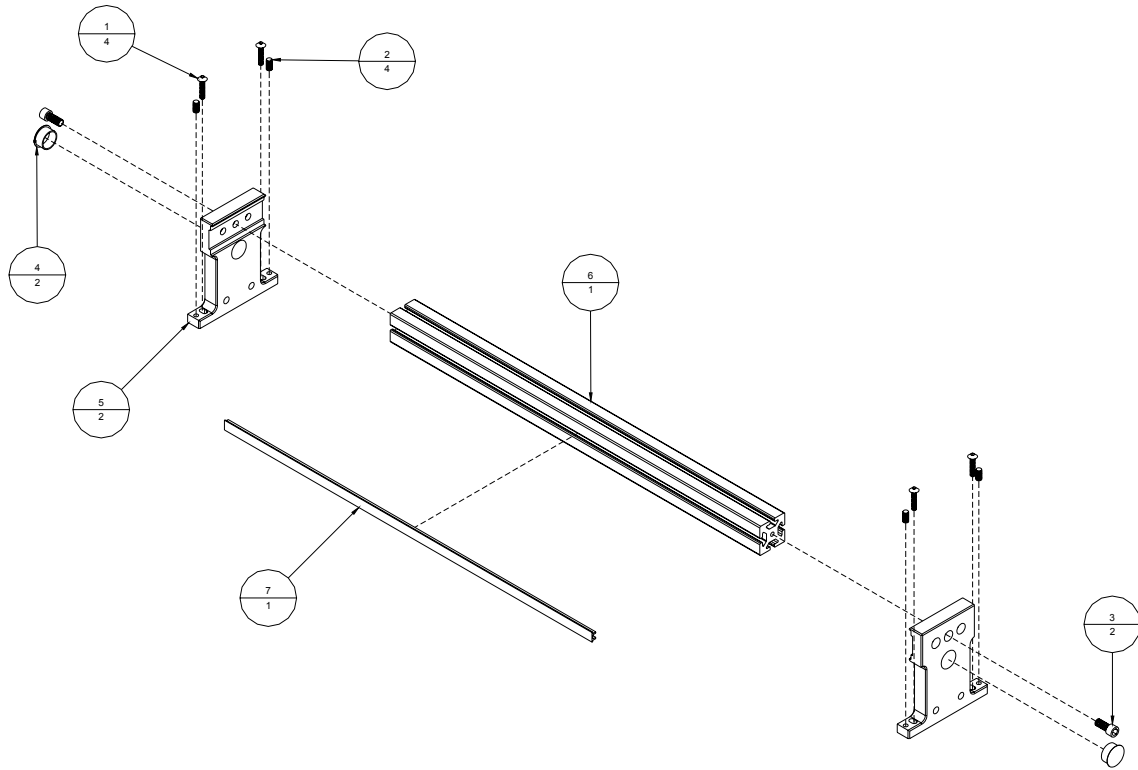
Table A-5: *Printhead Bridge, Single (BK79B-XX)*

Item	Part Number	Quantity	Description	Reference
1	405570	4	Screw, BHCS, ¼-20 UNC x 1"	
2	405830	4	Screw, SHSS, ¼-20 UNC x ½"	
3	406250	2	Screw, SHCS, 5/16-18 UNC x ¾"	
4	615425	2	Hole Plug, 7/8" I.D.	
5	9101702	2	Double Rail Support	
6	9102204	1	Bridge, Extrusion, 15 Series, 18"	BK79B-18
	9101718		Bridge, Extrusion, 15 Series, 22"	BK79B-22
	9103070		Bridge, Extrusion, 15 Series, 39"	BK79B-39
7	9101723	1	Grey T-Slot T Cover, 15 Series	BK79B-22

Note: The bridge product code is BK79B-XX where XX refers to the approximate rail length (as indicated in the Reference column).

BK79B-18 uses (2) T-Nuts to secure the bridge (9102643).

Figure A-6: *Printhead Bridge, Double (BK79BD-XX)*
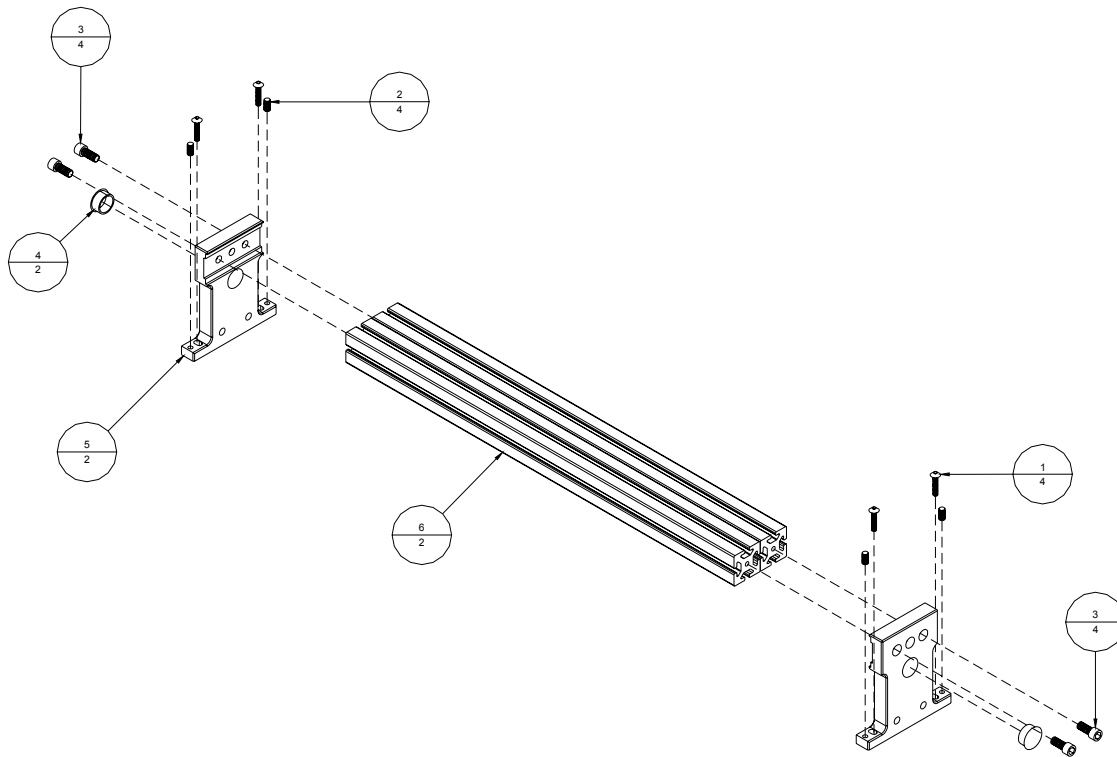
Table A-6: *Printhead Bridge, Double (BK79BD)*

Item	Part Number	Quantity	Description	Reference
1	405570	4	Screw, BHCS, ¼-20 UNC x 1"	
2	405830	4	Screw, SHSS, ¼-20 UNC x ½"	
3	406250	2	Screw, SHCS, 5/16-18 UNC x ¾"	
4	615425	2	Hole Plug, 7/8" I.D.	
5	9101702	2	Double Rail Support	
6	9102204	2	Bridge, Extrusion, 15 Series, 18"	BK79B-18
	9101718		Bridge, Extrusion, 15 Series, 22"	BK79B-22
	9103070		Bridge, Extrusion, 15 Series, 39"	BK79B-39

Note: The bridge product code is BK79BD-XX where XX refers to the approximate rail length (as indicated in the Reference column).

BK79BD-18 uses (2) T-Nuts to secure the bridge (9102643).

Figure A-7: *Data Path Card Assembly (9100194A)*
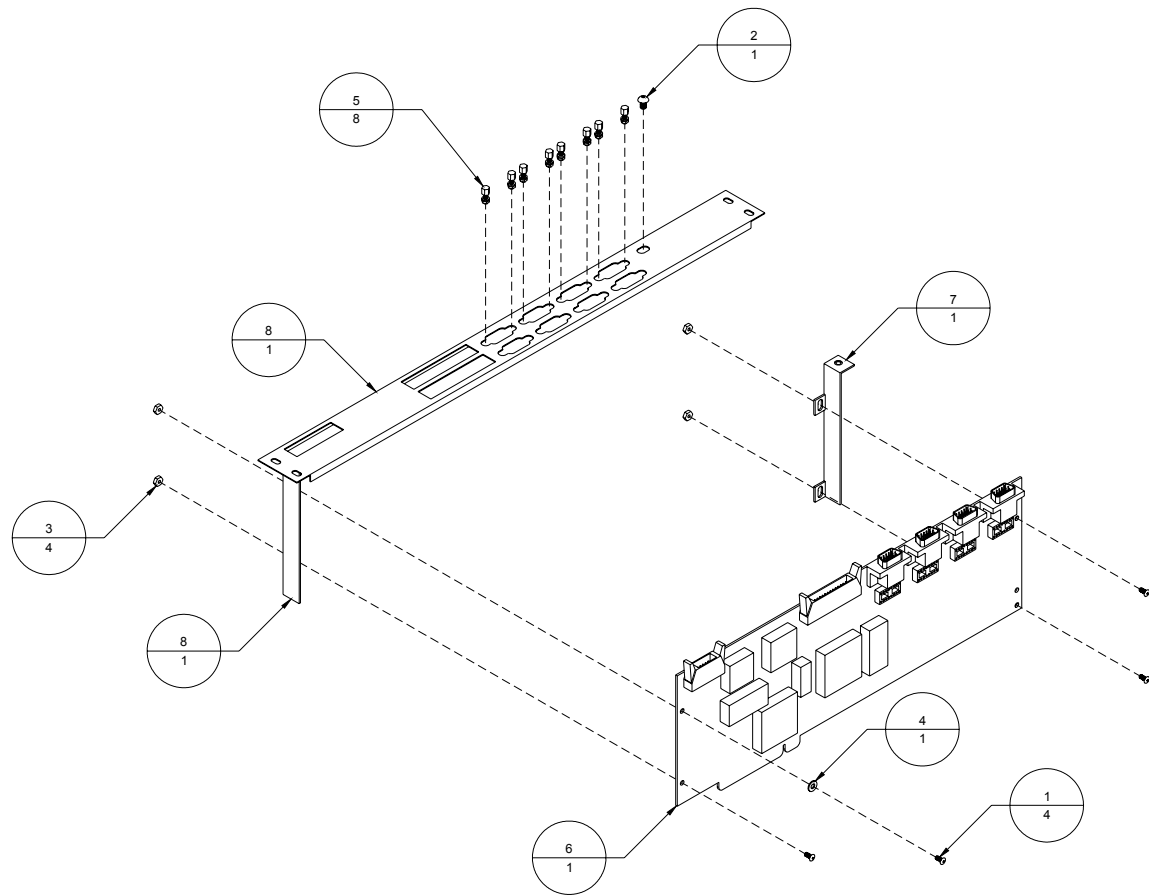
Table A-7: *Data Path Card Assembly (9100194A)*

Item	Part Number	Quantity	Description	Reference
1	401310	4	Screw, PHMS, 4-40 UNC x ¼"	
2	403510	1	Screw, BHCS, 8-32 UNC x ¼"	
3	420004	4	Nut, 4-40 UNC	
4	440530	1	Washer, #6 Nylon	
5	615322	8	Female Screwlock, 4-40 UNC	
6	9100194	1	Card, Datapath	
7	9100335	1	Secondary Card Support Bracket	
8	9101867	1	Bracket, Datapath Card, Dual	

Figure A-8: *Offline Controller Cabinet Assembly (9100704A)*
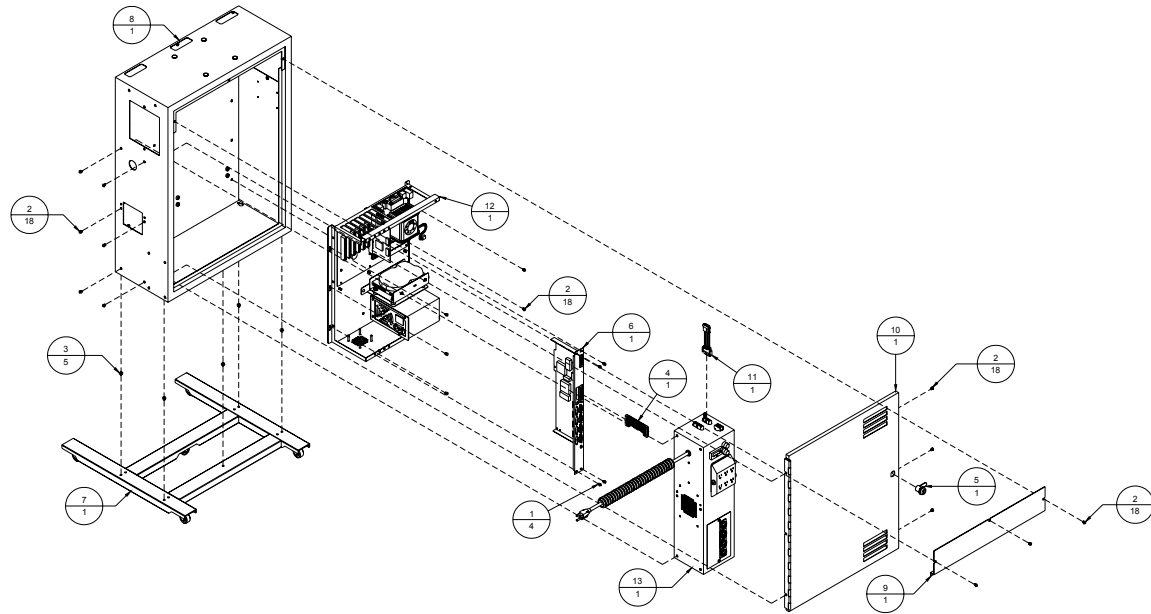
Table A-8: *Offline Controller Cabinet Assembly (9100704A)*

Item	Part Number	Quantity	Description	Reference
1	403510	4	Screw, BHCS, 8-32 UNC x ¼"	
2	404510	18	Screw, BHCS, 10-32 UNF x ¼"	
3	405510	5	Screw, BHCS, ¼-20 UNC x ¼"	
4	614601A	1	Cable, Jet Drive I/O	
5	615313	1	Cam Lock, 5/8"	
6	9100194A	1	Data Path Card Assembly	Page A-7
7	9100702A	1	Offline Controller Carriage	
8	9100704	1	Offline Controller Cabinet	
9	9100706	1	Offline Controller Rear Cover	
10	9100707	1	Offline Controller Door	
11	9100719A	1	Power Cable (12V, 5V)	
12	9101860A	1	Computer Chassis Assembly, P4	Page A-24
13	9103708A	1	Power Box Assembly, BK700	Page A-26

Figure A-9: *HP Plate Assembly (9100709A)*

614009   9100282
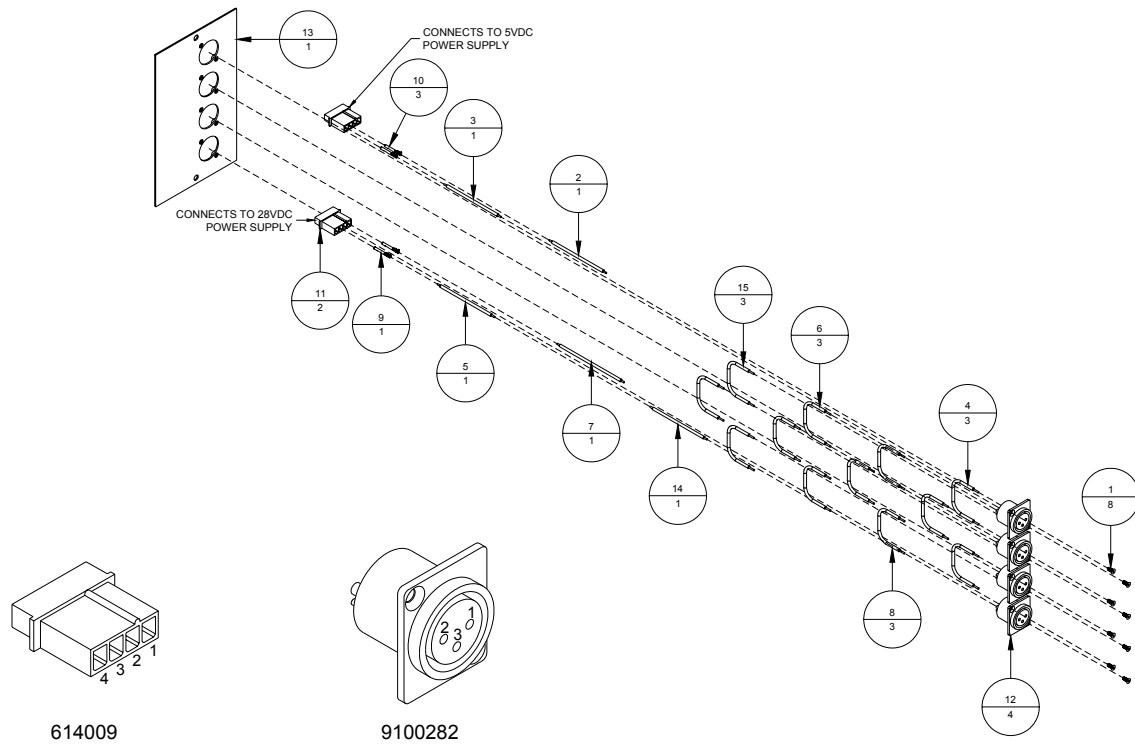
Table A-9: *HP Plate Assembly (9100709A)*

Item	Part Number	Quantity	Description	Reference
1	401010	8	Screw, FHCS, 4-40 UNC x ¼"	
2	606020	6"	Wire, #18, Black, Hook-up, 6"	
3	606022	6"	Wire, #18, Red, Hook-up, 6"	
4	606022	3 x 5"	Wire, #18, Red, Hook-up, 5"	
5	606023	6"	Wire, #18, Green, Hook-up, 6"	
6	606023	3 x 5"	Wire, #18, Green, Hook-up, 5"	
7	606025	6"	Wire, #18, Orange, Hook-up, 6"	
8	606025	3 x 5"	Wire, #18, Orange, Hook-up, 5"	
9	614004	1	Contact, Male, 20-14 AWG, Mate-n-lok	
10	614008	3	Contact, Male, 24-18 AWG, Mate-n-lok	
11	614009	2	Connector, 4-Pin, Male, Mate-n-lok	
12	9100282	4	Receptacle, 3-Pin, Female, Neutrik	
13	9100709	1	Plate, HO Connector, Power Box	
14	9102246	6"	Wire, #18, Green/Yellow, 6"	
15	9102246	3 x 5"	Wire, #18, Green/Yellow, 5"	

Figure A-10: *Sprite Fan Assembly (9100714A)*
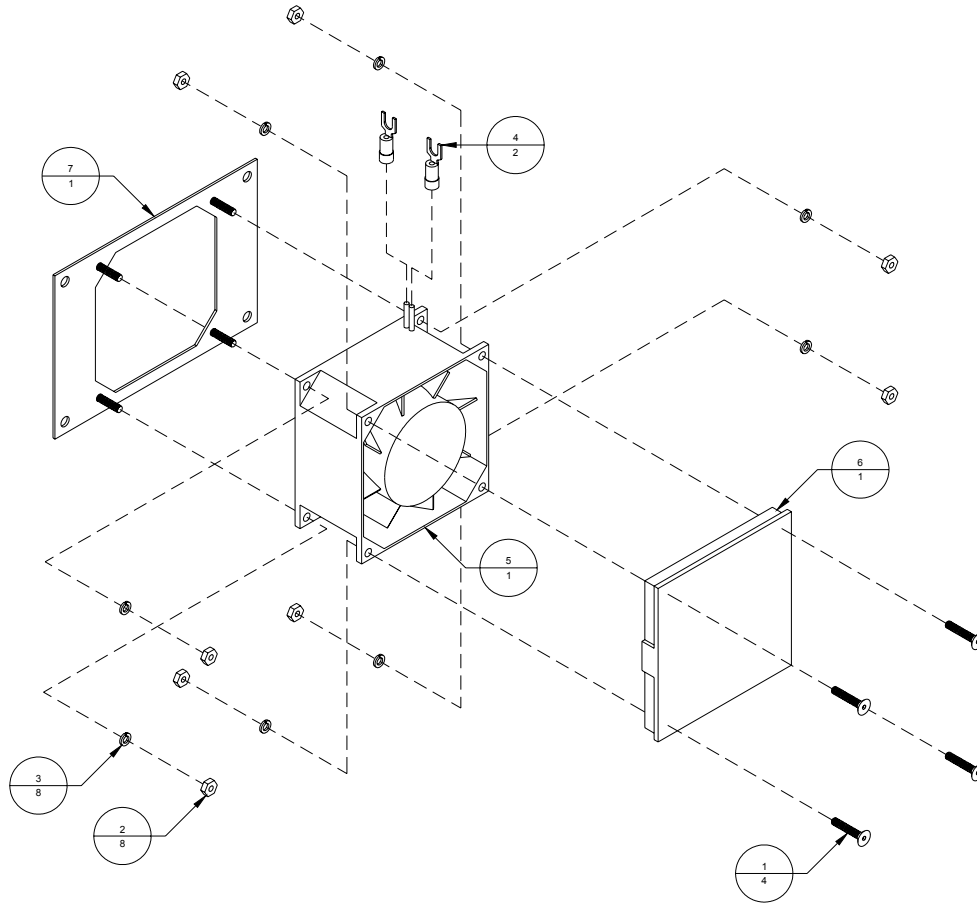
Table A-10: *Sprite Fan Assembly (9100714A)*

Item	Part Number	Quantity	Description	Reference
1	402050	4	Screw, FHCS, 6-32 UNC x ¾"	
2	420006	8	Nut, 6-32 UNC	
3	439006	8	Lockwasher, No. 6	
4	609108	2	Terminal, Fork, #10, 22-18 AWG, Red	
5	9100712	1	Fan, Sprite Tubeaxial AC	
6	9100713	1	Fan Filter Guard, Sprite	
7	9100714	1	Fan Mounting Plate, Sprite	

Figure A-11: *Connector Plate Assembly (9100721A)*
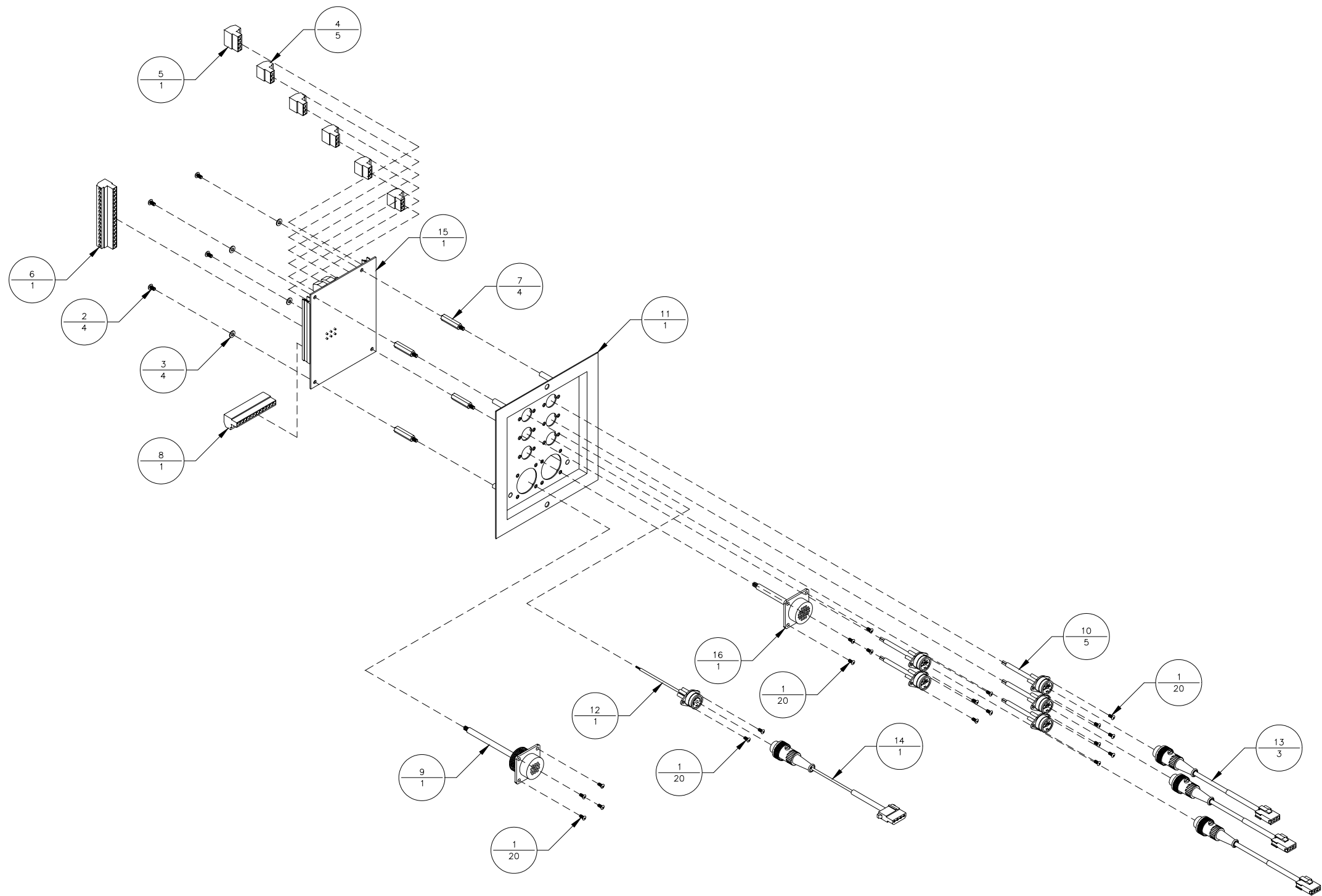
Table A-11: *Connector Plate Assembly (9100721A)*

Item	Part Number	Quantity	Description	Reference
1	401310	20	Screw, PHMS, 4-40 UNC x ¼"	
2	402310	4	Screw, PHMS, 6-32 UNC x ¼"	
3	440530	4	Washer, #6, Nylon	
4	615063	5	Female Connector, 3-pin, BLA3	
5	615066	1	Female Connector, 4-pin, BLA4	
6	615079	1	Female Connector, 16-pin, BLA16	
7	9100383	4	Hex Spacers, 6-32 UNC x 1", Al	
8	9100465	1	Female Connector, 12-pin, BLA12	
9	9100466A	1	Output Cable	
10	9100711A	5	Field Sensor Cable Assembly	
11	9100721	1	Offline Controller Connector Plate	
12	9100723A	1	Field Encoder Cable Assembly	
13	9100724A	3	Jam/Proxi/Photocue Extension Cable	
14	9100725A	1	Shaft Encoder Extension Cable	
15	9100731	1	Field Connection Board	
16	9100739A	1	Input Cable	
17	9100740A	1	Input Extension Cable (Not shown)	
18	9101172A	1	Output Extension Cable (Not shown)	

Figure A-12: *Upper Latch Striker Assembly (9100729A)*
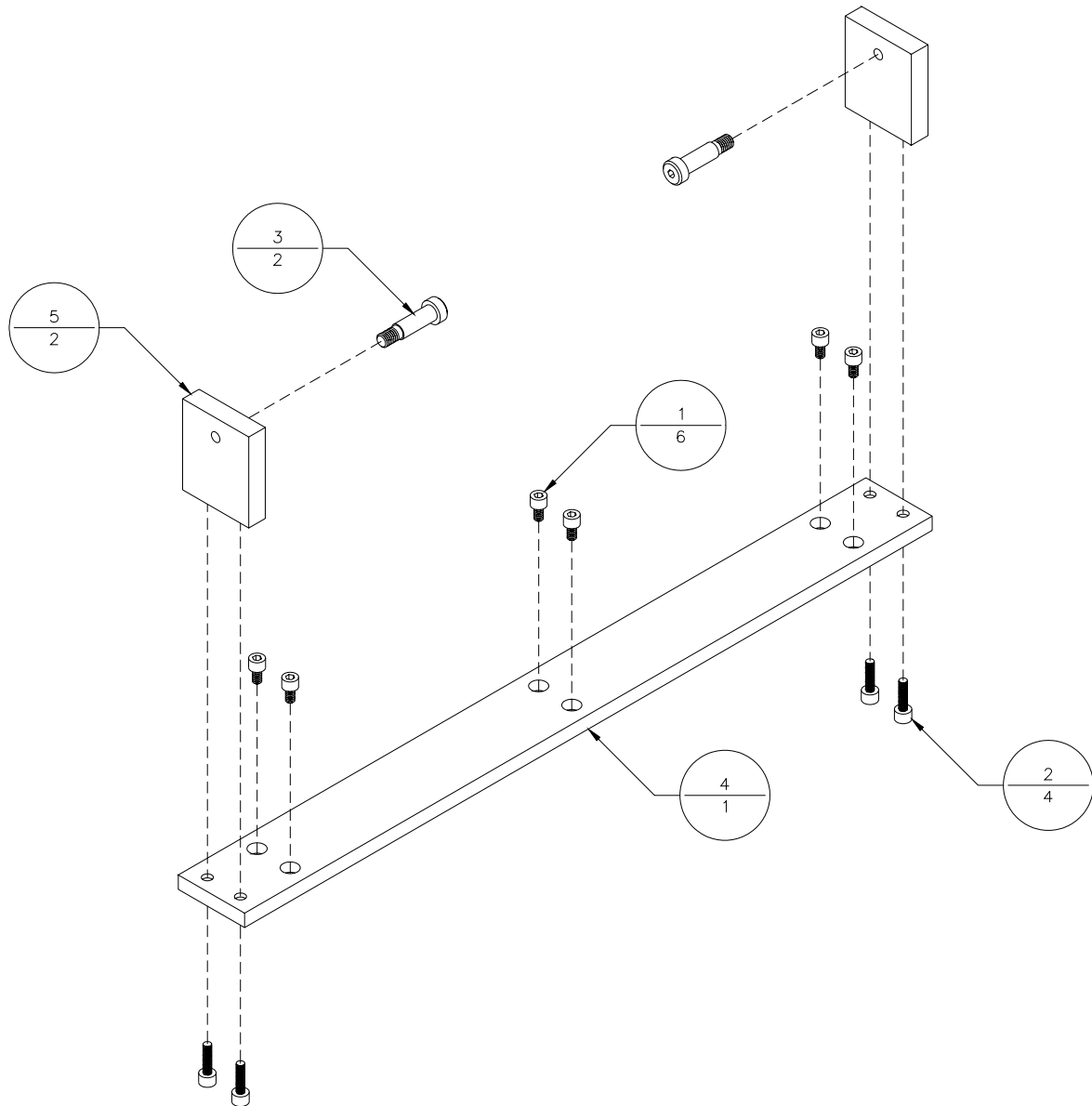
Table A-12: *Upper Latch Striker Assembly (9100729A)*

Item	Part Number	Quantity	Description	Reference
1	405220	6	Screw, SHCS, ¼-20 UNC x 3/8"	
2	405250	4	Screw, SHCS, ¼-20 UNC x ¾"	
3	416170	2	Shoulder Bolt, 3/8 x 1" (5/16-18 UNC)	
4	9100729	1	Latch Striker Pin Bar	
5	9100730	2	Latch Striker Pin Plate	

Figure A-13: *Lower Latch Striker Assembly (9100732A)*
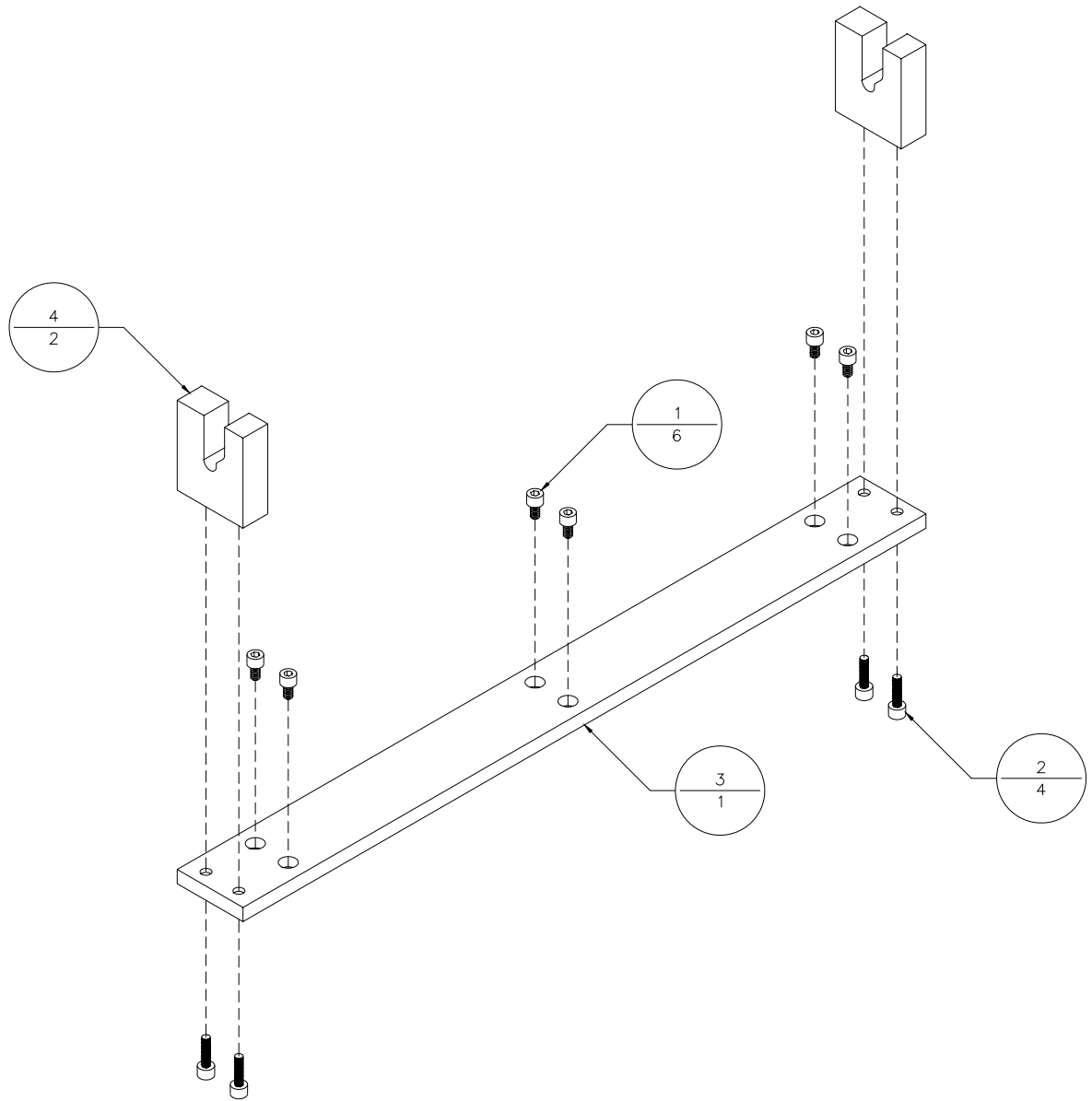
Table A-13: *Lower Latch Striker Assembly (9100732A)*

Item	Part Number	Quantity	Description	Reference
1	405220	6	Screw, SHCS, ¼-20 UNC x 3/8"	
2	405250	4	Screw, SHCS, ¼-20 UNC x ¾"	
3	9100729	1	Latch Striker Pin Bar	
4	9100732	2	Lower Latch Block	

Figure A-14: *Controller Faceplate Assembly (9100737A)*

9102205 AND 9103248A
WIRING DETAIL

CABLE 2   CABLE 2
WHITE   BLACK

CABLE 1   LINE   CABLE 1
WHITE   BLACK
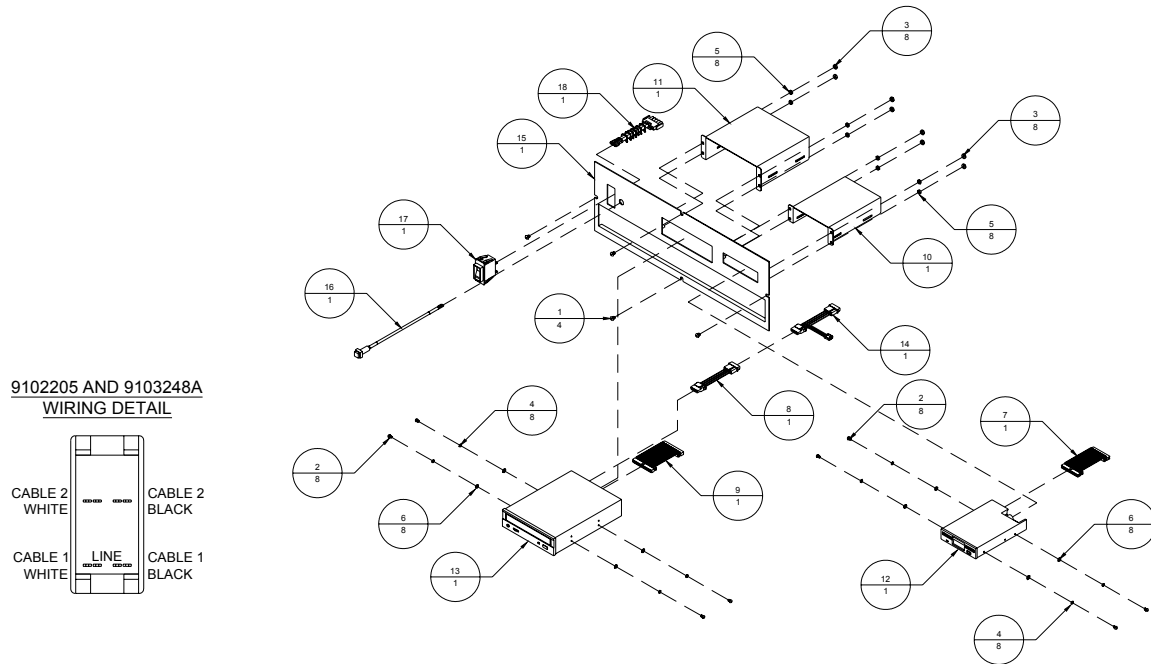
Table A-14: *Controller Faceplate Assembly (9100737A)*

Item	Part Number	Quantity	Description	Reference
1	404510	4	Screw, BHCS, 10-32 UNF x ½"	
2	413506	8	Screw, BHCS, M3 x 6	
3	420008	8	Nut, 10-32 UNF	
4	439006	8	Lockwasher, No. 6	
5	439009	8	Lockwasher, No. 10	
6	440005	8	Washer, No. 6	
7	606361A	1	Single Floppy Drive Ribbon Cable	
8	614009A	1	Drive Power Cable	
9	614306A	1	CD-ROM Ribbon Cable	
10	713343	1	Floppy Drive, 3 ½"	
11	713603	1	CD-ROM Drive Cage	
12	803600	1	Floppy Drive, 3 ½", Black	
13	803601	1	CD-ROM Drive, Black	
14	9100004	1	Floppy Cable Assembly	
15	9100182	1	Controller Faceplate	
16	9100199A	1	Momentary Switch Cable	
17	9102205	1	Switch, Breaker, 15A, 2 Pole, Green	
18	9103248A	1	Cable, Main Power Switch, BK700	

Figure A-15: *Controller Console Assembly (9100738A)*
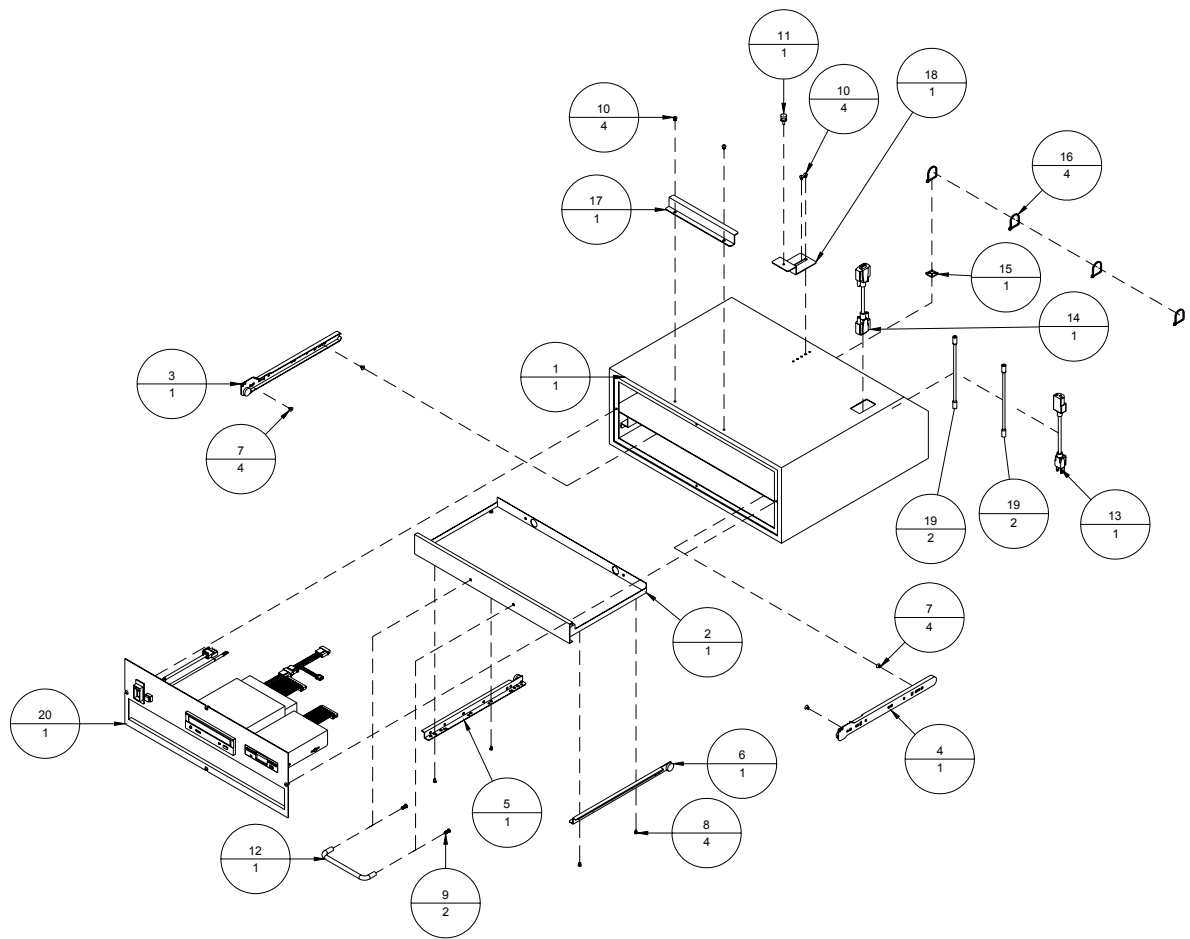
Table A-15: *Controller Console Assembly (9100738A)*

Item	Part Number	Quantity	Description	Reference
1	212603A	1	Drawer Slide Mount Assembly	
2	212604	1	Keyboard Drawer	
3	212605	1	Drawer Slides, 12" (Left Cabinet)	
4	212605	1	Drawer Slides, 12" (Right Cabinet)	
5	212605	1	Drawer Slides, 12" (Left Drawer)	
6	212605	1	Drawer Slides, 12" (Right Drawer)	
7	402010	4	Screw, FHCS, 6-32 UNC x ¼"	
8	402310	4	Screw, PHMS, 6-32 UNC x ¼"	
9	404330	2	Screw, PHMS, 10-32 UNF x ½"	
10	404510	4	Screw, BHCS, 10-32 UNF x ¼"	
11	438171	1	Thumbscrew, 10-32 UNF x 3/8"	
12	438313	1	Inkwell Container Handle	
13	606322	1	Monitor Power Cord	
14	606323	1	Monitor Extension Cable, 6'	
15	615100	1	Adhesive Backed Tie Mount	
16	615140	4	Lashing Tie	
17	707310	1	Monitor mount, Front	
18	707311	1	Monitor Mount, Rear	
19	9100666	2	Keyboard Extension Cable, PS2 to PS2	
20	9100737A	1	Controller Faceplate Assembly	Page A-15

Note: 212605 includes all drawer slide components as one part.

Figure A-16: *Controller HP Reservoir Assembly (9100743A)*
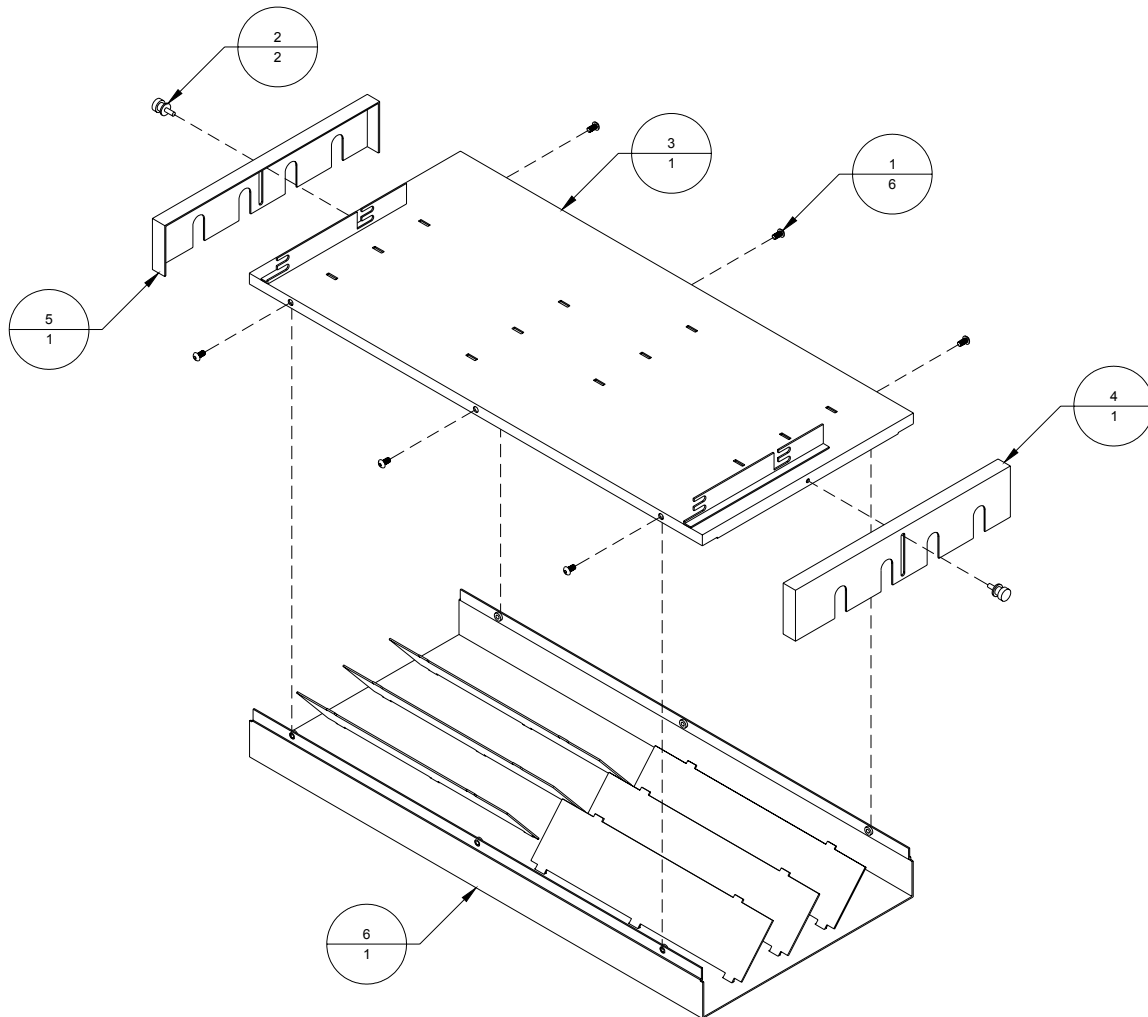
Table A-16: *Controller HP Reservoir Assembly (9100743A)*

Item	Part Number	Quantity	Description	Reference
1	404520	6	Screw, BHCS, 10-32 UNF x 3/8"	
2	438171	2	Thumbscrew, 10-32 UNF x 3/8"	
3	9100276	1	HP Reservoir Top Cover	
4	9100278	1	HP Reservoir Side Cover, Right	
5	9100482	1	HP Reservoir Side Cover, Left	
6	9100742A	1	Controller HP Reservoir Container	

Figure A-17: *Offline Controller Inkwell Assembly (9100744A)*

PIN 1 - NOT CONNECTED
PIN 2 - WHITE
PIN 3 - NOT CONNECTED
PIN 4 - NOT CONNECTED
PIN 5 - BLACK
PIN 6 - RED

9100717
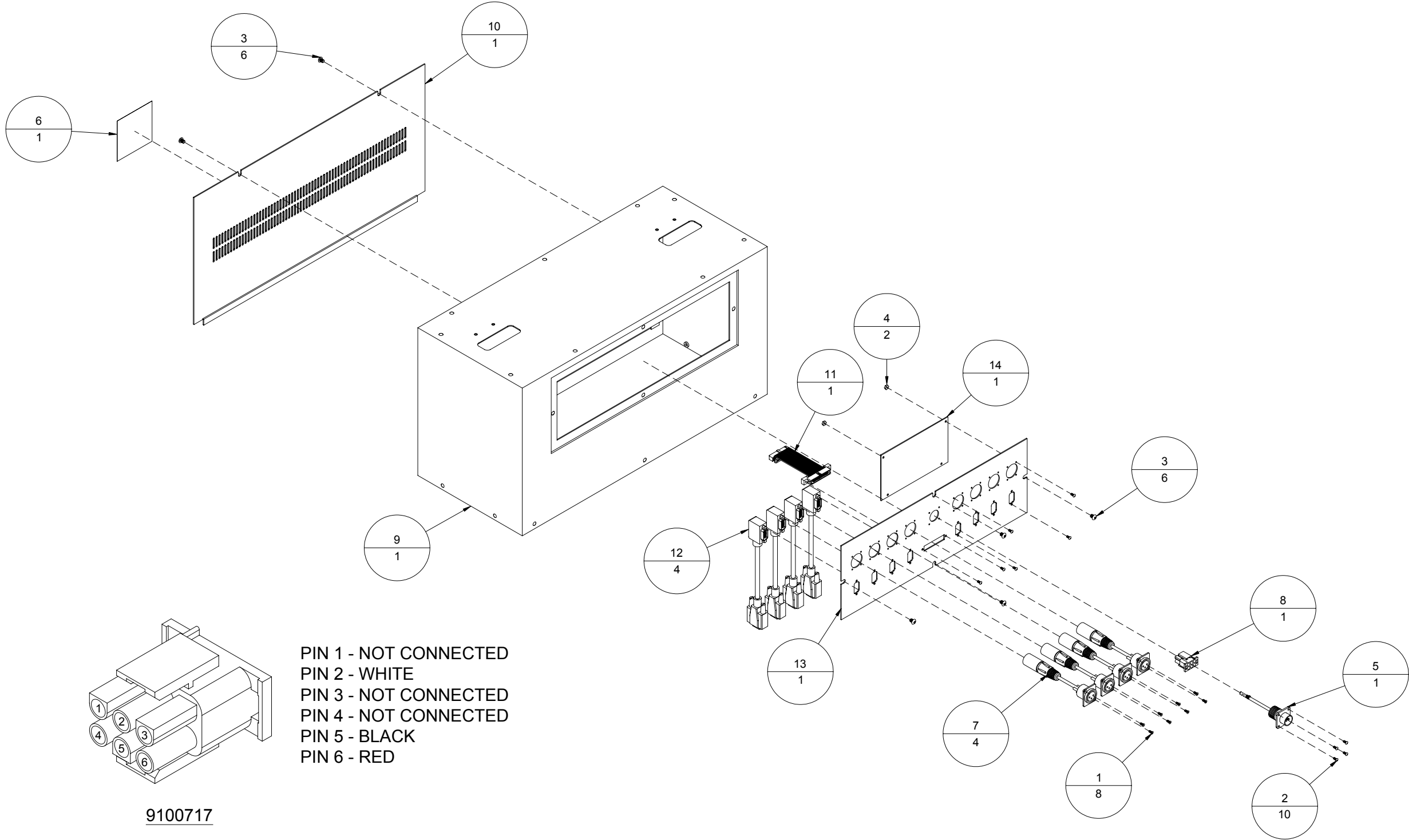
Table A-17: *Offline Controller Inkwell Assembly (9100744A)*

Item	Part Number	Quantity	Description	Reference
1	401010	8	Screw, FHCS, 4-40 UNC x ¼"	
2	401510	10	Screw, BHCS, 4-40 UNC x ¼"	
3	404510	6	Screw, BHCS, 10-32 UNF x ¼"	
4	420004	2	Nut, 4-40 UNC	
5	614114A	1	Panel Mount Counter Cable	
6	803020	1	Electrical Warning Label	
7	9100282A	4	Panel Mount Printhead Power Cable	
8	9100717	1	Plug, Mate-n-lok, 6-pin	
9	9100744	1	Offline Controller Inkwell	
10	9100746	1	Controller Inkwell Rear Door	
11	9100748A	1	I/O Panel Mount Cable	
12	9102705A	4	Cable, Printhead Data, 6', Left	
13	9102969	1	Plate, Inkwell Connector, HP, 8"	
14	9103164	1	Cover, HP Mounting Plate	

Figure A-18: *Encoder Wheel Assembly, 600 DPI (BK-ENC-600W or 9101543A)*
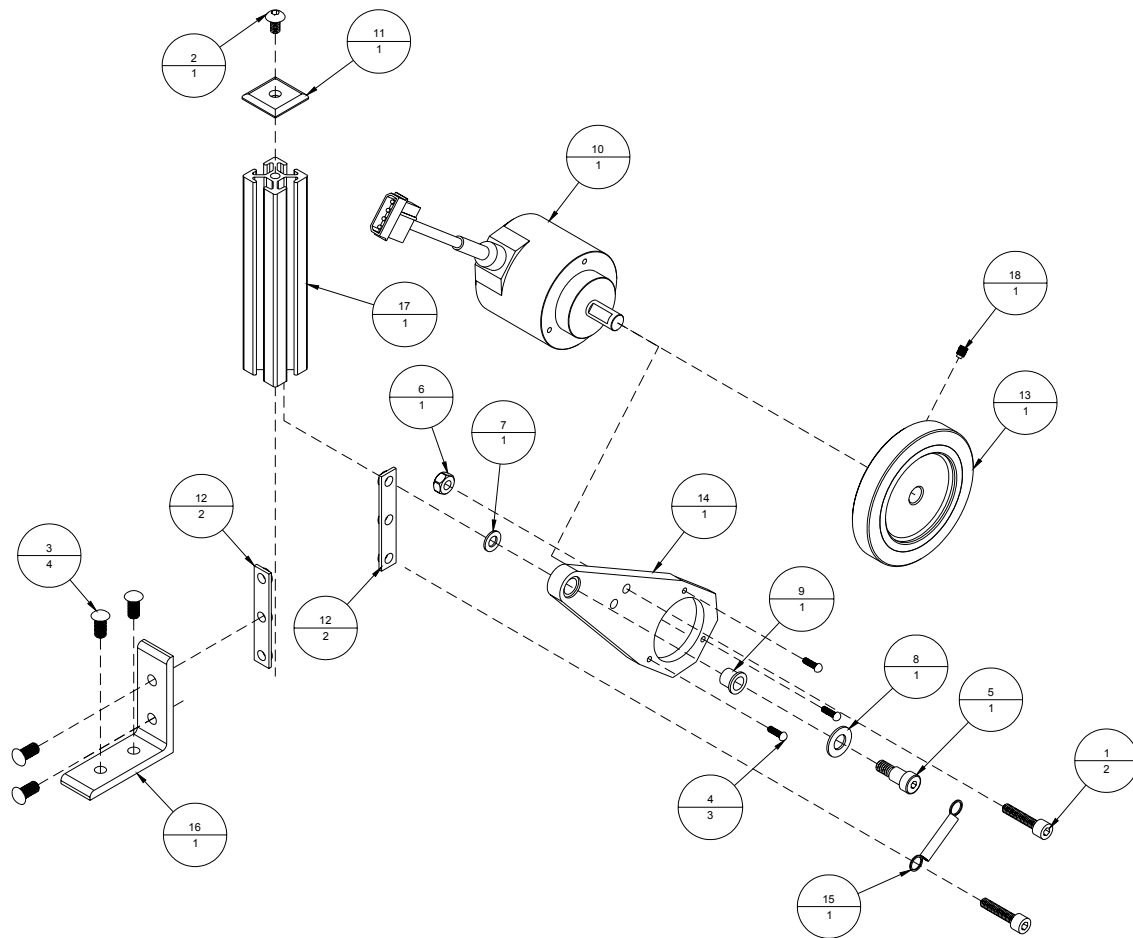
Table A-18: *Encoder Wheel Assembly, 600 DPI (BK-ENC-600W or 9101543A)*

Item	Part Number	Quantity	Description	Reference
1	405270	2	Screw, SHCS, ¼-20 UNC x 1"	
2	405520	1	Screw, BHCS, ¼-20 UNC x 3/8"	
3	405530	4	Screw, BHCS, ¼-20 UNC x ½"	
4	413510	3	Screw, BHCS, M3 x 10 mm	
5	415120	1	Shoulder Bolt, 5/16" x 3/8" (1/4-20 UNC)	
6	420010	1	Nut, ¼-20 UNC	
7	440010	1	Washer, ¼ I.D.	
8	440015	1	Washer, 5/16 I.D.	
9	505563	1	Flange Bushing, 5/16 ID x 3/8 OD x 3/8 lg	
10	9100188A	1	Shaft Encoder Assembly, 6000 ppr	
11	9100360	1	Endcap (10 Series)	
12	9100361	2	T-Nut, ¼-20 Triple	
13	9101543	1	Encoder Wheel, 3.19" O.D.	
14	9101544	1	Encoder Wheel Arm	
15	9101665	1	Spring, Extension	
16	9101666	1	10 Series Inside Corner Bracket	
17	9101675	1	Encoder Wheel Extrusion Rail, 5"	
18	9102963	1	Screw, SHSS, 10-32 UNF x 3/16", BT	

Figure A-19: *Encoder Wheel Assembly, Program (BK-ENC-PROGW or 9101668A)*
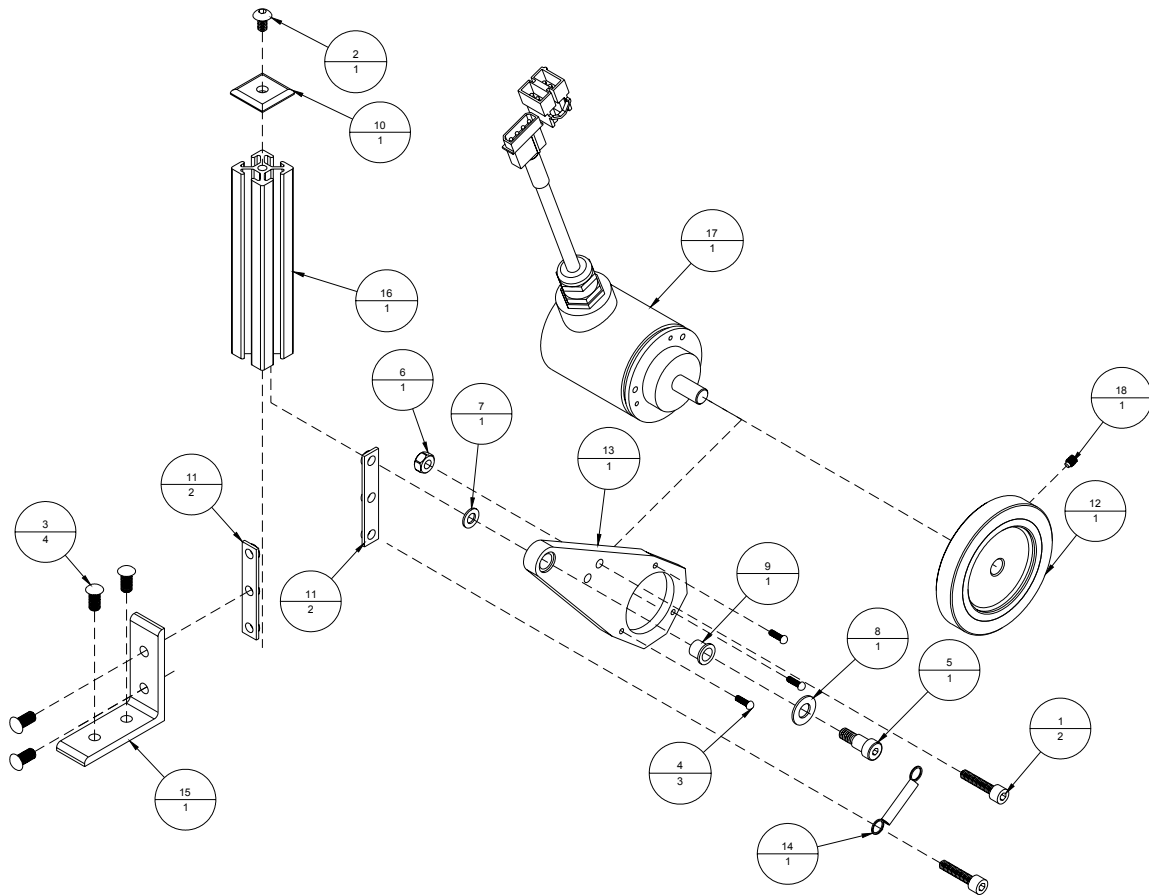
Table A-19: *Encoder Wheel Assembly, Program (BK-ENC-PROGW or 9101668A)*

Item	Part Number	Quantity	Description	Reference
1	405270	2	Screw, SHCS, ¼-20 UNC x 1"	
2	405520	1	Screw, BHCS, ¼-20 UNC x 3/8"	
3	405530	4	Screw, BHCS, ¼-20 UNC x ½"	
4	413510	3	Screw, BHCS, M3 x 10 mm	
5	415120	1	Shoulder Bolt, 5/16" x 3/8" (1/4-20 UNC)	
6	420010	1	Nut, ¼-20 UNC	
7	440010	1	Washer, ¼ I.D.	
8	440015	1	Washer, 5/16 I.D.	
9	505563	1	Flange Bushing, 5/16 ID x 3/8 OD x 3/8 lg	
10	9100360	1	Endcap (10 Series)	
11	9100361	2	T-Nut, ¼-20 Triple	
12	9101543	1	Encoder Wheel, 3.19" O.D.	
13	9101544	1	Encoder Wheel Bracket	
14	9101665	1	Spring, Extension	
15	9101666	1	10 Series Inside Corner Bracket	
16	9101675	1	Encoder Wheel Extrusion Rail, 5"	
17	9101705A	1	Encoder Assembly, Programmable	
18	9102963	1	Screw, SHSS, 10-32 UNF x 3/16", BT	

Figure A-20: *Encoder Wheel Assembly, 660 DPI (BK-ENC-660W or 9101685A)*
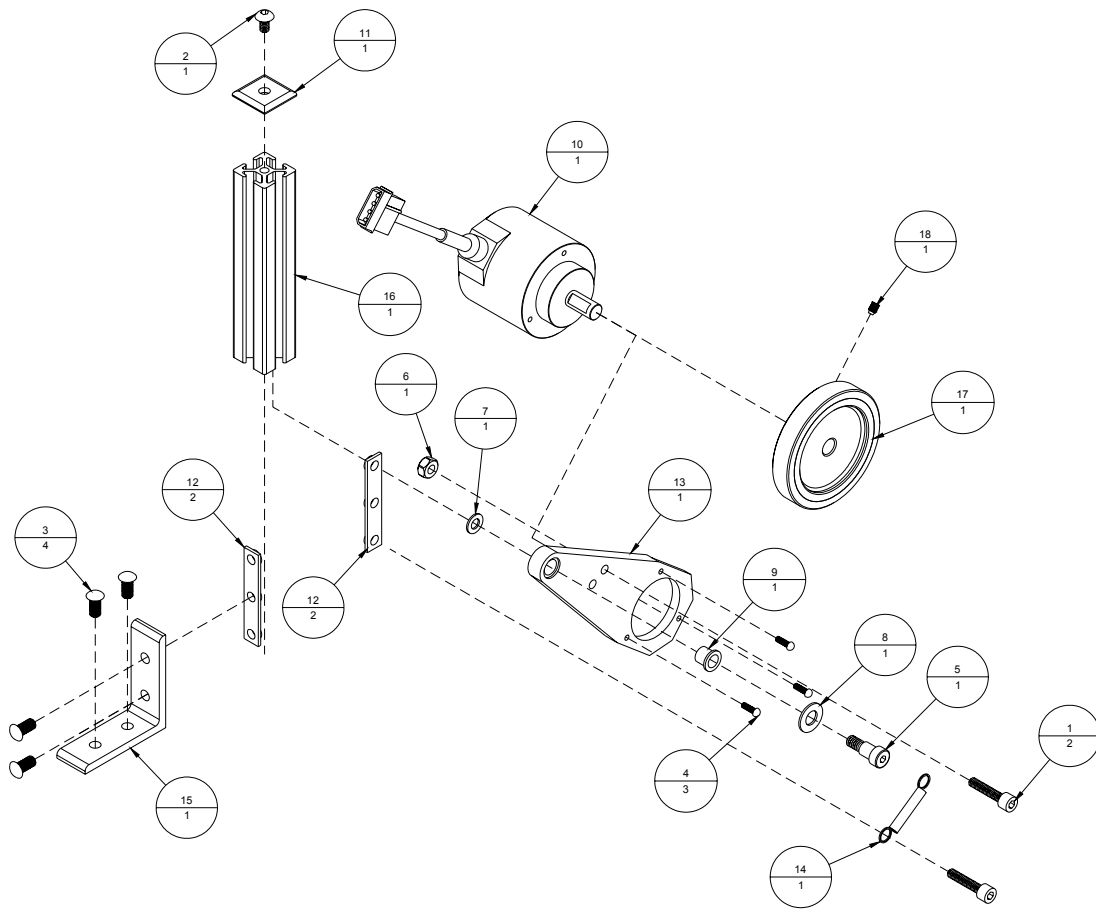
Table A-20: *Encoder Wheel Assembly, 660 DPI (BK-ENC-660W or 9101685A)*

Item	Part Number	Quantity	Description	Reference
1	405270	2	Screw, SHCS, ¼-20 UNC x 1"	
2	405520	1	Screw, BHCS, ¼-20 UNC x 3/8"	
3	405530	4	Screw, BHCS, ¼-20 UNC x ½"	
4	413510	3	Screw, BHCS, M3 x 10 mm	
5	415120	1	Shoulder Bolt, 5/16" x 3/8" (1/4-20 UNC)	
6	420010	1	Nut, ¼-20 UNC	
7	440010	1	Washer, ¼ I.D.	
8	440015	1	Washer, 5/16 I.D.	
9	505563	1	Flange Bushing, 5/16 ID x 3/8 OD x 3/8 lg	
10	9100188A	1	Shaft Encoder Assembly, 6000 ppr	
11	9100360	1	Endcap (10 Series)	
12	9100361	2	T-Nut, ¼-20 Triple	
13	9101544	1	Encoder Wheel Arm	
14	9101665	1	Spring, Extension	
15	9101666	1	10 Series Inside Corner Bracket	
16	9101675	1	Encoder Wheel Extrusion Rail, 5"	
17	9101685	1	Encoder Wheel, 2.88" O.D.	
18	9102963	1	Screw, SHSS, 10-32 UNF x 3/16", BT	

Figure A-21: *Computer Chassis Assembly (9101860A)*
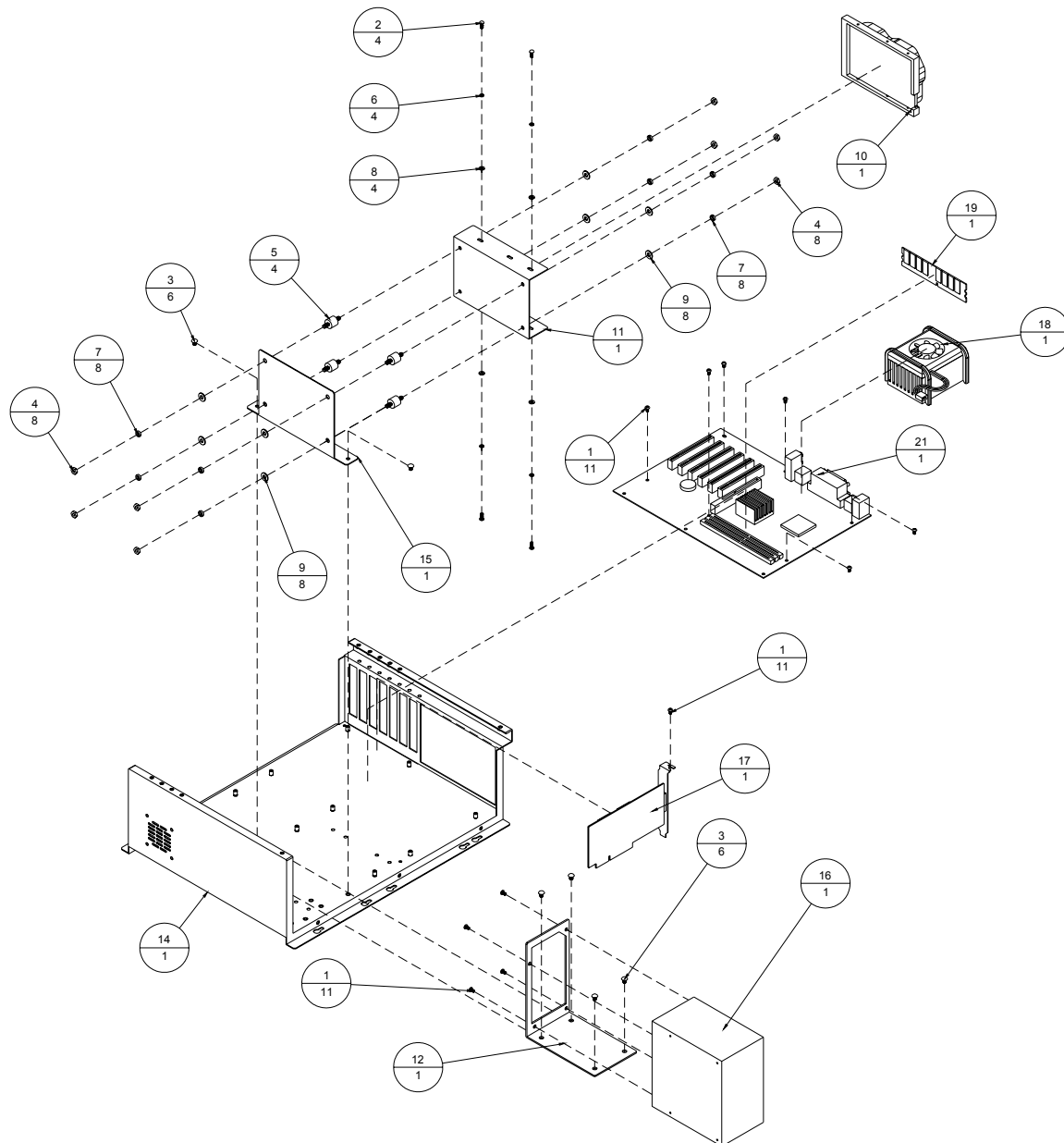
Table A-21: *Computer Chassis Assembly (9101860A)*

Item	Part Number	Quantity	Description	Reference
1	402310	11	Screw, PHMS, 6-32 UNC x ¼"	
2	402320	4	Screw, PHMS, 6-32 UNC x 3/8"	
3	404310	6	Screw, PHMS, 10-32 UNF x ¼"	
4	420008	8	Nut, 10-32 UNF	
5	426301	4	Hard Drive Rubber Mount	
6	439006	4	Lockwasher, No. 6	
7	439009	8	Lockwasher, No. 10	
8	440005	4	Washer, No. 6 ID	
9	440008	8	Lockwasher, No. 10 ID	
10	600333	1	Hard Drive, IDE	
11	713314	1	Hard Drive Mount	
12	713318	1	Computer Power Supply Bracket	
13	806600	1	Software, Windows (Not Shown)	
14	9100236	1	Controller Chassis	
15	9100239	1	Hard Drive Mount Bracket	
16	9101863	1	Power Supply, 12V, ATX	
17	9101864	1	Card, Video, AGP	
18	9101866	1	CPU, Pentium 4, Socket 478	
19	9101932	1	Memory, 256MB DDR	
20	9101971	1	Software, Compose (Not Shown)	
21	9102308	1	Motherboard, P4B533, Socket 478	

Figure A-22: *Power Box Assembly (9103708A)*

SOLDER WIRE TO
CORCOM FILTER
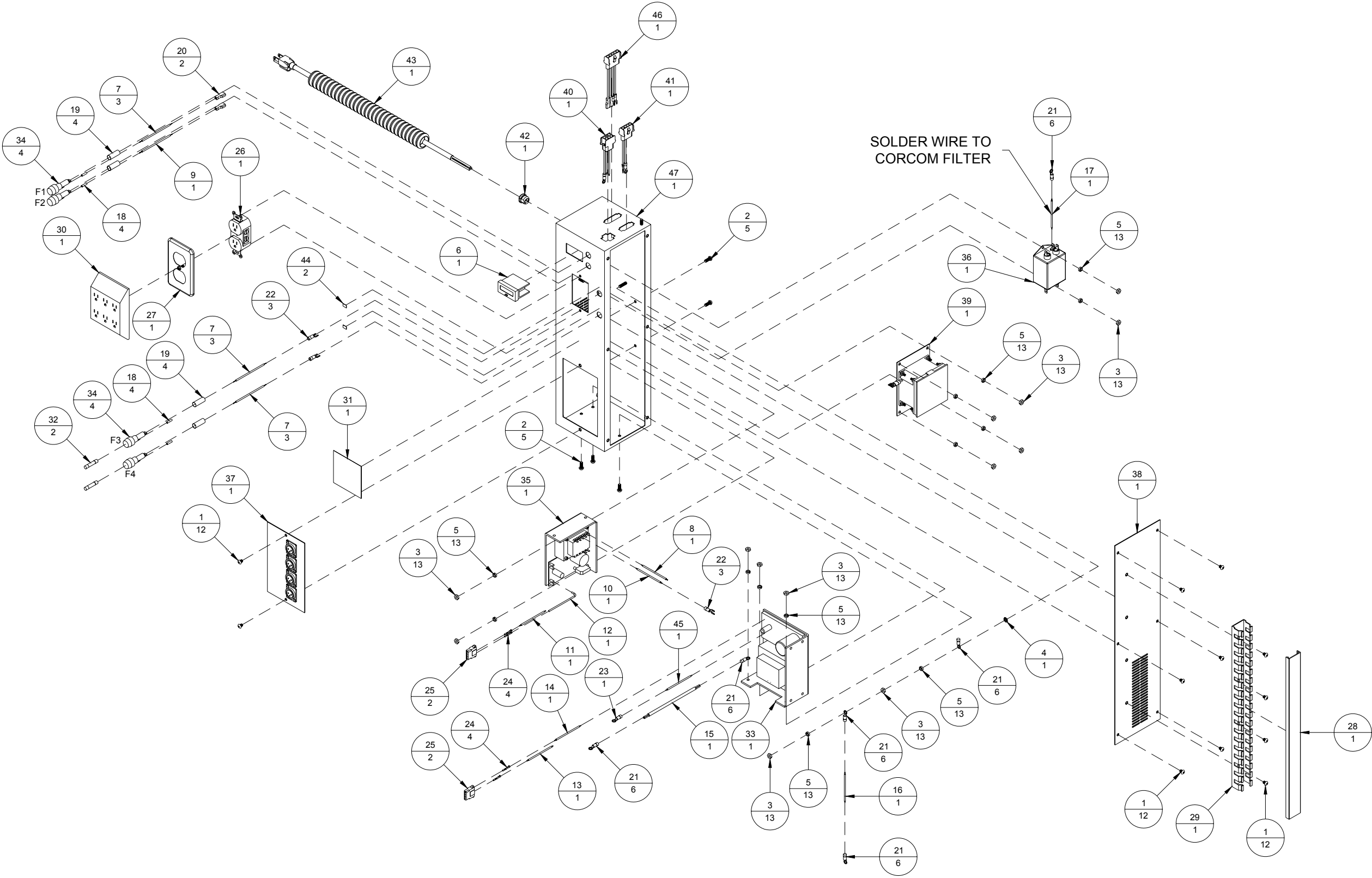
Table A-22: *Power Box Assembly (9103708A)*

Item	Part Number	Quantity	Description	Reference
1	404510	12	Screw, BHCS, 10-32 UNF x ¼"	
2	404530	5	Screw, BHCS, 10-32 UNF x ½"	
3	420008	13	Nut, 10-32 UNF	
4	439008	1	Lockwasher, No. 10, External Tooth	
5	439009	13	Lockwasher, #10	
6	600101	1	Counter	
7	606000	3 x 6"	Wire, #16, Black	
8	606000	11"	Wire, #16, Black	
9	606009	6"	Wire, #16, White	
10	606009	11"	Wire, #16, White	
11	606020	7"	Wire, #18, Black	
12	606022	7"	Wire, #18, Red	
13	606023	5"	Wire, #18, Green	
14	606025	5"	Wire, #18, Orange	
15	606034	24"	Cable, #16-3, SJOW-A	
16	606359	7"	Wire, #16, Green/Yellow	
17	606359	8"	Wire, #16, Green/Yellow	
18	609000	4 x 0.75"	Shrink Wrap, 3/16" I.D.	
19	609003	4 x 1"	Shrink Wrap, 3/8" I.D.	
20	609110	2	Connector, Push-on, Blue	
21	609111	6	Terminal, Ring, #10, 16-14 AWG, Blue	
22	609112	3	Terminal, Fork, #10, 16-14 AWG, Blue	
23	609116	1	Terminal, Ring, #10, 22-18 AWG, Red	
24	614006	4	Contact, Female, 24-18 AWG, Mate-n-lok	
25	614007	2	Connector, 4-Pin, Socket Housing, Mate-n-lok	
26	614014	1	Receptacle, Duplex, 2 Pole, 3 Wire Ground	
27	615155	1	Box Cover, Duplex Receptacle	
28	615210	15"	Wiring Duct Cover, 1"	
29	615220	15"	Wiring Duct, 1" x 1"	
30	640003	1	Surge Suppressor, Full 3-line	
31	803020	1	Electrical Warning Label	
32	9100271	2	Fuse, 3A, 250V, ¼ x 1-1/4", MDA	
33	9100281	1	Power Supply, 28V	
34	9100285	4	Panel Mount Fuse Holder	
35	9100393	1	Power Supply 5V, 3A	
36	9100674	1	Filter, Corcom, 10A	
37	9100709A	1	HP Plate Assembly	Page A-9
38	9100710	1	Offline Controller Power Cover	
39	9100714A	1	Sprite Fan Assembly	Page A-10
40	9100718A	1	Power Box Counter Cable	
41	9100720A	1	Power Box Cable (12V)	
42	9100783	1	Strain Relief Bushing, Round Cables	
43	9101572	1	Cable, #16-3, 13A/125V, SJO Cord	
44	9101902	2	Label, 3A	
45	9102246	1	Wire, #18, Green/Yellow, 12"	
46	9103249A	1	Cable, Power Box Switch Receptacle	
47	9103708	1	Chassis, Power Box, BK700	

List of Figures

Figure B-1: *Power Box Electrical Schematic, 115VAC (9103708AE)*

Fuse Details

F1 = 9100096, 10A, Slo-blow
F2 = 9100096, 10A, Slo-blow
F3 = 9100271, 3A, Slo-blow
F4 = 9100271, 3A, Slo-blow

J2

15A
DPST

BK 1   1 BK
WH 2   2 WH
WH 3   3 WH
BK 4   4 BK
5   5

GN

**Main Power Switch
Outside Power Box**

**From Computer
Power Supply**

J1
(rear view)

J3

+12 VDC   1   YE
GND   2
3
4

GN/YE   GN/YE
Ground
Stud

WH
BK
RD
BK

4 - Reset
3 - Count
2 - 0 V
1 - Keylock

BK F1, 10A
115 VAC
Line Input   WH F2, 10A
GN/YE

Ground
Stud

RFI
Filter

Fan

F3, 3A

120VAC

+28VDC
V+

Ground
V-

OG 1
2
3   GN
4

GN
GN/YE
Ground
Stud

J5 J6

1 OG
2
3 GN
4

9100709A - HP Plate Assembly

OG   OG   OG   OG

J7   **J8**   **J9**   **J10**

GN/YE   GN/YE   GN/YE
GN   RD   GN   RD   GN   RD

GN/YE
GN

WH
J4
BK

GN/YE
Ground
Stud

BK

BK
F4, 3A

WH

120VAC

+5VDC
V+

Ground
V-

RD 4
3
BK 2
1

J12 J11

4 RD
3 BK
2
1

Figure B-2: *Power Box Electrical Schematic, 200/230VAC (9103708AE)*

Fuse Details

F1 = 646007, 5A, Slo-blow
F2 = 646007, 5A, Slo-blow
F3 = 9100271, 3A, Slo-blow
F4 = 9100271, 3A, Slo-blow

Figure B-3: *BK700 Controller (HP Version)*

Figure B-4: *Field Connection Board Wiring*

Field Connection Board

C.1   Introduction

The Field Connection Board (FCB) shown in **Figure C-1** is used to interconnect the field inputs and outputs in the inkjet system with the Base Interface Board, the Datapath card, and an optional Programmable Logic Controller. The inkjet system architecture is illustrated in **Figure C-2**..

Figure C-1: *Field Connection Board*

Output Connector (J3)
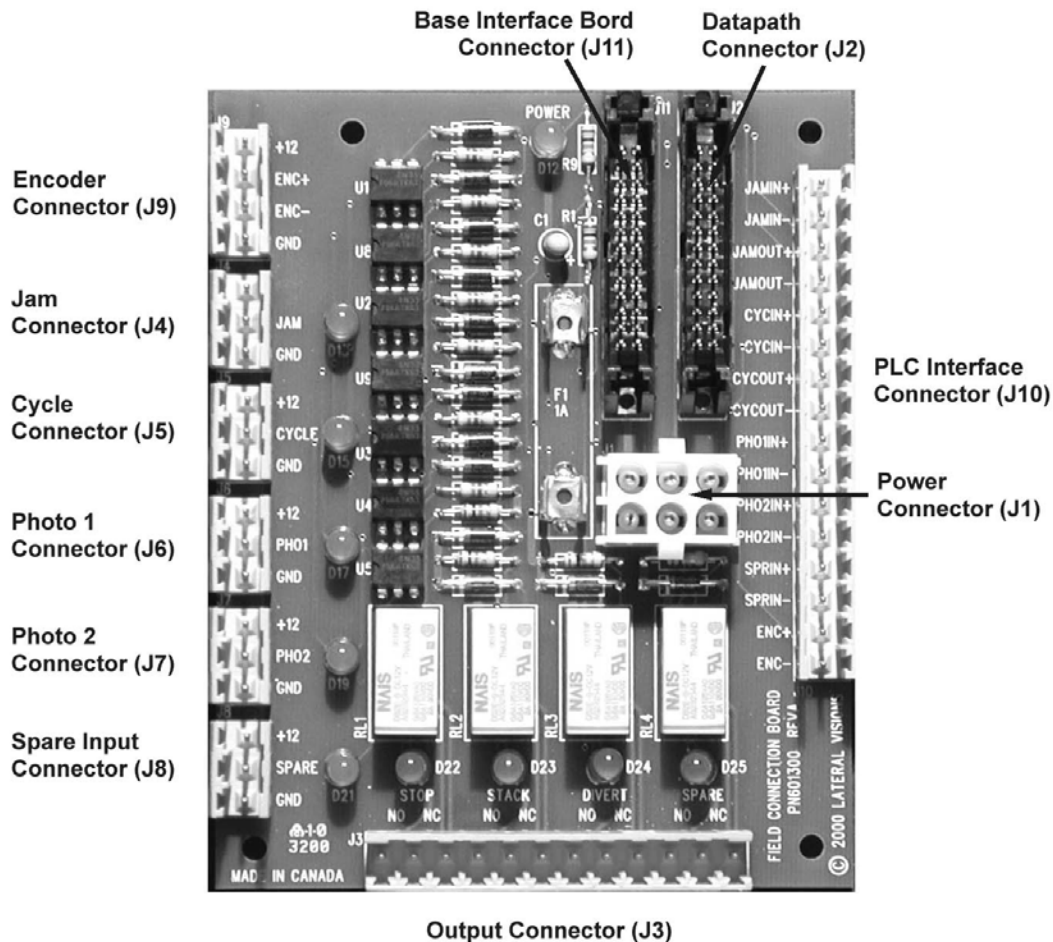
Figure C-2: *Inkjet Controller Field Connections*
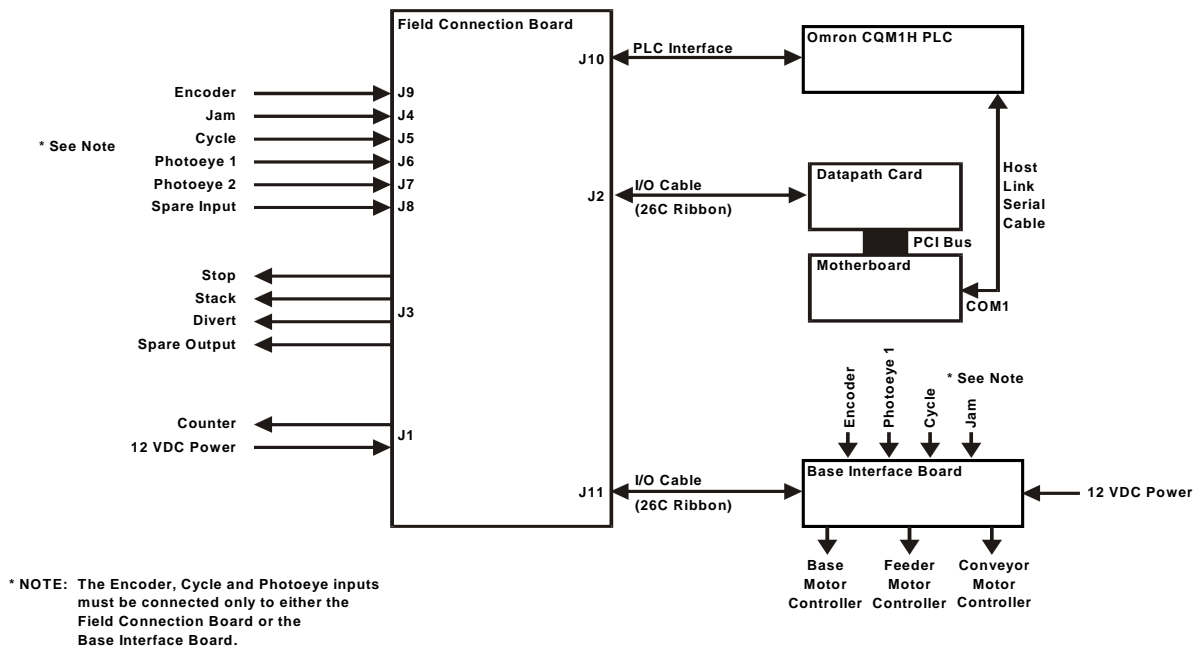
C.2 Field Connection Board Inputs & Outputs

The FCB provides connection points to the inputs of the controller. The inputs can be used by the customer to process signals from external equipment. The inputs are as follows:

Encoder Provides the transport position and is used to synchronize the jetting process.

Jam Indicates a material jam condition.

Cycle Indicates the beginning of a feed cycle.

Photocue 1 Used to detect the material and register the print location.

Photocue 2 Currently not used.

Spare Input Currently not used.

The FCB provides connection points to the outputs of the controller. The outputs can be used by the customer to control external equipment and include the following:

Stop   Provides a momentary output (0.25 s) indicating that the transport has been commanded to stop by the controller.

Stack   Provides an output to indicate that a stack should be performed on the current cycle. A stack represents a bundle of mail to a post office defined delivery area. The stack function is configured with the inkjet software.

Divert   Provides an output to indicate that a divert should be performed on the current cycle. The divert function is used to divert the stack bundles which fall below a post office defined minimum size. The divert function is configured with the inkjet software.

Spare   Currently not used.

The FCB provides an interface to a Programmable Logic Controller (PLC). The PLC is used in applications where the control of an inserter or similar device is required. The interface provides the ability to receive the field inputs from or send the field inputs to the PLC. The signals of the PLC interface are optically isolated so that the PLC may operate on a different voltage than the Inkjet Controller. The signals provided by the PLC interface include the following:

Encoder   Encoder signal received by the FCB or Base Interface Board, and sent to the PLC. Note that the encoder signal is *not* optically isolated to allow for high-speed operation.

Jam In   PLC generated jam signal sent to the inkjet controller.

Jam Out   Jam signal received by the FCB or Base Interface Board, and sent to the PLC.

Cycle In   PLC generated *Machine Cycle* signal sent to the inkjet controller.

Cycle Out   *Machine Cycle* signal received by the FCB or Base Interface Board, and sent to the PLC.

Photo 1 In   PLC generated *Material Detected* signal sent to the inkjet controller.

Photo 2 In   PLC generated *Photoeye 2* signal sent to the inkjet controller.
                      Currently not used.

Spare In   PLC generated spare input signal sent to the inkjet controller.
                      Currently not used.

C.3   Connector Pin Assignments

This section provides the pin assignments for each of the FCB connectors. The connector
locations are shown in **Figure C-1**.

C.3.1   J1 - Power Connector

The Power Connector is a 6-pin male Mate-N-Lock connector. The connector provides 12
Volt DC power to the board. The connector also provides the counter output signal from the
board.

Table C-1: *Power Connector (J1)*

Signal	Pin	Description
+12V	1	12 Volt Supply
Count	2	Counter Output (Pulled up to 12V)
NC	3	Not connected
GND	4	Ground
GND	5	Ground
NC	6	Not connected

C.3.2 J2 – Datapath Connector

The Datapath Connector is a 26-pin male header connector. The connector is used to connect the FCB to the Datapath Card through a 26-conductor ribbon cable.

Table C-2: *Datapath Connector (J2)*

Signal	Pin	Description
GND	1	Ground
NC	2	Not connected
NC	3	Not connected
NC	4	Not connected
NC	5	Not connected
CARDON	6	Indicates Datapath Card is powered
PHOTO2	7	Photocue 2 input
STOPBUT	8	Stop button input
CYCLE	9	Machine cycle input
JAM	10	Jam input
SPDO1	11	Spare Output 1
SPDO2	12	Spare Output 2
SPDO3	13	Spare Output 3
DIVERT	14	Divert Output
STACK	15	Stack Output
COUNT	16	Counter Output
STOP	17	Stop Output
GND	18	Ground
ENC+	19	Encoder Positive Input
ENC-	20	Encoder Negative Input
GND	21	Ground
PHOTO1	22	Photocue 1 input
SPDI1	23	Spare Input 1
SPDI2	24	Spare Input 2
SPDI3	25	Spare Input 3
SPDI4	26	Spare Input 4

C.3.3 J3 - Output Connector

The Output connector is a 12-position Weidmüller header connector. The connector provides Stop, Stack, Divert, and 1 Spare output. The Output contacts are rated for 2 Amps at 30 VDC, or 0.6 Amps at 125 VAC.

Table C-3: *Output Connector (J3)*

Signal	Pin	Description
STOPNO	1	Stop (Normally Open) Output
STOPCOM	2	Stop (Common) Output
STOPNC	3	Stop (Normally Closed) Output
STACKNO	4	Stack (Normally Open) Output
STACKCOM	5	Stack (Common) Output
STACKNC	6	Stack (Normally Closed) Output
DIVERTNO	7	Divert (Normally Open) Output
DIVERTCOM	8	Divert (Common) Output
DIVERTNC	9	Divert (Normally Closed) Output
SPARENO	10	Spare (Normally Open) Output
SPARECOM	11	Spare (Common) Output
SPARENC	12	Spare (Normally Closed) Output

C.3.4 J4 - Jam Connector

The Jam connector is a 3-position Weidmüller header connector. The connector is used to connect a *Jam* switch. Grounding the *Jam* input indicates a material jam condition.

Table C-4: *Jam Connector (J4)*

Signal	Pin	Description
NC	1	Not connected
JAM	2	Jam Input (Active Low)
GND	3	Ground

C.3.5 J5 - Cycle Connector

The Cycle connector is a 3-position Weidmüller header connector. The connector is used to connect a *Cycle* switch. The negative going edge of the cycle input is used to indicate the start of a machine feed.

Table C-5: *Cycle Connector (J5)*

Signal	Pin	Description
12V	1	12 VDC
CYCLE	2	Cycle Input
GND	3	Ground

C.3.6 J6 - Photo 1 Connector

The Photo 1 connector is a 3-position Weidmüller header connector. The connector is used to connect a material registration photo detector. Grounding the Photo input indicates that the detector is *not* blocked.

Table C-6: *Photo 1 Connector (J6)*

Signal	Pin	Description
12V	1	12 VDC
PHO1	2	Photocue Input 1
GND	3	Ground

C.3.7 J7 - Photo 2 Connector

The Photo 2 connector is a 3-position Weidmüller header connector. The connector is used to connect a material registration photo detector. Grounding the Photo input indicates that the detector is **not** blocked. This input is currently not used.

Table C-7: *Photo 2 Connector (J7)*

Signal	Pin	Description
12V	1	12 VDC
PHO2	2	Photocue Input 2
GND	3	Ground

C.3.8 J8 - Spare Input Connector

The Spare Input connector is a 3-position Weidmüller header connector. The connector is provided for future use.

Table C-8: *Spare Input Connector (J8)*

Signal	Pin	Description
12V	1	12 VDC
SPARE	2	Spare Input
GND	3	Ground

C.3.9 J9 - Encoder Connector

The Encoder connector is a 4-position Weidmüller header connector. The connector is used to connect the transport shaft encoder.

Table C-9: *Encoder Connector (J9)*

Signal	Pin	Description
12V	1	12 VDC
ENC+	2	Encoder Positive Input
ENC-	3	Encoder Negative Input
GND	4	Ground

C.3.10 J10 - PLC Interface Connector

The PLC interface connector is a 16-pin male header connector. The connector is used to connect the FCB to a Programmable Logic Controller used for Inserter control. The FCB provides optical isolation for the inputs and outputs to the PLC.

Table C-10: *PLC Interface Connector (J10)*

Signal	Pin	Description	Direction
ENC-	16	Encoder Negative (Not Isolated)	To or From PLC
ENC+	15	Encoder Positive (Not Isolated)	To or From PLC
SPRIN-	14	Spare Input Negative	From PLC
SPRIN+	13	Spare Input Positive	From PLC
PHO2IN-	12	Photocue 2 Output Negative	To PLC
PHO2IN+	11	Photocue 2 Output Positive	To PLC
PHO1IN-	10	Photocue 1 Output Negative	To PLC
PHO1IN+	9	Photocue 1 Output Positive	To PLC
CYCOUT-	8	Cycle Output Negative	To PLC
CYCOUT+	7	Cycle Output Positive	To PLC
CYCIN-	6	Cycle Input Negative	From PLC
CYCIN+	5	Cycle Input Positive	From PLC
JAMOUT-	4	Jam Output Negative	To PLC
JAMOUT+	3	Jam Output Positive	To PLC
JAMIN-	2	Jam Input Negative	From PLC
JAMIN+	1	Jam Input Positive	From PLC

C.3.11 J11 - Base Interface Board Connector

The Base Interface Board connector is a 26-pin male header connector. The connector is used to connect the FCB to the Base Interface Board through a 26-conductor ribbon cable.

Table C-11: *Base Interface Board Connector (J11)*

Signal	Pin	Description
GND	1	Ground
NC	2	Not Connected
NC	3	Not Connected
NC	4	Not Connected
NC	5	Not Connected
CARDON	6	Indicates Datapath Card is powered
PHOTO2	7	Photocue 2 Input
STOPBUT	8	Stop Button Input
CYCLE	9	Machine Cycle Input
JAM	10	Jam Input
SPDO1	11	Spare Output 1
SPDO2	12	Spare Output 2
SPDO3	13	Spare Output 3
DIVERT	14	Divert Output
STACK	15	Stack Output
COUNT	16	Counter Output
STOP	17	Stop Output
GND	18	Ground
ENC+	19	Encoder Positive Input
ENC-	20	Encoder Negative Input
GND	21	Ground
PHOTO1	22	Photocue 1 input
SPDI1	23	Spare Input 1
SPDI2	24	Spare Input 2
SPDI3	25	Spare Input 3
SPDI4	26	Spare Input 4

C.4   Output Drive Characteristics

The FCB provides connection points to the outputs of the inkjet controller. The outputs can be used by the customer to control external equipment. The outputs include the following:

Stop　　　　　Provides a momentary output (0.25 s) indicating that the transport has been commanded to stop by the controller.

Stack　　　　　Provides an output to indicate that a *stack* should be performed on the current cycle. A stack represents a bundle of mail to a post office defined delivery area. The stack function is configured with the Inkjet software.

Divert　　　　　Provides an output to indicate that a *divert* should be performed on the current cycle. The divert function is used to divert the stack bundles which fall below a post office defined minimum size. The divert function is configured with the Inkjet software.

Spare　　　　　Currently unused.

The output contacts are rated for 2 Amps @ 30 VDC, or 0.6 Amps @ 125 VDC/VAC.

Each output provides a *normally open* and a *normally closed* contact. The following diagrams detail each type of connection:
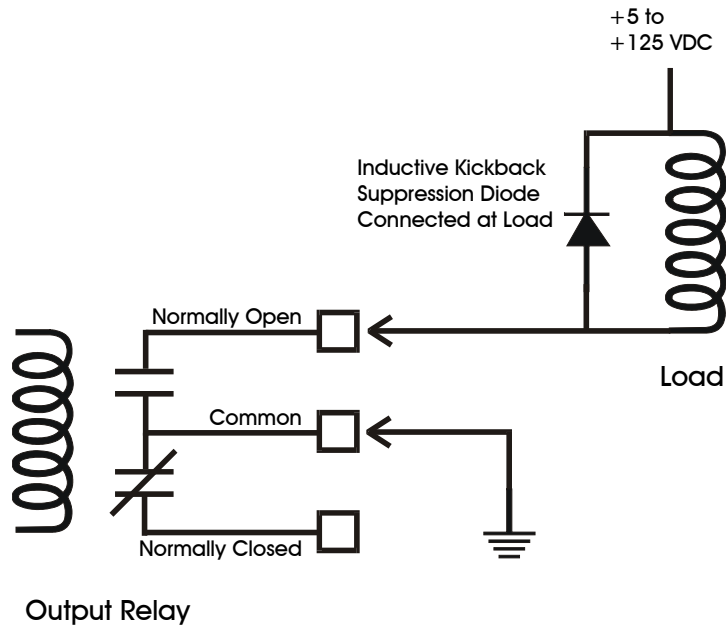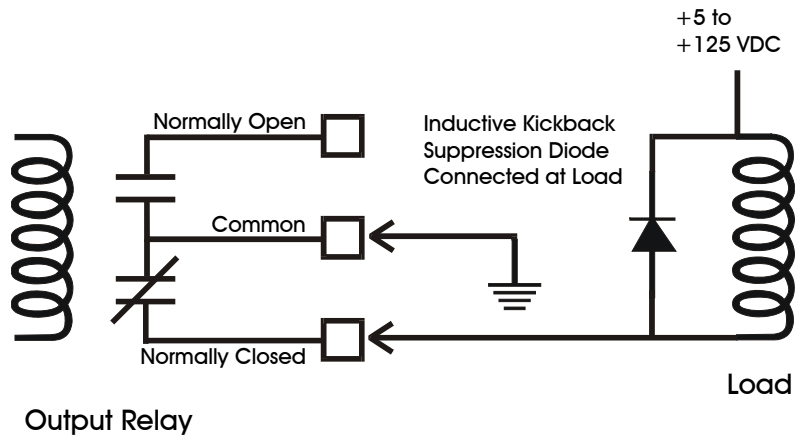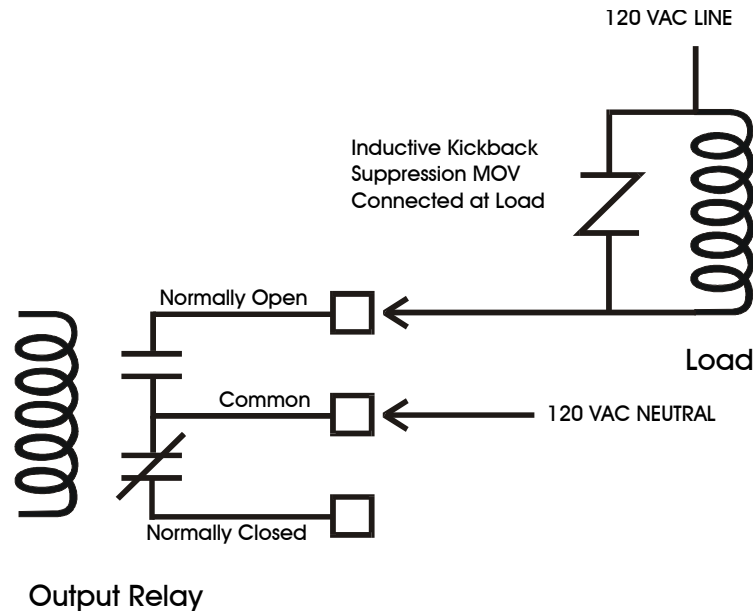
Figure C-3: *Normally Open Connection of a DC Load*

+5 to
+125 VDC

Inductive Kickback
Suppression Diode
Connected at Load

Load

Normally Open

Common

Normally Closed

Output Relay

Figure C-4: *Normally Closed Connection of a DC Load*

+5 to
+125 VDC

Normally Open

Inductive Kickback
Suppression Diode
Connected at Load

Common

Normally Closed

Load

Output Relay

Figure C-5: *Normally Open Connection of an AC Load*

C.5　PLC Interface Characteristics

The FCB provides an interface to a Programmable Logic Controller. The PLC is used in applications where the control of an inserter or similar device is required. The interface provides the ability to receive the field inputs from, or send the field inputs to the PLC. The signals of the PLC interface are optically isolated, so that the PLC may operate on a different voltage from the inkjet controller. The signals provided by the PLC Interface include the following:

Encoder　　*Encoder* signal received by the FCB or Base Interface Board, and sent to the PLC. Note that the encoder signal is ***not*** optically isolated to allow for high-speed operation.

Jam In　　PLC generated *Jam* signal sent to the inkjet controller.

Jam Out　　*Jam* signal received by the FCB or Base Interface Board, and sent to the PLC.

Cycle In　　PLC generated *Machine Cycle* signal sent to the inkjet controller.

Cycle Out　　*Machine Cycle* signal received by the FCB or Base Interface Board, and sent to the PLC.

    Photo 1 In Inkjet generated *Material Detected* signal sent to the PLC.

    Photo 2 In Inkjet generated *Photoeye 2* signal sent to the PLC. Currently
           unused.

    Spare In PLC generated *Spare Input* signal sent to the inkjet controller.
           Currently unused.

Note that each input signal must be provided by ***only one*** source (i.e. the FCB, the Base
Interface Board, or the PLC). The exception is the *Jam* input, which can be generated by all
sources. A material jam is indicated if any of the sources assert their *Jam* input.

The PLC Interface input connections are provided so that a PLC generated signal may be sent
to the FCB. Optically isolated input connections are provided for *Jam*, *Cycle*, and one spare.
The input connections are directional, with each input having a positive and a negative
terminal. Examples of connections to a PLC output using a negative or positive common are
shown in **Figure C-6** and **Figure C-7**.

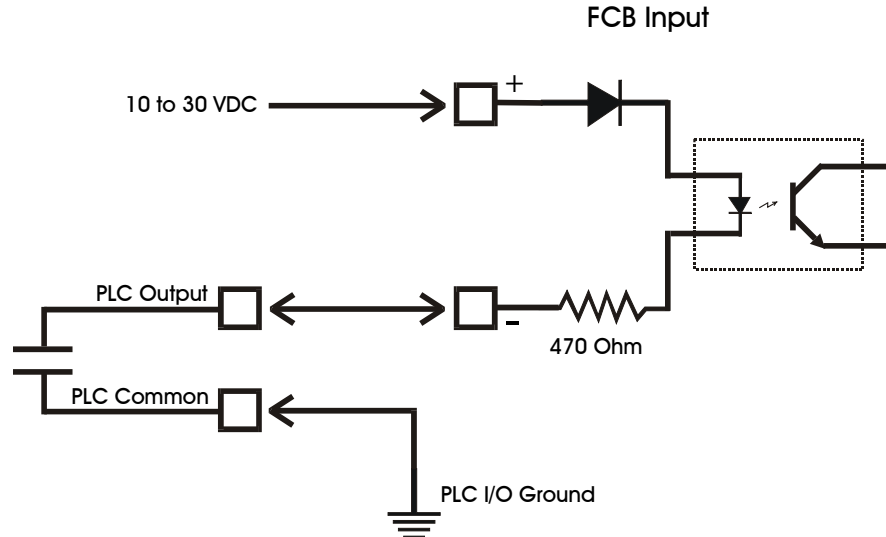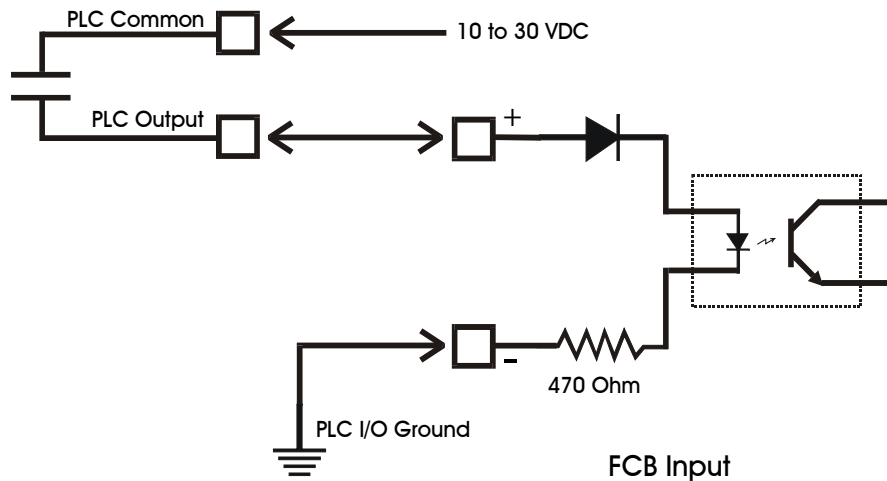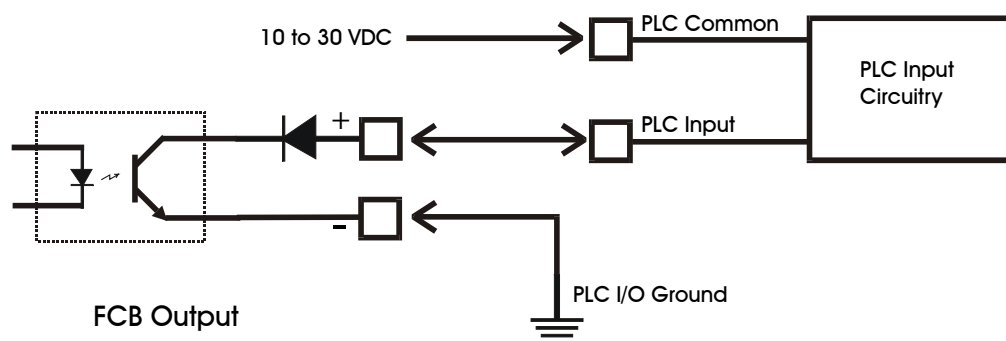**Figure C-6**: *Input Connection for Negative Common PLC Output*

Figure C-7: *Input Connection for Positive Common PLC Output*

The PLC interface provides output connections for the *Jam* and *Cycle* signals. The output connections are provided so that a FCB or Base Interface Board generated signal may be sent to the PLC. The optically isolated output connections are directional, with each output having a positive and a negative terminal. An example of a connection to a PLC input using a positive common is provided in **Figure C-8**.

The FCB outputs will sink a guaranteed minimum of 20 mA (typically 60 mA), due to the transfer ratio of the output optocoupler. The PLC documentation needs to be consulted to determine if this current is sufficient to operate the inputs at a given PLC I/O voltage.

Figure C-8: *Output Connection for Positive Common PLC Input*

Serial Communication

D.1   Introduction

For communication with other computer equipment the BK700 controller may be equipped with a serial communication card with up to 4 serial ports. Buskro uses Comtrol's RocketPort cards for this purpose.

D.2   Features and Specifications

The heart of the RocketPort card is Comtrol's exclusive AIOPIC chip, a 36 Mhz ASIC (Application Specific Integrated Circuit) that enables the RocketPort to transmit and receive data at rates far higher than multiport cards based on conventional 16550 UART technology— up to 921 Kbps full duplex across all ports simultaneously. While most serial cards use shared dual-port memory which can cause conflicts with other hardware and software products, the RocketPort is I/O memory mapped to avoid shared memory conflicts. This makes installation, configuration, and port expansion easy and hassle-free.

D.2.1 Features

- Up to 32 COM ports can be added in a single slot without using any IRQs

- Dedicated 36 MHz Application Specific Integrated Circuits (ASIC) processors, one per every eight ports, for optimum performance

- ASIC integration reduces the number of components by 80%, resulting in improved reliability and the high Mean Time Between Failure times (MTBF)

- Up to 921 Kbps* transmit-and-receive across all ports simultaneously—sustains fully compressed ISDN throughput

- Both ISDN terminal adapters and modems can be connected to the same card

- I/O mapping eliminates memory conflicts and allows plug-and-play compatibility

- Supports PCI and ISA bus architectures, ensuring compatibility regardless of the host environment

- Supports serial interfaces, including RS-232, RS-422, and RS-485

- Easy installation—no shared memory to configure (and no IRQs required)

- Minimal "host" CPU utilization

- Large FIFOs, 64 times larger than a 16550 UART, maximize speed and minimize data loss while optimizing host efficiency and data integrity

  * Speed dependent on hardware configuration and operating system

D.2.2 Approvals

- Canadian EMC Requirements
- FCC Part 15 Class A Certification
- Product Safety UL Recognized
- European EMC Requirements
- ESD and Surge Protection to EN 50082-1 Standard

D.2.3 Specifications

Model #   95860-4
Type   Quad/DB25

Table D-1: *Serial Communications Card Specifications*

D.2.3.1 Hardware			
	# of cards/system	1	
	# of ports/card	4	
	Interrupts	none, 3, 4, 5, 9, 10, 11, 12, 15	
	Baud rate	460K	
	Data bits	7 or 8	
	Parity	odd, even, none	
	Stop bits	1 or 2	
D.2.3.2 Interfaces			
	Bus interface	PCI	
	Communications interface	RS-232	
D.2.3.3 Conditions			
	Operating temperature	0 to 40°C	
	MTBF (years)	23.5	
	Humidity (Non-condensing)		
	System on	8% to 80%	
	System off	20% to 80%	
D.2.3.4 Physical Specifications			
	Dimensions	5.6" by 4.2"	
	Weight (card only)	4 oz - 10 oz	
D.2.3.5 Electrical Requirements			
	+ 5 VDC	410 mA	
	+ 12 VDC	100 mA	
	- 12 VDC	160 mA	

D.3   Installation

> **Note:** To avoid conflicts with the Data Path Card (designed to use PCI Slot 4), the
> RocketPort Card must be installed in PCI Slot 1 or 2.

I/O mapping makes the RocketPort series easy to install. Memory collisions that often occur
with cache memory are eliminated, simplifying configuration and installation. To further
expedite installation, there are no switches or jumpers to configure for the RS-232 interface
box. Simply plug it in with the supplied cable. Selectable IRQs can be easily changed through
the device driver configuration. The RocketPort series uses either no interrupts or one
interrupt, contingent on the operating system.

For this installation Buskro provides a CD-ROM with all necessary files and detailed
instructions on the hardware and software configuration required.