

BK660/640 Inkjet System User's Guide

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Published by: Buskro Ltd. 1410 Bayly St., Unit #15 Pickering, ON, L1W 3R3 Canada Tel.: (905) 839-6018 Fax: (905) 839-6023

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First Edition, 1998

Printed in Canada

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General Information

Chapter

1.1 Description

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- 1.2.2 Vacuum Table Belts
- 1.2.3 Controller Upgrade-ability
- 1.2.4 Quiet Operation
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- 1.4.1 BK660 Inkjet Base System Drawing
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1.1 Description

The Buskro Inkjet Base is a mailpiece feeding and transportation system comprised of a feeder station and transport mechanism that is controlled via a centrally located operator control panel. The system was specifically designed as a flexible and reliable platform whose purpose was to optimize the performance of an inkjet imaging system. The inkjet base, in conjunction with the BK660 Inkjet Controller or BK640 Controller, produces some of the highest quality imaging within one of the simplest and most efficient operating environments.

The feeder, capable of separating and dispensing a wide variety of mailpieces from single sheets to publications, is of a vacuum shuttle style equipped with adjustable side and rear guides to accommodate various mailpiece sizes, a movable material gate and upper feed rollers for thickness adjustments, and vacuum control in the form of differing feed plates assisted by a regulating valve.

The mailpiece transport system, designed for the inkjet process, consists of vacuum equipped table belts with and electronic variable pitch control technology that permits regulation of the belt movement to adjust to the mailpiece's size. In addition, an alignment section with side guides is present at the output of the feeder to reduce mailpiece skew prior to entry into the inkjet imaging area. Sequencing of the inkjet process is provided by a directly coupled shaft encoder mounted on the transport belt driveshaft.

Operator control of the inkjet base is provided by a series of electrical switches and buttons displayed on a clear unhindered control panel centrally positioned at the front of the base. The control panel consists of circuit breaker switches for the Main and Pump power; a resetable LCD piece totalizing counter; rotary dial potentiometers for the conveyor, base, and pitch control; Start/Stop/Jog pushbutton controls for machine operation; and an On/Off/Auto selector for the conveyor.

All these features, in addition to the manufacturing quality and innovative product design, add up to an extremely functional inkjet base capable of years of reliable, trouble-free operation.

1.2 Features

1.2.1 Vacuum Shuttle Feeder

The Buskro Inkjet Base features a vacuum shuttle feeder capable of feeding a wide variety of mailpieces from single sheets to thick publications. The feeder is equipped with adjustable side and rear guides, variable height material gate and upper feed rollers, and various feed plates and a valve for vacuum regulation. If needed, the shuttle plate also comes with two rear pushers which provide feeding assistance for heavy mailpieces. In addition, the unique vacuum plate construction enhances the separating capabilities of the feeder.

1.2.2 Vacuum Table Belts

The table belts, which transport the mailpieces from the feeder past the inkjet imaging region, are equipped with vacuum to provide positive adhesion and transport resulting in a completely unhindered area for the inkjet heads, enabling unparalleled head placement capabilities.

1.2.3 Controller Upgrade-ability

The inkjet base will accommodate both the BK400 and BK600 controllers with the ability to field-upgrade from a BK400 to BK600 controller at any time. A minimal amount of effort and time is required to accomplish the upgrade task.

1.2.4 Quiet Operation

The vacuum pumps, mounted on damping feet, have been placed in a separate chamber lined with sound-abatement foam resulting in reduced noise levels below 75 db.

1.2.5 Electronic Gap Controller

The inkjet base has a unique gap controller permitting an unlimited belt pitch setting which translates into greater productivity with no sacrifice in print quality. In essence, the inkjet base will electronically monitor and regulate the inter-piece gap minimizing it for optimum print quality and performance.

Gap control is done through an adjustment of the **Gap** potentiometer mounted on the machine's instrument panel. Simply adjust the pot dial for a desired gap setting and the gap controller will adjust the feeder and transport motors accordingly. Similarly, the **Conveyor** potentiometer can be adjusted to achieve a desired shingle spacing of the mailpiece on the conveyor bed.

1.2.6 Complete Instrument Panel

All necessary controls required to operate the inkjet base are easily accessible to the operator on a central instrument panel. The control panel comes complete with circuit-breaker equipped rocker switches, large pushbuttons for all machine/conveyor functions, variable speed potentiometers for machine/conveyor speed regulation, and a resetable piece counter.

1.2.7 BK1600 Series Conveyor Compatibility

The inkjet base is fully compatible with any BK1600 series conveyor from a 6-ft model through to an 18-ft. model. Connection to the conveyor is made through a 7 pin circular plastic connector located at the end of the base. A DCspeed controller mounted inside the base comes with a speed potentiometer, located on the front panel, for complete control of the conveyor's belt speed. As previously mentioned the **Conveyor** potentiometer will automatically regulate shingle spacing in the automatic mode, or if required, can also set media shingling manually.

1.2.8 BK530 Tabber Compatibility

The inkjet base is compatible with a BK530 Tabber allowing full integration between the Tabber and base controls such that either tabber or base operator controls can directly stop and/or start the entire system. Connection to the BK530 Tabber is made through a 37 pin circular plastic connector located at the end of the base.

1.2.9 Ancillary Feeder Compatibility

The inkjet base is equipped with a 9-pin connector for complete control of feeder attachments. The feeder, used for open-ended and difficult media, is installed in the feeder hopper, and can be controlled automatically via the operator speed controls situated on the base's instrument panel.

1.2.10 Maintenance Considerations

The Buskro inkjet base is designed to facilitate maintenance should it be required. The front upper panel and tabletops are easily removable in order to expose all the mechanical components. Electrically, all of the base's controls are centrally located on the Base Control Board making troubleshooting simple.

1.2.11 Print Quality Considerations

The inkjet base has been specifically designed for the inkjetting process and as such incorporates certain unique features to optimize print quality. Included are a smooth mechanical transport, directly-driven encoder mounting, vacuumassisted transport belts, and a sturdy cabinet construction all resulting in improved printing.

1.3 Specifications

Table 1.1 - BK660/640 Base specifications

1.3.1 Product handling			
	Minimum	3.0" X 5.0"	76 mm X 127 mm
	Maximum	16.0" x 17.0"	405 mm X 432mm
	Thickness	Single Sheet to 1 1/8"	Up to 28 mm
1.3.2 Physical			
	Overall Length	69.0"	1752 mm
	BK 660 Overall Height including monitor	66.0"	1676 mm
	BK 640 Overall Height including Keypad	50.0"	1270 mm
	Tabletop Height	35.5" to 37.0"	901 mm to 940 mm
	Overall Width including inkwell	40.0"	1016 mm
	Weight crated	900 lbs	409 kg
1.3.3 Production rate			
	Belt Speed	0 to 600 ft/min	0 to 3.05 m/s
	Cycle Speed	0 to 30,000 pph	
	Cycle Pitch	3.0" to 17.0"	76 to 432 mm
	Conveyor Speed	0 to 26.0" in/s	0 to 0.7 m/s
1.3.4 Electrical require	nents		
	Line Voltage	$220\pm~15\%~VAC$	
	Line Current	15 Amps	
	Power	3.3 KVA	
	Base Motors	1/2 H.P., 180 VDC @ 2.8A	
	Feeder Pump	3/4 H.P., 220 VAC @ 5.9A 1.8 CFM @ 20Hg	
	Transport Blower	1/8 H.P., 220 VAC @ 1.1A 27 CFM @ 0" H ₂ O	
	Conveyor Interface	1/8 H.P., 90 VDC @ 1.3A DC Controller	

Table 1.1 - BK660/640 Base specifications (continued)

1.3.5 Operator controls Circuit-Breaker Switch Main, Pump Machine Pushbuttons Start, Stop, Run/Jog Conveyor Selector On/Off/Auto Potentiometers Gap, Production, Conveyor Counter 6-digit resetable 1.3.6 System connectors Value Conveyor 7 pin, 23-7 receptacle Amp #206227-1 Inline Remote 37 pin, 23-37 receptacle Amp #206306-1 Feeder 14 pin, 17-14 receptacle Amp #206043-1 Main Power 3 pin, 220 VAC @ 20A Hubbell #2321CN NEMA L6-20P Controller Power 3 pin, 115 VAC @ 15A Hubbell #5266CCM				
Machine Pushbuttons Start, Stop, Run/Jog Conveyor Selector On/Off/Auto Potentiometers Gap, Production, Conveyor Counter 6-digit resetable 1.3.6 System connectors Conveyor Zonveyor 7 pin, 23-7 receptacle Amp #206227-1 Inline Remote 37 pin, 23-37 receptacle Amp #206306-1 Feeder 14 pin, 17-14 receptacle Amp #206043-1 Main Power 3 pin, 220 VAC @ 20A Hubbell #2321CN Controller Power 3 pin, 115 VAC @ 15A Hubbell #5266CCM	1.3.5 Operator controls			
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Main Power3 pin, 220 VAC @ 20AHubbell #2321CNNEMA L6-20PController Power3 pin, 115 VAC @ 15AHubbell #5266CCN		Inline Remote	37 pin, 23-37 receptacle	Amp #206306-1
NEMA L6-20P Controller Power 3 pin, 115 VAC @ 15A Hubbell #5266CCN		Feeder	14 pin, 17-14 receptacle	Amp #206043-1
		Main Power	• ·	Hubbell #2321CN
			• *	Hubbell #5266CCN

1.4 Inkjet System Drawings

1.4.1 BK660 Inkjet Base System Drawing

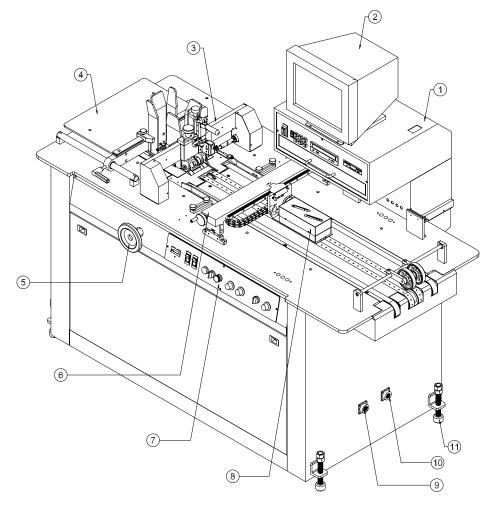


Table 1.2 - BK660 Inkjet Base Operator Controls, Features, and Installation Points.

Item	Description	Reference
1	BK660 Controller	Chapter 3, Page A-35
2	Computer Monitor	
3	Feeder Bridge	Page A-12
4	Rear Table	Page A-24
5	Handwheel	
6	Printhead Bridge	Page A-50
7	Instrument Panel	Page A-41
8	Printhead	Page A-51, Page A-54
9	Inline Connector	Page B-8, B18
10	Conveyor Connector	Page B-6, B-19
11	Base Mounting Foot	

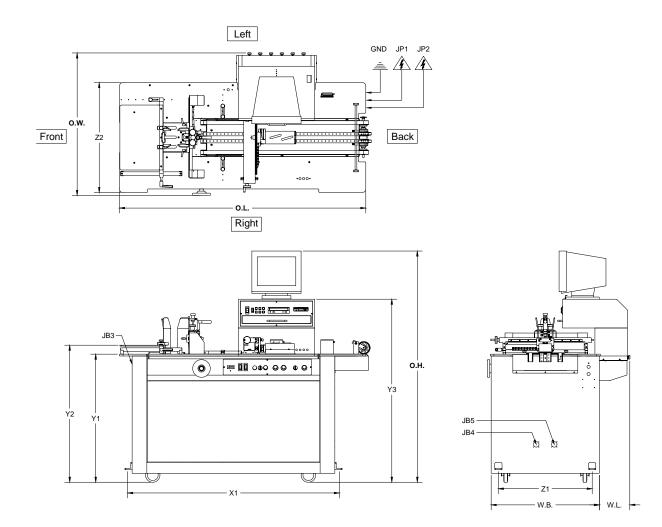
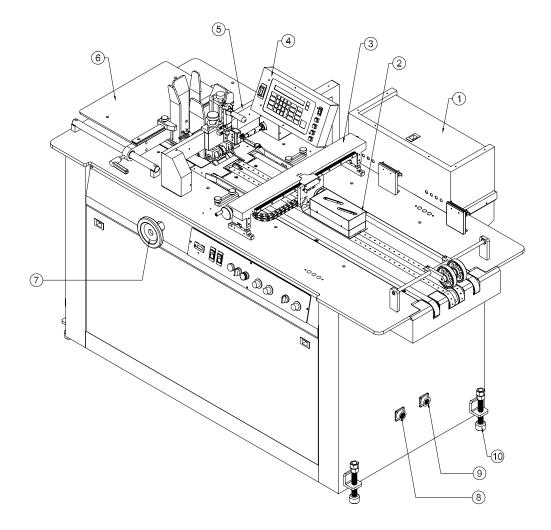


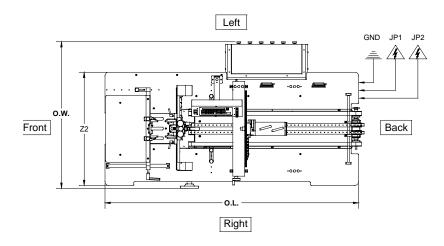
Table 1.3 - BK660 Inkjet System Dimensions and Interface Specifications

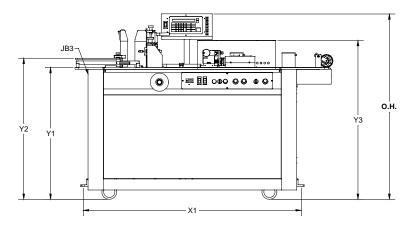
Symbol	Description	n	 Dimens	sions
O.W.	Overall Width		40.00"	1016 mm
0.L.	Overall Length		69.00"	1752 mm
O.H.	Overall Height		66.00"	1676 mm
W.B.	Overall Base Width		30.00"	762 mm
W.L.	Inkwell Extension		9.00"	229 mm
X1	Leveling Foot Length		58.68"	1490 mm
Y1	Tabletop Height		35.5" to 37"	901 mm to 940 mm
Y2	Rear Table Height		38.00"	965 mm
Y3	Controller Height		50.75"	1289 mm
Z1	Leveling Foot Width		26.00"	660 mm
Z2	Tabletop Width		30.50"	775 mm
JB3	Auxiliary Feeder Connector	(see Appendix B)	14 pin CPC Receptacle	female (AMP P/N 206043-1)
JB4	Inline Connector	(see Appendix B)	37 pin CPC Receptacle	male (AMP P/N 206306-1)
JB5	Conveyor Connector	(see Appendix B)	7 pin CPC Receptacle	female (AMP P/N 206227-1)
JP1	Base Power Connector	(see Appendix B)	Twist-Lock Plug, 20A, 250V	(HUBBELL P/N. 2321CN)
JP2	Controller Power Connector	(see Appendix B)	Straight Blade Plug, 15A, 125V	(HUBBELL P/N 5266CN)

1.4.2 BK640 Inkjet Base System Drawing



Item	Description	Reference
1	Inkwell Container	Page A-35
2	Printhead	Page A-51, Page A-54
3	Printhead Bridge	Page A-50
4	BK640 Controller	Chapter 3, Page A-57
5	Feeder Bridge	Page A-12
6	Rear Table	Page A24
7	Handwheel	
8	Instrument Panel	Page A-41
9	Inline Connector	Page B-8, B18
10	Conveyor Connector	Page B-6, B-19
11	Base Mounting Foot	





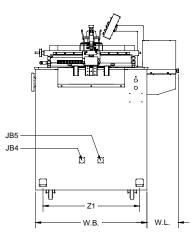


Table 1.5 - BK640 Inkjet System Dimensions and Interface Specifications

Symbol	Description		Dimensions	
0.W.	Overall Width		40.00"	1016 mm
0.L.	Overall Length		69.00"	1752 mm
O.H.	Overall Height		50.00"	1270 mm
W.B.	Overall Base Width		30.00"	762 mm
W.L.	Inkwell Extension		9.00"	229 mm
X1	Leveling Foot Length		58.68"	1490 mm
Y1	Tabletop Height		35.5" to 37"	901 mm to 940 mm
Y2	Rear Table Height		38.00"	965 mm
Y3	Inkwell Height		42.75"	1086 mm
Z1	Leveling Foot Width		26.00"	660 mm
Z2	Tabletop Width		30.50"	775 mm
JB3	Auxiliary Feeder Connector	(see Appendix B)	14 pin CPC Receptacle	female (AMP P/N 206043-1)
JB4	Inline Connector	(see Appendix B)	37 pin CPC Receptacle	male (AMP P/N 206306-1)
JB5	Conveyor Connector	(see Appendix B)	7 pin CPC Receptacle	female (AMP P/N 206227-1)
JP1	Base Power Connector	(see Appendix B)	Twist-Lock Plug, 20A, 250V	(HUBBELL P/N. 2321CN)
JP2	Controller Power Connector	(see Appendix B)	Straight Blade Plug, 15A, 125V	(HUBBELL P/N 5266CN)

Operator Instructions



2.1 Instrument Panel Functions

- 2.1.1 Power Rocker Switches
- 2.1.2 Production, Conveyor, and Gap Regulation Dials
- 2.1.3 Machine and Conveyor Function Pushbuttons
- 2.1.4 Resetable Piece Counter

2.2 Feeder Setup Instructions

- 2.2.1 Vacuum Plate Selection and Installation
- 2.2.2 Upper Feed Roller and Material Gate Adjustment
- 2.2.3 Feeder Side and Rear Guide Adjustment
- 2.2.4 Feeder Rear Pusher Setting

2.3 Material Side Guide Adjustments

2.4 Vacuum System Instruction

- 2.4.1 Vacuum Level Setting
- 2.4.2 Feeder Spool Valve Adjustments

2.5 Maintenance Schedule

2.1 Instrument Panel Functions

The Buskro BK660 Inkjet base is equipped with a centrally located instrument panel which displays all the necessary controls to operate the system. The controls can be sub-divided into 4 distinct classes of functions which are:

- Main and Vacuum Power Rocker Switches
- Machine and Conveyor Function **Pushbuttons**
- Production, Conveyor Speed, and Gap Regulation **Dials**
- Resetable Piece Counter

Note : Refer to *Feeder/Base Connection Schematics - BASEEL3.CDR* for connection details to the Base Control Board P/N 600402.

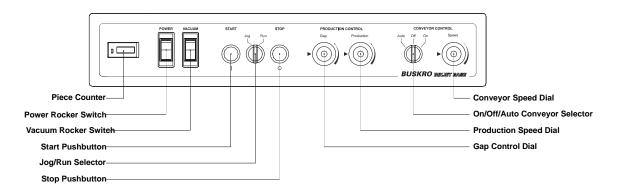


Figure 2.1- BK660 Base Instrument Panel illustrating operator controls including power switches, speed and gap regulation dials, machine and conveyor pushbuttons, and a resetable piece counter.

2.1.1 Power Rocker Switches

The power rocker switches, the two switches located to the right of the piece counter, provide power to the inkjet base (**Power**) and the feeder pump and transport blower (**Vacuum**). These switches are equipped with resetable circuit breakers to protect against overload conditions.

Power Rocker Switch

Switch which turns on the main power to the inkjet base. The switch is marked with a "**I**", which when exposed, indicates that power is ON. The power is turned OFF when the switch is placed to the "**0**" indication. The circuit breaker is rated at 15 Amps @ 220 VAC for the BK660 inkjet base.

Note : When working in the electrical box, disconnect the inlet plug for complete safety. Turning the **Power** rocker switch OFF will not disengage all 220 VAC circuitry.

Vacuum Rocker Switch

Switch which applies power to the feeder pump and the transport blower turning them on. When the switch is ON, it should illuminate indicating that power is available to the feeder pump and the transport blower. The circuit breaker is rated at 10 Amps @ 220 VAC for the BK660 inkjet base.

2.1.2 Production, Conveyor, and Gap Regulation Dials

The speed regulation dials, one for the base (**Production**) and one for the conveyor (**Conveyor**) are situated to the right of the machine pushbuttons and to the right of the instrument panel respectively. These dials permit adjustment of transport belt and conveyor speeds in the following manner; A clockwise rotation of the **Production** and **Conveyor** speed dials corresponds to a speed increase. Conversely, a counter-clockwise rotation of the dials results in a speed decrease.

In addition, the BK660 Inkjet Base is equipped with an electronic gap-control device that monitors and maintains the desired gap spacing regardless of the base speed as set by the **Production** dial; That is, when operating in *Auto* mode an onboard electronic system will adjust the feeder speed to ensure that a desired material gap setting is maintained in the event of a transport belt speed change. This material gap is set by means of the **Gap** dial located to the left of the **Production** dial. Furthermore, when in *Auto* mode, the gap control device will also automatically adjust conveyor speed to maintain shingle spacing on the delivery.

Production Dial

The **Production** dial adjusts the speed of the transport belts and is not dependent on the setting of the *Feeder Manual/Auto* switch. The speed settings range from 0 (0) to 30,000 (10) pieces/hour (PPH). A clockwise rotation of the dial corresponds to a speed increase of the transport belts. Conversely, a transport belt speed decrease is observed for a counter-clockwise rotation of the **Production** dial.

Feeder Mode switch (S4) setting

The **Gap** and **Conveyor** dials have two operating modes depending on the setting of the Base Control Board's *S4 - Feeder mode* switch (*see Figure 2.2 below*). The Base Control board (P/N 600402) is situated in the electrical box on the left side of the machine (*See 713612A - Electrical Box A'ssy, item #11*)

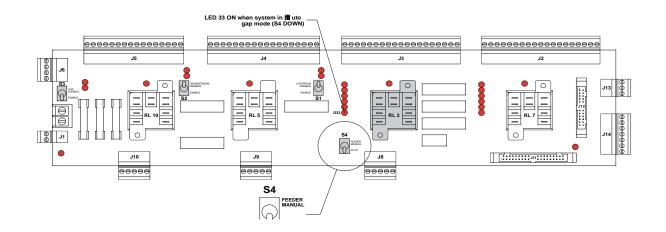


Figure 2.2 - Base Control board (P/N 600402) indicating the location of Feeder mode switch S4. Refer to BASEEL3.CDR for further details. S4 is set down in the Auto mode.

When *S4* is placed in the *Auto* mode (*switch is Down*) the **Gap** dial regulates inter-piece spacing while the **Conveyor** dial regulates material shingling on the delivery conveyor. In the *Manual* mode (*switch is Up*), the **Gap** dial directly controls the speed of the feeder whereas the **Conveyor** dial directly controls the output speed of the conveyor belts.

Table 2.1 - Feeder mode switch S4 settings

S4 setting	Gap Dial	Conveyor Dial
Manual (Up)	Regulates feeder speed. feeder speed set lower than transport belt speed to prevent material overlap.	Regulates conveyor belt speed independent of base speed.
Auto (down)	Regulates Material gap from 1" to 5".	Regulates Material shingle from 1" to 5".

Gap Control Dial

In the *Auto* mode (*See S4 switch setting*), rotating the **Gap** dial in a clockwise manner will cause a gap increase whereas a counter-clockwise rotation will decrease it. In the event that the system must be operated in the *Manual* mode, the **Gap** dial will regulate the feeder mechanism directly in the same manner as the **Production** and **Conveyor** dials control speed; that is a clockwise rotation of the **Gap** dial will result in a feeder speed increase.

With the switch set in *Auto* mode (*see Figure 2.2*), the **Gap** dial acts as a gap control device which regulates the amount of gap between mailpieces. A clockwise rotation of the dial corresponds to an increase in the material gap. Conversely, a counter-clockwise rotation of the dial corresponds to a decrease in the material gap. A "0" dial setting corresponds to a material gap of 1" while a setting of "10" results in a 5" material gap.



Figure 2.3 - Feeder Mode switch (S4) on the Base Control board set in Manual mode (switch Up)

Note : Operating the system in *Manual* mode will "reverse" the operation of the **Gap** dial since rotating it clockwise will increase the feeder speed resulting in a decreased gap setting.

In *Manual* mode (*see Figure 2.3*), the **Gap** dial acts as the speed regulation control for the feeder motor. In this case, a clockwise rotation of the dial corresponds to a speed increase of the feeder reducing the material gap. Conversely, a counter-clockwise rotation of the dial corresponds to a feeder speed decrease causing the creation of a larger gap. Hence the appearance that this dial works "backwards" depending on the mode selected.

With the *Feeder Mode* switch set to *Manual* mode, the **Gap** dial is an independent speed control for the feeder motor.

With the *Feeder Mode* switch set to *Manual* mode, the **Production** dial must be set faster than the **Gap** dial to prevent mailpiece overlap.

Note : With the *Feeder Mode* switch set to *Auto* mode, the **Gap** dial controls the amount of gap between mailpieces.

Conveyor Dial

Similar to the **Gap** dial, the **Conveyor** dial has two operating modes depending on the setting of the Base Control Board's *Feeder Mode* switch (S4). The conveyor can be operated both manually and automatically depending on the setting of the **S4** switch of the Base Control Board (*See BASEEL3.CDR in Appendix B*). When in *Manual* mode, the shingling spacing on the delivery conveyor is operator set. In *Auto* mode, the **Conveyor** dial regulates and maintains material shingle with speeds being adjusted automatically to "follow" any base speed changes.

With switch *S4* set in *Auto* mode (*see Figure 2.2*), the dial acts as a shingle spacing control regulating material overlap on the delivery belt. In the event of a transport speed change, the conveyor speed would automatically change to maintain the pre-set shingle spacing. A clockwise rotation of the **Conveyor** dial corresponds to an increase in conveyor belt speed effectively increasing material shingle spacing. Conversely, a counter-clockwise rotation of the dial corresponds to a decrease in material shingle spacing. A setting of "0" on the **Conveyor** dial will result in a material shingle spacing of 1" while a setting of "10" results in a 5" material shingle. Shingling is defined as the distance between lead-edge to lead-edge of adjacent mailpieces on the delivery belt.

With switch *S4* set in *Manual* mode (*see Figure 2.3*), the dial would directly control the speed of the conveyor <u>independent</u> of the base speed setting. A clockwise rotation of the **Conveyor** dial corresponds to a speed increase of the conveyor belt, whereas a counter-clockwise rotation would correspond to a speed decrease.

Note : With the *Feeder Mode* switch set to *Auto* mode, the **Conveyor** dial controls the amount of shingling overlap on the delivery belts.

With the *Feeder Mode* switch set to *Manual* mode, the **Conveyor** dial acts as an independent speed control for the conveyor belts.

2.1.3 Machine and Conveyor Function Pushbuttons

The pushbuttons and selector knobs located on the instrument panel permit control of the machine and conveyor operation. The **Start** (*green*) and **Stop** (*red*) pushbuttons allow engagement and suspension of the inkjet operation while the **Run/Jog**(*black*) selector sets the system to run continuously (RUN) when the **Start** button is momentarily depressed, or intermittently (JOG) while the **Start** button remains depressed.

The conveyor is equipped with its own control in the form of an **On/Off/Auto** selector knob (*black*) which determines the operating mode of the conveyor. It can be operated continuously, in conjunction with the base, or turned off completely.

Stop Pushbutton

The red mushroom-button which suspends operation of the inkjet system by interrupting the power to the machine relays located on the Base Control board. This button is used mostly as an emergency stop since depressing it will cause the machine to stop immediately regardless of the printing status. *LED #20* on the Base Control board will illuminate when the **Stop** button is depressed.

LED #20 will light when Stop button pressed.

Note : The Stop pushbutton has a locking feature, which when engaged, will prevent the system from functioning. Should this condition occur, twist and release the locking mechanism to allow base operation.

Start Pushbutton

The green Pushbutton which engages relays *RL3* & *RL10* on the Base Control board applying power to the feeder and transport motor controllers (*See BASEEL3.CDR in Appendix B for details*). When this button is depressed, *LED #13* should go ON and the machine should cycle provided that the following conditions have been met :

- The machine **Stop** button is not locked in a depressed condition. *LED* #20 would be ON indicating this condition.
- The conveyor **Stop** button is not depressed (if present).
- With a conveyor not present, the Auxiliary switch S3 is set to Disable (Up).
- With a downstream device (i.e. BK530 tabber) <u>not</u> present, the *Downstream switch S2* is set to <u>Disable</u> (Up).
- The Upstream switch S1 is set to Disable (Up).

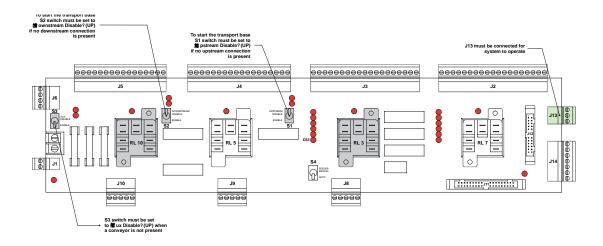


Figure 2.4 - Base Control board (P/N 600402) indicating the location of the switches and the life counter connector J13.

Run/Jog Selector

Selector knob which permits a choice between continuous and intermittent machine operation. When the **Run** mode has been selected and the **Start** button is depressed, the machine will operate continuously. In the **Jog** mode, the machine will cycle only as long as the **Start** button remains depressed.

- **Run Mode** Machine will operate the instant **Start** button is depressed. *LED #26* will light when system in Run mode.
- Jog Mode Machine will operate only while the Start button is depressed.

Note : *LED* #26 on the Base Control board will illuminate when system in RUN mode.

On/Off/Auto Selector

The conveyor **On/Off/Auto** selector determines the operating mode of the conveyor. With an AUTO selection, the conveyor "mirrors" the status of the inkjet base's operation; that is, it is on when the base is on, and off when it is off. An ON selection, on the other hand, sets the conveyor to run continuously independent of the base's operating mode. An OFF selection suspends the conveyor's operation all together.

Note : *LED* #28 on the Base Control board will illuminate when the conveyor selector is set to AUTO. *LED* #27 will illuminate when the conveyor selector is set to ON.

2.1.4 Resetable Piece Counter

Counter, located on the left side of the instrument panel, which monitors and totalizes the number of mailpieces that are detected by the photocue sensor. The counter can be reset to zero by depressing the reset button located on the front of the counter. If desired to prevent accidental resets, the counter reset button can be locked by clicking it in the down position.

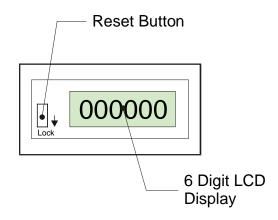


Figure 2.5 - Front panel piece counter indicating the location of the reset button and its locking mechanism.

2.2 Feeder Setup Instructions

The feeder setup instructions comprise all the adjustments necessary to properly separate and feed any mailpiece which conforms to the specifications outlined in *Chapter 1 - 1.3.1 Material handling*, this being a minimum size of 3" x 5" (76 X 127 mm) and a maximum size 17" x 17" (432 X 432 mm). With the feeder bridge in its normal position, the product thickness handled is from a single sheet to 5/8" (16 mm). For pieces thicker than 5/8", the feeder bridge can be adjusted to handle products up to 1 1/8"(28.6 mm). Proper feeder setup will include the following :

- The selection of an appropriate feed plate, and possibly, the regulation of vacuum in the event of thin materials.
- An upper feed roller and gate adjustment for material thickness.
- Side and Rear guide adjustments to accommodate product size.
- The use of feeder pushers to assist feeder vacuum for thick pieces.
- Adjustment of material side guides to correct material skew prior to entry in the inkjet region.

2.2.1 Vacuum Plate Selection

The selection of an appropriate vacuum plate for the mailpiece being processed is central to the proper operation of the feeding system. In most instances the concave plate should be used first as most mailpieces are of a pliable nature and can conform to the surface of this plate. For thicker pieces such as magazines, a flat plate is ideal. For open-ended mailpieces it is best to attempt the concave plate initially, however if the upper page separates from the lower one(s) and interferes with the material gate, the convex plate should be employed.

Convex Plate

The convex plate is used primarily with open-ended mailpieces whose leading edge must be bent to ensure that all its individual pages are compressed together into a single edge. The plate's lead five holes are threaded (8-32 UNF) to permit the installation of set screws in the event that vacuum leakage occurs.

Concave Plate

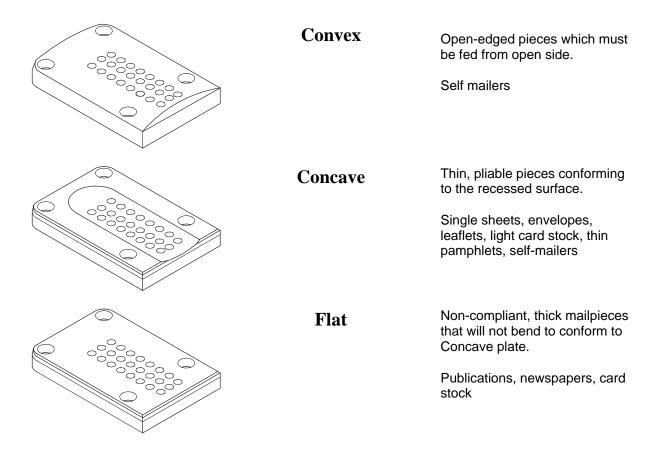
The concave plate, also known as a dish plate, is the polyurethane covered vacuum plate with a depression in the center. This plate is used with thin pliable mailpieces capable of being "sucked down" to conform to the recessed surface. The plate's lead five holes are threaded (8-32 UNF) to permit the installation of set screws preventing vacuum leakage for certain materials. Mailpieces used with this plate could include : single sheets, envelopes, leaflets, light cardstock, thin pamphlets, self mailers, etc.

Flat Plate

The flat plate, is used for those mailpieces which cannot bend and conform to the concave plate's surface usually thick, rigid materials. The plate's lead five holes are threaded (8-32 UNF) to permit the installation of set screws in the event of vacuum leakage. Typical mailpieces which can be processed are thick publications, newspapers, cardstock, etc.

To Select the Vacuum Feed Plate

There are three vacuum feed plates provided with the inkjet base which include a flat plate, convex plate, and concave plate. Select one of the following plates based on the following criteria :



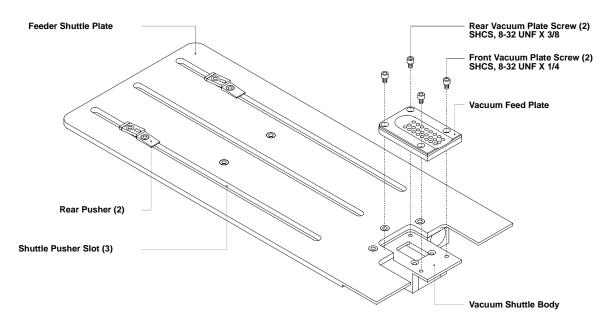


Figure 2.6 - Shuttle feed plate illustrating all adjustments points including the feed plate and pushers.

To Install a Vacuum Feed Plate (*see Figure 2.6*)

Upon selecting a feed plate following the instruction $\boxed{=}^{t}$ To Select the Vacuum Feed Plate, the plate will have to be installed in the vacuum shuttle body.

- 1. Raise the Material Gate using the quick-release handle (see *Figure 2.6*) to more readily access the vacuum plate and to prevent interference with the tip of the material gate during installation.
- 2. With the handwheel, rotate the machine so that the feeder shuttle plate is fully back, exposing most of the vacuum feed plate.
- 3. With a *9/64" hex* key, loosen and remove all four 8-32 UNF vacuum plate screws. Remove the vacuum feed plate.
- 4. Place the required vacuum feed plate into position and replace the vacuum plate screws. Ensure that the 8-32 UNF X ¹/₄" screws are installed at the front of the vacuum plate (*see Figure 2.6*). Do not over-tighten these screws as it may result in the threads being stripped in the vacuum shuttle body.

Note : Do not over-tighten the vacuum plate screws as it may result in stripped threads located in the vacuum shuttle body.

Ensure that the 8-32 UNF X $\frac{1}{4}$ " screws are installed at the front of the vacuum plate to prevent interference with the lower hopper mechanism.

Cycle the system manually with the handwheel to ensure that the vacuum plate does not interfere with the material gate tip.

2.2.2 Upper Feed Roller and Material Gate Adjustment

Upper feed roller and material gate adjustment must be done to accommodate differing mailpiece thicknesses. A successful adjustment of these items will result in a single mailpiece being deposited onto the transport belts without any hint of skewing.

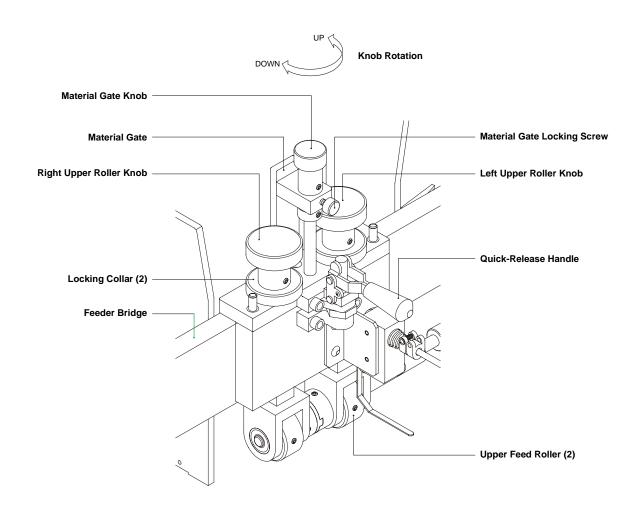


Figure 2.7 - *Feeder material gate and upper feed roller details indicating adjustment points located on the feeder bridge assembly.*

To Set the Upper Feed Rollers (see Figure 2.7)

When feeding a new mailpiece, it may be necessary to adjust the upper feed rollers to accommodate the mailpiece's thickness. Adjustment should be made so that there is just enough tension on a mailpiece between the upper and lower feed rollers such that it cannot be removed by pulling it. Adjustment of the left and right upper feed roller should be done evenly to prevent the mailpiece from skewing upon exit from the rollers.

- 1. Loosen the material gate locking screw. Then loosen the locking collars by rotating them counterclockwise.
- 2. Raise the material gate sufficiently so that a single mailpiece easily clears its tip. This is done by turning the material gate knob counterclockwise.
- 3. Raise both the left and right upper feed rollers until a single mailpiece clears both rollers. This is accomplished by turning the feed roller knobs in a counterclockwise direction.
- 4. Ensure that the lower feed rollers are fully upward. This can be accomplished by rotating the handwheel until the shuttle plate is fully forward.
- 5. Place the desired mailpiece in between the upper and lower feed rollers. Grip the rear of the mailpiece with one hand and lower the left upper feed roller onto it until firm pressure is applied. (*when it becomes impossible to pull away the mailpiece from under the rollers*). A clockwise rotation of the left upper roller knob corresponds to a lowering of the feed roller.
- 6. Repeat *step 5* for the right upper feed roller.
- 7. When the proper upper feed roller setting has been attained for the mailpiece, tighten the locking collars of the feed roller by rotating them clockwise until they lock against the gate adjuster plate.

Note : An improper setting of the upper feed rollers will result in skewed or delayed mailpieces.

Do not over-tighten the upper feed rollers as this will result in rapid wearing of the upper and lower feed rollers as well as placing an excessive load on the hopper roller cam assembly. This condition is usually detected when the feed rollers make a "clunking" noise when they meet.

Always make sure that the lower feed rollers are up when making this adjustment, otherwise the aforementioned wear condition may occur.

To Set the Material Gate

- 1. Ensure that the material gate is in a raised position as described in the previous instructions entitled I = To Set the Upper Feed Rollers.
- 2. Turn ON the feeder pump by engaging the **Vacuum** switch on the instrument panel.
- 3. Place a mailpiece centrally in the hopper and advance the feeder shuttle plate until the lead edge has passed by the material gate. This is accomplished by rotating the handwheel clockwise.
- 4. Now place a second mailpiece over the first one and lower the material gate onto it by rotating the material gate knob clockwise. Grip the rear of the top mailpiece and pull it away from the material gate; a slight resistance should be present.
- 5. After removing the top mailpiece, lower the material gate slightly by incrementally rotating the material gate knob clockwise. <u>Do not</u> lower the material gate excessively causing the remaining mailpiece to be pinched.
- 6. After the proper setting has been attained, tighten the material gate locking screw.
- **Note :** An improper gate setting will result in multiple mailpieces being dispensed if the gate is too high. Conversely, damaged or unfed mailpieces will result if the gate is too low.

In the event that a very thin mailpiece is used with a concave plate; it may be necessary to regulate the vacuum flow in addition to adjusting the material gate to obtain the desired result.

When changing feed plates, ensure that the material gate is raised up since interference may occur between the new vacuum feed plate and the material gate. This would result in damage to the vacuum feed plate and possibly the material gate. Adjustments for mailpieces thicker than 5/8" must be done by screw re-adjustment on the feeder.

To Set the Feeder Bridge for material thicker than 5/8" (16mm)

- 1. Loosen off the 4 bridge ¹/₄-20 UNC cap screws with a *3/16" hex* key. (see *Figure* 2.8). Remove them from the upper holes of the bridge.
- 2. Carefully lift the bridge assembly up until the lower bridge mount holes line up with the ¹/₄-20 unc threaded holes.
- 3. Place a cap screw in one of the holes and with the *3/16" hex* key, gently re-tighten it. Do the same for the other 3 cap screws. Once all screws are in place, tighten them all securely.
- 4. Follow the instructions in *To Set the Upper Feed Rollers* to adjust the upper rollers for the material.
- 5. Follow the instructions in *To Set the Material Gate* for a proper material gate setting.

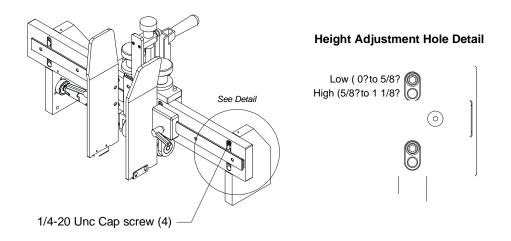


Figure 2.8 - *Feeder bridge assembly identifying the location of the four bridge mounting screws and the hole settings for a low and high height adjustment range.*

2.2.3 Feeder Side and Rear Guide Adjustment

The feeder guides must be set to accommodate differing mailpiece sizes. This adjustment, though quite simple, requires some attention since a setting which is too tight or too loose may cause ineffective material feeding. Typically, a rear table guide which is set loosely causes material misfeeds because the mailpiece oscillates back and forth within the shuttle preventing the vacuum from securing and advancing the front of the mailpiece. As well, side guides which are tight causes the material to be pinched and prevents the mailpiece stack from dropping onto the shuttle plate. In addition, it is often necessary to remove the side guide bottom plates for thin, narrow mailpieces as these hold up the material and prevents it from being sucked down by the vacuum feed plate. Material lift pins are also provided on the rear side guides to lift and assist material separation and feeding for thin products.

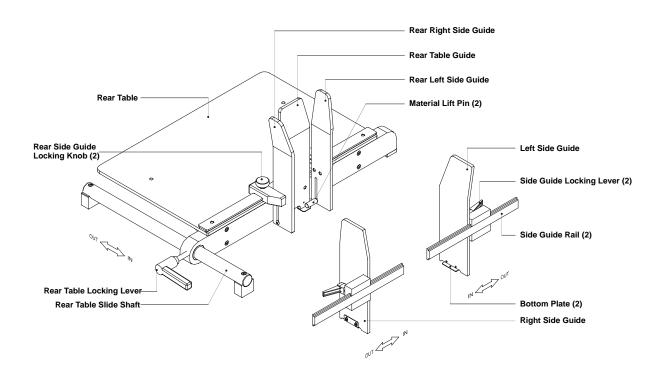


Figure 2.9 - Rear table and side guide illustration indicating the various adjustment points of the feeder.

Installation of the vacuum feed plate (See \square To Install a Vacuum Feed Plate) and adjustment of the feed rollers (See \square To Set the Upper Feed Rollers) and material gate (See \square To Set the Material Gate) should be done prior to setting the material guides as the guides are usually moved when performing the aforementioned setup steps.

To Set the Feeder Side Guides (see Figure 2.9)

The feeder's side guides, mounted on slide rails on the feeder, are used to align the mailpiece stack centrally in the feeder hopper such that the mailpiece is transported evenly on the transport belts.

- 1. Rotate the *rear table locking lever* counter-clockwise to loosen the rear table assembly. Loosen and remove the *rear table locking knob*. Slide the rear table assembly back to a fully open position.
- 2. Loosen both *left* and *right rear side guide locking knobs* and slide both outward to a fully open position.
- 3. Loosen both *left* and *right side guide locking levers* and slide both outward to a fully open position.
- 4. Place the desired mailpiece centrally in the hopper.
- 5. Slide the *left* and *right side guides* inward until both are 1/16" to 1/8" (1.5 mm) from the side edges of the mailpiece. Ensure that both *side guide bottom plates* (if used) are underneath the mailpiece and then re-tighten *the side guide locking levers*.

Note : If the guides are closed too tightly against the mailpiece, proper feeding will be affected due to mailpiece pinching.

In the event that the mailpiece is thin and narrow, it is probably best to remove the side guide bottom plates as these sometimes hinder the separating and feeding operation.

Occasionally, due to the edge of the mailpiece which is presented to the material gate, it is better to offset the mailpiece slightly along the centerline in order to improve the feeding operation.

To Set Rear Table Assembly (see Figure 2.9)

The rear table assembly must be properly set to control the rear of the mailpiece stack such that the it does not oscillate with the feeder shuttle's motion. In addition rear guides and lift pins are available to prevent product skew and assist feeding respectively.

- 1. Ensure that the rear table assembly is fully backward as described in *I To Set the Feeder Side Guides*.
- 2. Place a mailpiece in the feeder hopper.
- 3. Slide the rear table assembly forward until the *rear guide* is approximately 1/16" (1.5 mm) from the rear of the mailpiece. Ensure that the rear guide bottom plate and/or the *material lift pins* are underneath the mailpiece.
- 4. Re-tighten the *rear table locking lever*. Place the *rear table locking knob* in the nearest threaded hole located in the base's tabletop and tighten it by rotating it in a clockwise fashion.

Note : A loose adjustment of the rear table assembly will result in oscillation of the mailpieces resulting in intermittent feeding.

To Set the Rear Side Guides (see Figure 2.9)

The feeder's rear side guides, mounted on slide rails on the rear table, are used to align the mailpiece in the hopper and raise the rear of the mailpiece to occasionally assist in feeding material.

- 1. Ensure that the *rear table* position is set as described in *I To Set Rear Table*.
- 2. Slide the *left* and *right rear side guides* inward until both are 1/16" to 1/8" from the side edges of the mailpiece. Ensure that the mailpiece stack is sitting on top of the *material lift pins*.
- 3. Re-tighten the *left* and *right rear side guide locking knobs*.
- 4. Using a 1/8" hex key, adjust the rear material lift pins as required.

The material lift pins can be adjusted as required using a 1/8" hex key.

Note : If the rear guides are closed too tightly against the mailpiece, proper feeding will be affected due to mailpiece pinching.

2.2.4 Feeder Rear Pusher Setting

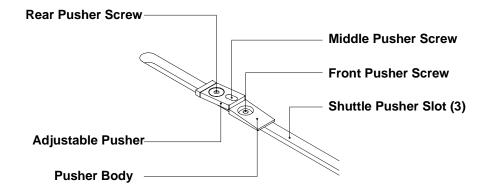


Figure 2.10 - Rear pusher details indicating the location of the various adjustment points.

To Set Rear Pushers for Thick Mailpieces (see Figure 2.10)

Rear pushers are to be used if the vacuum feed plate is not sufficient to advance the mailpiece into the feed rollers. This condition may present itself with thick, heavy mailpieces. Adjustment of the rear pushers may best be accomplished with the rear table fully back.

- 1. Rotate the handwheel in a clockwise direction until the shuttle plate is fully back.
- 2. With a *3/32" hex* key, loosen the *front* and *rear pusher screws* until the pusher assembly is just loose. If both pushers are used, loosen the screws for the second pusher assembly.
- 3. Slide the pusher(s) fully back in the slots of the shuttle plate.
- 4. Place a mailpiece in the feeder hopper.
- 5. Advance the *pusher(s)* until it is up against the rear of the mailpiece. With the *3/32" hex* key, set the height of the pusher just below the top surface of the mailpiece, by rotating the *middle pusher screw*. A clockwise rotation corresponds to a lowering of the pusher.
- 6. After the proper height has been attained, set the pusher(s) so that the pusher is approximately 1/8'' (3 mm) from the rear edge of the mailpiece.
- 7. Tighten both the *front* and *rear pusher screws* using the 3/32" hex key.
- 8. Set the rear table as per instructions provided in \square *To Set Rear Table*. Ensure that the rear pushers do not remain under the mailpiece stack when the shuttle plate is fully back. If the pushers do in fact remain under the bottom mailpiece, repeat *steps 2 to 7*.

Note : Two pushers are provided with the BK660 inkjet base. In the case of a narrow piece, only one pusher in the central pusher slot may be required.

An improper pusher setting will result in a damaged or jammed mailpiece if the pusher is set too high. Conversely, a pusher which is set too low or too far away will have no effect on feeding performance.

2.3 Material Side Guide Adjustments

Proper adjustment of the material side guides will permit dependable and accurate feeding of the mailpieces so that they are correctly aligned when presented under the printhead(s). The objective of this section of the transport base is to straighten out any mailpiece which may come out of the feeder in a skewed manner such that when the printheads produce the image, it will be placed properly and accurately onto the mailpiece. When adjustment of the side guides is performed, it is imperative that they not squeeze and retard the advancing mailpiece as this would result in incorrect print positioning.

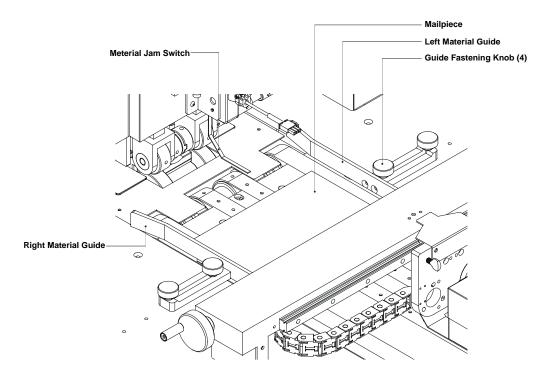


Figure 2.11 - Outfeed section of the feed rollers illustrating the material side guides.

To Adjust the Material Side Guides (see Figure 2.11)

The material side guides, used to correct mailpiece skew, must be set correctly to ensure that the mailpieces are directed in a straight fashion into the inkjet imaging area

- 1. Loosen and remove the fastening knob(s) present on each *material side guide*.
- 2. Turn the vacuum pump ON and place mailpieces in the feed hopper. Rotate the handwheel in a clockwise fashion to cycle the machine and dispense a mailpiece onto the transport belts. Stop the rotation the instant the trailing edge of the mailpiece has cleared the feed rollers.
- 3. Place the *left* and *right side guides* about 1/16" to 1/8" from the corresponding edge of the mailpiece. Ensure that the guides <u>do not</u> pinch the mailpiece anywhere along its edges.
- 4. Replace the fastening knob(s) in the nearest threaded holes located in the base's tabletop, and by turning them in a clockwise fashion, re-tighten them.
- 5. Dispense another mailpiece onto the transport belts by rotating the handwheel and check that the mailpiece's path is unobstructed by the material side guides. If so repeat *steps 1 to 4*.

Note : If the material side guides are improperly set, the mailpiece may become trapped between them and/or cause a jam at the output of the feed rollers. The Material Jam switch may trigger resulting in a system stoppage if the material side guides are incorrectly set.

Because there are no threaded holes in the vacuum tabletop, only one fastening knob may be used for #10 envelopes.

2.4 Vacuum System Adjustments

The vacuum system consists of a **Vacuum** circuit-breaker switch, a centrifugal pump for the feeder, and a regenerative blower for the transport belts. In addition, the feeder pump system is equipped with a vacuum distribution block featuring a relief valve and vacuum gauge, and a hose leading to the feeder vacuum plate. Vacuum flow through the hose is regulated with a shutoff valve for light mailpieces (*see Figure 2.12*).

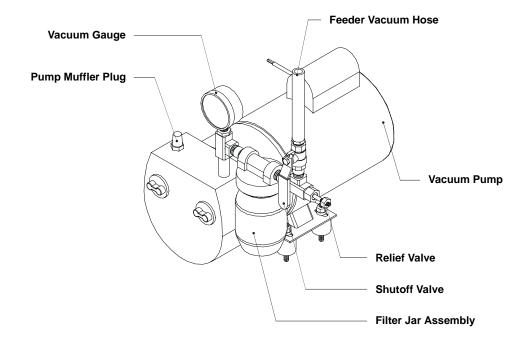


Figure 2.12 - *Feeder vacuum pump system illustrating vacuum relief valve, shutoff valve, filter jar assembly, vacuum gauge and hose location.*

2.4.1 Feeder Vacuum Level Setting

Adjustments to the vacuum system are simple and accomplished quite readily by an operator. Most adjustment points are situated on the distribution block with filter replacement being done at the filter jar assembly. Vacuum pressure regulation in the range of 20 to 25 in. Hg is provided by the vacuum relief valve and is observed at the vacuum gauge. Should vacuum pressure remain persistently low even after filter replacement and relief valve adjustment, it may be necessary to replace the pump vanes which should only be performed by the factory or an authorized dealer.

To Set Vacuum Level (25 in. Hg) (see Figure 2.12)

Peak feeder performance is achieved when the vacuum level is set to its maximum which is in the 20 - 25 in. Hg range. Adjustment is made via the vacuum relief valve located on the distribution block.

- 1. Remove the front panel door to expose the vacuum pump and distribution block.
- 2. Close the shutoff valve by rotating it fully clockwise so that the valve handle points to the right (away from the vacuum pump).
- 3. Turn the vacuum pump ON with the **Vacuum** switch located on the instrument panel (*see Figure 2.1*).
- 4. Take a vacuum level reading from the vacuum gauge. If it appears low (< 20 in. Hg.), an adjustment of the vacuum relief valve will be required.
- 5. Place a flat screwdriver in the vacuum relief valve slot, and, with the other hand, rotate the nut in a clockwise direction in order to compress the spring. Keep rotating downward until maximum pressure (25 In. Hg.) has been attained.

Note : If after this adjustment has been completed, the vacuum level is still below acceptable values (< 20 In. Hg.) and the filter has been replaced, it may be necessary to replace the vacuum pump vanes. This should only be done by an authorized technician.

If it appears that the vacuum pump vanes are worn, please contact your dealer or the factory for assistance.

2.4.2 Feeder Spool Valve Adjustments

The spool valve which controls the vacuum flow to the vacuum feed plate must be properly set to ensure optimum performance of the feeder station. The correct vacuum setting is such that when the shuttle plate is completely back, the vacuum is fully ON. Conversely, it must just go OFF when the leading edge of the mailpiece is 1/4" (6 mm) past the feed rollers.

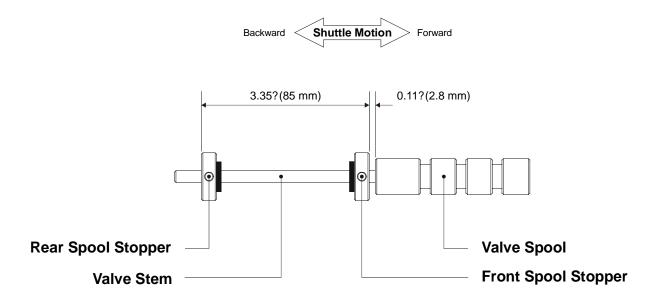


Figure 2.13 - Spool valve assembly illustrating the initial settings for the front and rear spool stoppers. Arrow indicates shuttle feed plate movement.

The spool valve controls the sequencing of the vacuum supply to the vacuum feed plate permitting proper mailpiece separation and dispensation. The front spool stopper regulates the vacuum turn-ON time which occurs when the shuttle feed plate is fully back causing the vacuum feed plate to "pull down" (separating) the next mailpiece from the stack. Vacuum supply just begins when the shuttle feed plate is 1/8" (3mm) from the fully back position and is completely supplied at the fully back position. Once the vacuum is ON, it remains so until the rear spool stopper disengages it 1/4" past the center of the feed rollers.

Improper setting of the front spool stopper will cause a partially obstructed vacuum port resulting in insufficient vacuum being supplied to the feeder.

The rear spool stopper's task is to shut-OFF the vacuum after the front of the vacuum feed plate has past the center of the feed rollers by 1/4" (6 mm) with the objective being to keep the vacuum supply ON until the shuttle feed plate has brought the separated mailpiece into the feed rollers whereupon it is dispensed onto the transport belts. If vacuum is maintained too long, the mailpiece may be damaged as the feed rollers would attempt to advance it while the vacuum would continue to "hold it down" acting as a brake. Conversely, if the vacuum is not maintained ON long enough, the mailpiece might slip with its lead edge not being deposited between the feed rollers resulting in a misfeed.

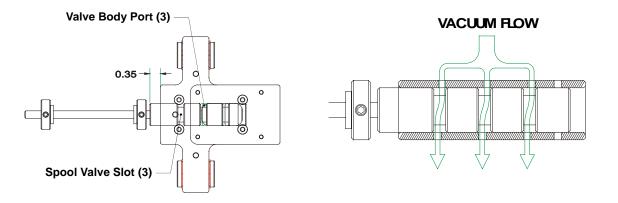


Figure 2.14 - Feeder vacuum valve assembly illustrating the location of the spool assembly when the shuttle feed plate has attained its fully back position. Side view shows vacuum flow from the top to the lower valve body port when spool valve slots are properly centered along the ports. End port shown is the vent port which is completely blocked by the spool.

To Adjust the Front Spool Stopper (Vacuum ON setting)

This adjustment is best accomplished by removing the vacuum feed plate in order to view the spool valve slot alignment with respect to the valve body ports (3) (*see Figure 2.6*).

- 1. Remove the vacuum feed plate as per \Box *To Install a Vacuum Feed Plate.*
- 2. With a 3/32" hex key, loosen both the front and rear spool stoppers. The spool stopper screws should be accessed through the central pusher slot of the shuttle feed plate *If the screws are not aligned with the pusher slot, The feeder plate will have to be removed to access and rotate the spool such that the screws are visible from the top.*
- 3. Adjust the front spool stopper as per the initial setting illustrated in *Figure 2.13*. Tighten lightly onto the valve stem with a 3/32" hex key. Repeat for the rear spool stopper.
- 4. Rotate the handwheel until the shuttle feed plate is fully back. Observe the position of the spool valve's slot with respect to the corresponding valve body's port. The spool valve's slot should be centered over the upper and lower ports with no slot edges showing (*see Figure 2.14*). If this is not so, the front spool stopper will have to be adjusted; proceed to *step 5*.
- 5. Loosen the front spool stopper screw with a 3/32'' hex key.
- 6. Insert the 3/32" hex key in the rear spool stopper screw, and proceed to move the complete spool valve assembly until the spool valve's slot is centered over the upper and lower valve body ports. No spool valve slot edges should be visible.
- 7. With a *3/32" hex* key, tighten the front spool stopper screw against the valve stem ensuring that the rubber washer and front spool stopper are resting against the Shuttle Slide Shaft Mount (*P/N 330605*).
- 8. Repeat *step 4* to ensure that the front spool stopper is properly set. You can double-check this setting by measuring the distance by which the spool protrudes from the rear of the valve body. This measurement should be 0.35" (8.9 mm) as per *Figure 2.14*.

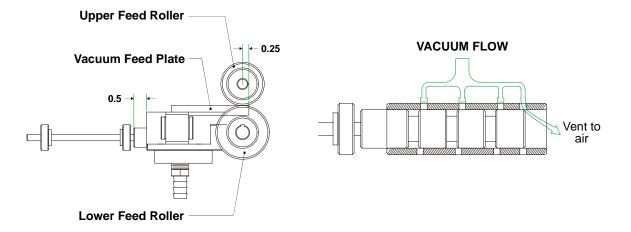


Figure 2.15 - Feeder vacuum valve assembly illustrating the location of the spool assembly when the shuttle feed plate is 1/4" past the center of the feed rollers. Side view shows vacuum flow from the top to the exhaust port when vacuum is released. End port shown is the vent port which is fully open.

To Adjust the Rear Spool Stopper (Vacuum OFF setting)

- 1. Once the proper position has been achieved for the front spool stopper, it is now necessary to adjust the rear spool stopper such that the vacuum shuts off the instant the lead edge of the vacuum feed plate is 1/4" (6 mm) past the center of the feed rollers. With the initial rear spool stopper setting as per *Figure 2.13*, rotate the handwheel slowly until the vacuum is just OFF and is no longer supplied to the vacuum feed plate. Measure the position of the lead edge of the vacuum feed plate with respect to the center of the feed rollers.
- 2. If the vacuum shuts OFF too soon (*the front of the vacuum feed plate position is* < 1/4''), then the rear spool stopper moved backward the distance necessary to cause vacuum shutoff at 1/4''.

- OR -

- 2. If the vacuum shuts OFF too late (*the front of the vacuum feed plate position is* > 1/4''), then the rear spool stopper will have to be moved forward the distance necessary to cause vacuum shutoff at 1/4''.
- 3. Once you have determined the amount of movement necessary and the direction in which the rear spool stopper should be moved as per *step 2*, loosen the rear spool stopper screw with a 3/32'' hex key.
- 4. Hold the spool valve assembly stationary by placing a *3/32" hex* key in the front spool stopper screw.

- 5. Place another 3/32" hex key in the rear spool stopper screw and move it according to the distance calculated in *step 2*. Ensure that the rubber washer and rear spool stopper are resting against the Shuttle Slide Shaft Mount (*P/N 330605*) and retighten the screw in the rear spool stopper when the distance has been achieved.
- 6. Cycle the machine by rotating the handwheel until the vacuum supply is just OFF. Observe the position of the lead edge of the vacuum feed plate with respect to the center of the feed rollers. The distance measured should be about 1/4". If this is not so, the rear spool stopper will have to be re-adjusted by repeating *steps 1 to 5*.
- 7. Replace the vacuum feed plate.
- 8. Cycle the machine with the handwheel and ensure that the vacuum sequencing is correct. If not "finetune" the settings as per the previous instructions until proper sequencing is achieved.

Note : Valve spool setting is very important to the smooth operation of the feeder station. Incorrect placement of the front and/or rear spool stopper will result in inconsistent or complete failure of the feeding operation.

An improper front spool stopper setting results in insufficient vacuum being supplied to the vacuum feed plate. The resulting lack of optimal vacuum supply may cause inconsistent material feeding because the vacuum feed plate may not be able to "pull down" and "hold onto" the bottom mailpiece. If the rear spool stopper is improperly set, it will result in inconsistent or no material feeding since the vacuum feed plate is not depositing the front of the mailpiece between the feed rollers. Damage of the mailpiece may also occur if the vacuum holds on too long to a mailpiece after the feed rollers have engaged.

2.5 Maintenance Schedule

The maintenance schedule table presented below applies to equipment which is operated daily on an 8 hour basis. If the equipment is to be used more frequently than the aforementioned operating standard, please adjust your schedule accordingly.

 Table 2.2 - Maintenance Schedule Table

Period	Maintenance Function		
Daily	Wipe table surface clean of paper dust and other accumulated debris.		
	Remove the front door and clean any debris which may have fallen into the machine.		
	Check the vacuum filters. If they appear to be clogged, remove them from the jars and clean them. If they are beyond cleaning, replace the vacuum filters (<i>P/N 802036</i>).		
	Wipe away any ink which may have settled on the tabletops, belts, and rollers. Use of FastDri maintenance spray (<i>P/N 800814</i>) will facilitate the ink removal procedure.		
Monthly	The following operations should be performed with the shuttle feed plate removed for access. (See item #3 & #12 - 325604A, Tabletop assy)		
	Remove vacuum feed plate and clean the vacuum valve assembly removing any dust which may be present. This may best be accomplished with a small compressor. (See To Install a Vacuum Feed Plate (Figure 2.5))		
	Remove the feeder shuttle plate and clean the exposed shuttle mechanism assembly. Apply a few drops of light oil to the hardened shuttle slide shafts along the contact area of the linear bearings. (See item #5 & #2 - 325603A - Shuttle feeder assy)		
	Using a grease gun with a flexible nozzle, apply grease to the rod ends (See item #16 - 325603A - Shuttle feeder assy)		
	Clean vacuum lines and fittings with compressed air.		
Semi-Annually	The following operations should be performed with the Transport Belt Tabletop Assy removed for access. (See item #18 - BK660A, Inkjet Base assy)		
	Grease the two bearings holding the transport driveshaft. These bearings are equipped with grease nipples. Use any commercially available grease. (See item #7 & #12 - 100601A - Transport Driveshaft Assy)		
	Examine all mechanical drive components for wear. Replace if necessary.		
	Examine the table belts and feed rollers for wear. Replace if necessary.		

Note : Acquiring a small air compressor is recommended. Compressed air is useful in removing debris and is indispensable in cleaning out the vacuum systems.

Inkjet Controllers

Chapter 3

3.1 BK660 Inkjet Controller

- 3.1.1 Power Rocker Switches
- 3.1.2 Priming System Pushbuttons
- 3.1.3 CD-ROM Drive
- 3.1.4 3 1/2" Floppy Drive
- 3.1.5 Keyboard & Mouse
- 3.1.6 Compose Software Setup

3.2 BK640 Inkjet Controller

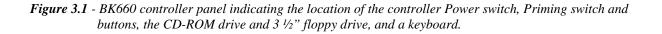
- 3.2.1 Power Rocker Switches
- 3.2.2 Priming System Pushbuttons
- 3.2.3 Controller Keypad
- 3.2.4 Controller Software Setup

3.1 BK660 Inkjet Controller

The BK660 Inkjet Controller provides the user with a complete computer interface package including a video display as well as an easy-to-use priming system. Upon boot-up, the video display should display Compose, the inkjet application software, indicating that is has successfully loaded and is ready for operation. All necessary controls are available on the centrally mounted controller panel. The controls can be subdivided into 5 distinct classes of functions which are:

- Power Rocker Switches
- Priming System Pushbuttons
- CD-ROM Drive & 3 ¹/₂" Floppy Drive
- Keyboard & mouse
- Video Display c/w Compose

		CD-ROM Drive
Priming Buttons (# 1 to 6)		3 1/2? Floppy Drive
	J	
	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	
	<u></u>	
Power Rocker Switch		Keyboard Drawer
Priming Pump Rocker Switch		



3.1.1 Power Rocker Switches

The power rocker switches are located on the far left side of the faceplate panel of the BK660 Inkjet Controller. The purpose of these switches is to provide power to the controller and the priming. The main power switch is equipped with resetable circuit breaker to protect against overload conditions.

Controller Power Switch

Switch, located on the left-side of the controller panel, which turns on the main power to the inkjet controller. Upon turning this switch ON, the red indication light should go on indicating that power is now available to all the controller's electrical components. After a boot-up period, the video monitor should display Compose, the inkjet application software (see Figure 3.2). The switch is equipped with a circuit breaker rated @ 5 Amps (120 VAC). See Compose V3.0 User's guide for a complete explanation of its operation.

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New Open	Layout Test Setup Position	Pause Print Search	ep "	
1 000001 <mark>30 0 32 8</mark>	1BARCODE CERTIFICATION TEST	JUMPING JIMS TRAMPOLINE COMPAN	402 NW 114TH WAY	GAIN
000002 30 0 34 6	2BARCODE CERTIFICATION TEST	BROWNS QUICK FIX-IT GLASS COMP	104 NORFORK DR	NOR
000003 <mark>30 0 36 4 1</mark> 000004 30 0 38 2	3BARCODE CERTIFICATION TEST 4BARCODE CERTIFICATION TEST	JONES EMPLOYMENT AGENCY	10506 STIRRUP WAY 3208 KELLOGG RD	TAM NOB
000005 391 464	5BARCODE CERTIFICATION TEST	ASSOCIATED BUILDING SERVICES	1307 3RD ST N	TEX
1 000006 391 473	6BARCODE CERTIFICATION TEST	ASSOCIATED BOILDING SERVICES	1008 GARGAN ST	HOU
000007 391 482	7BARCODE CERTIFICATION TEST		1809 16TH ST N	TEX
000008 391 400	8BARCODE CERTIFICATION TEST		801 POINT BLANK DR	HOU
000009 391 419	9BARCODE CERTIFICATION TEST	HAPPY TRAILS SADDLE SHOP	1002 SW BERTHA BLVD	POR
000010 28 2 32 8	10BARCODE CERTIFICATION TEST	TOTAL PLUMBING	2304 E MARYANN LN	HER
000011 28 2 34 6	11BARCODE CERTIFICATION TEST	GEORGE'S BARBER SHOP	4606 E LUCY CT	HER
000012 38 2 46 4	12BARCODE CERTIFICATION TEST		8008 RANCHETTE RD	KEY
000013 28 2 30 0 000014 28 2 32 8	13BARCODE CERTIFICATION TEST 14BARCODE CERTIFICATION TEST		7502 S KIRK PT 22004 COUNTY RD 51.1	LEC TRIN
000014 28 2 32 8 000015 27 3 31 9	15BARCODE CERTIFICATION TEST	GEORGE'S BARBER SHOP	22004 COUNTY RD 51.1 9204 N 21ST ST	TAM
000016 27 3 30 0	16BARCODE CERTIFICATION TEST	GEORGES BARDEN SHOP	13503 N CENTRAL AVE	TAM
000017 27 3 33 7	17BARCODE CERTIFICATION TEST	DR. ALBERT CLOVER	7506 N CENTRAL AVE	TAM
000018 27 3 35 5	18BARCODE CERTIFICATION TEST	WINCHESTER CLEANERS	108 W BROREIN ST	TAM
000019 37 3 42 8	19BARCODE CERTIFICATION TEST	BROWNS QUICK FIX-IT GLASS COMP	505 SE 21ST AVE	0CA
000020 26 4 28 2	20BARCODE CERTIFICATION TEST	AUTOMOTIVE SERVICE & REPAIR	502 PALM AVE	PIEF
000021 36 4 40 0	21BARCODE CERTIFICATION TEST		14504 W SANDDOLLAR LN	CRY
000022 36 4 42 8	22BARCODE CERTIFICATION TEST	HAPPY TRAILS SADDLE SHOP	15006 BASSWOOD AVE	TAM
000023 36 4 44 6	23BARCODE CERTIFICATION TEST	JONES COMPUTER COMPANY	5208 STONEHURST RD	TAM
000024 36 4 38 2 000025 35 5 41 9	24BARCODE CERTIFICATION TEST 25BARCODE CERTIFICATION TEST	GEORGE'S PICTURE GALLERY	6002 MEIER RD 13906 NE 63RD CT	NOF RED
000025 35 5 41 5	268ARCODE CERTIFICATION TEST	POPLAR STREET FLORIST	908 E CHILKOOT AVE	TAM
000027 35 5 38 2	278ARCODE CERTIFICATION TEST	FOI EAR STREET FEORIST	5703 N HIGHLAND AVE	TAM
000028 35 5 40 0	28BARCODE CERTIFICATION TEST	JESSIE'S JUMBO HOT DOGS	1705 SIMON CT	TAM
000029 35 5 42 8	29BARCODE CERTIFICATION TEST		12407 N 51ST ST	TAM
				Þ
L.L List				
Job: usps List File: c:\maillist\usps.lst	1 2			
Size: 222		Bar1 Bar2		
Time: 0 min.	aaaa pph (0.00 ^{m/s} 🔹	>	

Figure 3.2 - Illustration of Compose software after successful completion of the boot-up sequence.

Priming Pump Rocker Switch

The switch, located to the right of the **Power** switch, which turns on power to the priming system. Upon turning this switch ON, the orange indication light should go on indicating that power is available to each of the priming switches.

Note : The priming system rocker switch cannot be engaged if the **Power** switch has not been turned ON.

3.1.2 Priming System Pushbuttons

These six pushbuttons, located between the CD-ROM drive and the **Priming** pump switch, are each assigned to one of the individual printbars and permit their priming. The pushbuttons, are numbered one to six, which indicates the printbar that will be primed when the button is pressed. *Figure 3.3* below depicts the numbering scheme and physical location of each of the printbars as they are mounted on the inkjet base.

Momentary priming or continuous priming is available for each pushbutton and is controlled by the operator's applied pressure on the switch. Momentary priming is achieved by pressing the desired pushbutton and releasing it immediately. Continuous priming is done by pressing the desired pushbutton and holding it for the desired length of time. In either case, a "clicking" noise should be heard indicating that the valve solenoid has energized and the priming valve is open.

See Chapter 4 - Printheads for the various priming procedures available.

Note : The connection between the priming buttons and the printbars is dependent on which priming hose is inserted into which inkwell. Check the numbers on the priming hoses.

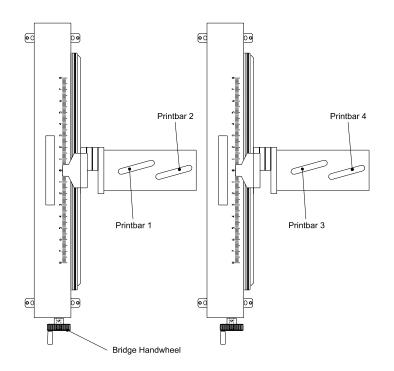


Figure 3.3 - Location of the printbars for the priming system on BK660 inkjet system.

3.1.3 CD-ROM Drive

The CD-ROM drive, located in the center of the controller panel, provides a data exchange interface between the user and the BK660 Controller. The CD-ROM can be used for installing various software packages that are stored on CD-ROM. The CD-ROM drive is designated as the "**D**" drive.

Note : The CD-ROM drive is designated as the "D" drive.

3.1.4 3 1/2" Floppy Drive

The 3 $\frac{1}{2}$ " drive, located on the right side of the controller panel, provides a data exchange interface between the user and the BK660 Controller. The floppy drive can be used to download data stored on a 3 $\frac{1}{2}$ " floppy diskette. When the disk is being accessed, the green light located just below the drive, should illuminate. The 3 $\frac{1}{2}$ " floppy drive is denoted as the "**A**" drive.

Note : The 3 1/2" floppy drive is denoted as the "A" drive.

3.1.5 Keyboard & mouse

The BK660 Controller provides the user with a keyboard input device, located in the keyboard drawer, should the user need to communicate directly with the controller. The keyboard tray, located just below the pushbuttons, provides a storage space for the keyboard. This drawer can be pulled out to access the keyboard or pushed in if the keyboard is not required.

In addition, a mouse is also provided for communication with the controller, which operates in a Windows[™] environment. This mouse is of a stationary trackball variety and is located on the tabletop.

3.1.6 Compose Software Setup

The BK660 Inkjet System requires that the Compose **V3.01or higher** imaging software be installed. To ensure an acceptable version of Compose is installed follow the instructions below.

To check Compose Version

- 1. In the Operator screen, click on the **Help...** menu.
- 2. From the Help... menu, click on About COMPOSE...
- 3. The following dialog box should appear indicating the version of Compose currently installed.

C	ompose 🔀
	Compose 3.01
	Copyright © 1994-1996 Lateral Visions. All Rights Reserved.
	Portions Copyright Microsoft Corporation.
	У ок

4. If Compose V3.01 (or higher) is <u>not</u> installed in your system, please contact your dealer for assistance or contact the factory.

In addition, in the Machine Setup dialog box, it is required that the printhead type be set as one of the following:

- AllWrite 10
- Versa 10
- FastDri 10
- HiDef 10

An incorrect printhead type setting will result in slanted print from the BK660 Inkjet System. *Figure 3.4* below illustrates the Machine Setup dialog box in the Compose software. Please refer to the *Compose V3.0 User's Guide* for instructions on how to access the Machine Setup dialog box.

Machine Setup			x
Head 1	Head 2	Head 3	Head 4
Type: AllWrite 10	Type: Versa 10 💌	Type: None	Type: None
Temperature: 30 C	Temperature: 60 C	Temperature:	Temperature:
# Position	# Position	# Position	# Position
Print Bar A 1 6.006	Print Bar A 3 21.006	Print Bar A	Print Bar A
Print Bar B 2 9.266	Print Bar B 4 24.260	Print Bar B	Print Bar B
Print Bar C	Print Bar C	Print Bar C	Print Bar C
Print Bar D	Print Bar D	Print Bar D	Print Bar D
Stacker		Diverter	
Delay in Pieces 2 Delay in Pieces 16			
Hold	d in Pieces 1	Diverter Enabled Minir	num Bundle Size 1
🕱 Stacker Enabled Max	imum Bundle Size 999	🗸 ок 🔀 С	ancel ? Help

Figure 3.4 - Illustration of Machine Setup dialog box indicating AllWrite 10 and Versa 10 settings for the BK660 inkjet system.

3.2 BK640 Inkjet Controller

The BK640 Inkjet Controller provides the user with a keypad for complete control of the inkjet process, a main power switch, and priming controls for the printheads. All aforementioned operator controls are available on the centrally located controller enclosure (*see Figure 3.5*). The controls can be subdivided into 3 distinct classes of functions which are:

- Power Rocker Switches
- Priming System Pushbuttons
- Controller Keypad

Power Rocker Switch -	Controller Keypad	Priming Pump Rocker Switch
	I Image: Controller Image: Control con	
		Priming Buttons (#1 to 4)

Figure 3.5 - BK640 controller enclosure identifying the location of the Power rocker switch, Priming pump switch and buttons, and keypad.

3.2.1 Power Rocker Switches

The power rocker switches which include the main **Power** and the **Priming** pump switches, are located on the far left side and at the upper right of the controller enclosure respectively. The purpose of these switches is to provide power to the controller and the priming system.

Controller Power Switch

The switch which turns on the main power to the BK640 inkjet controller. Upon turning this switch ON, the red rocker light should go on indicating that power is now available to all of the controller's electrical components. After a boot-up period, the keypad's LCD display should indicate "*Offline Buffer Empty*". The switch is equipped with a circuit breaker rated @ 5 Amps (120 VAC). *See BK400 User's Guide for a complete explanation of its functions.*

Priming Pump Switch

The switch which turns on the power to the priming system. Upon turning this switch ON, the orange switch light should go on indicating that power is available to each of the priming buttons.

Note : The priming system rocker switch cannot be engaged if the **Power** switch has not been turned ON.

3.2.2 Priming System Pushbuttons

These four pushbuttons, located directly below the **Priming** pump switch, are each assigned to one of the individual printbars and permit their priming. The pushbuttons, are numbered one to four, which indicates the printbar that will be primed when the button is pressed. *Figure 3.6* below depicts the numbering scheme and physical location of each of the printbars as they are mounted on the inkjet base.

Momentary priming or continuous priming is available for each pushbutton and is controlled by the operator's applied pressure on the switch. Momentary priming is achieved by pressing the desired pushbutton and releasing it immediately. Continuous priming is done by pressing the desired pushbutton and holding it for the desired length of time. In either case, a "clicking" noise should be heard indicating that the valve solenoid has energized and the priming valve is open. *See Chapter 4 -Printheads for a detailed explanation of the priming procedures available.*

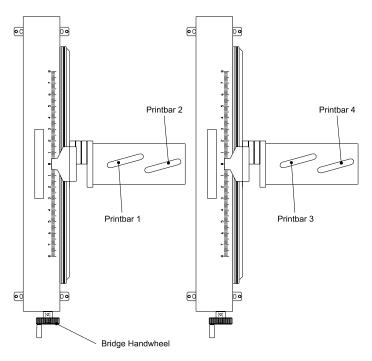


Figure 3.6 - Location of the printbars for the priming system on BK640 inkjet system.

Note : The connection between the priming buttons and the printbars is dependent on which priming hose is inserted into which inkwell. Check the numbers on the priming hoses.

3.2.3 Controller Keypad

A keypad is available which lets the operator communicate with the controller to direct its functions. For this 30 keys are provided with controller feedback being displayed on a 2 line LCD display. For additional details on the controller **Keypad**, please refer to the *BK400 Inkjet Controller User's Guide*.

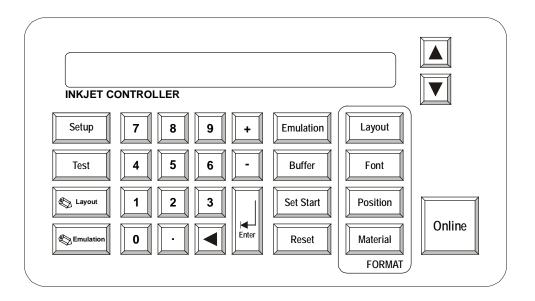


Figure 3.7 - BK640 Controller keypad identifying the various keys and the LCD display.

3.2.4 Controller Software Setup

The BK640 Inkjet System requires that the **BK400 Program** Chip on the Jet Memory/Interface Board be **V1.1 or higher**. To ensure an acceptable version is installed please check the Jet Memory/Interface Board. Please refer to *Appendix E* - *Jet Memory/Interface Board Specifications* for the location of the **BK400 Program** chip.

In addition, under the Setup button functions, dialog box, it is required that the **BASE TYPE** be set to NEW for and the **INK TYPE** be set to one of the following:

- AllWrite
- Versa
- FastDri
- HiDef

Figure 3.8 below illustrates required setting under the Setup button. Please refer to the *BK400 Inkjet Controller User's Guide* for instructions on how to access the Setup button functions

	TYPE : NEW CONTROLLER		
Setup Test	7 8 9 + 4 5 6 -	Emulation Buffer Font	
Emulation		Set Start Reset FORMAT	Online

Figure 3.8 - BK640 Controller keypad indicating the setup for the BK640 Inkjet system.

Printheads - Trident, Ultrajet

Chapter 4

4.1 Printhead Overview

- 4.1.1 Ink Reservoir
- 4.1.2 Printhead
- 4.1.3 Check Valves
- 4.1.4 Inks
- 4.1.5 Temperature and Voltage

4.2 Printhead Installation

4.3 Priming and Purging

- 4.3.1 Orifice Plate Wiping
- 4.3.2 Priming
- 4.3.3 Purging
- 4.3.4 Shutdown
- 4.3.5 Printbar Shipping

4.4 Print Quality

- 4.4.1 Printbar Height
- 4.4.2 Base speed
- 4.4.3 Voltage and Temperature

4.5 Printbar Recommendations

- 4.5.1 Printbar "Do's"
- 4.5.2 Printbar "Don'ts"
- 4.5.3 AllWrite and FastDri Printbars Start-Up Considerations

4.6 Trident Warranty Coverage

4.7 FAQ about Trident Printbars

4.8 Glossary of Terms

4.1 Printhead Overview

Buskro Inkjet systems utilize the Trident ULTRAJET[™] printheads which are comprised of a Printbar and an ink Reservoir connected by 48" of Viton tubing. Each component is described in further detail below.

These printheads function with a variety of oil-based inks requiring their own particular operating parameters, notably voltage and temperature. Ink replenishment is achieved by inserting an ink bottle in the ink reservoir which in turn supplies the printhead as needed. In the event that the ink level drops below acceptable levels, an "*Ink Low*" message appears on the controller display. A discussion of the various ink types available is provided in *section 4.1.4*.

4.1.1 Ink Reservoir

The basic components of the Ink Reservoir include the Reservoir Cap, Vent Cap, Gasket, Level detect, and Filter. *Figure 4.1* below shows an illustration of the ink reservoir.

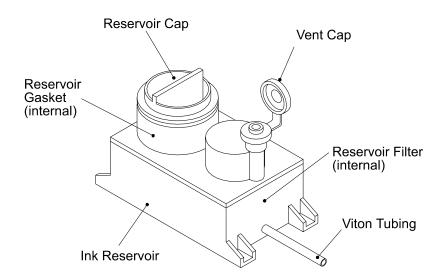


Figure 4.1 - Ink Reservoir illustrating its various components.

Vent Cap

The attached **Vent Cap** seals the vent hole during shipping. The hole <u>must</u> be open to the atmosphere to allow air to vent inside the reservoir system when operating the inkjet system. The cap <u>must be opened</u> during operation and should only be closed for shipping.

Level Detect

A single flotation **Level Detect** indicates when the ink reservoir is running empty. The ink reservoir holds about 25 ml of ink within it, which equates to about 50,000 addresses. When there is about 3 ml of ink left, the ink low message will appear on the controller display indicating which printbar requires ink. Although immediate ink replenishment is not required, it is good practice to refill the reservoir when the message appears since running completely empty will cause ingestion of large amounts of air which may be difficult to remove.

A 7-pin blue ribbon cable connects the level detect to the printbar and can be detached at both ends for ease of assembly or removal. The ribbon cable connector is keyed for proper orientation.

Reservoir Filter

There is a 25 micron stainless steel mesh filter inside the reservoir to filter out any paper dust and debris entering through the vent hole or through the Reservoir top opening when the bottle is being inserted.

4.1.2 Printbar

The Printbar is comprised of a cast body which embodies the fluid path, a PC board which mounts the sensors and piezo-crystals, and a length of viton hose which transports the ink via capillary action. The replaceable components of the Printhead include a **Filter**, **Thermal Fuse**, **Check Valve**, and **End Cap** which are described below in *Figure 4.2*. The printbar also comes equipped with a **Ship Cap** which protects and seals the orifices during shipping or long periods of inactivity (*See Figure 4.5*). A check valve, preventing ink back flow, can also be found mounted inline with the viton tube.

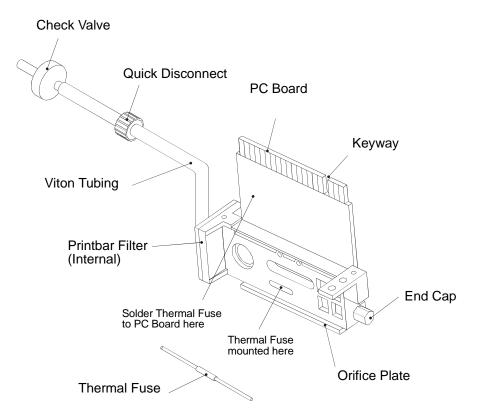


Figure 4.2 - An illustration of the Printbar and its individual components.

Viton Tube

The **Viton Tube**, which also includes a check valve and a quick-disconnect connector, provides for passage of the ink from the ink reservoir to the printbar. The Viton tubing is contained within a flexible plastic conduit to prevent accidental contact resulting in potential de-prime conditions.

Note : The Viton Tubing is sensitive to shock and vibration (*especially FastDri and AllWrite Printbars*). Severe shock to the Tubing will de-prime the Printhead.

PC Board

The **PC Board**, whose function is to terminate all electrical components, provides a means of connection via a 44 pin edge connector which is keyed (*see Figure 4.2*) with a slot to assure proper coupling with the **Printbar Cable**. The gold-plated edge connector must be kept clean of ink at all times so as to provide a good contact.

Note : The PC Board can be cleaned using Isopropyl alcohol or any certified electronic cleaner.

Printbar Filter

The **Printbar Filter**, a removable round disk, is located immediately after the viton tube inlet. The filter itself is a 1" diameter disc of 10-micron sintered stainless steel <u>which should only be replaced by a qualified technician</u>.

Thermal Fuse

The **Thermal Fuse** is installed into the printbar's body to prevent overheating of the printbar. The fuse will open at temperatures of 70°C ± 1 (160°F ± 2) for all printbars. The fuse is field-replaceable by use of a small screwdriver and a soldering iron. Refer to *Figure 4.2* for the location of the fuse on the printbar. It is important that the fuse leads <u>do not touch</u> the printbar's body on installation as this will cause a short resulting immediately in a blown fuse.

Note : The fuse leads <u>must not touch</u> the Printbar's cast body on installation to prevent its destruction.

End Cap

The **End Cap** is screwed on with an internal elastomeric seal and is located at the opposite end of the printbar from the viton tube inlet area. It should only be removed for the purge procedure described in *Section 4.3.3*. During operation, the **End Cap** <u>must be in place</u> or de-priming will result.

Note : It is suggested that a nut driver, not a wrench, be used to loosen and tighten the End Cap. Only 80 in-oz of torque is required. Over-torquing can break the end cap stem, which is not repairable. Breakage of the stem will void any warranties.

If using a 1/4" wrench, use extreme CAUTION when loosening or tightening the End Cap. Breakage can **easily** occur with the use of a wrench.

Ship Cap

If the printbar is going to sit unused for 2 days or longer, the printbar should be properly capped to protect it from debris and ink drying. Refer to *section 4.3.4 Shutdown* for details on how to cap the printbars.

On a daily basis, it is suggested that the printbars be left uncapped overnight. By not capping the printbars, priming can usually be avoided the next morning with only a wipe with a moist lint-free wipe necessary the next morning to remove any dried ink.

Static Pressure Requirement

The Printheads function by drawing ink through the viton tube from the ink reservoir via capillary action, the same way branches of trees obtain water from its roots. *It does not work through gravity feed.*

For proper operation, the height differential between the printhead and ink level is critical. The Printbar is optimally positioned when its orifices are level with the top plane of the ink supply. Raising the uncapped orifices more than 3" (7.5 cm) above this top plane will cause de-prime of some of the orifices. Conversely, lowering the orifices below this level will create a positive pressure resulting in *weeping* of the ink at the orifices. Ink reservoirs on Buskro inkjet systems are operator-adjustable should one of the aforementioned conditions present itself.

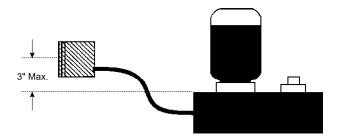


Figure 4.3 - Static Pressure Requirement

4.1.3 Check Valves

A **Check Valve** is a device, which when installed inline in the viton tubing, prevents back-flow of the ink reducing the sensitivity of the **FastDri** and **AllWrite** printbars to deprime. Testing has indicated that check valves greatly improve the priming process on FastDri and AllWrite Printbars by preventing air from being ingested when the printhead is rotated.

Two different sizes of check valves are available; The small hose I.D. check valve (*P/N 800825*) is for **FastDri** and **AllWrite** Printbars, and if required, a larger I.D. check valve (*P/N 800826*) is available for **VersaPrint** and **HiDef** printbars. Ensure that the appropriate check valve is ordered and installed for the printbar used. See Figure 4.2 for an illustration of the check valve and its location.

To Install a Check Valve

Please follow the steps outlined below to install a check valve on a printbar.

- 1. Turn the Controller power **OFF**.
- 2. Disconnect the **Printbar Cable(s)** and remove the stainless steel cover on the printhead by loosening the 6-32 UNF screws using a 3/32'' hex key.
- 3. Remove the **Viton Tube** from the plastic clip on the printhead swivel mount.
- 4. Remove the 2 screws mounting each printbar to the mount block.
- 5. If using an older model, trim back the plastic spiral wrap about 6-8" (152-200mm) on the tubing.
- 6. Cut the tubing 3" (75mm) from the viton tubing inlet.
- 7. Fit the tubing on the valve stems located on each side of the check valve. <u>Make sure</u> the tapered end of the valve (*with the letters "VAC"*) is facing the printbar.
- 8. Secure the tubing on the valve with Tie-wraps.

- 9. With the printbar still removed from the mount block, open the end cap and purge the printbar. Purge the ink until there is no more air in the system (*see section 4.3.3 Purging*).
- 10. Re-install the end cap. <u>Do Not</u> over-tighten the **End Cap** as it will break. Finger tight is fine.
- 11. Remount the printbars in the mount block.
- 12. Re-clamp the tubing with the plastic clip on the printhead swivel mount.
- 13. Re-tape the tubing together with the blue ribbon cables.
- 14. Reinstall the stainless steel cover on the printhead.
- 15. Re-attach the printbar cable(s).
- 16. Turn the Controller power ON.
- **Note :** The **Check Valve** will maintain applied priming pressure to the printbar and therefore ink will continue to weep from the orifices for up to 30 seconds after completion of the priming process. Wipe the orifices clear of residual ink before commencing printing.

<u>Do Not</u> spill any ink on the circuit boards on the printbars. You should not get a lot of ink spillage, but you will get some. Wrap the circuit board with a cloth or wipe.

The slot opening in the mount block for the tubing from Printbar #2 is not wide enough to allow the Check Valve to fit through. Therefore, in order to be able to easily remove the printbar from the mount block, the Check Valve must be kept inside the mount block. Make sure that there is still a "smooth" bend in the hose from the Check Valve to the printbar. Any kind of "sharp" bend will cause kinking in the hosing. In order to keep this "smooth" bend the hose may need to be cut 4" from the printbar.

4.1.4 Inks

Trident produces several oil-based and/or glycol-based inks depending on the substrate of the mailpiece. The ink dries through a penetrative process in which it enters and binds with the substrate rather than through an evaporative process in which a carrier is evaporated leaving the ink on the material. This assures that the image will be stable, long-lasting, light-fast, water-fast, and organically-resistant.

Listed below in *Table 4.1* are some of the inks produced by Trident including their characteristics.

Ink Type	Application
HiDef [™] Ink	Developed for reduced spread on highly porous substrates such as newsprint.
VersaPrint [™] Black Ink	Developed to spread less than HiDef, and produce darker print on more absorbent substrates. Ideal for printing on newspaper stock.
VersaPrint [™] Colored Inks	Available in colors such as Red, Blue, Green. The VersaPrint family of inks can be flushed within the same Printbar.
FastDri [™] Ink	Designed to penetrate more quickly into magazine-type stocks and coated papers, thus reducing the potential for smearing. While this ink "dries" quickly on coated papers, it still requires some degree of paper absorbency, and, therefore, will not "dry" in a reasonable time on plastics, heavy coated stock, or varnished stocks.
AllWrite [™] Ink	Compromise formulation which produces darker images on both coated and semi-porous surfaces but does not dry as quickly as FastDri.

 Table 4.1 - Ink Types and their typical applications.

Note : The use of any non-compatible ink or misuse of Trident, Inc., ink voids any and all warranties.

Ink Dry Time Considerations

The image dry time is directly related to the following factors:

- The degree of coating on the stock.
- The print resolution (*the amount of overlap between adjacent ink droplets*).
- The droplet volume (*directly related to the drive voltage*). Lowering the voltage will decrease the amount of ink that is jetted hence improving dry time.
- The temperature of the ambient or stock printed upon. Warm air assisted with infrared lamps and/or blow-drier directed at the printed material prior to or after imaging, can decrease the dry time significantly.

Operating Environment

To ensure trouble free operation, it is important that the ink be transported and stored at the proper operating temperatures. Refer to *Table 4.2* below for specifications.

	Operating	Storage	Transit
Temperature (°F)	50 - 110	60 - 110	5 - 110*
Temperature (°C)	10 - 43	15 - 43*	-15 - 43*
% Humidity (non-condensing)	20 - 80	5 - 95	5 - 95

Table 4.2 - Printbar Operating Environments

Note : Ink must be at room temperature before use.

*At temperatures below 0°C (32°F), the ink should be permitted to thaw at room temperature for 24 hours prior to use.

Ink Shelf Life

A storage shelf-life of one year for a printbar and two years for the ink bottles at room temperature has been specified. The expiration date is stamped on the bottle label. The shelf life of these ink bottles decreases as a function of temperature, as follows :

Table 4.3 - Ink Shelf Life

Storage at:	Shelf life
20°C (68°F)	2 years
30°C (86°F)	1 year
40°C (104°F)	6 months
50°C (122°F)	3 months

Ink Usage Rate

125 ml of JetWrite[™] ink or other Trident inks will produce:

- 1.7 billion droplets.
- 35 million Courier 10 characters (50 dots/character).
- 1.0 million complete zip + 4 POSTNET barcodes (bars two dots wide).
- 1.6 million half-inch tall alphanumeric characters (1100 dots/character)
- About 250,000 addresses

Note : Due to reduced orifice diameter, multiply numbers by 1.4 to obtain HiDef Printbar usage rates.

Ink "Pot Life"

Trident HiDef inks have a pot life of approximately one to three months when the ink is stagnant, or when ink re-circulation is extremely low in the *heated printbar*. The result will be a jelling of the ink, causing clogging of some orifices to occur, which then typically spreads to the entire printbar.

In order to avoid this situation, it is suggested that any channels which are not being used be exercised by spraying some drops periodically, thus replenishing them with fresh ink.

Printbar Life

Due to the lack of moving parts, the printbars exhibit high reliability. Mean Time Between Repair is typically 9 to 12 months (application dependent), at which time the units may need to be cleaned by Trident. The mean-time-to-failure is approximately 4-5 years, after which the transducer seals may begin to leak from years of pressure priming and printing.

4.1.5 Temperature and Voltage

The two factors which most directly affect printbar performance and print quality are its temperature and voltage. Each type of printbar has its own operating temperature depending on the type of ink used (*See Table 4.4*); It is important that this temperature be maintained since a low-temperature setting will result in lighter print while a high-temperature setting may cause ink drying at the orifice plate for FastDri and AllWrite printheads.

Voltage, the other factor affecting print performance, correlates directly to the ink volume released; That is, the greater the voltage, the larger the amount of ink "spit out". The voltage should be set to within \pm 5 volts of the specified voltage identified on the side of the ink reservoir. An over-voltage condition may result in de-prime or ink weeping at the orifice plate, whereas an under-voltage condition will result in the production of a lighter print image.

Temperature

Each type of printbar has its own specified operating temperature. These temperatures are outlined below in *Table 4.4*. The viscous inks (*thicker*), **HiDef** and **VersaPrint** operate at higher temperatures (60 °C), whereas **FastDri** and **AllWrite** operate at 30 °C since an elevated temperature would cause drying at the orifice plate for these inks.

Printbar Type	Temperature (°C)	Temperature (°F)
HiDef	60 ± 1	140 ± 3
VersaPrint	60 ± 1	140 ± 3
FastDri	30 ± 1	86 ± 2
AllWrite	30 ± 1	86 ± 2

 Table 4.4 - Printbar Operating Temperatures

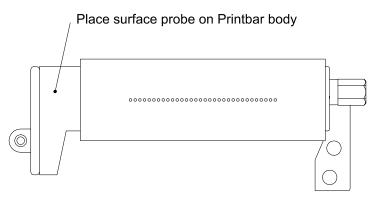


Figure 4.4 - Measuring Printbar temperatures with a surface probe.

Temperature Calibration

The Compose software will display the temperature reading of each installed printbar in degrees Celsius in the Diagnostics Window (*see page 131 of the Compose V3.0 User's Guide*). However, these temperature readings may vary from the actual printbar temperature since each printbar has its own characteristics due to inherent sensor errors. To display a correct temperature reading, each printbar temperature setting will have to be properly calibrated using a temperature gauge and surface probe.

For instructions on how to calibrate the printbar temperature, refer to *To Calibrate a Printbar's Temperature Reading on page 139 of the Compose V3.0 User's Guide.*

Note: The most accurate way to determine the operating temperature of a printbar is to measure the surface with a temperature probe. When using the surface probe, To prevent scratching of the printbar orifice plate, place the surface probe on the body of the printbar (see Figure 4.4).

Voltage

Each printbar requires a drive voltage to eject the ink from the orifices. This drive voltage is different for each printbar and is specified on the side of its ink reservoir. The Compose V3.0 software will display the voltage reading for each Printbar in the Diagnostics Window (*see page 131 of the Compose V3.0 User's Guide*). For additional information on printbar voltages, refer to *section* 5.2.1 Printbar Voltage Monitoring on page 136 of the Compose V3.0 User's Guide.

Note : It is important that AllWrite Printbars be set as close to the rated voltage as possible. Major deviations from this rated voltage may cause depriming.

4.2 Printbar Installation

To Prepare an Installed Printbar for Printing

Follow the steps below to prepare a printbar for printing. *Please refer to Figure 4.1 and Figure 4.2 for an illustration of the ink reservoir and the printbar.*

- 1. Open the ink reservoir **Vent Cap(s)** (*see Figure 4.1*). This cap <u>must remain</u> <u>open</u> when the printbar is operating.
- 2. During shipment the **Priming Hose(s)** are removed from their respective ink reservoirs. To install them, insert the clear, marked priming hose in the appropriate reservoir vent cap hole; *For example, insert the hose from solenoid valve #1 into Reservoir #1*. Do this for all the ink reservoirs present.
- 3. Rotate the printhead over 180° and remove the printbar **Ship Cap** by pulling the cap tab forward with one hand while holding the sides of the printhead with the other hand. *See Figure 4.5 below* for an illustration of the Ship Cap.

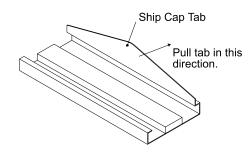


Figure 4.5 - Printbar Ship Cap

- 4. After removing the Ship Cap, *gently* wipe the face of the printbar with a lint-free wipe. Place the Ship Cap in a "Ziploc" bag or some other container to keep them as clean as possible.
- 5. Repeat *steps 1-4* for any other printbars installed on the system.
- 6. Turn the Controller power **ON** and wait for the printbars to come up to operating temperature. A *Printbar Temperature Low* icon will appear in the Alarm box in the Compose software (*refer to page 33 in the Compose V3.0 User's Guide*).
- 7. Prime the printbar. Follow the instructions outlined in Section 4.3.2 Priming.

Note : If the Vent Cap is closed the Printbar will lose prime after a few minutes of operation.

The Second Seco

Follow the steps below to install a new printbar on the inkjet system. Please refer to *Figure 4.1 and Figure 4.2* for an illustration of the ink reservoir and the printbar. The printbar is shipped in a square box with the serial number on the outside of the box.

- 1. Open the shipping box and remove the **Printbar** assembly from the foam packaging.
- 2. Cut the sealed polybag and remove the printbar and ink reservoir.
- 3. Slip the **Ink Reservoir** through the opening in the inkwell container situated just below the keyboard in the controller console. The reservoir can be fastened to the inkwell plate using two *6-32 UNF screws*.
- 4. Open the ink reservoir **Vent Cap** (*see Figure 4.1*). This cap <u>must remain open</u> when the printbar is operating.
- 5. Insert the clear priming hose in the appropriate reservoir vent cap hole as per *To Prepare an Installed Printbar for Printing.*
- 6. Mount the printbar in the BK602/BK601 head mount using *two 6-32 UNF screws*. Be sure to insert the brown **Insulation Strip** between the head mount and the printbar (*see Figure 4.6 below for an illustration*).

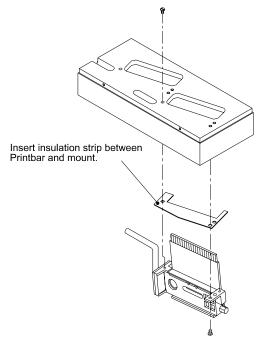


Figure 4.6 - Printhead assembly showing location of the Insulation Strip.

7. Attach the blue ribbon cable to the connector on the ink reservoir and to the connector on the printbar. This cable senses an "Ink Low" condition.

- 8. Remove the printbar ship cap by pulling the cap tab forward with one hand while holding the sides of the printbar with the other hand.
- 9. After removing the ship cap, *gently* wipe the face of the printbar with a lint-free wipe.
- 10. With the Controller power **OFF**, attach the 44-pin female connector to the PC board of the appropriate printbar. The 44-pin connector is keyed so the connector can only be installed one way (*see Figure 4.7 below*).

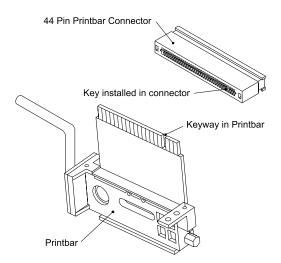


Figure 4.7 - Illustration of the printbar showing the orientation and attachment edge for the 44-pin *Printbar Cable.*

- 11. Repeat steps 1-10 for any other printbars.
- 12. Turn the Controller power **ON** and wait for the printbars to come up to operating temperature.
- 13. Prime the printbar. Follow the instructions outlined in section 4.3.2 Priming.
- **Note :** The shipping container and protective foam were designed to protect the Printbar from damage and should be saved for possible returns or other re-shipment.

Do Not attach the Printbar cables to the Printbar when the Controller is turned ON.

If the vent cap is closed the printbar will lose prime after a few minutes of operation.

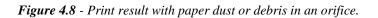
4.3 Priming and Purging

Occasionally, a small gap or void, sometimes followed by stray dots, will be observed in the print indicating that the Printbar requires attention. There are basically two types of maintenance that can be performed on the Printbar; wiping and priming. They are described below.

4.3.1 Orifice Plate Wiping

In most instances, when a small gap of void appears in the print, a bit of paper dust has either blocked an orifice or has caused the ejected ink to be missaimed. Paper dust will result in the type of gap seen in *Figure 4.8*





In this case, the correct procedure is to place a lint-free wipe against the face of the printbar and then gently wipe upward or along the short dimension of the orifice plate (*See Figure 4.10*). Wiping along the long direction, or side to side, may relocate the dust from one orifice into another.

Note : Aggressive wiping must be avoided. It can imbed surface debris into the orifices and scratch the orifice plate.

4.3.2 Priming

On some occasions, dust may have entered through an orifice as seen in previous example of *Figure 4.8*. On other occasions, an air bubble may be ingested, resulting in a larger gap (*See Figure 4.9*) in the print than is seen with paper dust blockage; In this event priming will be required. To resolve the aforementioned problem, a number of techniques are outlined below.

Priming is the process by which ink is forcefully expelled via the orifice plates to dislodge the air bubble or debris. In order to force ink out, air pressure is delivered through the priming hose and applied directly in the ink reservoir using a priming pump. By selecting the appropriate priming button, the operator can determine the printbar to be primed.



Figure 4.9 - Illustration of a print image demonstrating a missing channel due to an air bubble.

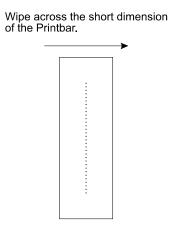
A number of priming techniques will be outlined below. It is important to note that each has its own level of involvement, hence the easiest methods should be attempted first. Listed below are a number of points which should be kept in mind when priming :

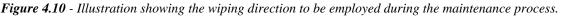
- Set a goal to be able to prime a printbar within 5-10 minutes.
- There are a number of priming techniques outlined below. If one technique is unsuccessful, then try another technique.
- The typical learning curve for priming is about 2 months.
- Try the simplest technique first and then progress to more difficult techniques.
- The printbar should be heated to its operating temperature before priming.
- Check that the reservoir gasket is in place.
- Fill up the ink reservoir with ink.
- Remove the ink bottle from the reservoir before priming.

Technique I - Wipe the Printbar

Always try to wipe the printbar before doing anything else. This is the simplest technique and will require the least amount of effort on the part of the operator. To wipe the printbar, follow the steps below.

- 1. Tilt the printhead at a 45° angle to access the orifice plate(s).
- 2. Fold a lint-free wipe in half twice and spray it with the appropriate **Maintenance Spray**.
- 3. Gently wipe the surface of the printbar with the moist wipe across the short dimension (*see Figure 4.10*). *Note: Do not wipe too hard or depriming may occur.*
- 4. Rotate the printhead back down to its printing position and resume printing.





Note: <u>Do not</u> wipe too hard or depriming may occur.

Technique II - Prime at a 45° Angle

If wiping is unsuccessful as per *Technique I - Wipe the Printbar*, try to prime the printbar without rotating the printhead over completely. Follow the steps below.

- 1. Tilt the printhead at a 45° angle.
- 2. Fold a lint-free wipe in half twice and spray it with the appropriate **Maintenance Spray**.
- 3. Press the appropriate **Priming Button** to prime the printbar. Wipe the ink with the lint-free wipe across the short dimension of the printbar. *See Figure* 4.10 for an illustration.
- 4. Rotate the printhead back down to its printing position and resume printing.
- 5. Test fire the channels by using the ForceJet function (*To Test Fire a Printbar on page 135 of the Compose V3.0 User's Guide*). If all 32 channels fire on each printbar, then continue with the next step. If not, then reprime the printbar as per *steps 1-3*.

Note : When using the ForceJet function, there may be an instance where the middle 8-10 channels are missing. Those channels are most likely primed, but did not fire using the ForceJet function. Ignore the missing channels and continue with the next step.

Technique III - Rotate Printhead

If priming at an angle is unsuccessful as per \mathcal{F} Technique II - Prime at a 45 ° Angle, it may be necessary to rotate the Printhead completely and prime it with its orifice plate facing up. Follow the steps outlined below.

- 1. Slide the printhead along the bridge rail towards the front of the machine. Stop at the end of the bridge rail. Tighten the locking screw.
- 2. Rotate the printhead over as far as it will go, preferably 180° with the orifice plate facing upward.
- 3. Press the appropriate **Priming Button** to prime the printbar. It is recommended that the button initially be depressed until a steady flow of ink flows from the orifices. Then use short quick bursts to complete the priming procedure.
- 4. Wipe the ink from the printbar until the ink flows equally from all 32 channels.
- 5. Test fire the channels by using the ForceJet function (*To Test Fire a Printbar on page 135 of the Compose V3.0 User's Guide*). If all 32 channels fire on each printbar, then continue with the next step. If not, then reprime the printbar as per *steps 3 & 4*.
- 6. Simultaneously, rotate and slide the printhead back over to its printing position and resume printing. Rotate the printhead as smoothly as possible to avoid depriming.

Technique IV - Raise the Printhead Bridge

This technique is similar to *Technique III*, but requires that the printhead orifices face directly upward. This technique will use the natural buoyancy of air bubbles in the ink to allow any air bubbles to easily escape from the channels.

- 1. Slide the printhead along the bridge rail towards the front of the machine. Stop at the end of the bridge rail.
- 2. Raise the height of the printhead by rotating the bridge **Handwheel**. Stop when the printhead can be rotated such that the orifices are facing <u>directly</u> <u>upward</u>.
- 3. Rotate the printhead over 180°.
- 4. Press the appropriate **Priming Button** to prime the printbar. It is recommended that the button initially be depressed until a steady flow of ink flows from the orifices. Then use short quick bursts to complete priming.
- 5. Wipe the ink from the printbar until the ink flows equally from all 32 channels.
- 6. Test fire the channels by using the ForceJet function (*To Test Fire a Printbar on page 135 of the Compose V3.0 User's Guide*). If all 32 channels fire on each printbar, then continue with the next step. If not, then reprime the printbar as per *steps 4 & 5*.
- 7. Simultaneously, rotate and slide the Printhead back over to its printing position and resume printing. Rotate the Printhead as smoothly as possible to avoid depriming.
- 8. Lower the height of the printhead to its original height by rotating the bridge handwheel to obtain the proper quality.

Note : This technique can also be repeated with the Printhead rotated over slightly past 180°.

Technique V - Using the Priming Bulb

The priming bulb, available with all systems, should be used to dislodge stubborn orifices since it allows more pressure to be applied during the priming process. The increased pressure may be enough to prime out the air bubble or debris. Follow the steps outlined below.

- 1. Remove the **Priming Hose** from the reservoir vent cap hole (*see Figure 4.1*).
- 2. Insert the **Priming Bulb** into the reservoir vent cap hole ensuring that there is a proper seal between it and the vent cap hole.
- 3. Repeat *Techniques III and IV* using the priming bulb instead of the priming system.

Note : Squeeze sides of the priming bulb. Do not cover the hole at the top of the priming bulb.

Technique VI - Gravity Prime

This technique uses gravity to prime the printbars. It requires raising the ink reservoir and rotating the printhead simultaneously and may require two people. Follow the steps outlined below.

- 1. Slide the printhead along the bridge rail towards the front of the machine. Stop at the end of the bridge rail.
- 2. Raise the **Ink Reservoir** several inches above the printbar's orifice plate height. This is done by sliding the ink reservoir on the slides in the **Inkwell** container. Gravity should cause ink to flow from all 32 channels. If necessary, remove the *6-32 UNF screws* fastening the reservoir to its inkwell plate to permit manual raising.
- 3. Wipe the ink from the printbar until the ink flows equally from all 32 channels. If desired, the priming system or priming bulb can be used for additional pressure.
- 4. After one minute, gently lower the ink reservoir to a level where the ink stops leaking, but still remains at the surface of the orifices.
- 5. Test fire the channels by using the ForceJet function (*To Test Fire a Printbar on page 135 of the Compose V3.0 User's Guide*). If all 32 channels fire on each printbar, then continue with the next step. If not, then resume gravity priming.
- 6. Simultaneously, rotate and slide the printhead back over to a **45° angle**. Rotate the printhead as smoothly as possible to avoid depriming. *Note: Because the ink Reservoir is higher than the Printbar, ink will begin to slowly weep from the orifices.*
- 7. Quickly lower the ink reservoir to its original level. When lowered, the ink should stop weeping from the printbar.
- 8. With the printhead at a 45° angle, gently wipe any excess ink from the printbar orifice plate.
- 9. Gently, rotate the printhead back down to its printing position and resume printing.

Note : By having ink leak from the orifices when rotating the printhead, air cannot be ingested into the Printbar.

Technique VII - Ship Cap over Channels

If there are a few stubborn channels that will not prime, isolate these channels using the printbar ship cap to create additional pressure on the affected orifices. Follow the steps outlined below.

- 1. Place the printbar **Ship Cap** over the primed channels, thereby isolating the unprimed ones.
- 2. Prime the printbar using one of the techniques outline above. All of the ink will be forced through the uncapped channels.
- 3. After one minute of priming, remove the ship cap and prime the printbar using one of the techniques outlined above.

Technique VIII - Let Printbar Sit at Operating Temperature

- 1. If all other techniques are unsuccessful, let the printbar sit at operating temperature for 5 to 20 minutes. The heat of the ink may cause the air bubble to dissolve in the fluid. Leave the printbar in the printing position.
- 2. After the printbar has sat under heat for 20 minutes, first try to print a test pattern (or address) instead of trying to prime. In many cases, the stubborn channel will be primed, and the system will be ready to print. <u>Do Not</u> first try to rotate the printhead over and prime.
- 3. If the stubborn channel is still missing, then let the Printbar sit undisturbed under heat overnight.

Note : This technique is often effective for **VersaPrint** and **HiDef** printbars. Therefore, upon initial installation, it is suggested that these types of printbars be left under heat overnight before attempting to prime.

4.3.3 Purging

In rare instances, large amounts of air will have entered the fluidics. This will be difficult to purge from the orifices alone. The air will remain in the chamber plate manifold and cause periodic depriming of channels. Ingestion of this amount of air can take place as the result of extreme shock to the printhead or because the end cap has been removed. *Other causes should be correctable with a simple reprime*.

Purging should be a <u>last resort procedure</u> before requesting a service call. A purge should only be necessary if the printbar has sustained a large shock or other occurrence which results in a large degree of air ingestion. Otherwise, standard priming should be sufficient to eliminate air from the system. In order to purge the systems of excessive air, the following steps should be taken:

To Purge a Printbar

- 1. Heat the printhead to its proper operating temperature.
- 2. Snap the orifice **Ship Cap** in place.
- 3. Place an absorbent material (lint-free wipe) strategically under the vent tube and directly under, but not touching, the orifice plate. The material should be lint-free and dust-free, and not liable to contaminate surfaces near the fluidic path. <u>CAUTION: Avoid the hot heater resistor under each Printbar, as well as all underside wiring</u>.
- 4. Raise the **Ink Reservoir** 6 to 12 inches (150 to 600 mm) above the level of the printbar.
- 5. Rotate the printhead 90° so the printbar orifices are facing sideways. This will prevent any ink from spilling onto the PC board.

- 6. The printbar End Cap (see Figure 4.2) should then be unscrewed, using a 1/4" nut driver (or wrench), and removed to purge the ink bubbles trapped in the printbar manifold. <u>CAUTION: Breakage of the End Cap can easily</u> <u>occur using a wrench</u>. Pressure must be maintained until a good steady flow of ink can be achieved once the End Cap has been removed.
- 7. While this flow is being maintained, the End Cap must be replaced. Maintaining the flow of ink is very important; otherwise, an air bubble will be left in the fluid path. Hand-tighten the End Cap. <u>CAUTION: Do not</u> <u>over tighten or End Cap breakage may occur. The Warranty is voided if</u> <u>the End Cap is broken.</u>
- 8. Carefully wipe off the outside of the printbar and the contacts at the base. Also wipe off any ink on the PC board with a lint-free wipe. Some Trident inks are conductive. Be certain to remove all ink from the PC board and back of the printbar. Take care to see that no wires are damaged. Then carefully wipe the orifice plate with a lint-free wipe.
- 9. Remove the orifice ship cap and follow one of the priming techniques outlined above.

Note : Removal of the Vent Cap exposes the fluidics to contamination. The above procedure is a last resort and should ONLY be attempted if repriming does not recover a jet outage. If performed incorrectly, the Printbar may be in worse condition that when the purge procedure was begun.

4.3.4 Shutdown

Daily Shutdown

There are two shutdown procedures for the printbars. On a daily basis, the printbars can be left *uncapped* at the end of the day. When starting the system the following day, simply turn the machine ON and print about 10-15 test patterns before printing any addresses. **AllWrite** and **FastDri** printbars may require the use of **Maintenance Spray** to remove any dried ink on the orifice plate.

To Daily Shut-Down Procedure

- 1. Gently tilt each Printhead at a 45° angle.
- 2. Turn the Controller power OFF.

Note : <u>Do Not</u> leave material underneath the Printbar(s) overnight. If the material touches the orifices, it will slowly draw all of the ink from the printbar and ink reservoir.

Weekend Shutdown

If the printhead is going to sit unused for 2 days or longer, the printbar(s) should be properly capped with the **Ship Cap** to protect it from debris and ink drying. When the ship cap is removed to resume printing, the printbar will have to be primed.

P Ship Cap Installation

- 1. Spray a small amount of appropriate **Maintenance Spray** across the printbar orifices. All but **HiDef** inks have their own respective sprays; HiDef does not require any. This will help dissolve any dried ink on the orifice plate and maintain the image quality. <u>Use the proper Maintenance Spray for your Printbar.</u>
- 2. Spray some Maintenance Spray on the printbar **Ship Cap** and wipe with a lintfree wipe until it appears to be clean. Again, use the proper Maintenance Spray.
- 3. Snap the Ship Cap into place on the printbar. The Cap is easier to remove if it is attached with the tab facing the front of the machine (*when the Printhead is turned over*). If the Ship Cap becomes delaminated, it's important that it be replaced with a new one immediately (*see Figure 4.5*).
- 4. Rotate the printhead so it is sitting at a 45° angle and let it sit overnight.

Note : <u>Do Not</u> swap the **FastDri** Ship Caps with Caps placed on **HiDef** or **VersaPrint** printbars. Clogging of the orifices could result.

Close the vent cap on the ink reservoir during extended periods of non-use (more than one week).

If you use the wrong type of maintenance spray, the ink may jell and clog the orifices.

4.4.5 Printbar Shipping

To prevent breakage and possible warranty voidance, the original Trident printbar shipping container and foam packaging or equivalent must be used. Appropriate care must be taken to prevent breakage or leakage due to improper packaging. Ensure that the following steps have been taken :

- The printbar Ship Cap must be in place. Failure to do so will result in ink leakage and severe deprime. In addition, the orifice plate will become susceptible to scratches. <u>Any printbars shipped back without</u> <u>the ship cap installed will immediately be returned</u>.
- The ink reservoir **Vent Cap** <u>must be closed</u> and the reservoir **Gasket** must be inserted. Failure to do so will result in severe ink leakage and deprime.
- The Printbar must be placed in the original plastic bag (or a "Ziploc" plastic bag).
- Fill out the **Return Form**, including a description of the problem and print samples.

Note : Please return Printbars without wipe cards, level detect cables, priming bulbs, and other accessories as they will not be returned.

4.4 Print Quality

The three main factors that can affect print quality are printbar height, speed, and voltage/temperature. Each case is explained in more detail below in order of importance.

4.4.1 Printhead Height

The most common problem associated with poor print quality, and also the one most easily remedied, is an improper printhead height setting. The printbar ink droplets are elongated during firing, created a spear shape. The distance from the printbar to the paper determines the amount of tail layover on each character. The greater the distance between the printbar(s) and the mailpiece, the worse the print quality. The following factors must be considered from the standpoint of printhead height.

- Printhead must be as close to the mailpiece as possible.
- Ideal height is when there is a slight drag on mailpiece when slid under printhead by hand.
- Head mount must be square to the tabletops to ensure that all of the orifices on each printbar(s) is equidistant from the mailpiece.
- Printbar orifice plate must be flush with the edges of the mount cavity.

4.4.2 Base Speed

Another factor in determining print quality is the speed at which the mailpiece travels through the printing area. At higher speeds, the tail of the ink droplet will land in a different location than the head of the droplet and cause the print to look "fuzzy". As the base speed increases, the print quality will decrease.

- With a 1" gap between pieces and the printhead height properly adjusted, speed will begin to affect print quality around 22,000 PPH (around 1.8 m/s) for No. 10 envelopes.
- At speeds greater that this, there may be a "shadowing" effect in the characters causing the print to look "fuzzy".

4.4.3 Voltage and Temperature

Another factor in determining print quality is the voltage and temperature settings of the printbar. The voltage and temperature settings <u>should only be</u> <u>adjusted by experienced trained personnel</u>. Temperature and voltage will affect print quality in the following ways :

- At low voltage, printbar does not "jet" enough ink to form character.
 Result is character looks distorted or "fuzzy".
- At lower (colder) temps, ink is too thick to flow smoothly and there is not enough ink "jetted" to form character. Result is similar to low voltage, where characters are distorted.
- Low temperatures are not usually a problem with FastDri or AllWrite printbars as operating temperatures of these printbars (30 °C) is close to ambient temps. HiDef and VersaPrint printbars are more likely to have print quality problems at colder temperatures.

4.5 Printbar Recommendations

Based on discussions with end-users, it has become apparent that end-users who print with the printbars on a regular basis have fewer debris or clogging problems than those who use the printbars only every few months.

Buskro recommends that, during extended periods of non-use, end-users perform a reprime of the printbars and print about 1000 test patterns every two weeks. By performing this bi-weekly maintenance on the printbars, the long term reliability will be increased.

For printbars that remain on the shelf for extended periods, it is recommended that these printbars be primed bi-weekly to circulate the ink.

4.5.1 Printbar "Do's"

- DO open the Vent Cap on the ink reservoir first.
- DO remove the **Ship Cap** on the printbar when mounted in your system.
- DO use approved lint-free wipes when priming the printbar.
- DO attempt all priming procedures before purging.
- DO purge ink/air throughout the printbar **End Cap** if orifices do not weep during gravity prime. (This is a last resort technique if priming doesn't recover all the channels.)
- DO check that the reservoir **Gasket** is installed before priming. Sometimes this gasket will stick to the ink bottle.
- DO print test patterns bi-weekly during extended periods of non-use.
- DO cap printbars with the **Ship Cap** if they will not be used for 2 days or longer.

4.5.2 Printbar "Don'ts"

- DO NOT move the printbar without installing the proper **Ship Cap**.
- DO NOT install or remove the bottle halfway or ink will overfill the ink reservoir.
- DO NOT over-tighten the ink bottle. Torque the bottle as if installing a light bulb.
- DO NOT operate with the reservoir **Vent Cap** closed.
- DO NOT SQUEEZE THE INK BOTTLE. A stiff bottle was chosen for the reservoir to eliminate problems caused by bottle squeezing.
- Squeezing the ink bottle overfills the ink supply.
- Squeezing the ink bottle with the reservoir **Vent Cap** closed can cause serious deprime.
- Squeezing the ink bottle with all surfaces capped will pressurize the system, causing overflow and printbar weeping.
- DO NOT leave the reservoir **Cap** unscrewed from the reservoir for any length of time. The ink supply should not be exposed to airborne debris.
- DO NOT prime with the ink bottle installed. This will result in massive ink spillage.
- DO NOT leave any materials under the **Printhead** while the machine is idle. If any material touches the surface of the printbar, it will draw all of the ink out of the system.
- DO NOT leave printbars under heat without printing for more than 1 week.
- DO NOT use compressed air to try to clean the printbars. You may break the transducers.

4.5.3 AllWrite and FastDri Printbars Start-Up Considerations

"Start-up problem" is defined as a weak or non-printing orifice following a period of non-firing, which due to evaporation or an ink component, leaves another thicker ink component behind in the orifices with the end result that the print demonstrates missing dots.

To remedy this, Buskro has incorporated "sub-jetting" which continually activates the channels when the printbar is at operating temperature and not firing. This "sub-jetting" is implemented in the Controller and has been found to be highly effective in inhibiting the start-up problem.

For those rare situations in which the controller may be **Offline** while the printhead is still being heated, the orifices can be recovered by simply wiping with **AllWrite** or **FastDri** Maintenance Spray. The procedure for the use of the spray is as follows:

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- 1. Spray several times on a lint-free wipe.
- 2. Gently, wipe the orifices with the moist part of the wipe, then with a dry section.

Table 4.5 outlines the conditions under which start-up problems can be expected with **AllWrite** and **FastDri** inks. All channels can be recovered from the start-up problems by wiping the surface of the printbar with the appropriate maintenance spray.

Table 4.5 - AllWrite and FastDri Start-Up Conditions

Condition	Start-up Problem period
Printbar not at operating temperature, but uncapped and not firing.	3 days or longer unfired.
Printbar at operating temperature, but uncapped and not firing.	10 to 15 minutes unfired.
Printbar at operating temperature, uncapped and not firing, but with sub-jetting implemented.	3 days or longer unfired.

4.6 Trident Warranty Coverage

Trident, Inc. strives to provide the most reliable, dependable product possible. Trident, Inc. warranties its ULTRAJETTM and will repair any problems falling within the warranty conditions at Trident's expense. Following are the conditions of this warranty.

Printbar Conditions which void the warranty:

- 1. Using any other ink other than Trident's or using improper Trident Ink for specified Printbar (i.e.) using HiDef[™] Ink in a FastDri[™] unit.
- 2. Disconnection of the printbar from the ink reservoir without sealing the printhead at the filter inlet.
- 3. Orifice plate/chamber missing, changed, or damaged. The plate is bonded in some configurations and would require a great shear force to tear it off. (*If a poor bonding has occurred, Trident will be able to tell by examining the orifice plate*).
- 4. Orifice plate coating abraded. This occurs only from extreme abrasion to the orifice plate. (*It appears as a dull or rough area on the plate*).
- 5. Broken transducers. Transducers require a shock to crack.
- 6. Cooked ink. Solidified ink which is determined by Trident to have resulted from an over-temperature condition.
- 7. Electrical/electric wiring removed, changed, or broken.
- 8. Any other "extreme" physical damage. **Examples :** Broken end cap stem or foot body leg.

4.7 Frequently Asked Questions about Trident Printbars

- Can I use any type of Maintenance Spray on any type of Printbar? For example, can FastDri Maintenance Spray be used on HiDef Printbars? If not, what can be used?
- Answer :DO NOT use the Maintenance Spray on anything but the type of
Printbar that it is designed for. FastDri Maintenance Spray on HiDef
Printbars will result in a chemical reaction causing clogged orifices.
AllWrite, FastDri, and VersaPrint Printbars have their own
Maintenance Spray. HiDef ink, due to its oil-based components,
should never dry in the orifices. Therefore, no maintenance spray is
needed.

2. Can the ink be intermixed?

<u>Answer</u>: Except for the VersaPrint inks, absolutely not. If the FastDri ink is mixed with any other ink, a tar-like substance will form.

3. How often are thermal fuses on the Printbar subject to failure?

Answer: Not very often. For the fuse to blow it requires that either pin 40 (Head Heater Return) shorts to ground; or pin 41 (sense resistor voltage) shorts to pin 40 sending high voltage through the fuse; or some other high voltage source connects across the thermal fuse. Typically, about one spare thermal fuse will cover 10 Printbars or more for one year.

4. What can be used to clean the Printbar and ink supply?

Answer : If you mean the outside, then alcohol will work well. Make sure the Ship Caps are in place. The inside of the Printbar should not be touched unless you are trained and are in clean room type conditions.

5. What is field replaceable without affecting the warranty?

- Answer : The thermal fuse.
- 6. How often is maintenance necessary?
- Answer :That depends on the particular application and Printbarimplementation. In most cases when a print anomaly is noticed, a mildwiping with a lint-free wipe will remove paper dust from the orifices,and correct the problem. Otherwise, a reprime will eliminate air whichmay have entered the channels. The frequency of these steps variesgreatly.

7. Do the Printbar orifices need to be capped every evening?

Answer : Capping all Printbars prior to evening shutdown is a good habit to stress. However, the Printbars may be left uncapped overnight to reduce priming time the next morning. It must be noted that a "skin" of ink may dry on the orifice plate of the FastDri and AllWrite Printbars which a wipe with a moist lint-free wipe may remove. HiDef, and VersaPrint Printbars do not need to be capped nightly as these inks do not exhibit any dryout. It is recommended that all Printbars be capped when they will sit unused for 2 days or longer. This will prevent accumulation of paper dust on the orifices or possible ink drying.

8. What will cause air to get into the channels?

Answer: A paper jam in from the orifices; a severe shock to the Printbar while uncapped; a shock to the hose between the Printbar and the Reservoir; or by removing the orifice Ship Cap while having the Reservoir Vent Cap in the "Closed" position can all result in air entering the channels.

9. Can handling of the circuitry attached to the Printbar result in a shock hazard?

Answer: Technically it is a potential shock hazard because it is above the 42 Volt maximum safety level set by many of the safety agencies. The current and power outputs to the Printbar are extremely low, but caution should be taken. In addition, the heater under the Printbar can get very hot and should not be touched.

10. Why can't the pressure generated by the transducer expel the air bubbles along with the ink?

Answer : The air bubbles can be highly detrimental in the micro-inch world of the inkjet chamber. As the transducer pulses and pressurizes the micro-chamber, the air bubbles shrink in diameter and act as energy absorbers, resulting in insufficient energy to eject the droplets.
 Pressure priming with the priming bulb, or by lowering the Printbar below the ink supply is therefore necessary.

11. Is there any other technique for getting a stubborn channel to prime?

Answer : If all else fails, allow the Printbar to sit at operating temperature overnight. Typically, any stubborn air bubbles will dissolve into the ink, and be gone the next morning.

12. Do the filters in the ink Reservoir and Printbar need periodic replacing?

- Answer: No. The filters were designed to have an extra large surface area to allow adequate flow even after years of operation. None of the units sold ever failed due to a clogged filter.
- 13. Should we be concerned about the routing on the hose between the Printbar and the ink Reservoir? In other words, if the hose dips very low relative to the Printbar, could air be ingested thorough the orifices?
- Answer: No, you need not be concerned over the routing. The important point is the relative positions of the orifices to the ink level inside the Reservoir.

4.8 Glossary of Terms

Channel	One of the units comprised of a piezoelectric transducer, restrictor and associated chamber/orifice plate. There are 32 individual Channels in the Printbar.
Debris	A solid material which blocks an orifice or entire channel. It can be generated either externally, (paper dust) or in rarer cases, internally (metal chips.
End Cap	The Printbar cap at the furthest end of the ink path. When removed, the Printbar can then be purged of air and ink.
Orifice	One of the openings at the end of each channel from which the ink droplet(s) are ejected. There are three orifices per channel in the Printbar.
Piezo Crystal	The transducer element which contracts, then relaxes, printing the droplets.
Prime	The process of evacuating ink and air out of the Channel Orifices.
Purging	The process of evacuating ink and air out of the Printbar End Cap.
Reservoir	Bottle supplied ink Reservoir with internal level detect system.
Restrictor Plate	The narrow fluidic path which controls the flow of ink into the chambers.

Start-Up	During periods of non-printing, the effect of evaporation of
	some ink components out of the orifices, leaving thicker ink
	components behind, resulting in reduction in droplet velocity
	and droplet volume.
Transducer	See "Piezoelectric Crystal".
Trim Pack	A group of 31 selected resistors connected to the Printbar
	which adjust or "trim" the voltage of each transducer to
	obtain the same drop velocity across all 32 Channels. Used
	when the Channel to Channel voltage variations exceed a
	predetermined range specification.
Vent Cap	The ink Reservoir cap where the priming bulb or priming
	hose is inserted.

Mechanical Base Drawings

Appendix **A**

BK660 Inkjet System

BK660A-2X, BK660 Inkjet System BK660A, BK660 Inkjet Base Assembly 300603A, Base Mechanical Assembly 100601A, Transport Driveshaft Assembly 100603A, Feed Roller Driveshaft Assembly 116302A, Transport Motor Assembly 300601A, Feeder Bridge Assembly 630020A, Jam Stop Microswitch Assembly 300602A, Sideframe Assembly 325601A, Shuttle Motor Assembly 325603A, Shuttle Feeder Assembly 630004A, Cycle Proximity Switch Assembly 325602A, Transport Belt Tabletop Assembly 325604A, Tabletop Assembly 100314A, Outfeed Roller Shaft Assembly 310340A, Rear Tabletop Assembly 630002A, Photocue Sensor Assembly 630600A, Shaft Encoder Assembly 700607A, Rear Door Assembly 706605A, Computer Cage Assembly (BK660) 711600A, Inkwell Assembly 713602A, Priming Pump Assembly 711601A, Controller Console Assembly 706609A, Faceplate Assembly 713613A, BK660 Base Cabinet Assembly 330607A, Blower Assembly 706608A, Instrument Panel Assembly 713612A, Electrical Box Assembly 706610A, Power Supply Assembly 801102A, Vacuum Pump Assembly 700605A, Communications Plate Assembly (BK660) 713601A, Printhead Bridge Assembly BK661A/F/H/V, Single Printhead Assembly, AllWrite/FastDri/HiDef/VersaPrint BK662A/F/H/V, Twin Printhead Assembly, AllWrite/FastDri/HiDef/VersaPrint

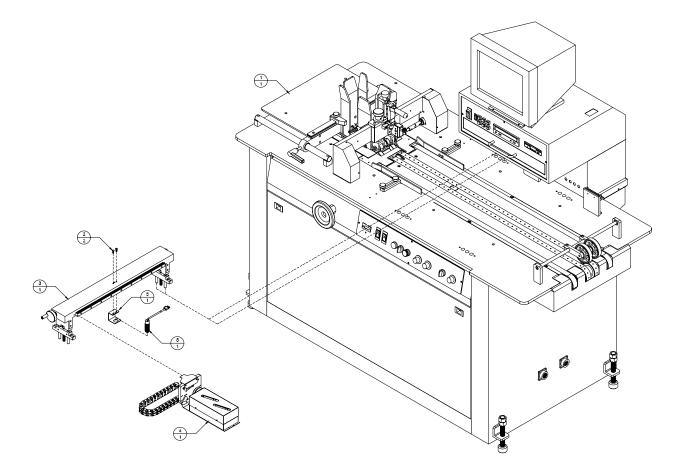
BK640 Inkjet System

BK640A-2X, BK640 Inkjet System

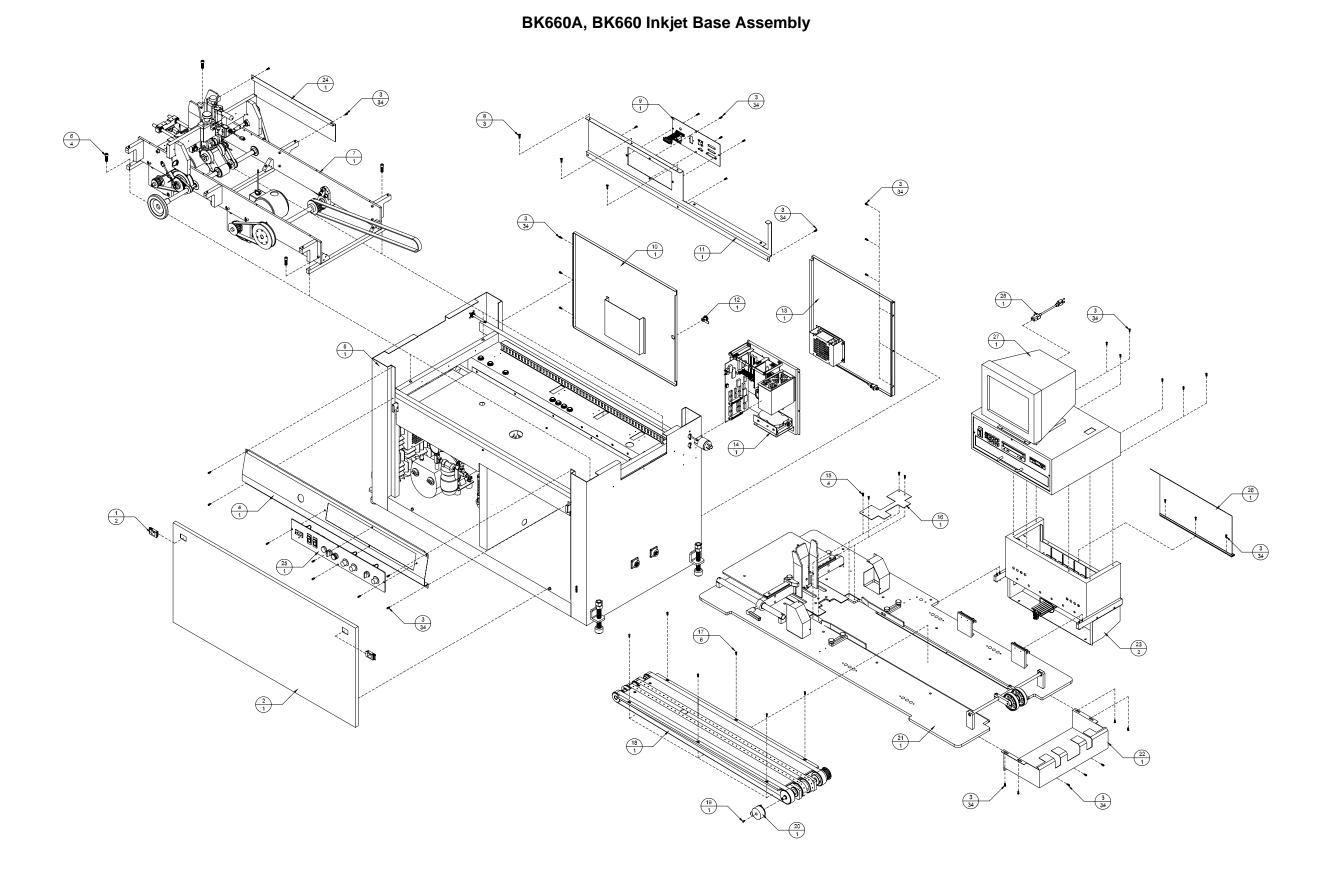
- BK640A, BK640 Inkjet Base Assembly
- 300603A, Base Mechanical Assembly
- 100601A, Transport Driveshaft Assembly
- 100603A, Feed Roller Driveshaft Assembly
- **116302A,** Transport Motor Assembly
- 300601A, Feeder Bridge Assembly
- 630020A, Jam Stop Microswitch Assembly
- 300602A, Sideframe Assembly
- 325601A, Shuttle Motor Assembly
- 325603A, Shuttle Feeder Assembly
- 630004A, Cycle Proximity Switch Assembly
- 325602A, Transport Belt Tabletop Assembly
- 325604A, Tabletop Assembly
- 100314A, Outfeed Roller Shaft Assembly
- 310340A, Rear Tabletop Assembly
- 630002A, Photocue Sensor Assembly
- 630600A, Shaft Encoder Assembly
- 700607A, Rear Door Assembly
- 706606A, Computer Cage Assembly (BK640)
- 711625A, Keypad Assembly
- 711600A, Inkwell Assembly
- 713602A, Priming Pump Assembly
- 713613A, BK660 Base Cabinet Assembly
- 330607A, Blower Assembly
- 706608A, Instrument Panel Assembly
- 713612A, Electrical Box Assembly
- 706610A, Power Supply Assembly
- 801102A, Vacuum Pump Assembly
- 700606A, Communications Plate Assembly (BK640)
- 713601A, Printhead Bridge Assembly
- BK661A, Single Printhead Assembly, AllWrite/FastDri/HiDef/VersaPrint
- BK662A, Twin Printhead Assembly, AllWrite/FastDri/HiDef/VersaPrint

Note : For part drawings for the BK640 Inkjet System, please refer to the page number listed above.

BK660A-2X, BK660 Inkjet System



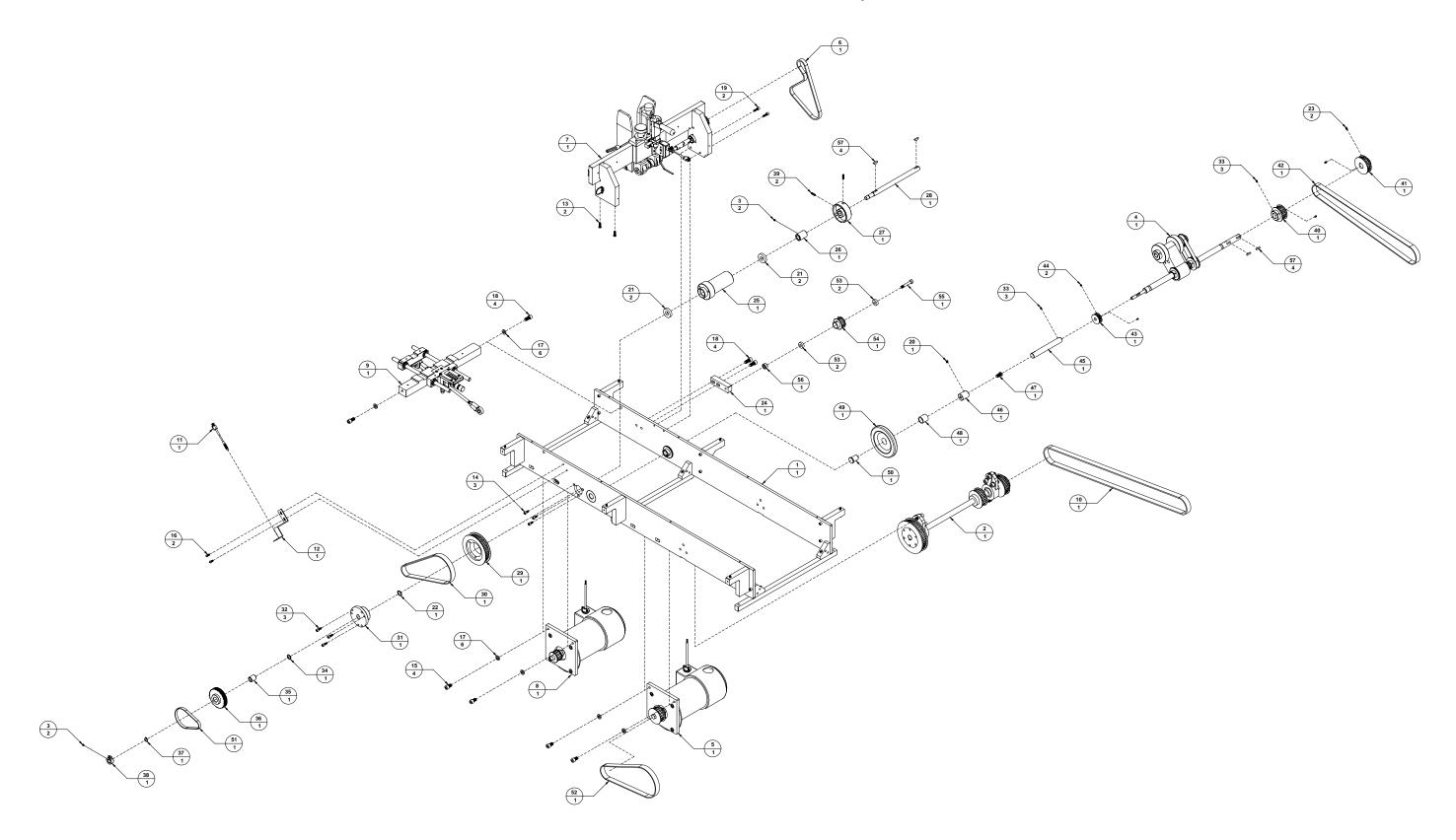
Item	Part Number	Quantity	Description	Reference
1	BK660A	1	BK660 Inkjet Base Assembly	Page A-3
2	402520	2	Screw, BHCS, 6-32 UNC x 3/8"	
3	713601A	1	Printhead Bridge Assembly	Page A-50
4	BK662A/F/H/V	1	Twin Printhead, AllWrite/FastDri/HiDef/VersaPrint	Page A-54
5	706602	1	Photocue Sensor Bracket	
6	630002A	1	Photocue Sensor Assembly	Page A-26



Item Description Description				
ltem	Part Number	Quantity	Description	Reference
1	446000	2	Slide Latch - A3	
2	700609	1	Front Door	
3	404510	34	Screw, BHCS, 10-32 UNF X 1/4"	
4	700610	1	Instrument Panel	
5	713613A	1	BK660 Base Cabinet Assembly	Page A-39
6	407275	4	Screw, SHCS, 3/8-16 UNC x 1 1/4"	
7	300603A	1	Base Mechanical Assembly	Page A-7
8	404040	3	Screw, FHCS, 10-32 UNF x 5/8"	
9	700605A	1	BK660 Communications Plate Assembly	Page A-48
10	700620	1	Right Rear Door	
11	700611	1	Rear Top Cover	
12	615313	1	Cam Lock, 5/8"	
13	700607A	1	Rear Door Assembly	Page A-28
14	706605A	1	Computer Cage Assembly	Page A-29
15	402510	4	Screw, BHCS, 6-32 UNF x 1/4"	
16	700617	1	Shuttle Feeder Cover	
17	404530	6	Screw, BHCS, 10-32 UNF X 1/2"	
18	325602A	1	Transport Belt Tabletop Assembly	Page A-20
19	404310	1	Screw, PHMS, M4 x 10	
20	630600A	1	Shaft Encoder Assembly	Page A-27
21	325604A	1	Tabletop Assembly	Page A-22
22	700608	1	Outfeed Roller Cover	
23	711600A	1	Inkwell Assembly	Page A-31
24	700616	1	Rear Pulley Cover	
25	706608A	1	Instrument Panel Assembly	Page A-41
26	700605	1	Controller Rear Door	
27	711601A	1	Controller Console Assembly	Page A-35
28	606322	1	Monitor Power Cord	

Table A.2 - BK660 Inkjet Base Assembly (BK660A)

300603A, Base Mechanical Assembly



Item	Part Number	Quantity	Description	Reference
1	300602A	1	Sideframe Assembly	Page A-14
2	100601A	1	Transport Driveshaft Assembly	Page A-8
3	404807	2	Screw, SHSS, 10-32 UNF x 3/16"	
4	100603A	1	Feed Roller Driveshaft Assembly	Page A-9
5	116302A	1	Transport Motor Assembly	Page A-10
6	120604	1	Double Gearbelt, D240L050	
7	300601A	1	Feeder Bridge Assembly	Page A-12
8	325601A	1	Shuttle Motor Assembly	Page A-15
9	325603A	1	Shuttle Feeder Assembly	Page A-17
10	120360	1	Timing Belt, 600L075	
11	630004A	1	Cycle Proximity Switch Assembly	Page A-18
12	706611	1	Cycle Switch Bracket	
13	405550	2	Screw, BHCS, ¼-20 UNC x ¾"	
14	405230	3	Screw, SHCS, ¼-20 UNC x ½"	
15	407240	4	Screw, SHCS, 3/8-16 UNC x 5/8"	
16	404510	2	Screw, BHCS, 10-32 UNF x ¼"	
17	439020	6	Lockwasher, 3/8" ID	
18	407250	4	Screw, SHCS, 3/8-16 UNC x 3/4"	
19	405250	2	Screw, SHCS, ¼-20 UNC x ¾"	
20	405810	1	Screw, SHSS, ¼-20 UNC x ¼"	
21	500040	2	Bearing, R10, 5/8" ID	
22	446330	1	Spacer Washer, 5/8" ID x 0.031" Thick	
23	404820	2	Screw, SHSS, 10-32 UNF x 3/8"	
24	330606	1	Idler Pulley Block	
25	330004H	1	Crankshaft Housing	
26	123600	1	Crankshaft Spacer	
27	109600	1	Lower Roller Hopper Cam	
28	100602	1	Shuttle Crankshaft	
29	116601	1	Pulley, 36LH075	
30	120332	1	Timing Belt, 255L075	
31	127314	1	Pulley Hub	
32	405240	3	Screw, SHCS, ¼-20 UNC x 5/8"	
33	404810	3	Screw, SHSS, 10-32 UNF x ¼"	
34	445015	1	Spacer Washer, ½" ID x 0.015" Thick	
35	500600	1	One Way Bearing, ½" ID x ¾" OD	
36	116602	1	Pulley, 48XLB037 x ³ / ₄ "	
37	437050	1	Retaining Ring, ½" ID, External	
38	109050	1	Sensor Cam	
39	405850	2	Screw, SHSS, ¼-20 UNC x ¾"	
40	116213	1	Pulley, 16LF075 x ¾"	
41	116606	1	Pulley, 20LB050 x ¾"	
42	120336	1	Timing Belt, 450L075	
43	116008H	1 2	Pulley, 16XL037 x 3/8"	
44	403807		Screw, SHSS, 8-32 UNC x 3/16"	
45	100605	1	Handwheel Coupling	
46	127304	1	Handwheel Shaft Collar	
47	407550	1	Screw, BHCS, 3/8-16 UNC x ³ / ₄ "	
48	500213	1	One Way Bearing, ³ / ₄ " ID x 1" OD	
49 50	127004	1	Handwheel	
	127302 120212		Handwheel Shaft	
51	120212	1	Timing Belt, 120XLB037 Timing Belt, 270L075	
52		1 2		
53	500020		Bearing, R6, 3/8" ID	
54 55	116533	1	Pulley, 12LF050 x R6 Shoulder Bolt, 3/8" x 1 ½" (5/16-18 UNC)	
55	416180 123601	1	Shoulder Bolt, 3/8 X 1 ½ (5/16-18 UNC)	
56				

Table A.3 - Base Mechanical Assembly (300603A)

100601A, Transport Driveshaft Assembly

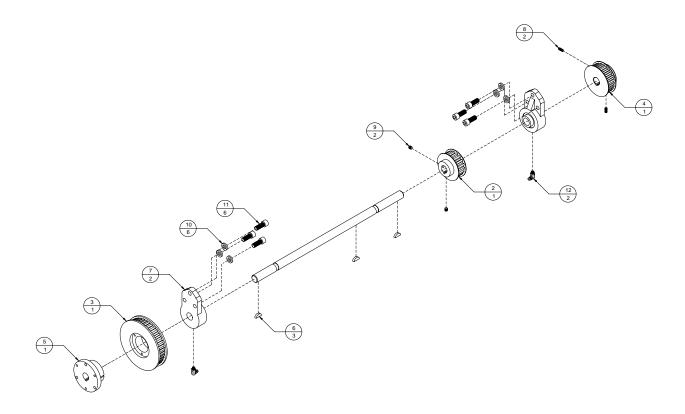
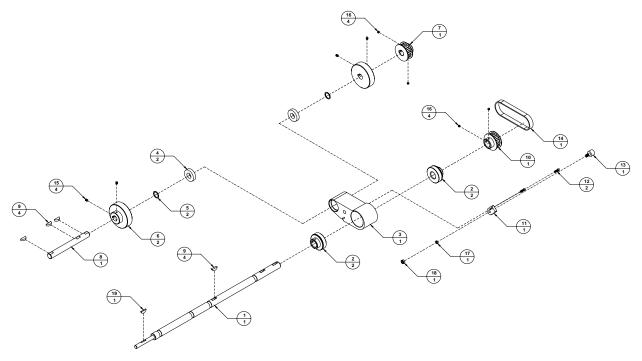


 Table A.4 - Transport Driveshaft Assembly (100601A)

Item	Part Number	Quantity	Description	Reference
1	100601	1	Transport Driveshaft	
2	116301	1	Pulley, 18LB075 x ¾"	
3	116538	1	Pulley, QD40LH075	
4	116600	1	Pulley, 24LB075 x ¾"	
5	127600	1	Bushing, Split Taper, ¾" ID	
6	430250	3	Woodruff Key, #606, 3/16" x ¾"	
7	500300	2	Bearing, UCFK204-12S, ¾" ID	
8	404830	2	Screw, SHSS, 10-32 UNF x ½"	
9	405810	2	Screw, SHSS, ¼-20 UNC x ¼"	
10	439020	6	Lockwasher, 3/8" ID	
11	407270	6	Screw, SHCS, 3/8-16 UNC x 1"	
12	802204	2	Grease Fitting, 90° ¼-28 UNF	



100603A, Feed Roller Driveshaft Assembly

Table A.5 -	Feed Roller	Driveshaft	Assembly	(100603A)
1 4010 11.0	I ccu nonci	Drivesnaji	instituty	(10000011)

Item	Part Number	Quantity	Description	Reference
1	100603	1	Feed Roller Driveshaft	
2	500055	2	Bearing, UBR204-12S, ¾" ID	
3	203600	1	ower Feed Roller Block	
4	500040	2	Bearing, R10, 5/8" ID	
5	446330	2	Spacer Washer, 5/8" ID x 0.031" Thick	
6	106602	2	Lower Feed Roller	
7	116604	1	Pulley, 14LF050 x 5/8"	
8	100604	1	Lower Roller Shaft	
9	430250	4	Woodruff Key, #606, 3/16" x ¾"	
10	116603	1	Pulley, 14LF050 x ¾"	
11	203601	1	Arm, Hopper Extension	
12	403230	2	Screw, SHCS, 8-32 UNC x 1/2"	
13	510040	1	Cam Follower, ½" OD	
14	120311	1	Timing Belt, 124L050	
15	404810	4	Screw, SHSS, 10-32 UNF x ¼"	
16	404805	4	Screw, SHSS, 10-32 UNF x 1/8"	
17	439009	1	Lockwasher, No. 10	
18	420009	1	Nut, 10-34 UNC	
19	430150	1	Woodruff Key, #406, 1/8" x ¾"	



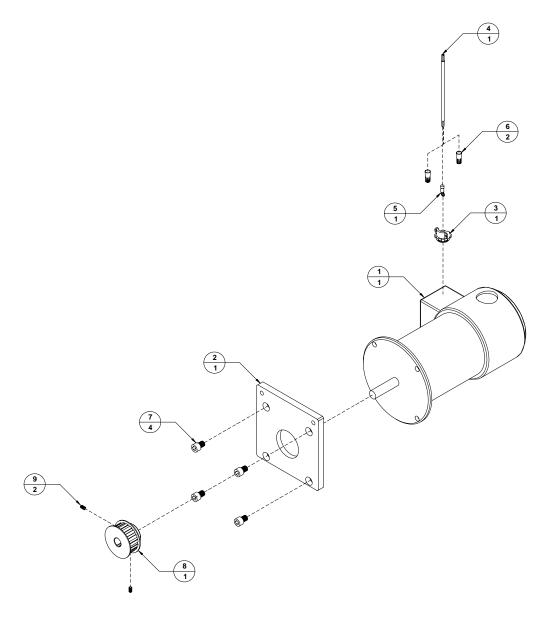
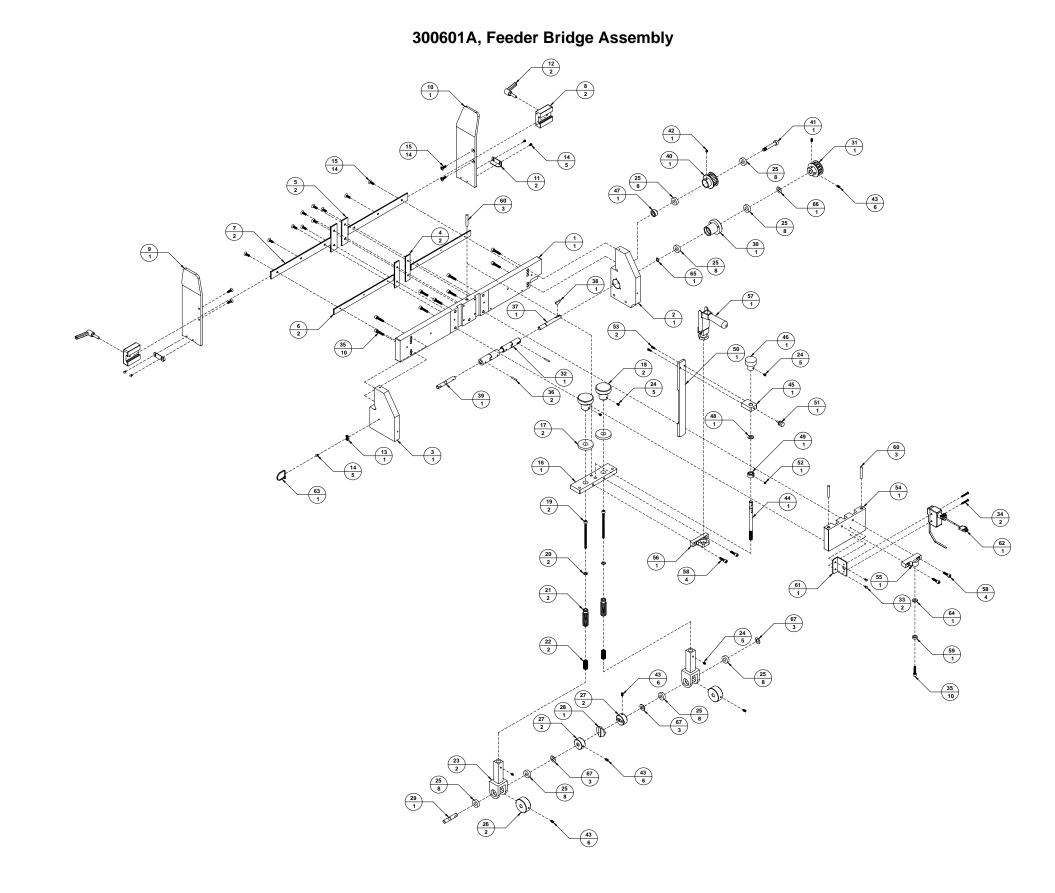


 Table A.6 - Transport Motor Assembly (116302A)

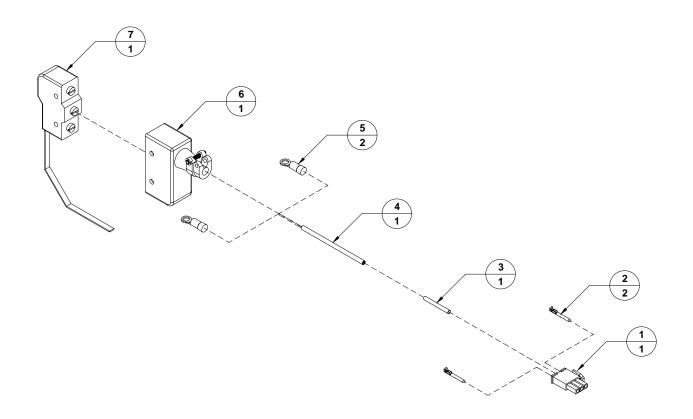
Item	Part Number	Quantity	Description	Reference
1	800002	1	Motor, 1/2 H.P., 180 VDC	
2	325601	1	Motor Mount Plate	
3	615131	1	Box Connector, 3/8", Cable	
4	606034	1	Cable, #16-3, SJOW-A	
5	609114	1	Ring Tongue Terminal, #10	
6	609101	2	Marette, Orange, 14-22	
7	407230	4	Screw, SHCS, 3/8-16 UNC x ½"	
8	116302	1	Pulley, 18LB075 x 5/8"	
9	405820	2	Screw, SHSS, ¼-20 UNC x 3/8"	



Item	Part Number	Quantity	Description	Reference
1	310600	1	Feeder Bridge	
2	300601	1	Left Bridge Frame	
3	300606	1	Right Bridge Frame	
4	340006H	2	Material Gate Slide Spacer, ¾" x 1/8"	
5	340009H	2	Material Gate Slide	
6	340007H	2	Side Guide Rail Spacer, ¾" x 1/8"	
7	340008H	2	Side Guide Rail, 1" x 1/8"	
8	212006	2	Side Guide Clamp Block	
9 10	707007H 707008H	1	Right Side Guide	
10	707008	1 2	Left Side Guide Side Guide Bottom Plate	
12	206010	2	Side Guide Locking Lever	
13	615101	1	Tie Mount	
14	402310	5	Screw, PHMS, 6-32 UNC x ¼"	
15	404030	14	Screw, FHCS, 10-32 UNF x 1/2"	
16	340600	1	Gate Adjuster Plate	
17	438008	2	Upper Roller Locknut	
18	438007H	2	Upper Roller Knob	
19	405295	2	Screw, SHCS, ¼-20 UNC x 3 ½"	
20 21	442530 330007H	2	Spacer Washer, ¼" ID x 0.032" Thick Upper Roller Adjuster	
21	209007	2	Upper Feed Roller Spring	
22	212009H	2	Upper Roller Holder	
24	404810	5	Screw, SHSS, 10-32 UNF x ¼"	
25	500020	8	Bearing, R6, 3/8" ID	
26	106007H	2	Upper Feed Roller	
27	122007H	2	Coupling Collar	
28	122006	1	Coupling Spider	
29	100019H	1	Right Upper Roller Shaft	
30 31	330008H	1	Bridge Bearing Block	
31	116607 122010HA	1	Pulley, 12LF050 x 3/8" Universal Assembly	
33	402510	2	Screw, BHCS, 6-32 UNC x ¼"	
34	402370	2	Screw, PHMS, 6-32 UNC x 1"	
35	405270	10	Screw, SHCS, ¼-20 UNC x 1"	
36	436050	2	Spring Pin, 1/8" Dia. x ¾"	
37	100018H	1	Upper Roller Driveshaft	
38	430150	1	Woodruff Key, #406, 1/8" x ¾"	
39	100020H	1	Left Upper Roller Shaft	
40	116533	1	Pulley, 12LF050 x R6	
41 42	416180 404807	1	Shoulder Bolt, 3/8" x 1 ½" (5/16-18 UNC) Screw, SHSS, 10-32 UNF x 3/16"	
42	404807	6	Screw, SHSS, 10-32 UNF x 3/16 Screw, SHSS, 10-32 UNF x 3/8"	
43	404020 429009H	1	Gate Adjustment Screw	
45	330011H	1	Material Gate Block	
46	438010	1	Gate Adjustment Knob	
47	123601	1	Shoulder Bolt Spacer	
48	440021	1	Brass Washer, 3/8" ID	
49	131020	1	Collar, 3/8" ID	
50	212011H	1	Material Gate	
51	438171	1	Thumbscrew, 10-32 UNF x 3/8"	
52 53	405805 402220	1 2	Screw, SHSS, ¼-20 UNC x 1/8" Screw, SHCS, 6-32 UNC x 3/8"	
53 54	212600	1	Bridge Slide Mount	
55	330610	1	Quick Release Anchor	
56	330604	1	Quick Release Bracket	
57	206200	1	Release Lever	
58	405250	4	Screw, SHCS, ¼-20 UNC x ¾"	
59	439015	2	Lockwasher, 5/16" ID	
60	436315	3	Dowel Pin, ¼" Dia. x 1 ½"	
61	615005	1	Microswitch Bracket	
62	603020A	1	Jam Stop Microswitch Assembly	Page A-13
63 64	615140	1	Lashing Tie Washer, 5/16" ID	
64 65	440015 437038	1	Retaining Ring, 3/8" ID, External	
66	443815	1	Spacer Waher, 3/8" ID x 0.015" Thick	
67	443830	3	Spacer Washer, 3/8" ID x 0.031" Thick	

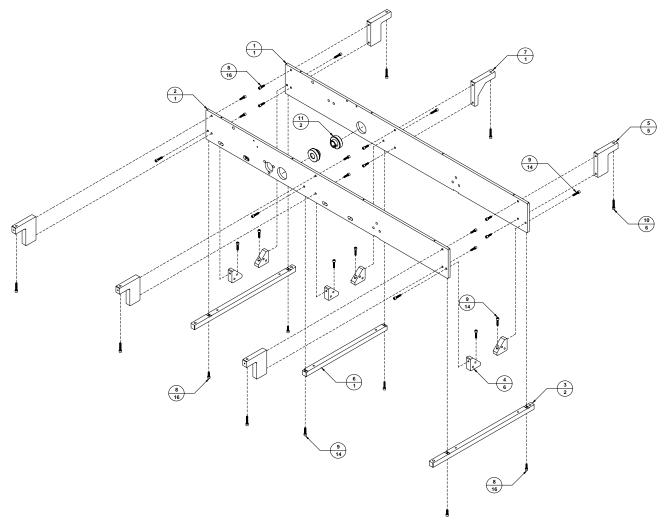
Table A.7 - Feeder Bridge Assembly (300601A)

603020A, Jam Stop Microswitch Assembly



Item	Part Number	Quantity	Description	Reference
1	614001	1	Plug, Cap Pin Housing	
2	614000	2	Male Contact, Pin	
3	609000	1	Shrink Wrap, 3/16" ID	
4	606012	1	Cable, #22-2, Unshielded	
5	609111	2	Ring Tongue Terminal	
6	603021	1	Microswitch Cover	
7	603020	1	Microswitch	

300602A, Sideframe Assembly



Item	Part Number	Quantity	Description	Reference
1	300602	1	Base Left Sideframe	
2	300603	1	Base Right Sideframe	
3	300604	2	Frame Mount Bar	
4	310322	6	Bracket, Angle	
5	310601	5	Tabletop Support	
6	300605	1	Middle Frame Spacer	
7	310602	1	Middle Tabletop Support	
8	405250	16	Screw, SHCS, ¼-20 UNC x ¾"	
9	405270	14	Screw, SHCS, ¼-20 UNC x 1"	
10	405275	6	Screw, SHCS, ¼-20 UNC x 1 ¼""	
11	500055	2	Bearing, UBR204-12S, ¾" ID	



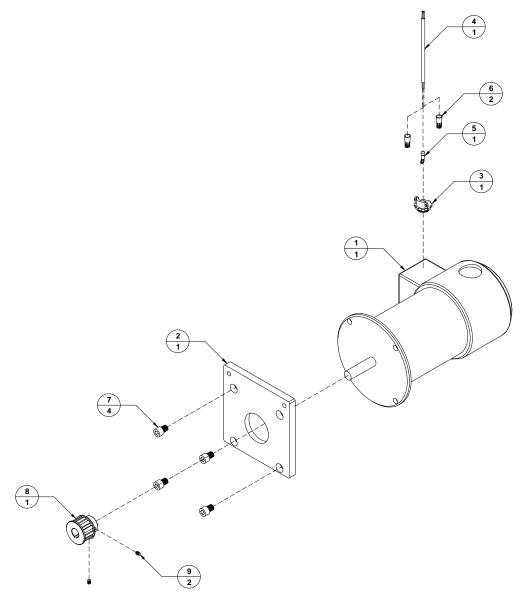
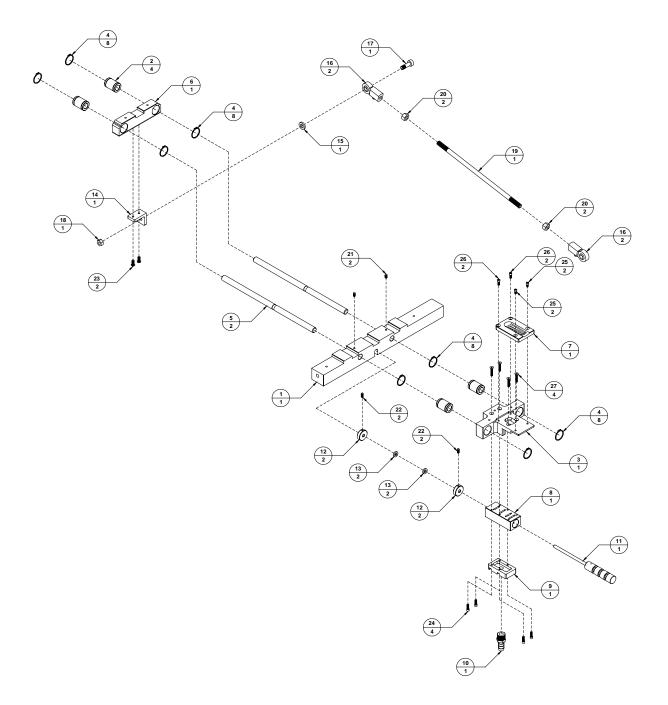


Table A.10 - Shuttle Motor Assembly (325601A)

Item	Part Number	Quantity	Description	Reference
1	800002	1	Motor, 1/2 H.P., 180 VDC	
2	325601	1	Motor Mount Plate	
3	615131	1	Box Connector, 3/8", Cable	
4	606034	1	Cable, #16-3, SJOW-A	
5	609114	1	Ring Tongue Terminal, #10	
6	609101	2	Marette, Orange, 14-22	
7	407230	4	Screw, SHCS, 3/8-16 UNC x ½"	
8	116537	1	Pulley, 14LF075 x 5/8"	
9	404810	2	Screw, SHSS, 10-32 UNF x ¼"	



325603A, Shuttle Feeder Assembly

Item	Part Number	Quantity	Description	Reference
1	330605	1	Shuttle Slide Shaft Mount	
2	212030	4	Linear Bearing	
3	212601	2	Shuttle Vacuum Body	
4	437088	8	Retaining Ring, 7/8" ID, External	
5	100007H	2	Shuttle Slide Shaft	
6	212602	1	Rear Shuttle Block	
7	310034H	1	Concave Feed Plate	
8	802004H	1	Vacuum Valve Body	
9	802007H	1	Vacuum Fitting Block	
10	802058	1	Barb Vacuum Hose Fitting, 3/8" NPT x ½"	
11	802005HA	1	Vacuum Valve Assembly	
12	212012	2	Shuttle Stopper	
13	440510	2	Rubber Washer, ¼" ID	
14	212003H	1	Rear Shuttle Bracket	
15	439020	1	Lockwasher, 3/8" ID	
16	200009	2	Rod End, 3/8" ID, c/w Lubrication Fitting	
17	416140	1	Shoulder Bolt, 3/8" x 5/8" (5/16-18 UNC)	
18	420015	1	Nut, 5/16-18 UNC	
19	200600	1	Shuttle Crank Link	
20	420025	2	Nut, 3/8-24 UNF	
21	404815	2	Screw, SHSS, 10-32 UNF x 5/16"	
22	404820	2	Screw, SHSS, 10-32 UNF x 3/8"	
23	404530	2	Screw, BHCS, 10-32 UNF x ½"	
24	403230	4	Screw, SHCS, 8-32 UNC x ½"	
25	403210	2	Screw, SHCS, 8-32 UNC x ¼"	
26	403220	2	Screw, SHCS, 8-32 UNC x 3/8"	
27	403050	4	Screw, FHCS, 8-32 UNC x ¾"	

Table A.11 - Shuttle Feeder Assembly (325603A)

630004A, Cycle Proximity Switch Assembly

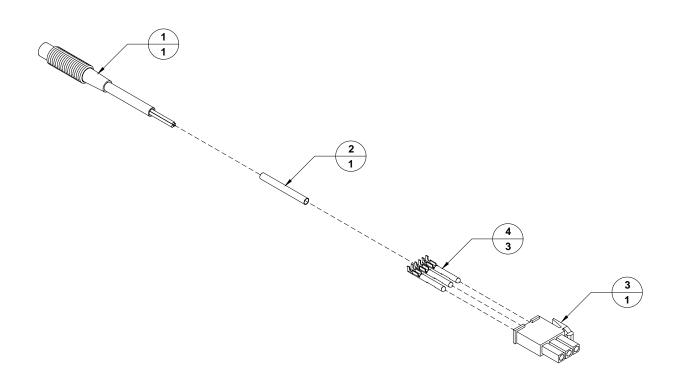
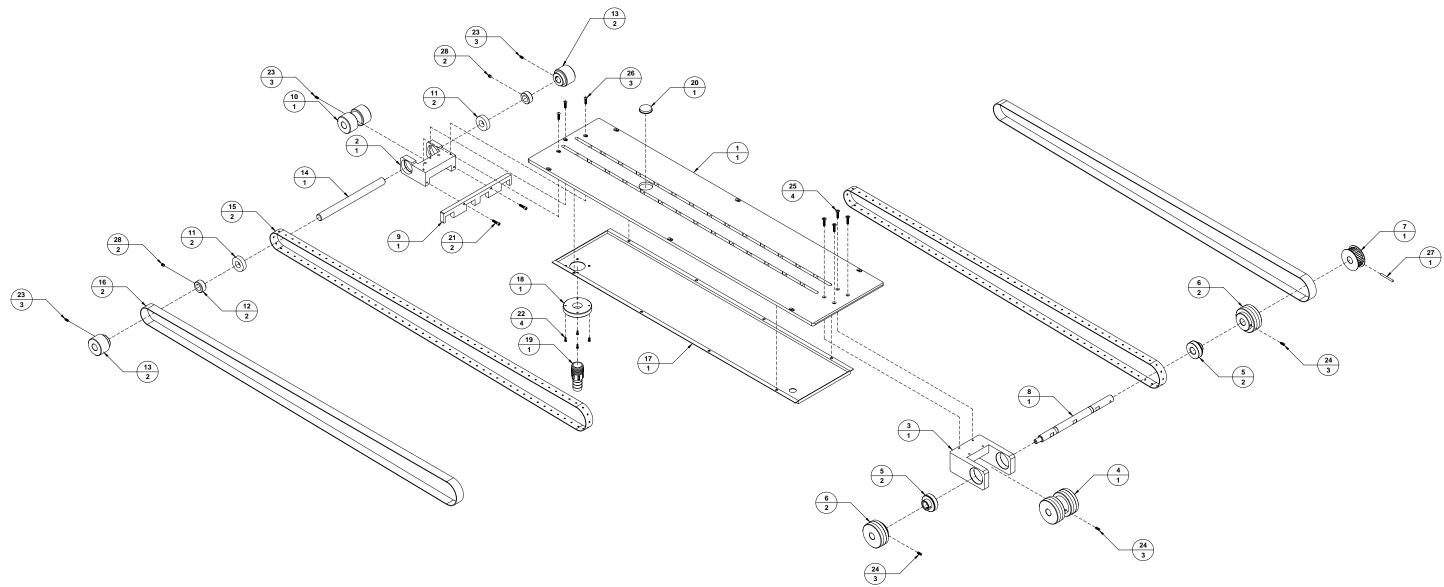


 Table A.12 - Cycle Proximity Switch Assembly (630004A)

Item	Part Number	Quantity	Description	Reference
1	630004	1	Proximity Switch (Cable cut to 6")	
2	609000	1	Shrink Wrap, 3/16" ID	
3	614001	1	Plug, Can Pin Housing	
4	614000	3	Male Contact, Pin	

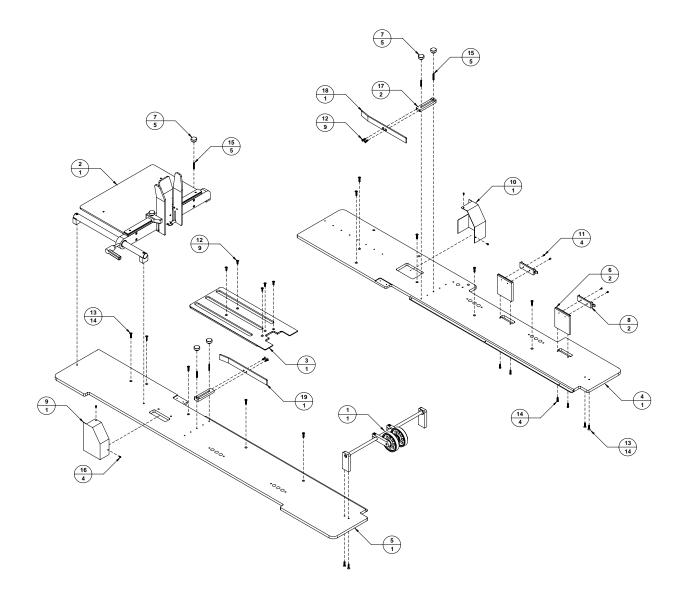
325602A, Transport Belt Tabletop Assembly



ltem	Part Number	Quantity	Description	Reference
1	325602	1	Transport Belt Tabletop	
2	330307	1	Vacuum Belt Takeup Block	
3	330603	1	Transport Belt Drive Block	
4	106601	1	Transport Belt Drive Roller	
5	500055	2	Bearing, UBR204-12S, ¾" ID	
6	106600	2	Transport Belt Roller	
7	116309	1	Pulley, 18LB075 x ¾" w/o Shoulder	
8	100600	1	Transport Belt Driveshaft	
9	343600	1	Transport Belt Guide	
10	106306	1	Twin Vacuum Takeup Roller	
11	500050	2	Bearing, R12, ¾" ID	
12	131050	2	Collar, ¾" ID	
13	106307	2	Vacuum Takeup Roller	
14	100313	1	Vacuum Belt Takeup Shaft	
15	120602	2	Vacuum Transport Belt (1" x 96 3/16"), c/w holes	
16	120603	2	Transport Belt (1" x 96 3/16")	
17	700603	1	Vacuum Column	
18	330608	1	Blower Hose Block	
19	802111	1	Hose Barb, 1" x 1", Plastic	
20	630003	1	Reflector, 35 mm Diameter	
21	404250	2	Screw, SHCS, 10-32 UNF x ¾"	
22	402320	4	Screw, PHMS, 6-32 UNC x 3/8"	
23	404820	3	Screw, SHSS, 10-32 UNF x 3/8"	
24	405830	3	Screw, SHSS, ¼-20 UNC x ½"	
25	404050	4	Screw, FHCS, 10-32 UNF x ¾"	
26	404550	3	Screw, BHCS, 10-32 UNF x ¾"	
27	436300	1	Spring Pin, 3/16" Dia. x ¾"	
28	405810	2	Screw, SHSS, ¼-20 UNC x ¼"	

Table A.13 - Transport Belt Tabletop Assembly (325602A)

325604A, Tabletop Assembly



Item	Part Number	Quantity	Description	Reference
1	100314A	1	Outfeed Roller Shaft Assembly	Page A-23
2	310340A	1	Rear Table Assembly	Page A-25
3	325603	1	Feeder Shuttle Plate	
4	325604	1	Left Tabletop	
5	325605	1	Right Tabletop	
6	330323	2	Ribbon Cable Mount	
7	438110	5	Side Guide Knob	
8	609300	2	Ribbon Cable Tie Mount	
9	700009H	1	Right Bridge Cover	
10	700614	1	Left Bridge Cover	
11	402310	4	Screw, PHMS, 6-32 UNC x ¼"	
12	404030	9	Screw, FHCS, 10-32 UNF x 1/2"	
13	404050	14	Screw, FHCS, 10-32 UNF x ¾"	
14	404550	4	Screw, BHCS, 10-32 UNF x ¾"	
15	404875	5	Screw, SHSS, 10-32 UNF x 1 ¼"	
16	402510	4	Screw, BHCS, 6-32 UNC x ¼"	
17	330321	2	Side Guide Bracket	
18	212300	1	Left Material Guide	
19	212301	1	Right Material Guide	

Table A.14 - Tabletop Assembly (325604A)

100314A, Outfeed Roller Assembly

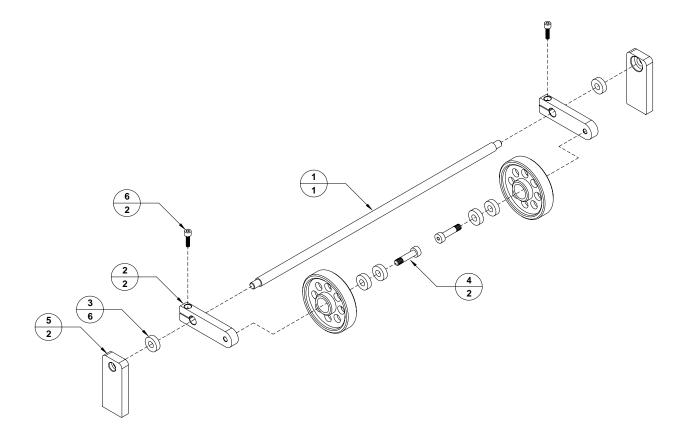
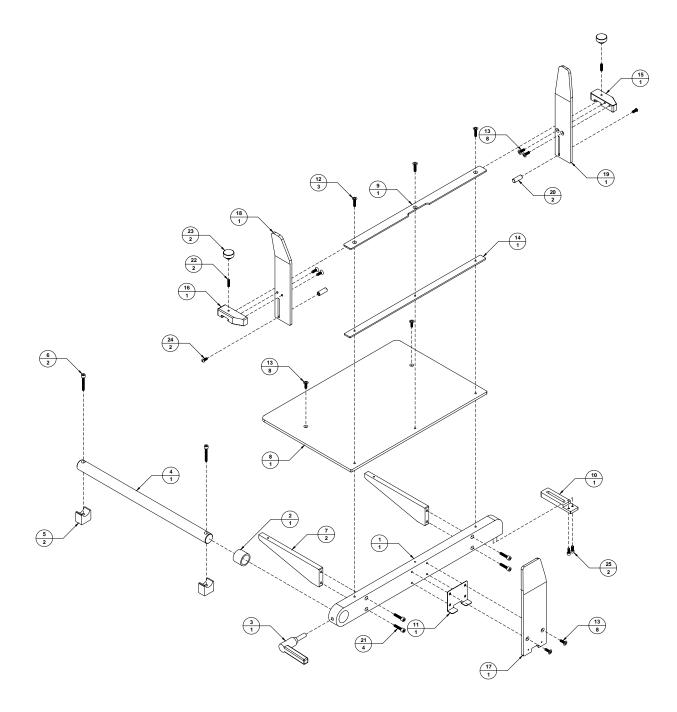


 Table A.15 - Outfeed Roller Assembly (100314A)

Item	Part Number	Quantity	Description	Reference
1	100314	1	Outfeed Roller Shaft	
2	203302	2	Outfeed Roller Arm	
3	500020	6	Bearing, R6, 3/8" ID	
4	416170	2	Shoulder Bolt, 3/8" x 1" (5/16-18 UNC)	
5	330309	2	Outfeed Roller Bracket	
6	405250	2	Screw, SHCS, ¼-20 UNC x ¾"	

310340A, Rear Tabletop Assembly



Item	Part Number	Quantity	Description	Reference
1	310340	1	Rear Table Crossmember	
2	505061	1	Bushing, 1" ID x 1 ¼" OD x 1" Long	
3	206011	1	Rear Table Locking Lever	
4	100344	1	Rear Table Shaft	
5	330341	2	Rear Table Shaft Block	
6	405280	2	Screw, SHCS, ¼-20 UNC x 1 ½"	
7	330344	2	Rear Table Support	
8	325345	1	Rear Table	
9	706342	1	Rear Table Rail	
10	330342	1	Rear Table Clamp Block	
11	707341	1	Rear Material Guide	
12	404050	3	Screw, FHCS, 10-32 UNF x ¾"	
13	404030	8	Screw, FHCS, 10-32 UNF x ½"	
14	706343	1	Rear Table Rail Spacer	
15	212606	1	Left Side Guide Block	
16	212607	1	Right Side Guide Block	
17	707011H	1	Rear Table Guide	
18	707600	1	Right Rear Side Guide	
19	707601	1	Left Rear Side Guide	
20	100606	2	Material Lift Pin	
21	405270	4	Screw, SHCS, ¼-20 UNC x 1"	
22	404850	2	Screw, SHSS, 10-32 UNF x ¾"	
23	438110	2	Side Guide Knob	
24	404530	2	Screw, BHCS, 10-32 UNF x ½"	
25	404230	2	Screw, SHCS, 10-32 UNF x ½"	

Table A.16 - Rear Tabletop Assembly (310340A)

630002A, Photocue Sensor Assembly

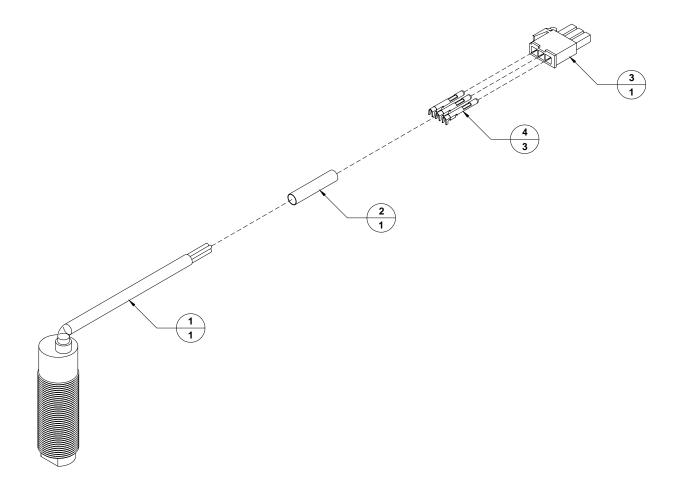


Table A.17 - Photocue Sensor Assembly (630002A)

Item	Part Number	Quantity	Description	Reference
1	630002	1	Photoelectric Switch	
2	609000	1	Shrink Wrap, 3/16" ID	
3	614001	1	Plug, Cap Pin Housing	
4	614000	3	Male Contact, Pin	

630600A, Shaft Encoder Assembly

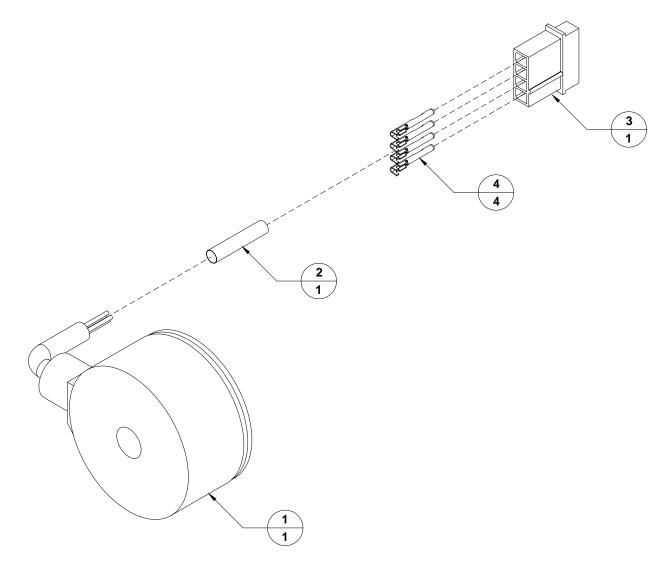


Table A.18 - Shaft Encoder Assembly (630600A)

Item	Part Number	Quantity	Description	Reference
1	630600	1	Shaft Encoder	
2	609000	1	Shrink Wrap, 3/16" ID	
3	614009	1	Plug, Pin Housing	
4	614008	4	Male Contact, Pin	

700607A, Rear Door Assembly

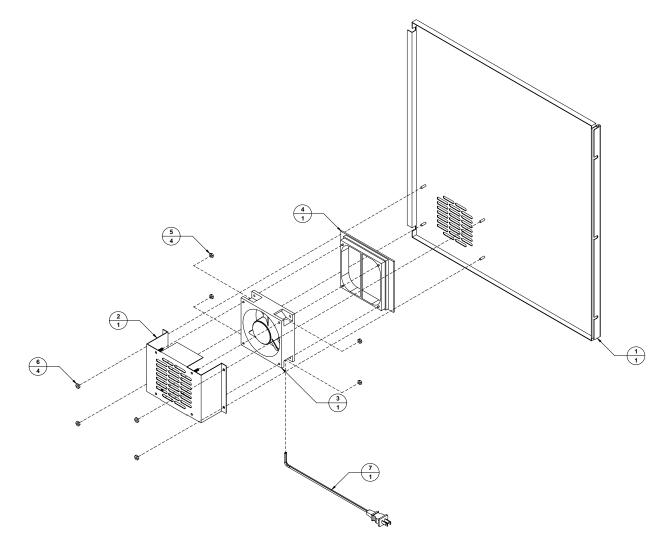
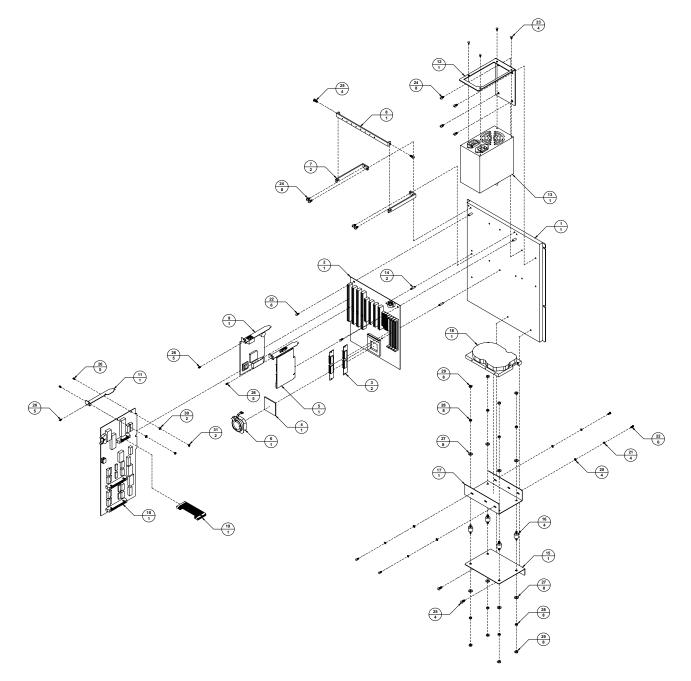


Table A.19 - Rear Door Assembly (700607A)

Item	Part Number	Quantity	Description	Reference
1	700607	1	Rear Door	
2	713315	1	Muffin Fan Mount	
3	803300	1	Muffin Fan	
4	803306	1	Muffin Fan Filter	
5	420007	4	Nut, 8-32 UNC	
6	420008	4	Nut, 10-32 UNF	
7	614121	1	Muffin Fan Cable	



706605A, Computer Cage Assembly (BK660)

Item	Part Number	Quantity	Description	Reference
1	706605	1	Computer Mounting Board	
2	600314	1	Motherboard - Pentium	
3	640324	2	8 MB SIMM	
4	600340	1	120 Pentium CPU	
5	600328	1	VGA Card, PCI Slot	
6	600315	1	Motherboard Fan	
7	706607	2	Auxiliary Card "L" Bracket	
8	706606	1	Auxiliary Card Bracket Mount	
9	652001	1	Modem, Internal, 14400 BPS	
10	600300	1	Jet Driver Board	
11	615300	1	Auxiliary Card Bracket	
12	713318	1	Computer Power Supply Bracket	
13	600312	1	Computer Power Supply	
14	615106	2	PCB Post, Nylon 6/6, 614-435	
15	706604	1	Hard Drive Mount Bracket	
16	426301	4	Hard Drive Rubber Mount	
17	713314	1	Hard Drive Mount	
18	600333	1	Hard Drive, 1.2 GB	
19	614601A	1	Jet Drive I/O Ribbon Cable	
20	440005	4	Washer, #6 ID	
21	439006	4	Lockwasher, No. 6	
22	402320	6	Screw, PHMS, 6-32 UNC x 3/8"	
23	402310	4	Screw, PHMS, 6-32 UNC x ¼"	
24	404520	8	Screw, BHCS, 10-32 UNF x 3/8"	
25	404510	4	Screw, BHCS, 10-32 UNF x ¼"	
26	401310	5	Screw, PHMS, 10-32 UNF x ¼"	
27	440008	8	Washer, #10	
28	439009	8	Lockwasher, No. 10	
29	420008	8	Nut, 10-32 UNF	
30	440530	2	Washer, #6, Nylon	
31	420004	2	Nut, 4-40 UNC	

711600A, Inkwell Assembly

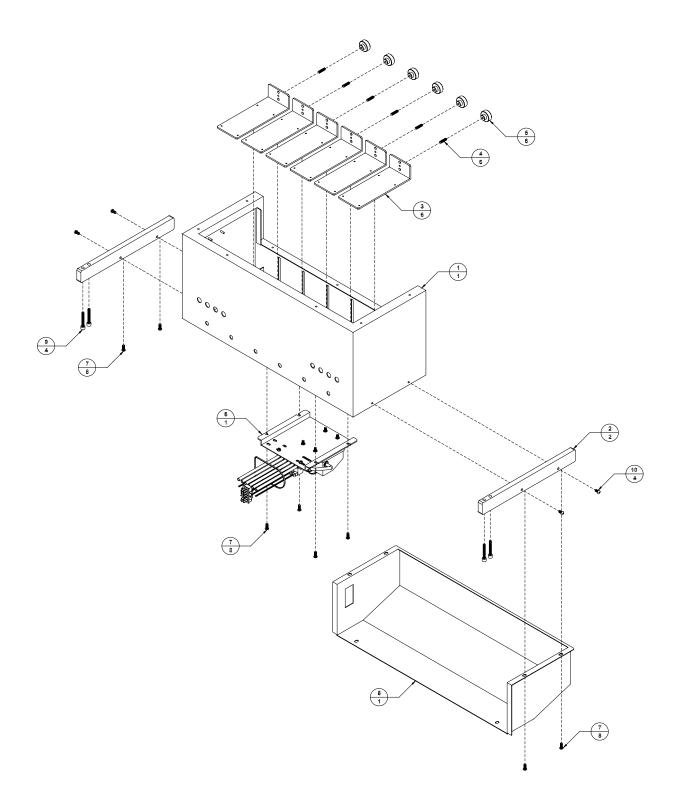


Table A.21 - Inkwell Assembly (711600A)

Item	Part Number	Quantity	Description	Reference
1	711600	1	Inkwell Cabinet	
2	310603	2	Inkwell Container Support	
3	706603	6	Inkwell Plate	
4	404850	6	Screw, SHSS, 10-32 UNF x ¾"	
5	438110	6	Side Guide Knob	
6	713602A	1	Priming Pump Assembly	Page A-33
7	404510	8	Screw, BHCS, 10-32 UNF x ¼"	
8	700612	1	Inkwell Support	
9	405280	4	Screw, SHCS, ¼-20 UNC x 1 ½"	
10	404520	4	Screw, BHCS, 10-32 UNF x 3/8"	

713602A, Priming Pump Assembly

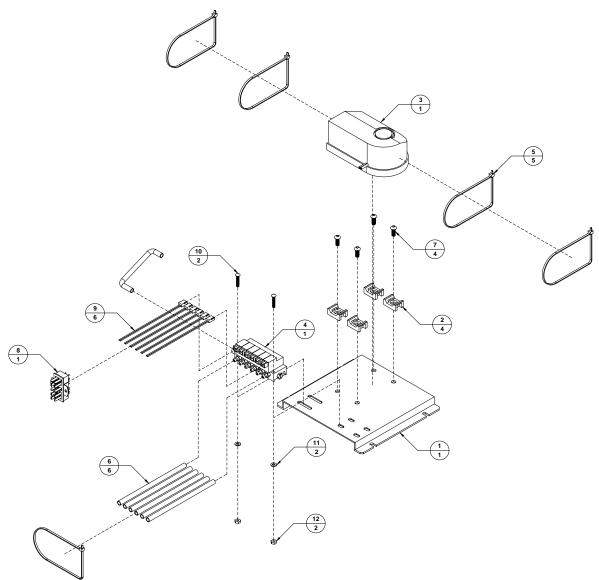
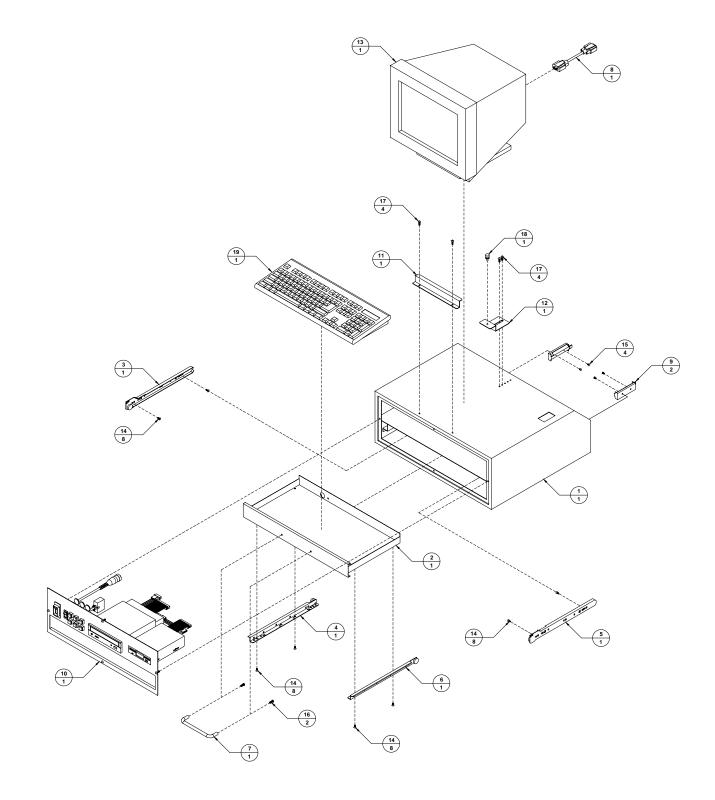


Table A.22 - Priming Pump Assembly (713602A)

Item	Part Number	Quantity	Description	Reference
1	713602	1	Priming Pump Mounting Bracket	
2	615102	4	Tie Wrap Mount	
3	803801	1	Priming Air Pump	
4	803809	1	Solenoid Valve Assembly	
5	615141	5	Lashing Tie	
6	803806	7	Hose, Clear, ¼" OD	
7	404510	4	Screw, BHCS, 10-32 UNF x ¼"	
8	9100002	1	Panel Mount Plug	
9	803812	6	Plug/Lead, 1000 mm, 115 VAC	
10	402350	2	Screw, PHMS, 6-32 UNC x ¾"	
11	440005	2	Washer, #6	
12	420006	2	Nut, 6-32 UNC	

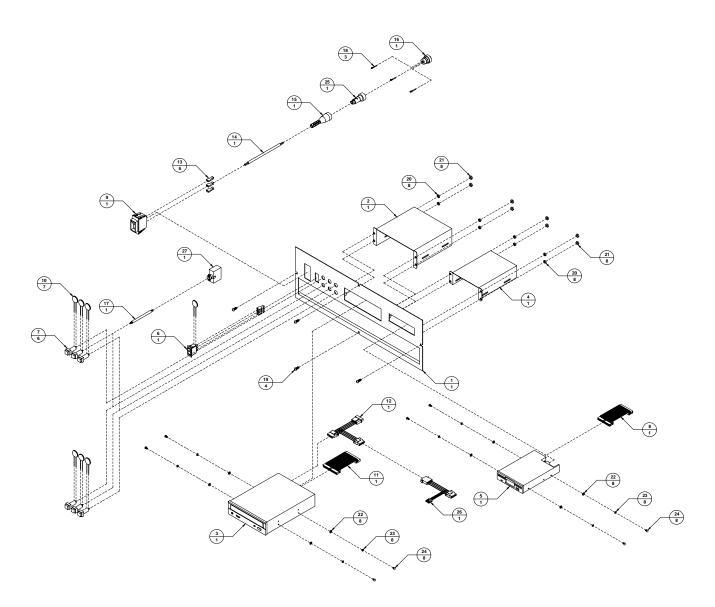
711601A, Controller Console Assembly



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" (Left Drawer)	
5	212605	1	Drawer Slides, 12" (Right Cabinet)	
6	212605	1	Drawer Slides, 12" (Right Cabinet)	
7	438313	1	Inkwell Container Handle	
8	606323	1	Monitor Extension Cable, 6'	
9	609300	2	Ribbon Cable Tie Mount	
10	706609A	1	Faceplate Assembly	Page A-37
11	707310	1	Front Monitor Mount	
12	707311	1	Rear Monitor Mount	
13	803308	1	Computer Monitor, 14", SVGA, Black Case	
14	402100	8	Screw, FHCS, 6-32 UNC x ¼"	
15	402310	4	Screw, PHMS, 6-32 UNC x ¼"	
16	404330	2	Screw, PHMS, 10-32 UNF x 1/2"	
17	404510	4	Screwm BHCS, 10-32 UNF x ¼"	
18	438171	1	Thumbscrew, 10-32 UNF x 3/8"	
19	803304	1	Computer Keyboard, 104/105, Mitsumi	

Note : Drawer slides (P/N 212605) are stocked in sets of 4.

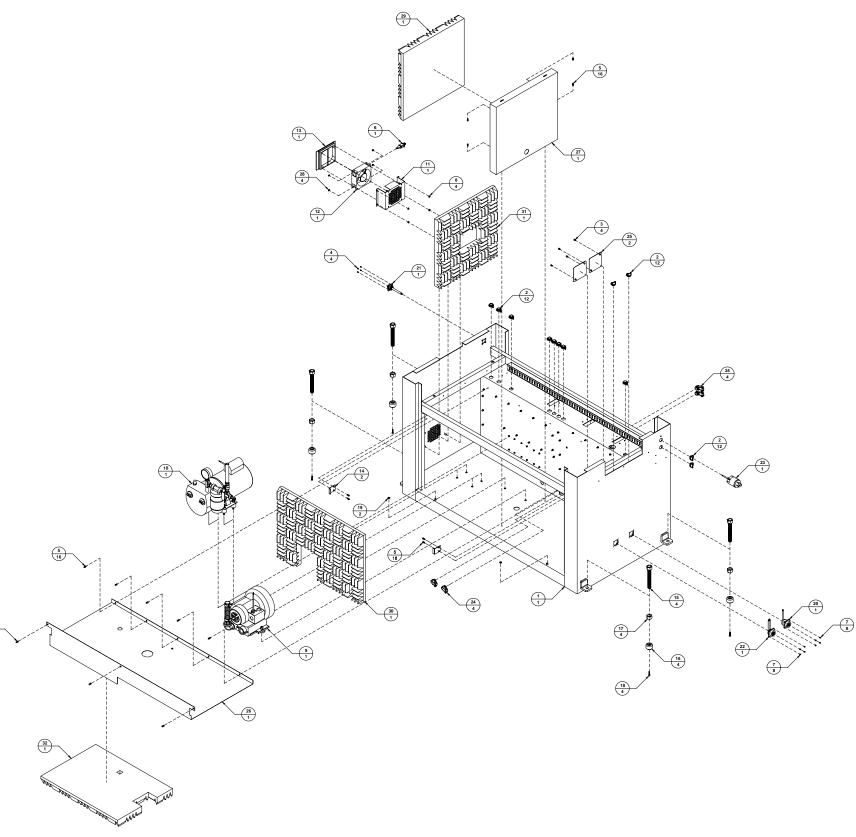
706609A, Faceplate Assembly



Item	Part Number	Quantity	Description	Reference
1	706609	1	Controller Faceplate	
2	713603	1	CD-ROM Drive Cage	
3	803601	1	CD-ROM Drive, Black	
4	713343	1	Floppy Drive Cage, 3 ½"	
5	803600	1	Floppy Drive, 3 ½", Black	
6	603117	1	Priming Pump Rocker Switch	
7	603129	6	Priming Button	
8	606361A	1	Single Floppy Drive Ribbon Cable	
9	603300	1	Circuit Breaker Switch, 5 Amp, 1 Pole	
10	640300	7	Metal Oxide Varistor, 120 VAC	
11	614306A	1	CD-ROM Ribbon Cable	
12	614007A	1	Drive Power Cable	
13	609110	6	Connector, Push-On	
14	606030	1	Cable, #18-3 - Unshielded	
15	614118	1	Cable Boot, Flexible	
16	614116	1	Plug Connector, 11-4, Reverse	
17	606018	1	Cable, #22-10, Shielded	
18	614122	3	Pin Contact, Male, Blue	
19	404510	4	Screw, BHCS, 10-32 UNF x ¼"	
20	439009	8	Lockwasher, No. 10	
21	420008	8	Nut, 10-32 UNF	
22	440005	8	Washer, No. 6	
23	439006	8	Lockwasher, No. 6	
24	402310	8	Screw, PHMS, 6-32 UNC x ¼"	
25	614117	1	Cable Grip, Internal	
26	9100004	1	Floppy Cable Assembly	
27	614332	1	Socket, 10 Pin	

Table A.24 - Faceplate Assembly (706609A)

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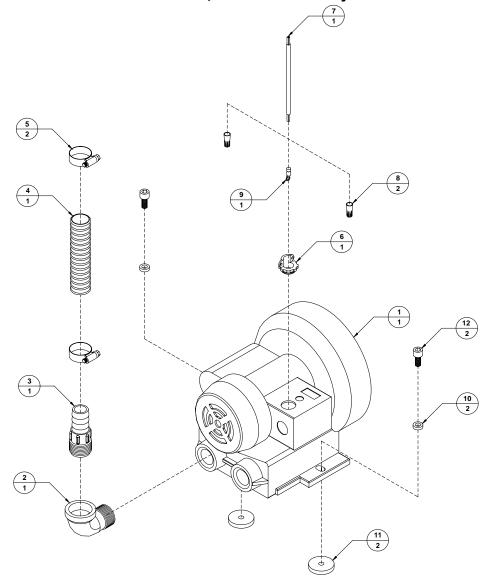
713613A, BK660 Base Cabinet Assembly

Item	Part Number	Quantity	Description	Reference
1	713612A	1	Electrical Box Assembly	Page A-43
2	615131	12	Box Connector, 3/8", Cable	
3	404320	4	Screw, PHMS, 10-32 UNF x 3/8"	
4	401310	4	Screw, PHMS, 4-40 UNC x ¼"	
5	404510	16	Screw, BHCS, 10-32 UNF x ¼"	
6	614121	1	Muffin Fan Cable	
7	402310	8	Screw, PHMS, 6-32 UNC x ¼"	
8	420008	4	Nut, 10-32 UNF	
9	330607A	1	Blower Assembly	Page A-40
10	801102A	1	Vacuum Assembly	Page A-47
11	713315	1	Muffin Fan Mount	
12	803300	1	Muffin Fan	
13	803306	1	Muffin Fan Filter	
14	717530	2	Door Catch	
15	343015	4	Base Mounting Leg	
16	343010	4	Base Mounting Foot	
17	343016	4	Jam Nut, 3/4-10 UNC	
18	405260	4	Screw, SHCS, ¼-20 UNC x 7/8"	
19	440510	2	Rubber Washer, 1/4" ID	
20	614057A	1	Conveyor Cable (640/660)	
21	614124A	1	Sure Feed Cable	
22	614135A	1	Inline Remote Cable	
23	614015A	1	Base Power Cable	
24	615132	4	Connectors 90 deg.	
25	615153	2	Box Cover, 4" x 4"	
26	713613	1	Upper Pan	
27	713614	1	Sound Barrier Pan	
28	420007	4	Nut, 8-32 UNC	
29	902600	1	Sonex Sound Insulation	
30	902600	1	Sonex Sound Insulation	
31	902600	1	Sonex Sound Insulation	
32	902600	1	Sonex Sound Insulation	

 Table A.25
 -BK660 Base Cabinet Assembly (713613A)

Note : Sonex sound insulation (P/N 902600) is cut to size for all 4 panels.

330607A, Blower Assembly



Item	Part Number	Quantity	Description	Reference
1	801104	1	Regenerative Blower	
2	802122	1	Street Elbow, 90°, Black	
3	802111	1	Hose Barb, 1" x 1", Plastic	
4	802601	48"	Vacuum Tubing, Grey PVC, 1"	
5	444004	2	Hose Clamp, Gear Type, 9-16" - 1 ¼"	
6	615131	1	Box Connector, 3/8", Cable	
7	606034	72"	Cable, #16-3, SJOW-A	
8	609101	2	Marette, Orange, 14-22	
9	609111	1	Ring Tongue Terminal	
10	439015	2	Lockwasher, 5/16" ID	
11	440511	2	Rubber Washer, 5/16" x 1 ½" x ¼"	
12	406250	2	Screw, SHCS, 5-16/18 UNC x 3⁄4"	

706608A, Instrument Panel Assembly

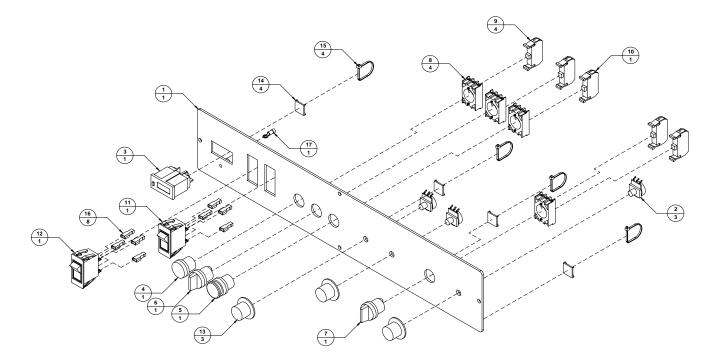
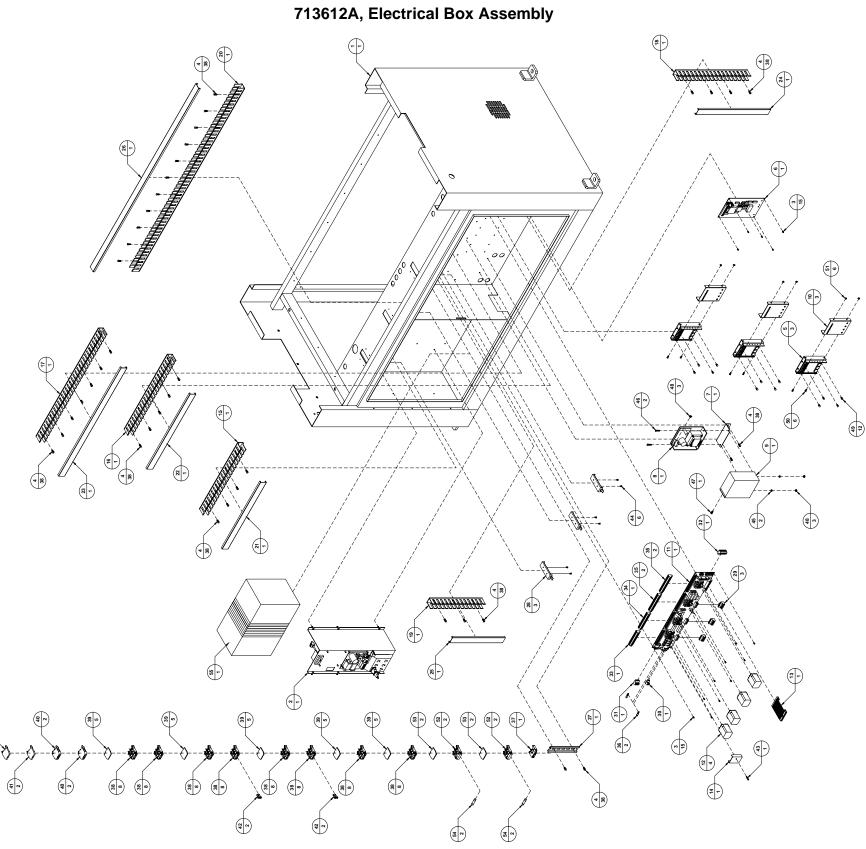


Table A.27	-Instrument	Panel	Assembly	(706608A)
1 0000 11027	Instructure	1 000000	isseniery	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

Item	Part Number	Quantity	Description	Reference
1	706608	1	Instrument Plate	
2	600011	3	Potentiometer, w/Dart 600005	
3	600100	1	Counter	
4	603120	1	Switch, Green Push Button	
5	603121	1	Switch, Red Mushroom Push Button	
6	603122	1	Switch, 2 Position Rotary Knob	
7	603123	1	Switch, 3 Position Rotary Knob	
8	603125	4	Switch Locking Collar	
9	603126	4	Block, N.O. Contact	
10	603127	1	Block, N.C. Contact	
11	603319	1	Circuit Breaker, 10A	
12	603415	1	Circuit Breaker Switch, 15A, 2 Pole	
13	613002	3	Knob, 36mm Skirted	
14	615100	4	Adhesive Backed Tie Mount	
15	615140	4	Lashing Tie	
16	609110	8	Connector, Push-on	
17	609114	1	Ring Tongue Terminal	

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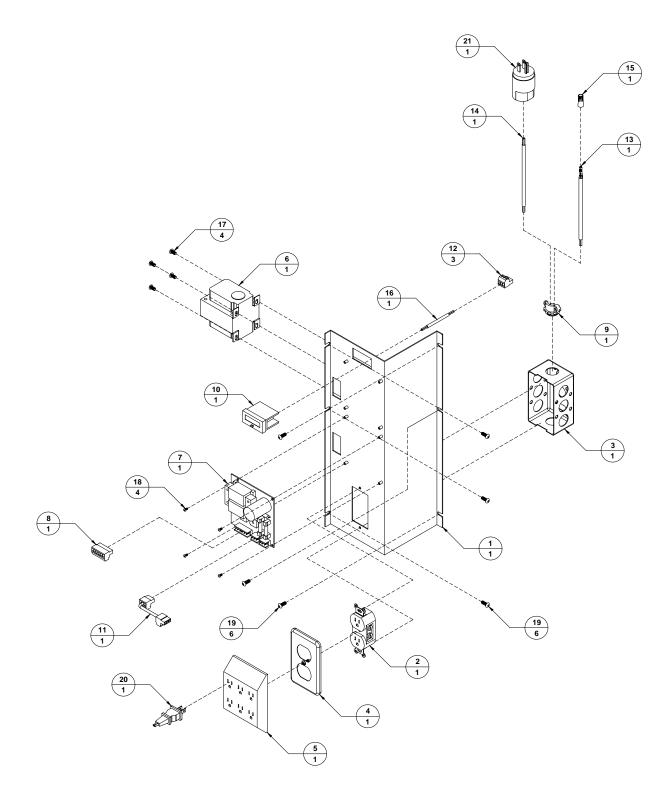


Item	Part Number	Quantity	Description	Reference
1	713607A	1	Base Cabinet Shell Assembly	
2	706610A	1	Power Supply Assembly	Page A-45
3	401310	15	Screw, PHMS, 4-40 UNC x ¼"	
4	404510	38	Screw, BHCS, 10-32 UNF x ¼"	
5	600005	3	DC Controller. 90 VDC	
6	600601	1	Gap Controller Board	
7	615020	1	Power Supply Bracket	
8	600600	1	Power Supply, 12 VDC	
9	700613	1	12 VDC Cover	
10	700321	3	Dart Control Cover	
11	600402	1	Base Interface Board	
12	610103	4	Relay, 12 VDC	
13	614600A	1	Gap Controller Ribbon Cable	
14	700619	1	Fuse Cover	
15	615600	16"	Wiring Duct, 1": x 1.5"	
16	615600	18"	Wining Duct, 1" x 1.5"	
17	615600	26"	Wiring Duct, 1" x 1.5"	
18	615600	15"	Wining Duct, 1" x 1.5"	
19	615600	11"	Wing Duct, 1" x 1.5"	
20		44"	Wing Duct, 1" x 1.5"	
20	615600	44 16"		
	615210		Wiring Duct Cover, 1"	
22	615210	18"	Wiring Duct Cover, 1"	
23	615210	26"	Wiring Duct Cover, 1"	
24	615210	15"	Wiring Duct Cover, 1"	
25	615210	11"	Wiring Duct Cover, 1"	
26	615210	44"	Wiring Duct Cover, 1"	
27	615021	6	T Rail, DIN, (6" Long)	
28	609300	3	Ribbon Cable Tie Mount	
29	615065	3	Female Connector, 5 Pin, BLA5	
30	615062	1	Female Connector, 2 Pin, BLA2	
31	615066	1	Female Connector, 4 Pin, BLA4	
32	615075	1	Female Connector, 7 Pin, BLA7	
33	615079	1	Female Connector, 16 Pin, BLA16	
34	615080	1	Female Connector, 18 Pin, BLA18	
35	615081	2	Female Connector, 19 Pin, BLA19	
36	609111	2	Ring Tongue Terminal	
37	615016	1	End Stop, BAM, 9.1mm	
38	615003	8	Terminal Block, M10/10, Grey, 10mm 7.5 A	
39	615012	5	End Section, FEM6, Grey, 2.5mm	
40	615018	2	Ground Block, M10/10.P, Green & Yellow	
41	615017	2	Terminal, EK2.5/35, Ground	
42	615006	2	Jumper Bar, BJM10	
43	401350	1	Screw, PHMS, 4-40 UNC x 3/4"	
44	402310	6	Screw, PHMS, 6-32 UNC x ¹ / ₄ "	
45	439009	2	Lockwasher, #10	
46	404550	2	Screw, BHCS, 10-32 UNF x ³ / ₄ "	
47	404530	1	Screw, BHCS, 10-32 UNF x 1/2"	
48	420008	3	Nut, 10-32 UNF	
49	403320	12	Screw, PHMS, 8-32 UNC x 3/8"	
50	402320	6	Screw, PHMS, 6-32 UNC x 3/8"	
51	420006	6	Nut, 6-32 UNC	
52	615001	2	Fuse Holder, Grey, 8 mm, 6.3 A	
53	615011	2	End Section, Grey, 1.5 mm	
54	646001	2	Fuse, 5 x 20, 5 A	
55	640001	1	Transformer, Single Phase, 240/120	

Table A.28 -Electrical Box Assembly (713612A)

Note: Items 52-55 appear in European Models only.

706610A, Power Supply Assembly



	11 2	-	,	
ltem	Part Number	Quantity	Description	Reference
1	706610	1	Power Supply Mount	
2	614014	1	Receptacle, Duplex, 2 Pole, 3 Wire Grndg	
3	615150	1	Electrical Junction Box, 2" X 4"	
4	615155	1	Box Cover, Duplex Receptacle	
5	640003	1	Surge Suppressor, Full 3-line	
6	640002	1	Transformer, 28 V	
7	600321	1	Power Supply Board	
8	615064	1	Female Connector, 6 Pin, BLA6	
9	615131	1	Box Connector, 3/8", Cable	
10	600101	1	Counter	
11	606013A	1	Jet Drive Board Voltage Cable	
12	615063	1	Female Connector, 3 Pin, BLA3	
13	606600A	1	Controller Power Cable	
14	606034	144"	Cable, #16-3 , SJOW-A	
15	609101	1	Marette, Orange, 14-22	
16	606013	53"	Cable, #22-3, Shielded	
17	404320	4	Screw, PHMS, 10-32 UNF x 3/8"	
18	401310	4	Screw, PHMS, 4-40 UNC x ¼"	
19	404510	6	Screw, BHCS, 10-32 UNF X ¼"	
20	614121	1	Muffin Fan Cable	
21	614016	1	Straight Blade Plug, 15 A, 125 V	

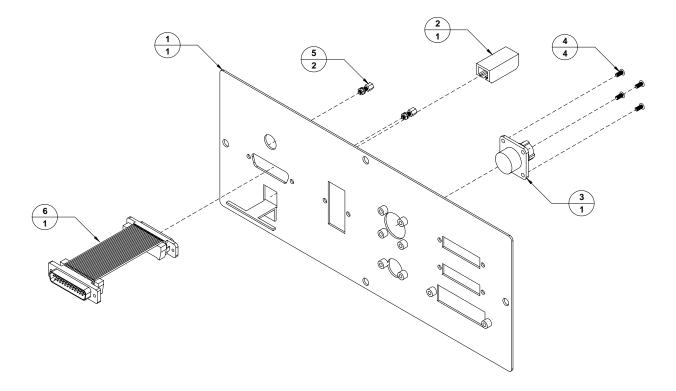
Table A.29 - Power Supply Assembly (706610A)

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801102A, Vacuum Pump Assembly

Item	Part Number	Quantity	Description	Reference
1	801102	1	Vacuum Pump	
2	615131	1	Box Connector, 3/8", Cable	
3	802013	1	Extension Pipe, 3/8" NPT x 2 1/2""	
4	802071	2	Pipe Tee, 3/8" NPT	
5	802065	1	Reducing Bushing, 3/8" - ¼" NPT	
6	802010	3	Extension Pipe, 3/8" NPT x 1 1/2"	
7	802036	1	Filter Assembly, AB 599	
8	802035	1	Vacuum Relief Valve, 3/8" NPT	
9	802045	1	Shuttle Feeder Valve, 3/8" NPT	
10	802030	1	Vacuum Gauge, 1/4" NPT	
11	802058	1	Barb Vacuum Hose Fitting, 3/8" NPT X 1/2"	
12	802046	24"	Hose, Clearflex, 1/2" ID	
13	426302	4	Anti-Vibration Mount, 5/16-18 UNC x 13/16"	
14	609110	2	Connector, Push-on	
15	606034	72"	Cable, #16-3 , SJOW-A	
16	609111	1	Ring Tongue Terminal	
17	439015	4	Lockwasher, 5/16 ID	
18	420015	4	Nut, 5/16-18 UNC	
19	802084	1	Vacuum Muffler/Filter, 3/8"	

Table A.30 -Vacuum Pump Assembly (801102A)

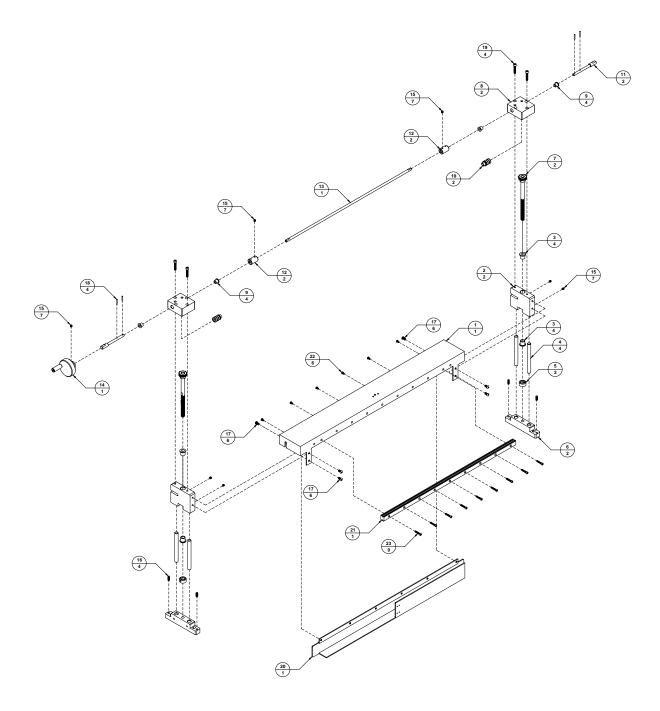


700605A, Communications Plate Assembly (BK660)

Table A.31 -Communications Plate Assembly (700605A)

Item	Part Number	Quantity	Description	Reference
1	700606	1	Communications Plate	
2	652002	1	Connector, Bulkhead Modem	
3	614119	1	Receptacle, 11-4, Reverse	
4	401310	4	Screw, PHMS, 4-40 UNC x ¼"	
5	615322	2	Female Screwlock, 4-40 UNC	
6	614326A	1	Parallel Ribbon Cable	

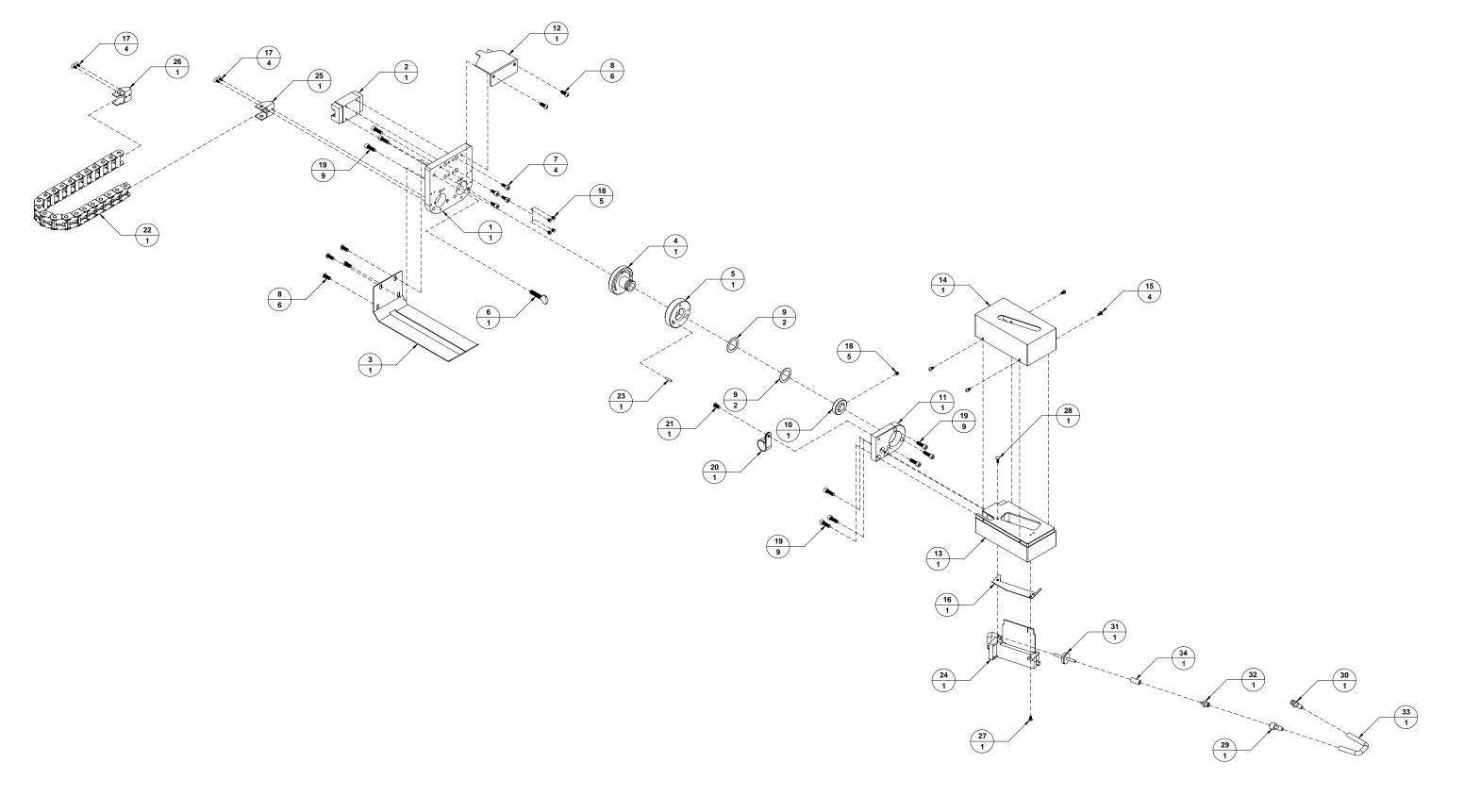
713601A, Printhead Bridge Assembly



Item	Part Number	Quantity	Description	Reference
1	713601	1	Printhead Bridge Body	
2	330609	2	Adjustable Mount	
3	505384	4	Flange Bushing, 3/8" ID X 1/2" OD x 1/2"	
4	100609	4	Height Adjustment Pin	
5	131020	2	Collar, 3/8" I. D.	
6	330314	2	Printhead Bridge Mounting Foot	
7	100540A	2	Height Adjustment Screw Assembly	
8	330315	2	Gearbox Body	
9	505463	4	Flange Bushing, ¼" ID X 3/8" OD x 3/8"	
10	110310	2	Gearbox Worm, Hardened, 1/4" Bore *	
11	100310	2	Gearbox Shaft	
12	122201	2	Gearbox Coupling	
13	100315	1	Printhead Bridge Shaft	
14	438311A	1	Bridge Handwheel Assembly	
15	404807	7	Screw, SHSS, 10-32 UNF x 3/16"	
16	405830	4	Screw, SHSS, ¼-20 UNC x ½"	
17	404520	6	Screw, BHCS, 10-32 UNF x 3/8"	
18	436312	4	Spring Pin, 3/32"Dia. X 5/8"	
19	404270	4	Screw, SHCS, 10-32 UNF x 1"	
20	706601	1	Igus Chain Support	
21	212611	1	Linear Bearing Rail	
22	402510	6	Screw, BHCS, 6-32 UNC x 1/4	
23	402250	9	Screw, SHCS, 6-32 UNC x ¾"	

Table A.32 - Printhead Bridge Assembly (713601A)

BK661A/F/H/V, Single Printhead Assembly, AllWrite/FastDri/HiDef/VersaPrint

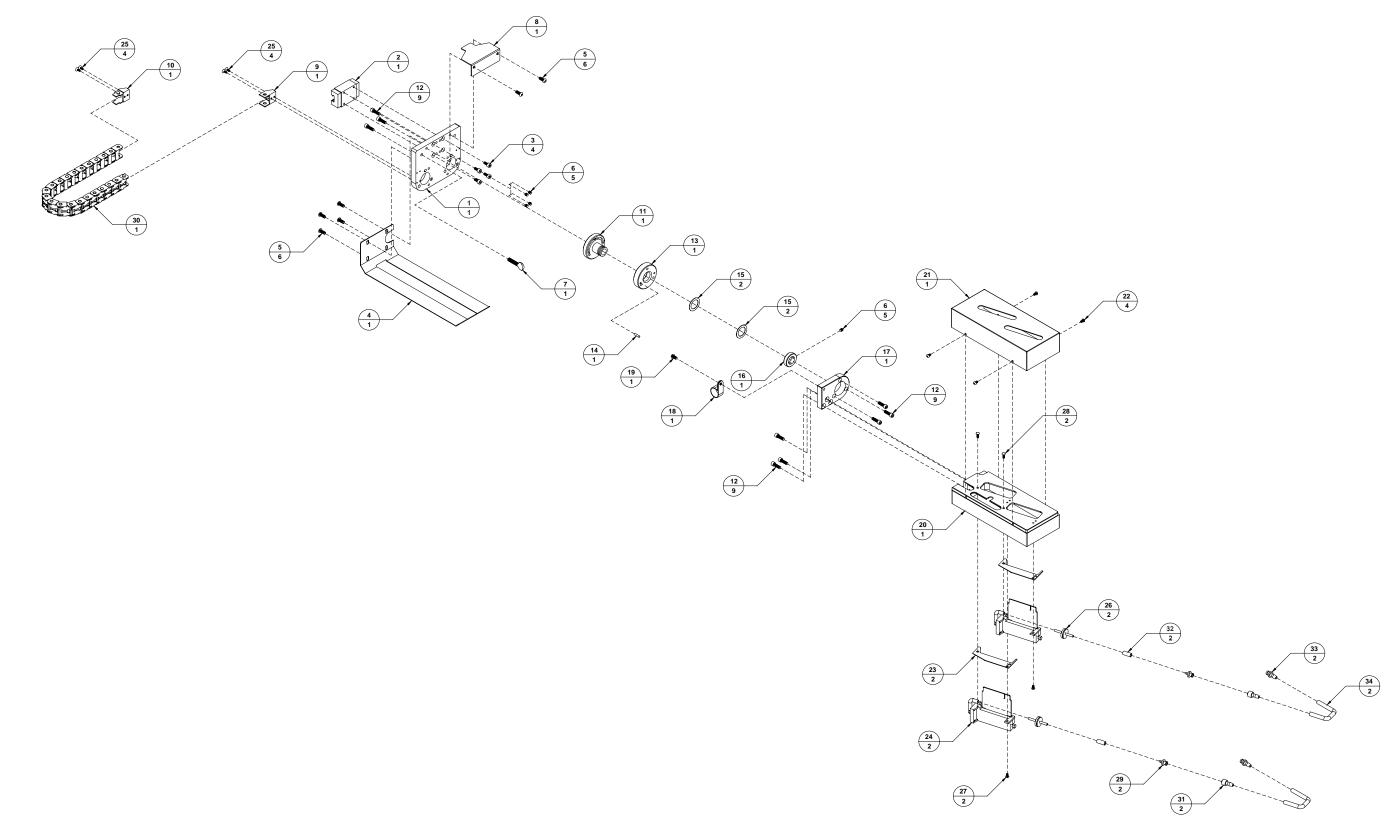


Item	Part Number	Quantity	Description	Reference
1	330326	1	Single Head Mount	
2	212610	1	Linear Bearing	
3	706319	1	BK601 Head Shield	
4	127310	1	Printhead Swivel Post	
5	127311	1	Head Swivel Disk	
6	438310	1	Locking Screw, ¼-20 UNC X 1"	
7	414210	4	Screw, SHCS, M4 X 10	
8	404510	6	Screw, BHCS, 10-32 UNF X ¼"	
9	439051	2	Wave Washer, ¾" ID	
10	131300	1	Rotary Joint Nut	
11	330319	1	Single Head Bracket	
12	706321	1	BK601 Head Indicator	
13	330318	1	BK601 Head Mount Block	
14	700311	1	BK601 Head Cover	
15	402510	4	Screw, BHCS, 6-32 UNC X ¼"	
16	706310	1	Printbar Insulation Shield	
17	401010	4	Screw, FHCS, 4-40 UNC x ¼"	
18	404807	5	Screw, SHSS, 10-32 UNF x 3/16"	
19	404240	9	Screw, SHCS, 10-32 UNF x 5/8"	
20	615108	1	Clamp, Cable	
21	404520	1	Screw, BHCS, 10-32 UNF X 3/8"	
22	804600	15"	Micro Zipper - Series 07	
23	436030	1	Spring Pin, 1/8" Dia. x ½"	
24	640391	1	Printbar, AllWrite	
	640397	1	Printbar, FastDri <i>(FastDri only)</i>	
	640396	1	Printbar, HiDef (HiDef only)	
	640395	1	Printbar, VersaPrint (VersaPrint only)	
25	804601	1	Mounting Brackets, Series 07	
26	804601	1	Mounting Brackets, Series 07	
27	402310	4	Screw, PHMS, 6-32 UNC X ¼"	
28	402320	2	Screw, PHMS, 6-32 UNC X 3/8"	
29	800847	1	Male Luer, 3/16"	
	800846	1	Male Luer, 3/32" (FastDri only)	
30	800849	1	Female Luer, 3/16"	
	800848	1	Female Luer, 3/32" (FastDri only)	
31	800825	1	Check Valve, 0.100" OD (AllWrite & FastDri only)	
32	800848	1	Female Luer, 3/32"	
33	800858	8"	Viton Tubing, 0.188" ID	
	800859	8"	Viton Tubing, 0.100" ID (FastDri only)	
34	800859	2"	Viton Tubing, 0.100" ID	

 Table A.33 - Single Printhead Assembly, AllWrite/FastDri/HiDef/VersaPrint (BK661A/F/H/V)

Note : Items 25 and 26 are stocked together under P/N 804601.

BK662A/F/H/V, Twin Printhead Assembly, AllWrite/FastDri/HiDef/VersaPrint



Item	Part Number	Quantity	Description	Reference
1	330311	1	Twin Printbar Mounting Plate	
2	212610	1	Linear Bearing	
3	414210	4	Screw, SHCS, M4 X 10	
4	706312	1	Twin Printhead Shield	
5	404510	6	Screw, BHCS, 10-32 UNF X ¼"	
6	404807	5	Screw, SHSS, 10-32 UNF x 3/16"	
7	438310	1	Locking Screw, ¼-20 UNC X 1"	
8	706313	1	Twin Printhead Indicator	
9	804601	1	Mounting Brackets, Series 07	
10	804601	1	Mounting Brackets, Series 07	
11	127310	1	Printhead Swivel Post	
12	404240	9	Screw, SHCS, 10-32 UNF x 5/8"	
13	127311	1	Head Swivel Disk	
14	436030	1	Spring Pin, 1/8" Dia. x 1⁄2"	
15	439051	2	Wave Washer, ¾" ID	
16	131300	1	Rotary Joint Nut	
17	330312	1	Twin Printbar Body Bracket	
18	615108	1	Clamp, Cable	
19	404520	1	Screw, BHCS, 10-32 UNF X 3/8"	
20	330310	1	Twin Printbar Mount Block	
21	700310	1	Twin Printhead Cover	
22	402510	4	Screw, BHCS, 6-32 UNC X ¼"	
23	706310	2	Printbar Insulation Shield	
24	640391	2	Printbar, AllWrite	
	640397	2	Printbar, FastDri (FastDri only)	
	640396	1	Printbar, HiDef, (HiDef only)	
	640395	1	Printbar, VersaPrint (VersaPrint only)	
25	401010	4	Screw, FHCS, 4-40 UNC x ¼"	
26	800825	2	Check Valve, 0.100" OD (AllWrite & FastDri only)	
27	402310	2	Screw, PHMS, 6-32 UNC X ¼"	
28	402320	2	Screw, PHMS, 6-32 UNC X 3/8"	
29	800848	2	Female Luer, 3/32"	
30	804600	15"	Micro Zipper - Series 07	
31	800847	2	Male Luer, 3/16"	
	800846	2	Male Luer, 3/32" (FastDri only)	
32	800859	2 x 2"	Viton Tubing, 0.100" ID	
33	800849	2	Female Luer, 3/16"	
	800848	2	Female Luer. 3/32" (FastDri only)	
34	800858	2 x 8"	Viton Tubing, 0.188" ID	
	800859	2 x 8"	Viton Tubing, 0.100" ID (FastDri only)	

Table A.34 - Twin	Printhead Assembly.	AllWrite/FastDri/HiDe	ef/VersaPrint	(BK662A/F/H/V)
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Note : Items 9 and 10 are stocked together under P/N 804601.

BK640A-2X, BK640 Inkjet System

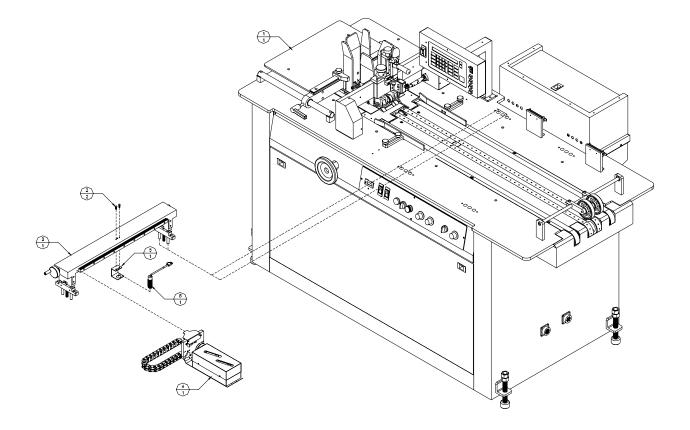
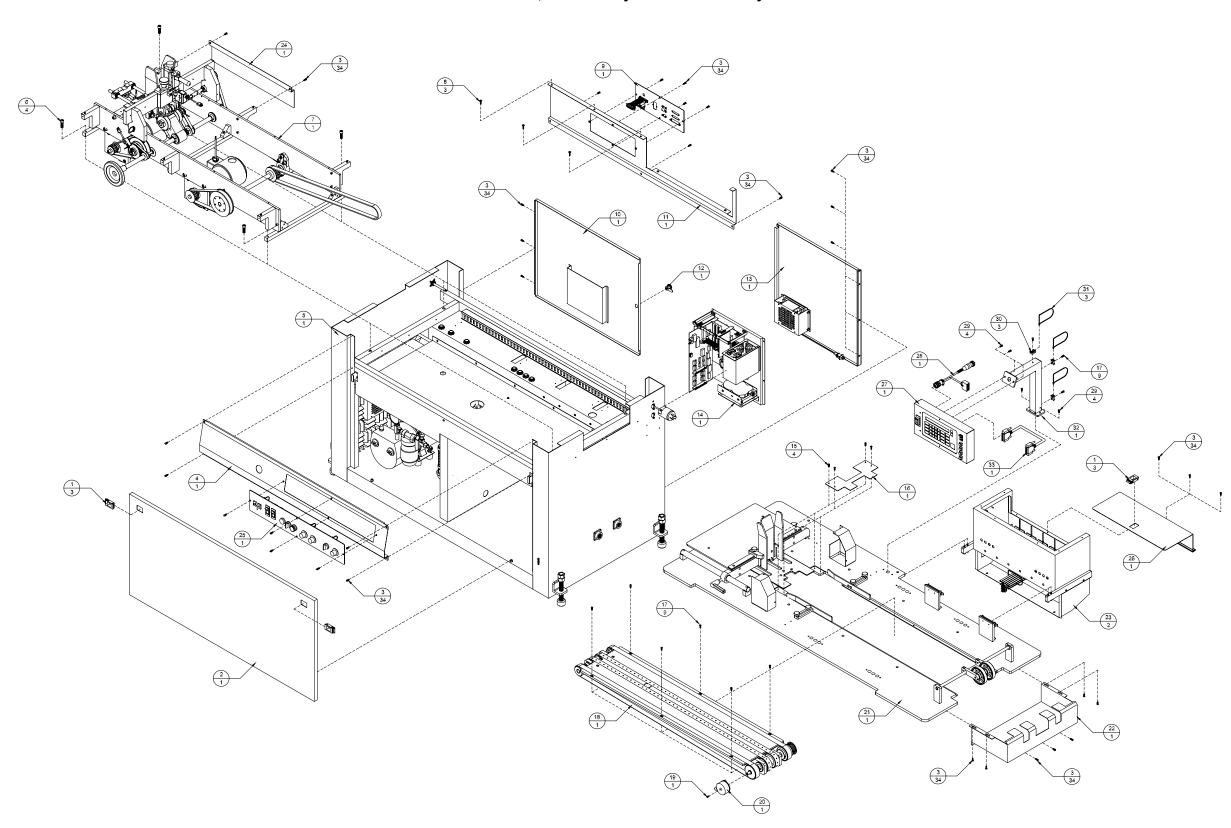


Table A.35 -	BK640	Inkiet	System	(BK640A-2X)
1 4010 11.00	DIGIO	majer	System	(Dironon 2n)

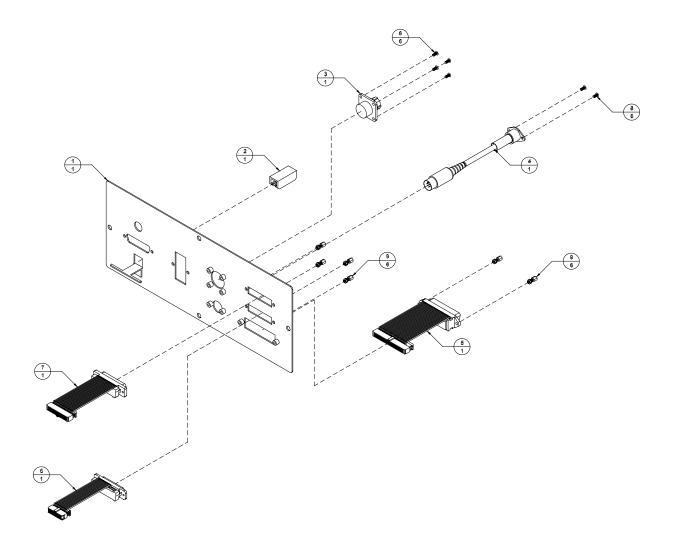
Item	Part Number	Quantity	Description	Reference
1	BK640A	1	BK640 Inkjet Base Assembly	Page A-57
2	402520	2	Screw, BHCS, 6-32 UNC x 3/8"	
3	713601A	1	Printhead Bridge Assembly	Page A-50
4	BK662A/F/H/V	1	Twin Printhead, AllWrite/FastDri/HiDef/VersaPrint	Page A-54
5	706602	1	Photocue Sensor Bracket	
6	630002A	1	Photocue Sensor Assembly	Page A-26



BK640A, BK640 Inkjet Base Assembly

Item	Part Number	Quantity	Description	Reference
1	446000	3	Slide Latch - A3	
2	700609	1	Front Door	
3	404510	34	Screw, BHCS, 10-32 UNF X 1/4"	
4	700610	1	Instrument Panel	
5	713613A	1	BK660 Base Cabinet Assembly	Page A-39
6	407275	4	Screw, SHCS, 3/8-16 UNC x 1 1/4"	
7	300603A	1	Base Mechanical Assembly	Page A-7
8	404040	3	Screw, FHCS, 10-32 UNF x 5/8"	
9	700606A	1	BK640 Communications Plate Assembly	Page A-48
10	700620	1	Right Rear Door	
11	700611	1	Rear Top Cover	
12	615313	1	Cam Lock, 5/8"	
13	700607A	1	Rear Door Assembly	Page A-28
14	706605A	1	Computer Cage Assembly	Page A-29
15	402510	4	Screw, BHCS, 6-32 UNF x 1/4"	
16	700617	1	Shuttle Feeder Cover	
17	404530	6	Screw, BHCS, 10-32 UNF X 1/2"	
18	325602A	1	Transport Belt Tabletop Assembly	Page A-20
19	404310	1	Screw, PHMS, M4 x 10	
20	630600A	1	Shaft Encoder Assembly	Page A-27
21	325604A	1	Tabletop Assembly	Page A-22
22	700608	1	Outfeed Roller Cover	
23	711600A	1	Inkwell Assembly	Page A-31
24	700616	1	Rear Pulley Cover	
25	706608A	1	Instrument Panel Assembly	Page A-41
26	700604	1	Inkwell Container Door	
27	711625A	1	Keypad Assembly	Page A-62
28	606637A	1	Power Extension Cable	
29	405530	1	Screw, BHCS, 1/4-20 UNC x 1/2"	
30	615102	3	Tie Mount	
31	615141	3	Lashing Tie	
32	330322	1	Keypad Mount	
33	606321	1	Serial Extension Cable, 6 ft., 25 Cond.	

Table A.36 - BK640 Inkjet Base Assembly (BK640A)

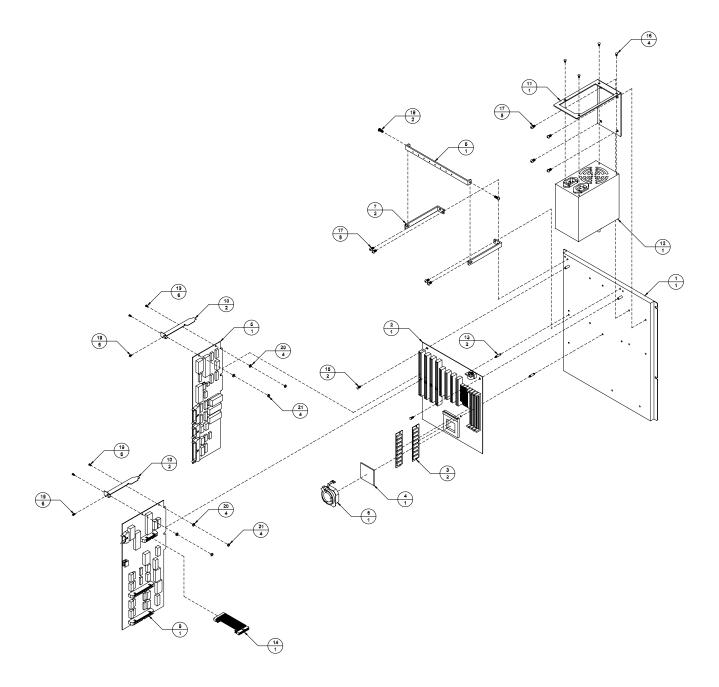


700606A, Communications Plate Assembly (BK640)

Table A.37 -Communications Plate Assembly, BK640 (700606A)

Item	Part Number	Quantity	Description	Reference
1	700606	1	Communications Plate	
2	652002	1	Connector, Bulkhead Modem	
3	614119	1	Receptacle, 11-4, Reverse	
4	606341A	1	Keyboard Cable	
5	606639A	1	Centronics Ribbon Cable	
6	606640A	1	Serial Ribbon Cable	
7	606642A	1	Keypad Ribbon Cable	
8	401310	6	Screw, PHMS, 4-40 UNC x ¼"	
9	615322	6	Female Screwlock, 4-40 UNC	

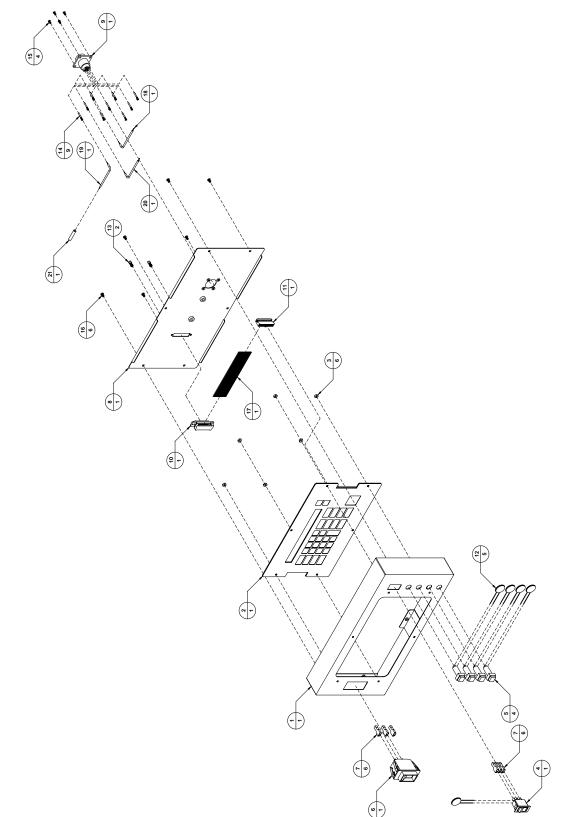




Item	Part Number	Quantity	Description	Reference
1	706605	1	Computer Mounting Board	
2	600314	1	Motherboard - Pentium	
3	640306	2	4 MB SIMM	
4	600340	1	120 Pentium CPU	
5	600320	1	Jet Memory/Interface Board	
6	600315	1	Motherboard Fan	
7	706607	2	Auxiliary Card "L" Bracket	
8	706606	1	Auxiliary Card Bracket Mount	
9	600300	1	Jet Driver Board	
10	615300	2	Auxiliary Card Bracket	
11	713318	1	Computer Power Supply Bracket	
12	600312	1	Computer Power Supply	
13	615106	2	PCB Post, Nylon 6/6, 614-435	
14	614601A	1	Jet Drive I/O Ribbon Cable	
15	402320	2	Screw, PHMS, 6-32 UNC x 3/8"	
16	402310	4	Screw, PHMS, 6-32 UNC x ¼"	
17	404520	8	Screw, BHCS, 10-32 UNF x 3/8"	
18	404510	2	Screw, BHCS, 10-32 UNF x ¼"	
19	401310	6	Screw, PHMS, 10-32 UNF x ¼"	
20	440530	4	Washer, #6, Nylon	
21	420004	4	Nut, 4-40 UNC	

Table A.38 - Computer Cage Assembly (BK640) (706606A)

711625A, Keypad Assembly



Item	Part Number	Quantity	Description	Reference
1	711325	1	Keypad Box	
2	600322A	1	Keypad Circuit Board Assembly	
3	420006	6	Nut, 6-32 UNC	
4	603117	1	Priming Pump Rocker Switch	
5	603129	4	Priming Button	
6	603300	1	Circuit Breaker Switch, 5 Amp, 1 Pole	
7	609110	6	Connector, Push-On	
8	615321	1	Keypad Box Rear Cover	
9	614124	1	Receptacle, Square Flange, 13-9	
10	614326	1	Receptacle, HDF-20, 25 Pin Female	
11	614307	1	Receptacle, Center Polarized, 26 Pin	
12	640300	5	Metal Oxide Varistor	
13	615322	2	Female Screwlock, 4-40 UNC	
14	614107	9	Male Contact, Pin, Yellow	
15	401310	4	Screw, PHMS, 4-40 UNC x ¼"	
16	402310	4	Screw, PHMS, 6-32 UNC x ¼"	
17	606325	10"	Ribbon Cable, #28-26, Grey, Unshielded	
18	606020	9"	Wire, #18, Black, Hookup	
19	606022	9"	Wire, #18, Red, Hookup	
20	606029	9"	Wire, #18, White, Hookup	
21	609000	1"	Shrink Wrap, 3/16" ID	

Table A.39 - Keypad Assembly (711625A)

Electrical System

Appendix **B**

Electrical Components

Terminal Block Assembly

Schematics

Base Power Schematics

Power & System Sensor Connection Schematics

Feeder/Base Connection Schematics

Conveyor Connection Schematics

Auxiliary Feeder Connection Schematics

Inline Remote Connection Schematics

Gap Controller Schematics

Auxiliary Feeder Connection Schematics

BK660 Controller Schematics

BK640 Controller Schematics

BK660 Controller Schematics (European Models)

BK640 Controller Schematics (European Models)

Base Connector Information

- JB1 Power Connector
- JB2 Priming Plug Connector
- JB3 Sure Feed Connector
- JB4 Inline Connector
- JB5 Conveyor Connector
- JB6 Input Sensor Connector
- JB7 Shaft Encoder Connector

BK660 Controller Connector Information

JC1 - Power Supply Connector

BK640 Controller Connector Information

- JA1 Keypad Connector
- JA2 Power Connector (at Keypad)

Terminal Block Assembly

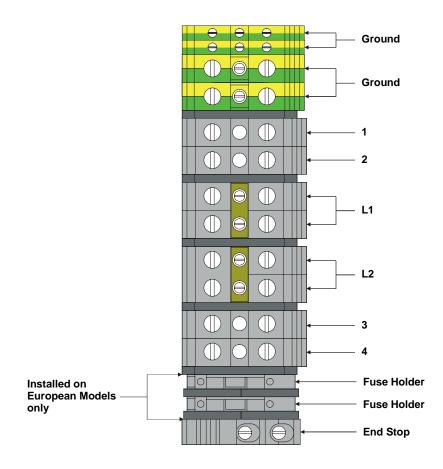


 Table B.1 - Terminal Block Part List

Symbol	Name	Part Number	Description
Ground	Earth Ground	615017	Ground Terminal Block, 6mm (4)
		615018	Ground Terminal Block, 10mm (1)
1	220 VAC, Line Power	615003	Terminal Block, Grey, 10mm
2	220 VAC, Line Power	615003	Terminal Block, Grey, 10mm
L1	220 VAC Main Switched Power	615002	Terminal Block, Grey, 6mm (2)
L2	220 VAC Main Switched Power	615002	Terminal Block, Grey, 6mm (2)
3	220 VAC Pump Switched Power	615002	Terminal Block, Grey, 6mm
4	220 VAC Pump Switched Power	615002	Terminal Block, Grey, 6mm
Fuse Holder	Fuse Holder, 5A	615001	Fuse Holder, Grey, 10 mm (2)

JB1 - Power Connector

PART NUMBER:	614119	
DESCRIPTION:	Connector that provides power to the Controlle	r.
TYPE: REFERENCE: ORIGIN: DESTINATION:	4 pin AMP CPC connector AMP #206430-1 120 VAC Junction Box Communications Plate	

Table B.2 - JB1-Power Connector Pin Assignment

Pin	Function
1	120 VAC, Line
2	120 VAC, Neutral
3	Switch 120 VAC, Line
4	Not Connected

JB2 - Priming Plug Connector

PART NUMBER:	614332, 9100002
DESCRIPTION:	Connector that provides 120 VAC power and switch control for the priming system. $\boxed{1 \prod \prod^2}$
TYPE: REFERENCE: ORIGIN: DESTINATION:	10 pin connector Cinch & Jones, S-310-CCT, P-310-AB Priming Pump System Communications Plate

Table B.3 - JB2-Priming Pump Pin Assignment

Pin	Function
1	Solenoid Valve 1, 120 VAC, Line
2	Solenoid Valve 2, 120 VAC, Line
3	Solenoid Valve 3, 120 VAC, Line
4	Solenoid Valve 4, 120 VAC, Line
5	Solenoid Valve 5, 120 VAC, Line
6	Solenoid Valve 6, 120 VAC, Line
7	Solenoid Valves, 120 VAC, Neutral (all jumpered together)
8	Not Connected
9	Priming Pump, Line
10	Priming Pump, Neutral

JB3 - Auxiliary Feeder Connector

PART NUMBER:	614124	
DESCRIPTION:	Connector that interconnects an Auxiliary feeder with the \bigcirc	Inkjet Base.
TYPE: REFERENCE: ORIGIN: DESTINATION:	9 pin AMP CPC connector AMP #206705-1 Base Control Board (J14) Inkjet Base, Infeed side	0,

Table B.4 - JB3-Auxiliary Feeder Connector Pin Assignment

Pin	Function
1	120 VAC, Line
2	120 VAC, Neutral
3	Speedpot, High
4	Speedpot, Wiper
5	Speedpot, Low
6	Feeder Select (jumper to ground)
7	Ground
8	Not Connected
9	Not Connected

JB4 - Inline Connector

PART NUMBER:	614135
DESCRIPTION:	To provide an inline connection between the Inkjet and the BK530 tabbing system.
TYPE: REFERENCE: ORIGIN: DESTINATION:	37 Pin AMP connectorAMP #206306-1 & 206305-1Base Control Board (J5)Inline Connector

Table B.5 - JB4-Inline Connector Pin Assignment

Pin	Function
1	Mode On
2	Mode Auto
3	Not Connected
4	Control Speedpot, Wiper
5	Control Speedpot, Wiper
6	Control Speedpot, Low
7	Remote Stop
8	Remote Stop
9	Ground
10	Remote Start
11	Interlock Stop Out
12	Interlock Stop Out
13	Feeder Start Out
14	Feeder Start Out
15	Speedpot, Wiper
16	Speedpot, Wiper
17	Speedpot, Low
18	Not Connected
19	Not Connected
20	Not Connected
21	Not Connected
22	Not Connected
23	Not Connected
24	Not Connected
25	Not Connected
26	Not Connected
27	Not Connected
28	Not Connected
29	Not Connected
30	Not Connected
31	Not Connected
32	Not Connected
33	Not Connected
34	Not Connected
35	Not Connected
36	Not Connected
37	Not Connected

JB5 - Conveyor Connector

PART NUMBER:	614106, 614127
DESCRIPTION:	To provide an inline connection between the Inkjet System and the BK1600 conveyor system.
TYPE: REFERENCE: ORIGIN:	7 Pin AMP Connector AMP #206137-1, 206227-1 Base Control Board (J6), Conveyor DCC
DESTINATION:	BK1600 Conveyor

Table B.6 - JB5-Conveyor Connector Pin Assignment

Pin	Function
1	Conveyor DCC-A1, Conveyor Motor A1
2	Conveyor DCC-A2, Conveyor Motor A2
3	Terminal GND, Ground
4	Jumper to Pin 6
5	Not Connected
6	Conveyor Stop
7	Conveyor Stop

JB6 - Sensor Input Connector

PART NUMBER:	614001
DESCRIPTION:	Connector that provides power to the Photocue, Cycle-proxi Switch and Jam Stop Microswitch sensors.
TYPE: REFERENCE: ORIGIN: DESTINATION:	3 Pin AMP Connector AMP #172329-1, 172337-1 Base Control Board (J2) Photocue/Cycle/Jam Stop sensors

Table B.7 - JB6-Photocue Connector Pin Assignment

Pin	Function
1	Photocue Input
2	+12 VDC
3	-0 VDC

JB7 - Shaft Encoder Connector

PART NUMBER:	614007
DESCRIPTION:	Connector that provides power to the Shaft Encoder.
TYPE: REFERENCE: ORIGIN: DESTINATION:	4 Pin AMP Connector AMP #1-480424-0, 606017-1

Table B.8 - JB7-Shaft Encoder Connector Pin Assignment

Pin	Function
1	Shaft Encoder Input, A+
2	Shaft Encoder Input, A-
3	+12 VDC
4	-0 VDC

JC1 - Power Supply Connector

PART NUMBER:	614009
DESCRIPTION:	To provide power to the CD-ROM and 3 ¹ / ₂ " Floppy drives via the computer power supply.
TYPE: REFERENCE: ORIGIN: DESTINATION:	4 pin AMP Connector AMP #1-480426-0 Computer Power Supply Drive Power Cable (P/N 614007A)

Table B.9 - JC1-Drive Power Cable Connector Pin Assignment

Pin	Function
1	+ 12 VDC (Yellow)
2	- 0 VDC (Black)
3	- 0 VDC (Black)
4	+5 VDC (Red)

JA1 - Keypad Connector

PART NUMBER:	614325	
DESCRIPTION:	To provide connection to the controller's keypad. All operator keypad functions including the keys and display are provided by this connector.	
TYPE: REFERENCE: ORIGIN: DESTINATION:	25 Pin "D" type male Connector AMP #747308-2 Communications Plate Jet Memory Interface Board (J3)	

Table B.10 - JA1-Keypad Connector Pin Assignment

 Pin	Function
1	N.C.
2	Keypad Scan Select
3	/Beeper
4	/LED 2
5	/LED 4
6	Keypad Scan Input 1
7	Keypad Scan Input 3
8	Ground
9	LCD Enable
10	LCD Data 0
11	LCD Data 2
12	LCD Data 4
13	LCD Data 6
14	Keypad Scan Select 0
15	Keypad Scan Select 2
16	/LED 1
17	/LED 3
18	Keypad Scan Input 0
19	Keypad Scan Input 2
20	+ 5 VDC
21	LCD Register Select
22	LCD Data 1
23	LCD Data 3
24	LCD Data 5

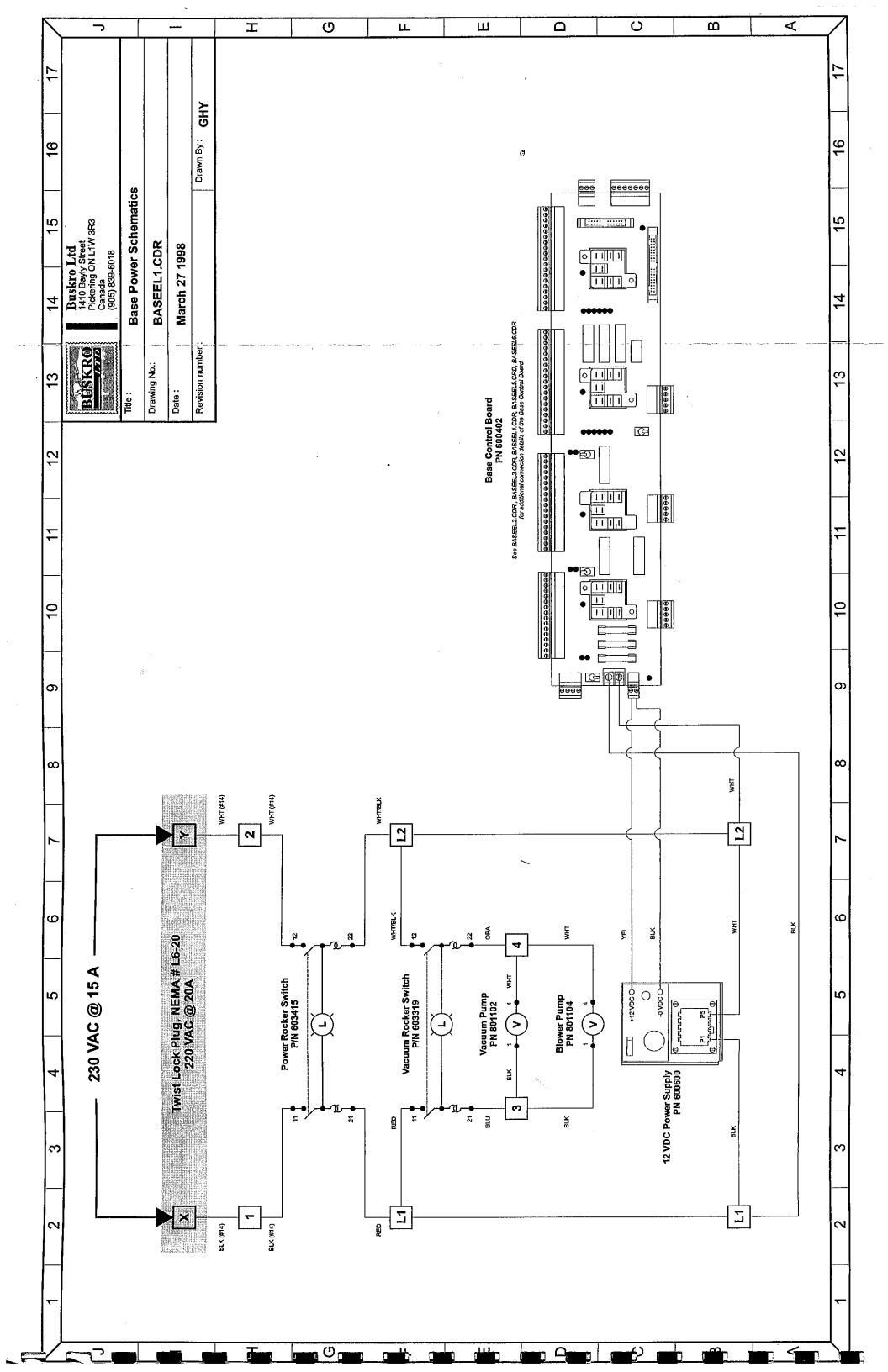
25 LCD Data 7

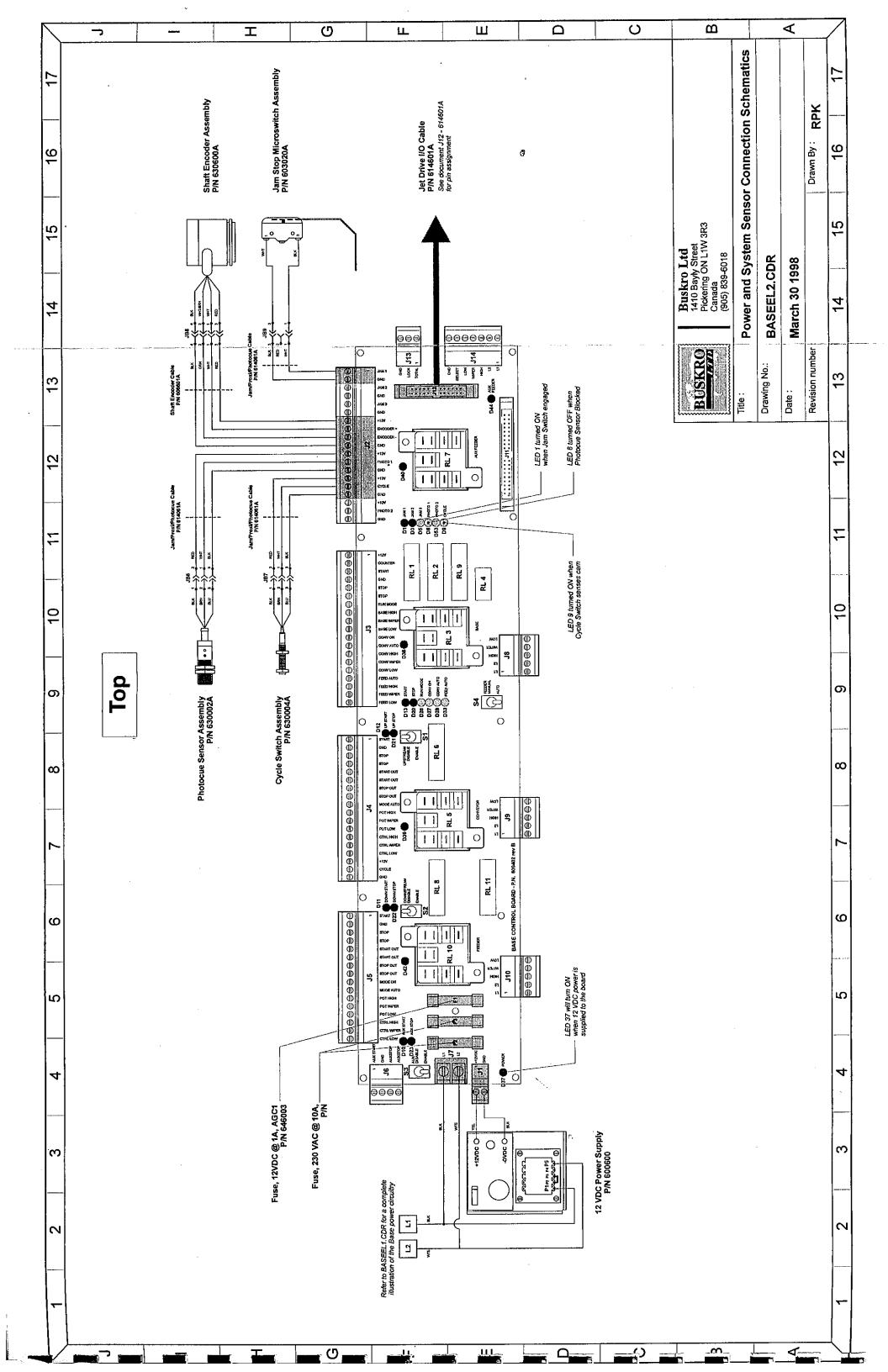
JA2 - Power Connector (at Keypad)

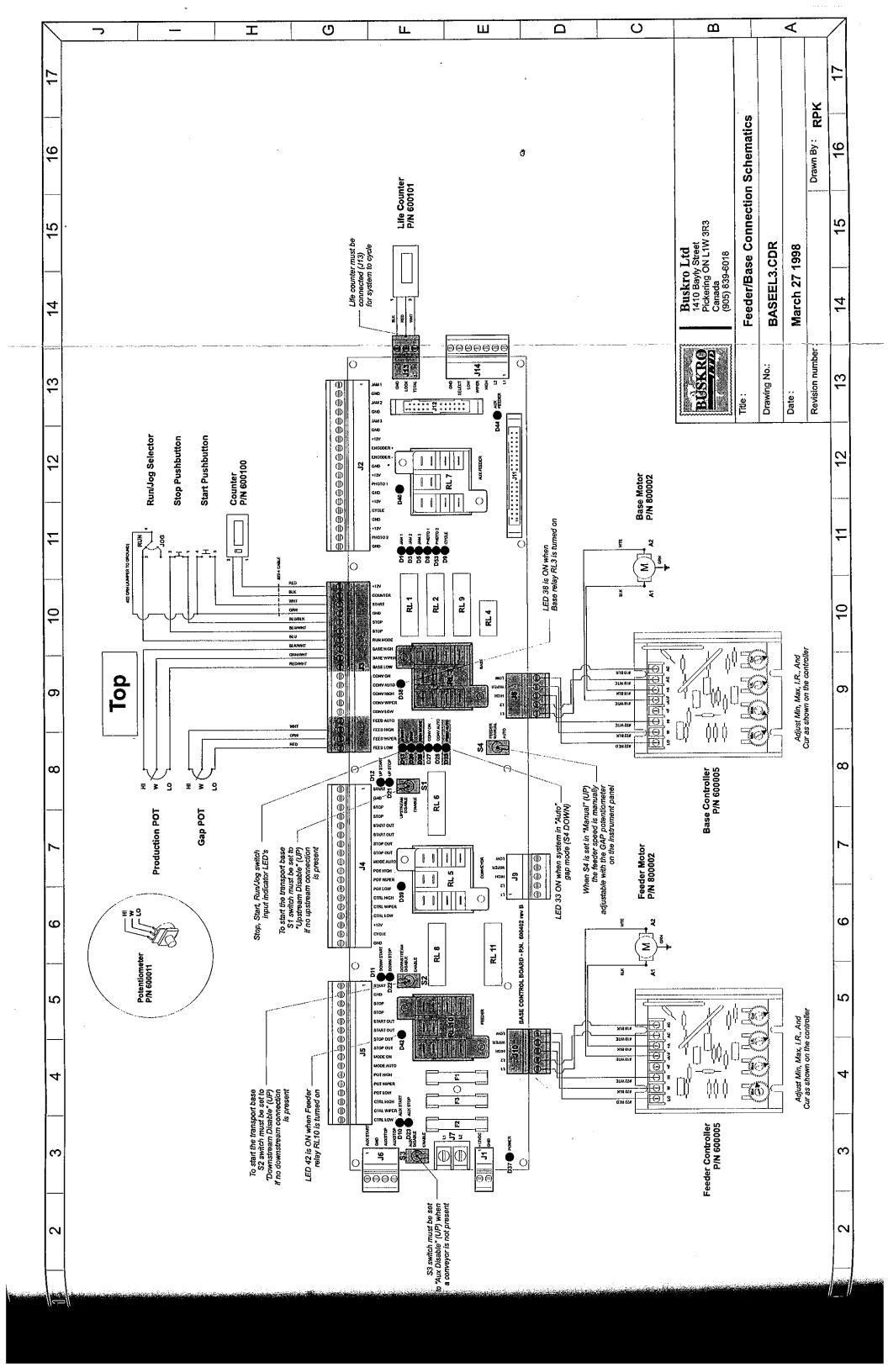
PART NUMBER:	614124
DESCRIPTION:	To provide connection for the BK640 controller's 120 VAC requirements. Power to the Inkjet controller is switched through the power rocker switch situated at the top left side of the keypad.
TYPE: REFERENCE: ORIGIN: DESTINATION:	9 pin AMP CPC connector AMP #206705-1 Controller Keypad Communications Plate

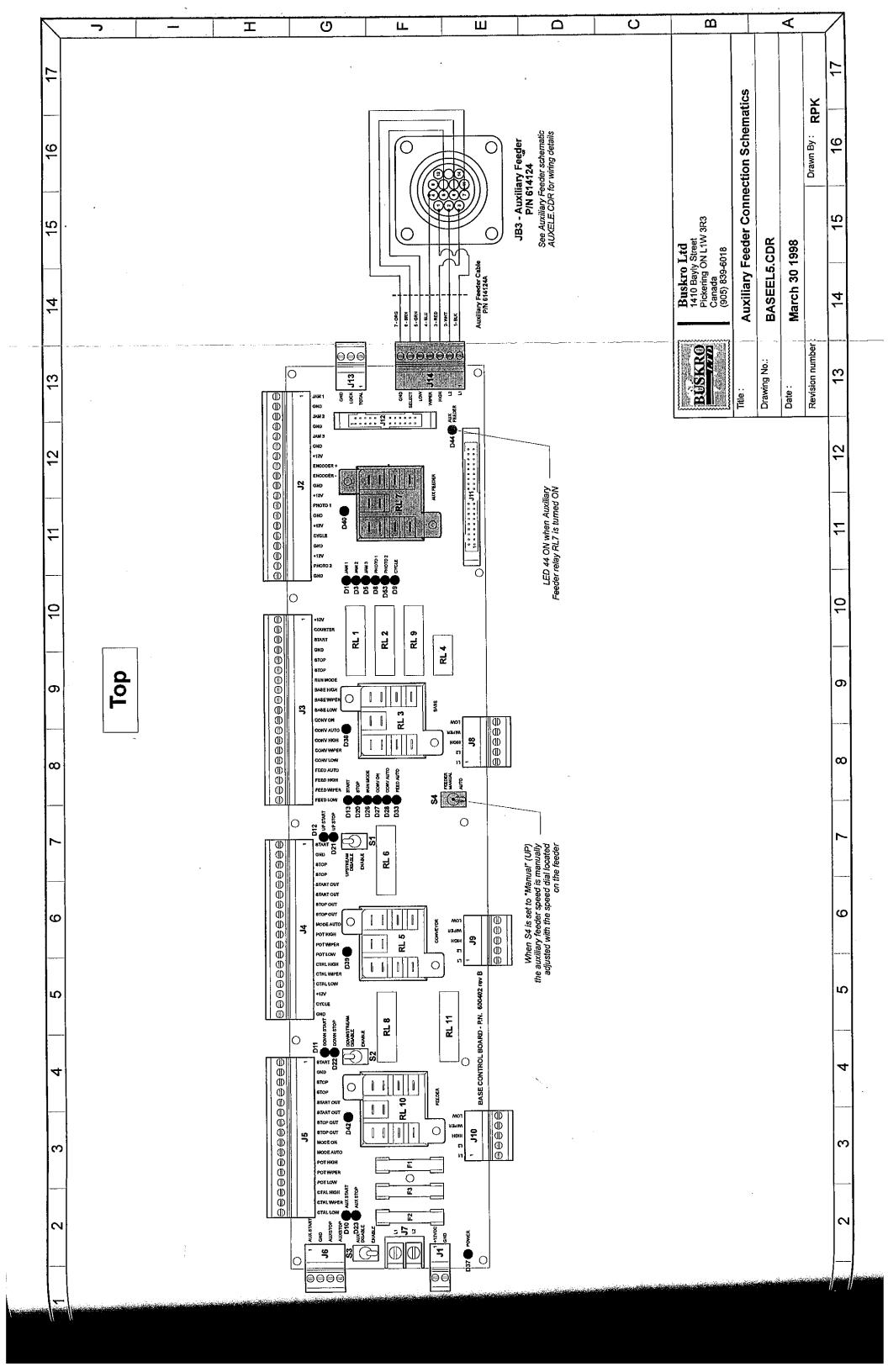
Table B.11 - JA2-Power Connector Pin Assignment

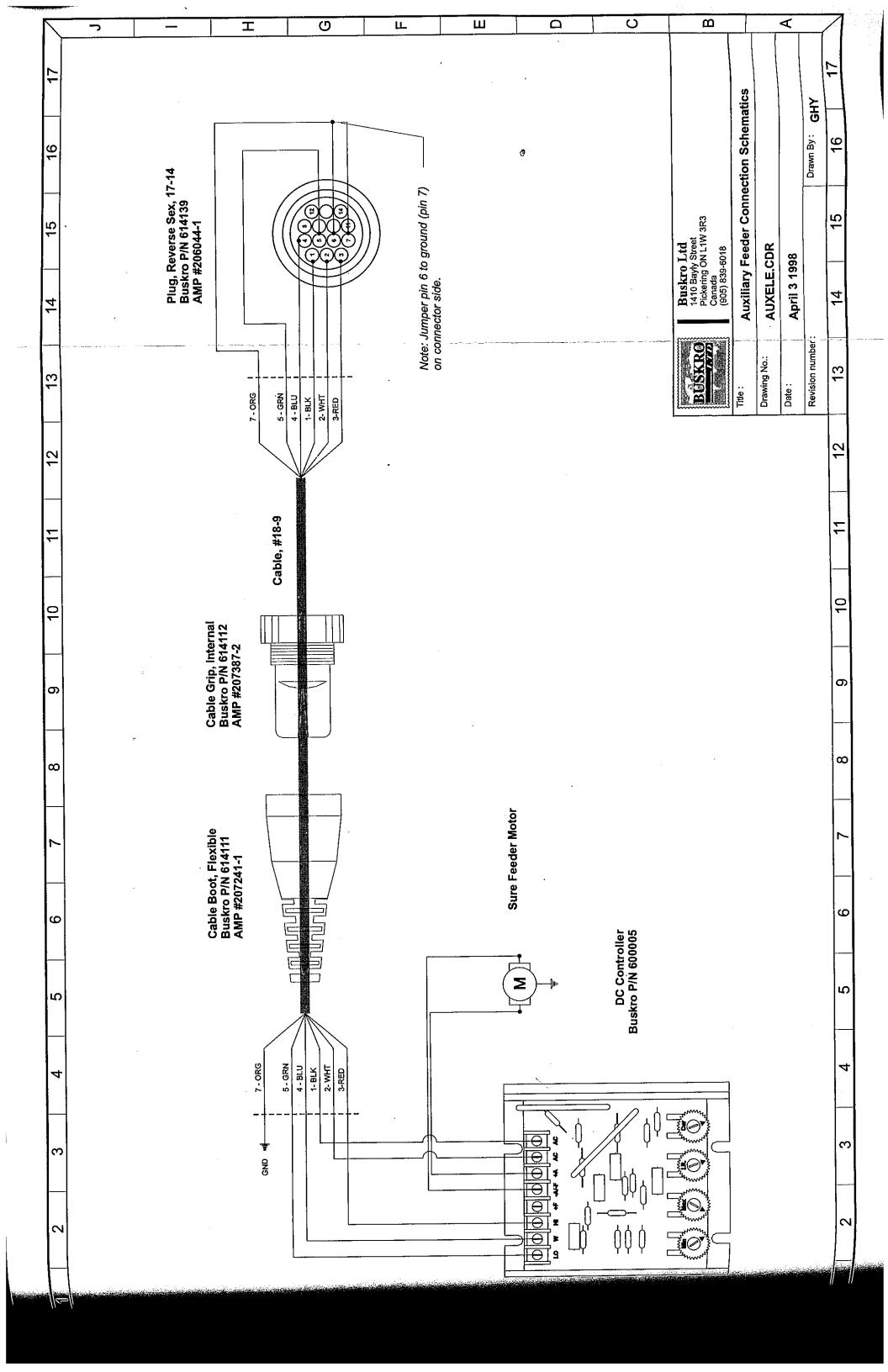
Pin	Function
1	120 VAC, Line
2	120 VAC, Neutral
3	Switch 120 VAC, Line
4	Priming Button 1, Line
5	Priming Button 2, Line
6	Priming Button 3, Line
7	Priming Button 4, Line
8	Priming Pump Power, 120 VAC, Neutral
9	Priming Pump Power, 120 VAC, Line

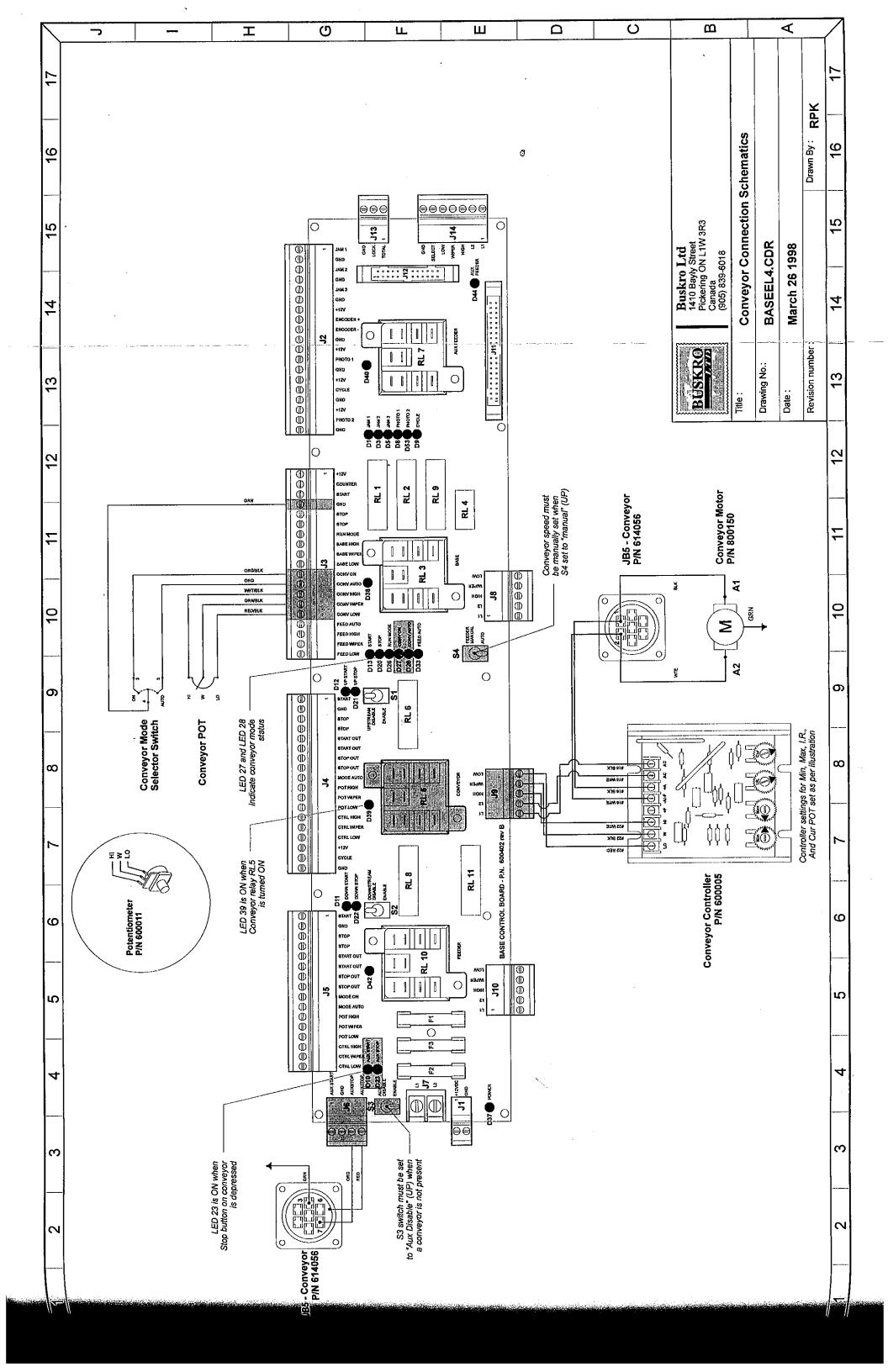


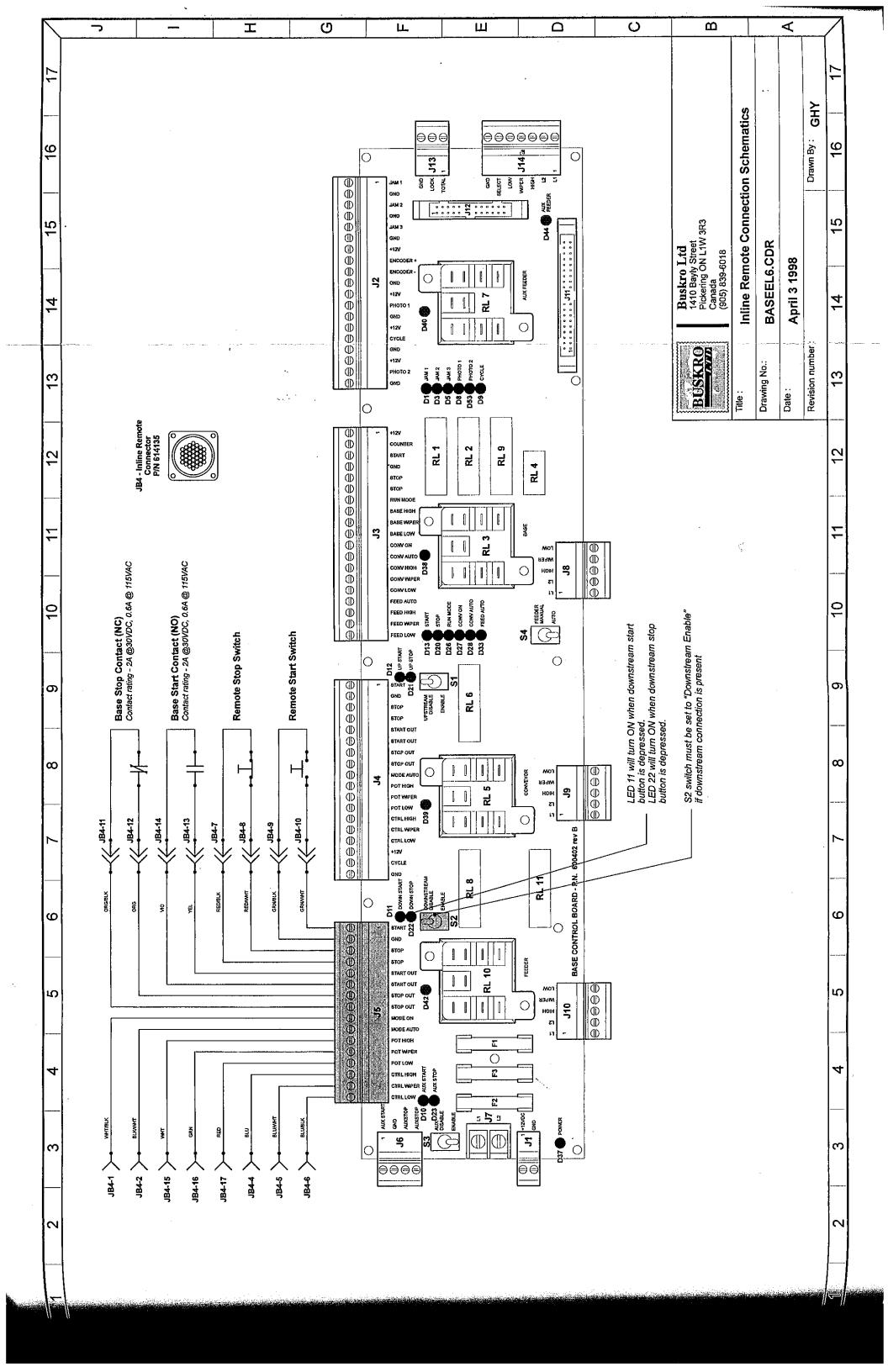


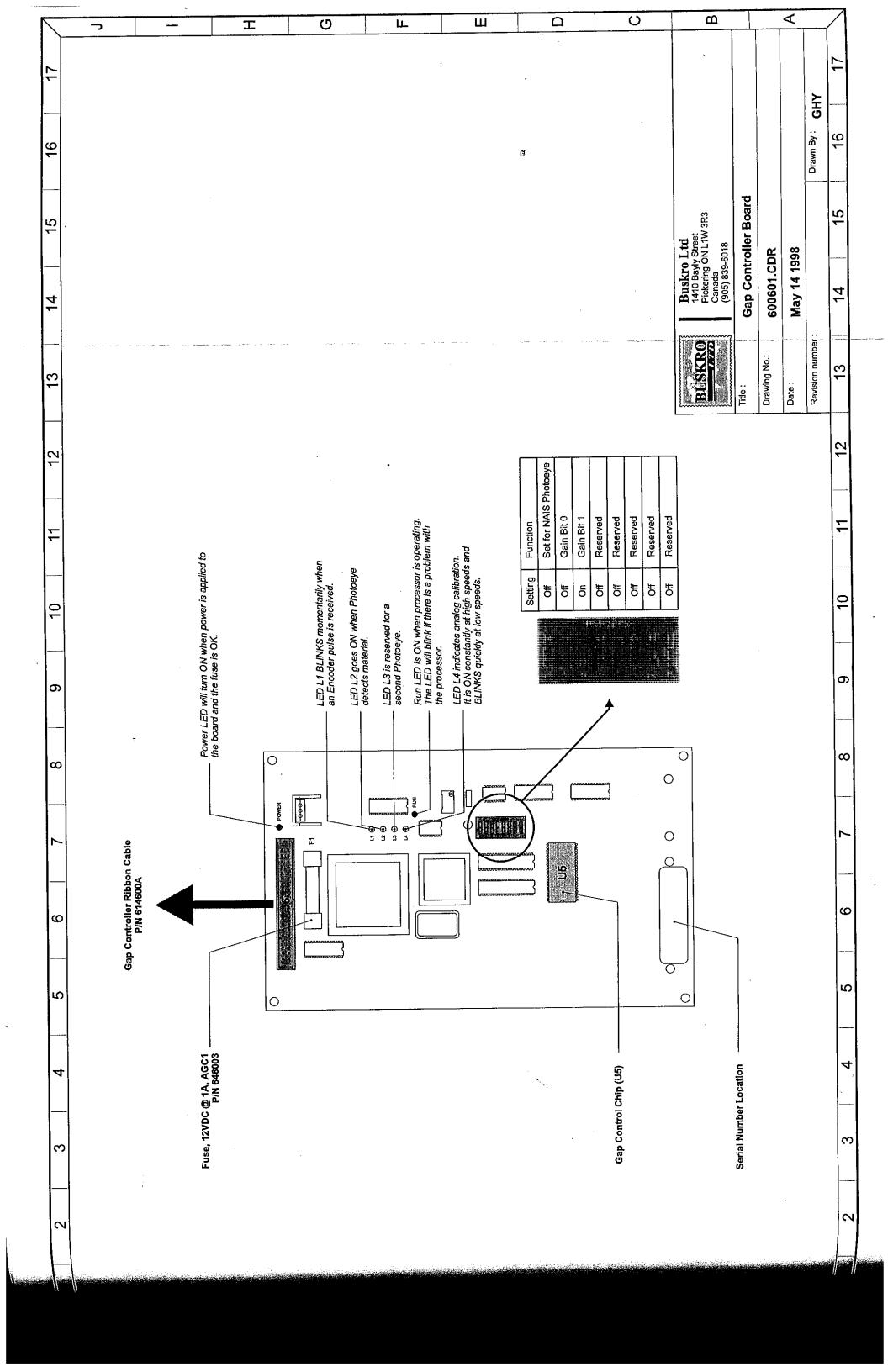


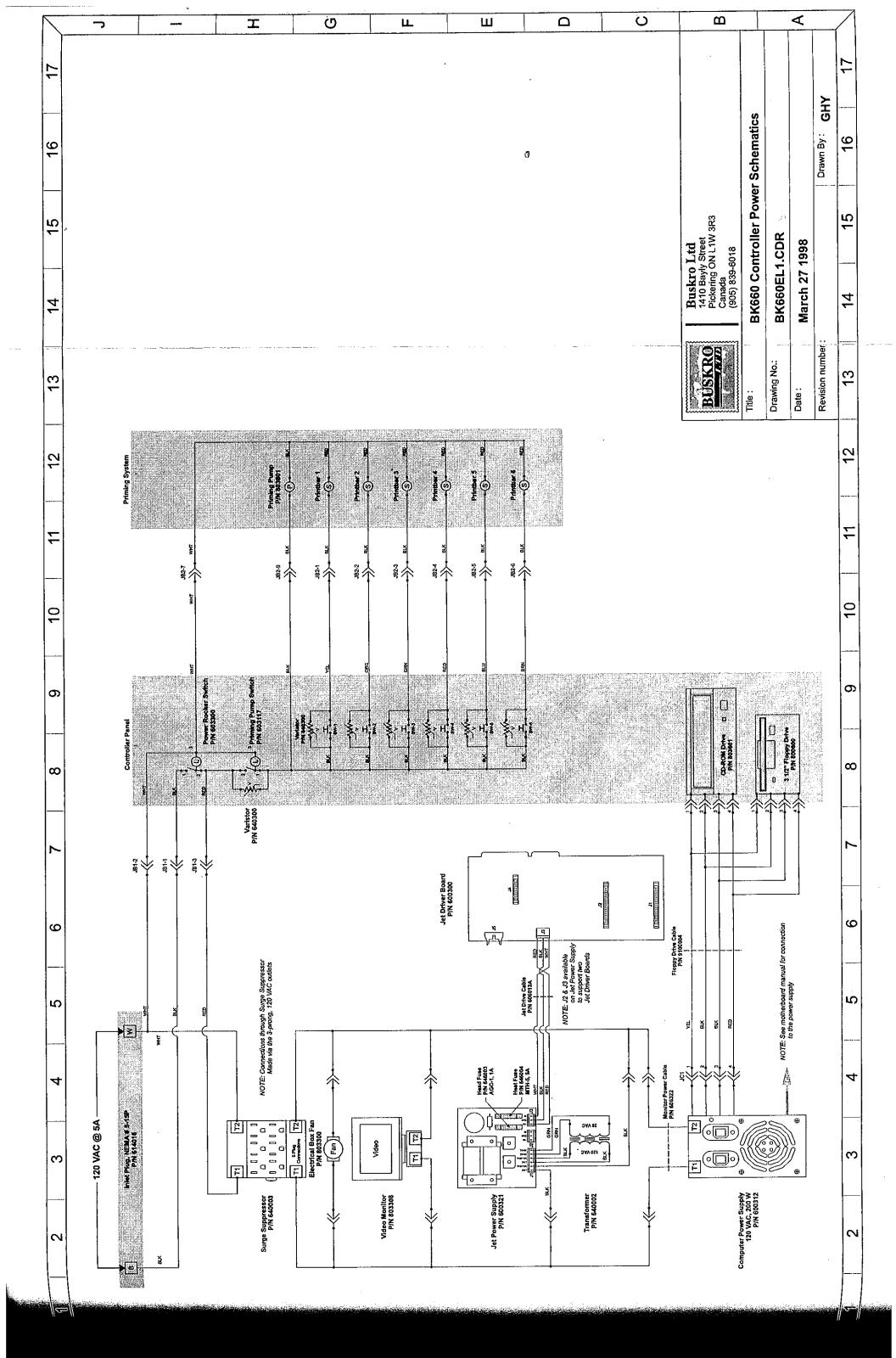


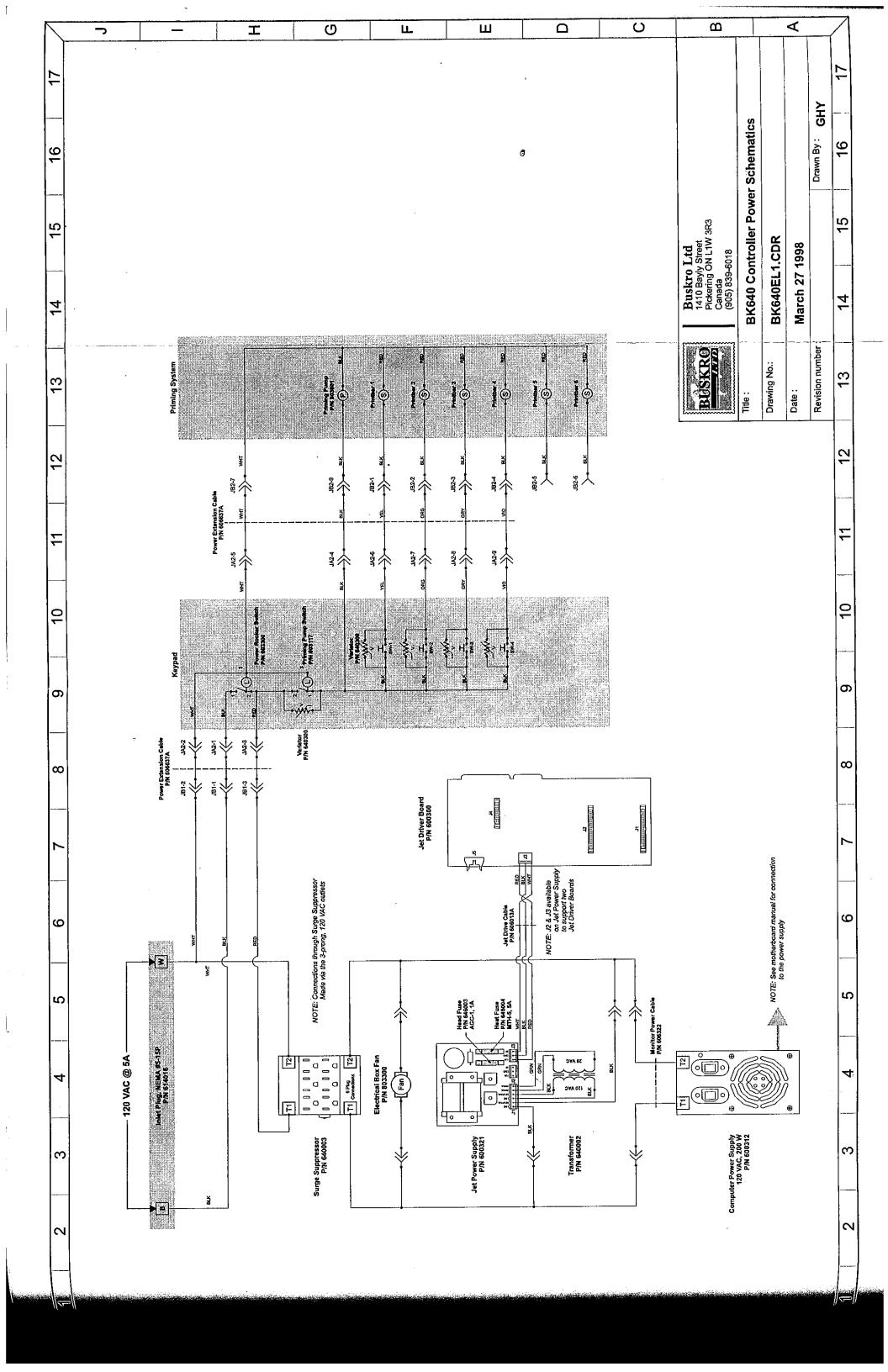


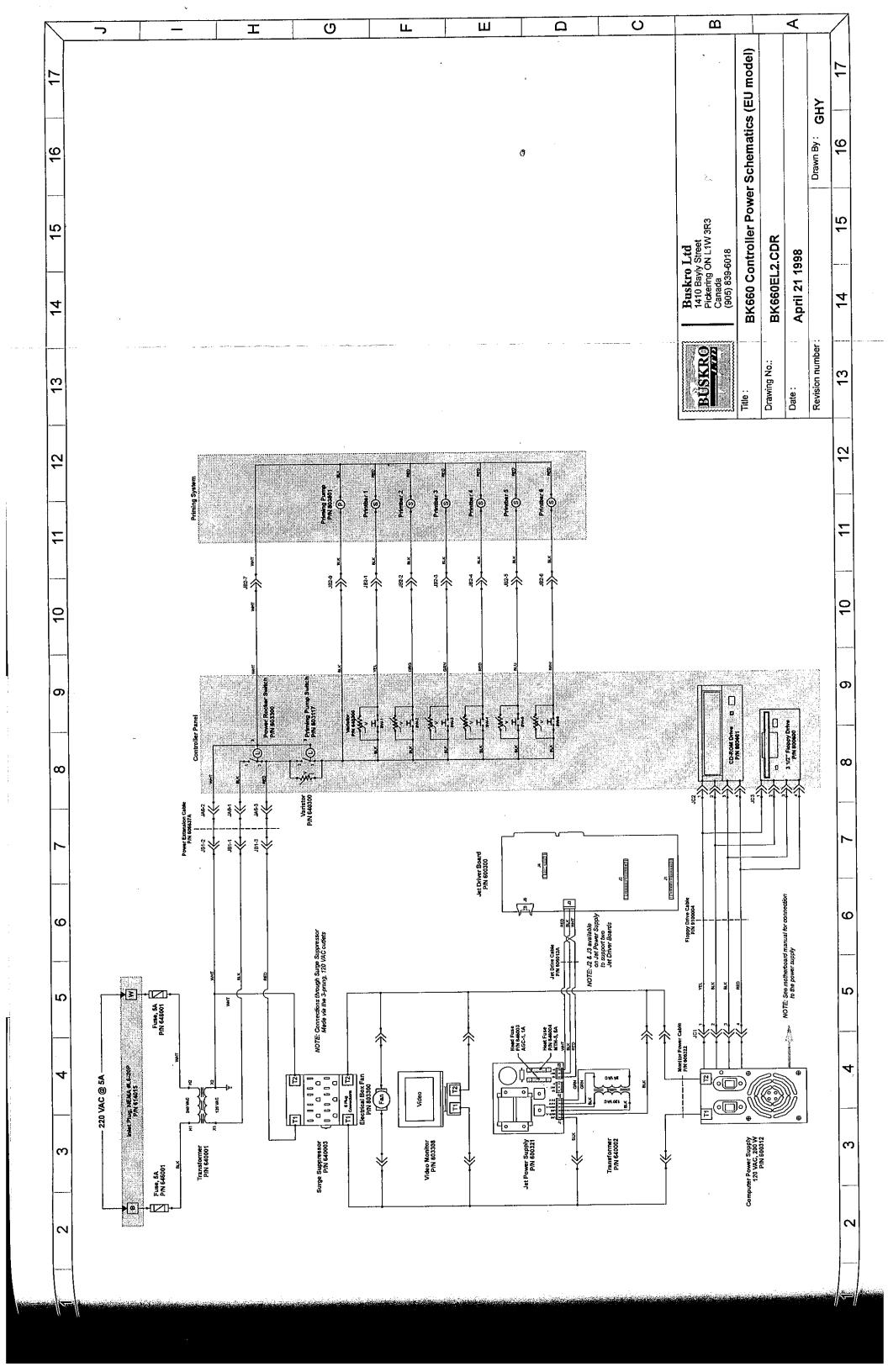


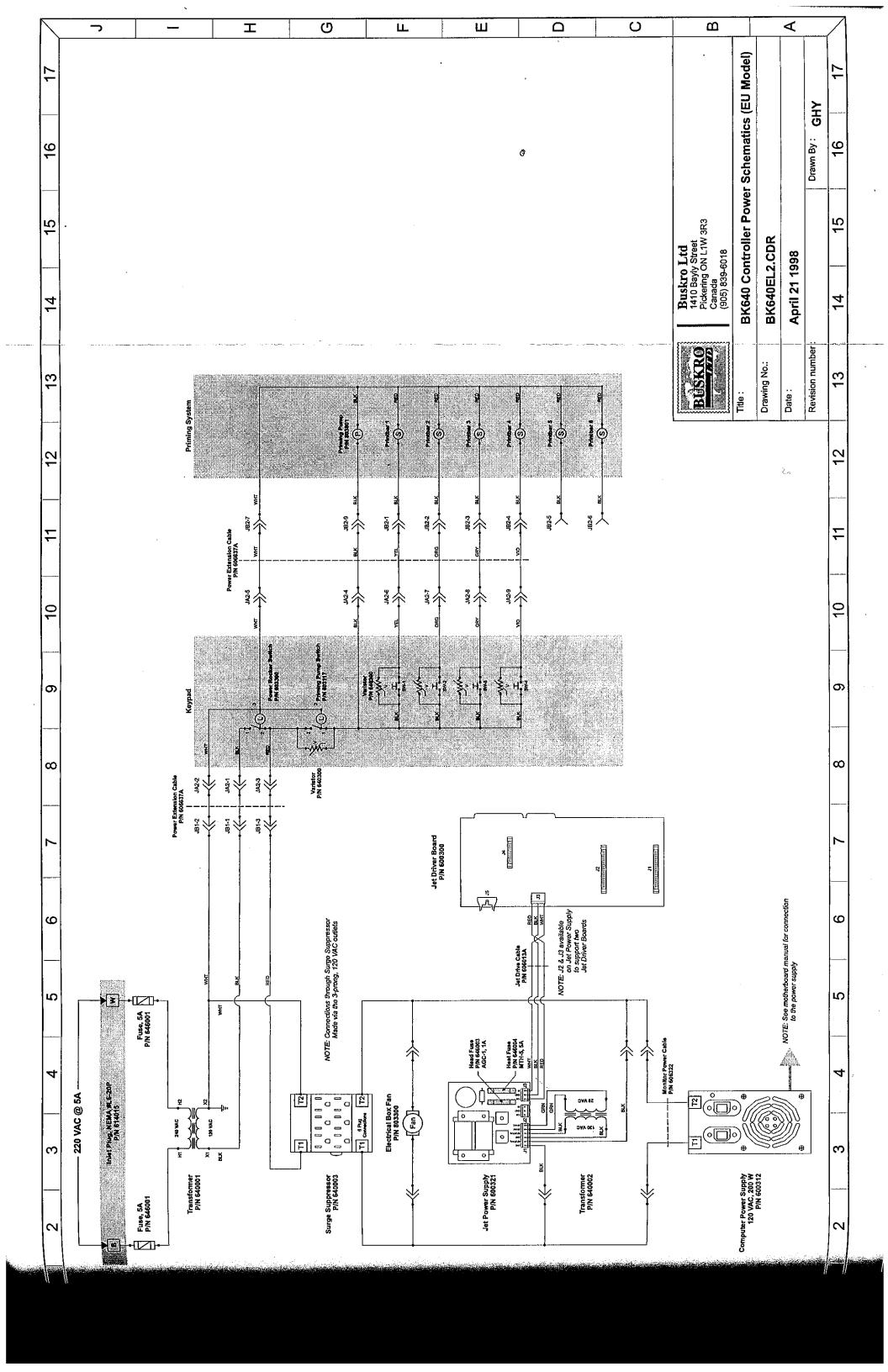












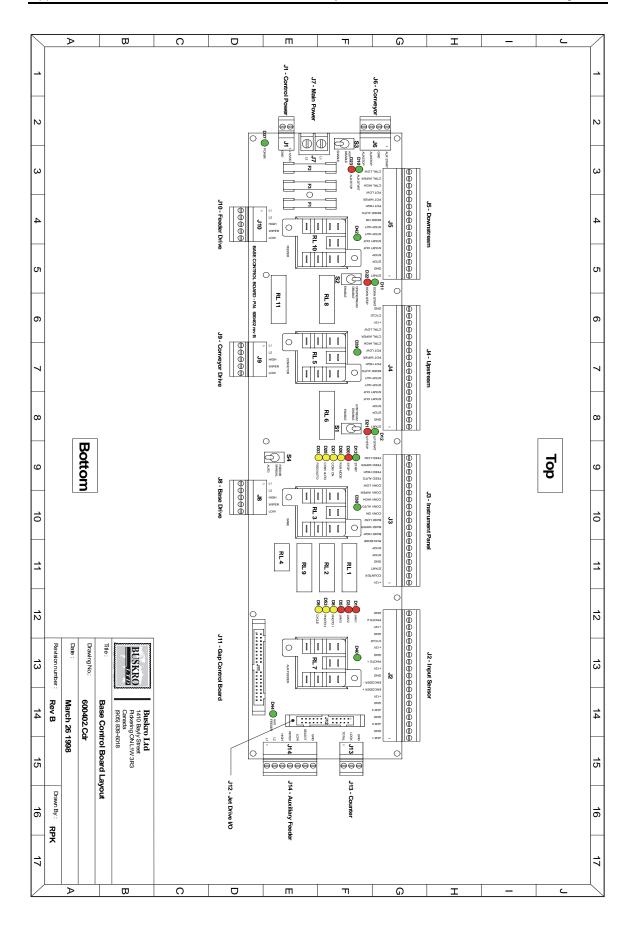
Base Control Board Specifications



Drawing

Connector Information

- J1 Control Power Connector
- J2 Input Sensor Connector
- J3 Instrument Panel Connector
- J4 Upstream Connector
- J5 Downstream Connector
- J6 Conveyor Connector
- J7 Main Power Connector
- J8 Base Drive Connector
- J9 Conveyor Drive Connector
- J10 Feeder Drive Connector
- J11 Gap Control Board Connector
- J12 -Jet Drive I/O Connector
- J13 Counter Connector
- J14 Auxiliary Feeder Connector



Connectors

J1 - Control Power Connector

PART NUMBER:	615062
DESCRIPTION:	Connector which provides 12 VDC power to the Base Control Board providing power to all of the sensors. Please refer to <i>BASEEL2.CDR</i> in <i>Appendix B</i> for the electrical schematics.
TYPE: REFERENCE: ORIGIN: DESTINATION:	2 pin Weidmuller connector, BLA2 Weidmuller #12817.6 Base Control Board 12 VDC Power Supply

Table C.1 - JB1-Control Power Connector Pin Assignment

Pin	Function
1	+ 12 VDC
2	GND

Note: The LED labeled D37 will illuminate when the Control power is supplied to the Base Control Board.

J2 - Input Sensor Connector

PART NUMBER:	615081	
DESCRIPTION:	Connector which interfaces the Base Contr shaft encoder, photocue sensor, and the cy <i>BASEEL2.CDR</i> in <i>Appendix B</i> for the elec	cle switch. Please refer to
TYPE: REFERENCE:	19 pin Weidmuller connector, BLA19 Weidmuller #12834.6	
ORIGIN: DESTINATION:		000000000000000000000000000000000000000

Table C.2 - J2-Input Sensor Connector Pin Assignment

Pin	Function
1	Jam 1
2	GND
3	Jam 2
4	GND
5	Jam 3
6	GND
7	+12 VDC, Shaft Encoder
8	Encoder +
9	Encoder -
10	GND
11	+ 12 VDC, Photocue
12	Photocue signal
13	GND
14	+ 12 VDC, Cycle Proximity Switch
15	Cycle Proximity Switch signal
16	GND
17	+ 12 VDC, Photcue 2
18	Photocue 2 signal
19	GND

Note: The LEDs labeled D1, D3, D5, D8, D53, and D9 will illuminate when the Base Control Board receives a signal from the Jam 1, Jam 2, Jam 3, Photo 1, Photo 2, and Cycle, respectively.

J3 - Instrument Panel Connector

PART NUMBER:	615081	
DESCRIPTION:	Connector that interfaces the Base Contro Please refer to <i>BASEEL3.CDR</i> in <i>Appendix</i>	-
TYPE: REFERENCE:	19 pin Weidmuller connector, BLA19 Weidmuller #12834.6	
ORIGIN: DESTINATION:	Base Control Board Instrument Panel	000000000000000000000000000000000000000

Table C.3 - J3-Instrument Panel Connector Pin Assignm	ent
---	-----

Pin	Function
1	+ 12 VDC, Resetable Counter
2	Resetable Counter
3	Start pushbutton
4	GND, Start pushbutton
5	Stop pushbutton
6	Stop pushbutton
7	Run mode
8	Base/Production pot high
9	Base/Production pot wiper
10	Base/Production pot low
11	Conveyor on
12	Conveyor auto
13	Conveyor pot high
14	Conveyor pot wiper
15	Conveyor pot low
16	Spare
17	Gap/Feeder pot high
18	Gap/Feeder pot wiper
19	Gap/Feeder pot low

Note: The LEDs labeled D13, D20, D26, D27, D28, and D33 will illuminate when the Base Control Board receives a signal from the Start pushbutton, Stop pushbutton, Run mode enabled, Conveyor On mode, Conveyor Auto mode, and Feeder Auto mode, respectively.

J4 - Upstream Connector

PART NUMBER:	615080	
DESCRIPTION:	Connector that interfaces the Base Control	ol Board with any upstream equipment.
TYPE: REFERENCE:	18 pin Weidmuller connector, BLA18 Weidmuller #12833.6	
ORIGIN: DESTINATION:	Base Control Board None	000000000000000000000000000000000000000

Table C.4 - J4-Upstream Connector Pin Assignment

_ Pin	Function
1	Start
2	GND
3	Stop
4	Stop
5	Start Out
6	Start Out
7	Stop Out
8	Stop Out
9	Mode auto
10	Pot high
11	Pot wiper
12	Pot low
13	Control high
14	Control wiper
15	Control low
16	+ 12 VDC
17	Cycle Switch
18	GND

Note: The LEDs labeled D12 and D21 will illuminate when the Base Control Board receives a signal from the Upstream Start and Upstream Stop, respectively.

J5 - Downstream Connector

PART NUMBER:	615080	
DESCRIPTION:	Connector that interfaces the Base Control equipment. The default connection is pres to allow starting and stopping from either the <i>BASEEL6.CDR</i> in <i>Appendix B</i> for the elect	et to operate with the BK530 Tabber machine. Please refer to
TYPE: REFERENCE: ORIGIN: DESTINATION:	18 pin Weidmuller connector, BLA18 Weidmuller #12833.6 Base Control Board Inline Connector, JB4	000000000000000000000000000000000000000

Table C.5 - J5-Downstream Connector Pin Assignment

Pin	Function
1	Start
2	GND
3	Stop
4	Stop
5	Start Out
6	Start Out
7	Stop Out
8	Stop Out
9	Mode on
10	Mode auto
11	Pot high
12	Pot wiper
13	Pot low
14	Control high
15	Control wiper
16	Control low

Note: The LEDs labeled D11 and D22 will illuminate when the Base Control Board receives a signal from the Downstream Start and Downstream Stop, respectively.

J6 - Conveyor Connector

PART NUMBER:	615066
DESCRIPTION:	Connector that interfaces the Base Control Board with the conveyor. Please refer to <i>BASEEL4.CDR</i> in <i>Appendix B</i> for the electrical schematics.
TYPE:	4 pin Weidmuller connector, BLA4
REFERENCE:	Weidmuller #12819.6
ORIGIN:	Base Control Board
DESTINATION:	Conveyor Connector, JB5

Table C.6 - J6-Conveyor Connector Pin Assignment

Pin	Function
1	Auxiliary Start
2	GND
3	Auxiliary Stop
4	Auxiliary Stop

Note: The LEDs labeled D10 and D23 will illuminate when the Base Control Board receives a signal from the Conveyor Start and Conveyor Stop, respectively.

J7 - Main Power Connector

PART NUMBER:	Part of Base Control Board.
DESCRIPTION:	Connector that provides the 220 VAC power to the Base Control Board. Please refer to <i>BASEEL2.CDR</i> in <i>Appendix B</i> for the electrical schematics.
TYPE: REFERENCE: ORIGIN: DESTINATION:	Screw connector None Base Control Board Terminal Blocks, L1 and L2

Table C.7 - J7-Main Power Connector Pin Assignment

Pin	Function
1	L1, 220 VAC
2	L2, 220 VAC

J8 - Base Drive Connector

PART NUMBER:	615056
DESCRIPTION:	Connector that interfaces the Base Control Board base drive motor DC controller. Please refer to <i>BASEEL3.CDR</i> in <i>Appendix B</i> for the electrical schematics.
TYPE: REFERENCE: ORIGIN: DESTINATION:	5 pin Weidmuller connector, BLA5 Weidmuller #12820.6 Base Control Board Base Drive DC controller

Table C.8 - J8-Base Drive Connector Pin Assignment

Pin	Function
1	L1, 220 VAC
2	L2, 220 VAC
3	Base/Production pot high
4	Base/Production pot wiper
5	Base/Production pot low

J9 - Conveyor Drive Connector

PART NUMBER:	615056
DESCRIPTION:	Connector that interfaces the Base Control Board conveyor drive motor DC controller. Please refer to <i>BASEEL4.CDR</i> in <i>Appendix B</i> for the electrical schematics.
TYPE: REFERENCE: ORIGIN: DESTINATION:	5 pin Weidmuller connector, BLA5 Weidmuller #12820.6 Base Control Board Conveyro Drive DC controller

Table C.9 - J9-Conveyor Drive Connector Pin Assignment

Pin	Function
1	L1, 220 VAC
2	L2, 220 VAC
3	Conveyor pot high
4	Conveyor pot wiper
5	Conveyor pot low

J10 - Feeder Drive Connector

PART NUMBER:	615056
DESCRIPTION:	Connector that interfaces the Base Control Board feeder drive motor DC controller. Please refer to <i>BASEEL3.CDR</i> in <i>Appendix B</i> for the electrical schematics.
TYPE: REFERENCE: ORIGIN: DESTINATION:	5 pin Weidmuller connector, BLA5Weidmuller #12820.6Base Control BoardFeeder Drive DC controller

Table C.10 - J10-Feeder Drive Connector Pin Assignment

Pin	Function
1	L1, 220 VAC
2	L2, 220 VAC
3	Feeder/Gap pot high
4	Feeder/Gap pot wiper
5	Feeder/Gap pot low

J11 - Gap Control Board Connector

PART NUMBER:	Part of Base Control Board	
DESCRIPTION:	Connector that interfaces the Base Control Board via the Gap Controller Ribbon Cable (P/N 61460 600601.CDR in Appendix B for additional detail	00A). Please refer to schematic
TYPE: REFERENCE: ORIGIN: DESTINATION:	40 pin Amp Connector None Base Control Board Gap Controller Board	1

Table C.11 - J11-Gap Controller Board Connector Pin Assignment

Pin	Function
1	Ground
2	Feeder Control PCM Input
3	Conveyor Control PCM Input
4 - 25	Not Connected
26	Stack Output to Gap Controller
27	Photoeye Output to Gap Controller
28	Not Connected
29	Encoder Output to Gap Controller
30	Feeder Rate Output to Gap Controller
31	Conveyor Output to Gap Controller
32 - 35	Not Connected
36	+ 5v from Gap Controller
37	+ 12 V to Gap Controller
38	+ 12 V to Gap Controller
39	Ground
40	Ground

J12 - Jet Driver Board Connector

PART NUMBER:	Part of Base Control Board
DESCRIPTION:	Connector that interfaces the base control with the Jet Driver Board via Jet Drive I/O Ribbon Cable (P/N 614601A). Please refer to Appendix D for additional details on the Jet Driver Board.
TYPE: REFERENCE: ORIGIN: DESTINATION:	26 pin Amp ConnectorNoneBase Control BoardJet Driver Board #1

Table C.12 - J12-Jet Driver Board Connector Pin Assignment

Pin	Function
1	Ground
2	Spare Analog Input 1
3	Spare Analog Input 2
4	Spare Analog Input 3
5	Spare Analog Input 4
6	Spare Digital Input 1
7	Spare Digital Input 2
8	Stop Button Input
9	Machine Cycle-Proxi Switch Input
10	Jam Switch Input
11	Spare Output 1
12	Spare Output 2
13	Spare Output 3
14	Divert Relay Output
15	Stack Relay Output
16	Production Counter Output
17	Stop Relay Output
18	Power Supply Ground
19	Encoder Positive or Single Ended Input
20	Encoder Negative Input
21	Power Supply Ground
22	Photcue Input
23-26	Spare

J13 - Counter Connector

PART NUMBER:	615063
DESCRIPTION:	Connector that interfaces the Base Control with the non-resetable counter mounted on the Power Supply Board. Please refer to <i>BASEEL3.CDR</i> in <i>Appendix B</i> for the electrical schematics.
TYPE: REFERENCE: ORIGIN: DESTINATION:	3 pin Weidmuller connector, BLA3 Weidmuller #12818.6 Base Control Board Non-resetable counter

Table C.13 - J13-Counter Connector Pin Assignment

Pin	Function
1	Ground
2	Lock
3	Total

J14 - Auxiliary Feeder Connector

PART NUMBER:	615075	
DESCRIPTION:	Connector that interfaces the Base Control with an Auxiliary feeder. When connected, the inkjet base's feeder motor will automatically be disabled. Please refer to ???? in Appendix B for the electrical schematics.	
TYPE: REFERENCE: ORIGIN: DESTINATION:	7 pin Weidmuller connector, BLA7 Weidmuller #12822.6 Base Control Board Auxiliary Feeder Connector, JB3	

Table C.14 - J14-Auxiliary Feeder Connector Pin Assignment

Pin	Function
1	L1, 220 VAC
2	L2, 220 VAC
3	Auxiliary Feeder pot high
4	Auxiliary Feeder pot wiper
5	Auxiliary Feeder pot low
6	Auxiliary Feeder Select
7	Ground

Note : The Auxiliary Feeder Select must be jumpered to Ground to disable the inkjet base's feeder motor. The jumper should be installed on the Auxiliary Feeder's incoming connector.

The LED labeled D44 will illuminate when the Auxiliary Feeder is connected to the Base Control Board.

Jet Driver Board Specifications

Appendix D

Features

Physical Specifications

Driver Board Connectors

- J1, J2 Printbar Connector
- J3 Voltage Connector
- J4 Input/Output Connector
- J5 Chain Connector

Driver Board Chip Set

Driver Board Jumpers

Printbar Voltage

Additional Driver Boards

Driver Board Installation Procedure

Jet Driver Board

The Jet Driver Board, the board(s) that is seated in the computer motherboard's bus slot, is used to drive two individual TridentTM UltrajetTM 96/32 printbars. The Jet Driver Board will only permit firing of the printbars when used in conjunction with the Compose Inkjet software. if more than one Driver Board is to be located on the motherboard, each Driver Board will require its own FIFO Address PAL (U37). In addition, a chaining cable between each Driver Board <u>must</u> be used.

Features

- Mounts directly in one of the computer motherboard's bus slots.
- Capable of controlling 2 individual Ultrajet[™] 96/32 printbars.
- Each Driver Board requires its own U37, U38 chip set.
- A board jumper exists to accommodate a normally open or closed photocue sensor.
- A board jumper exists to accommodate a differential or single ended shaft encoder.
- An 8K byte FIFO memory chip permitting imaging of 10" (horizontal).
- Adjustable voltage controls via trim pots for each printbar.
- A 26 pin ribbon cable connector for all Input/Output devices.
- Two 50 pin ribbon cable connectors for the printbar cables.
- A 10 pin ribbon cable connector for the chaining cable.

Physical Specifications

	16 Bit, AT Expansion slot
Slot Location :	Any available slot
Board Length :	13.00 in. (330 mm)
Board Height :	6.00 in. (152 mm)
Board Weight :	13.5 in. (400 gr)

Table C.1 - Physical Driver Board Specifications

Driver Board Connectors

A series of connectors are situated on the Driver Board which perform the following tasks: (*See Figure C.1 - Jet Driver Board connector locations*).

- Power Connector for 28 & 96 Volt DC input. (J3)
- Input/Output Connector for all sensors and output devices. (J4)
- Chain Connector to provide interconnection between Driver Boards. (J5)
- Printbar Connector for each printbar. (J1, J2)

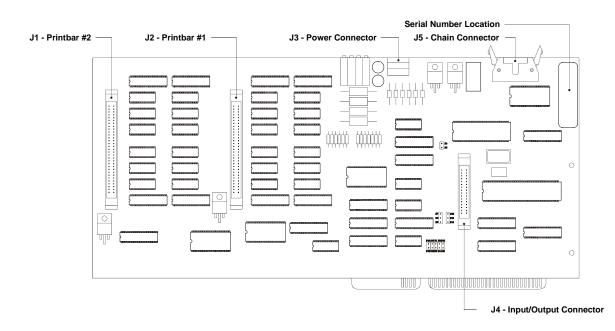


Figure C.1 - Jet Driver Board connector locations

J1, J2 - Printbar Connector

PART NUMBER:	On board
DESCRIPTION:	Connector that provides the signals to drive the printbars. J1 controls printbar #2 and J2 controls printbar #1.
TYPE: REFERENCE: ORIGIN: DESTINATION:	40 pin Amp Connector AMP #102153-9 Jet Driver Board Printbar #1, Printbar #2

 Table C.2 - Printbar Connector Pin Assignment

Pin	Function
1	Power Supply Ground
2	Jet Drive 1
3	Jet Drive 2
4	Jet Drive 3
5	Jet Drive 4
6	Jet Drive 5
7	Jet Drive 6
8	Jet Drive 7
9	Jet Drive 8
10	Jet Drive 9
11	Jet Drive 10
12	Jet Drive 11
13	Jet Drive 12
14	Jet Drive 13
15	Jet Drive 14
16	Jet Drive 15
17	Jet Drive 16
18	Jet Drive 17
19	Jet Drive 18
20	Jet Drive 19
21	Jet Drive 20
22	Jet Drive 21
23	Jet Drive 22
24	Jet Drive 23
25	Jet Drive 24
26	Jet Drive 25
27	Jet Drive 26
28	Jet Drive 27
29	Jet Drive 28
30	Jet Drive 29
31	Jet Drive 30
32	Jet Drive 31
33	Jet Drive 32
34	Power Supply Ground
35	Head Temperature Input
36	Power Supply Ground
37	Spare
38	Ink Low Detector Input
39	Spare
40	Heater Control Output

J3 - Power Connector

PART NUMBER:	On Board
DESCRIPTION:	Connector that receives the 130 VDC and 28 VDC power from the Jet Power Supply.
TYPE: REFERENCE: ORIGIN: DESTINATION:	3 pin Weidmuller connector Weidmuller #13469.6 Jet Driver Board Jet Drive Voltage Cable (P/N 606013A)

 Table C.3 - Power Connector Pin Assignment

Pin	Function
1	+ 130 VDC
2	Power Supply Ground
3	+28 VDC

J4 - Input/Output Connector

PART NUMBER:	On Board
DESCRIPTION:	Connector that controls all I/O signals to and from the Jet Driver Board.
TYPE: REFERENCE: ORIGIN: DESTINATION:	26 pin AMP connector AMP #102153-6 Jet Driver Board Base Control Board

Table C.4 - Input/Output Connector Pin Assignment

Pin	Function
1	Power Supply Ground
2	Spare Analog Input 1
3	Spare Analog Input 2
4	Spare Analog Input 3
5	Spare Analog Input 4
6	Spare Digital Input 1
7	Spare Digital Input 2
8	Stop Button Input
9	Machine Cycle Proxy Switch Input
10	Jam Switch Input
11	Spare Output 1
12	Spare Output 2
13	Spare Output 3
14	Divert Relay Output
15	Stack Relay Output
16	Production Counter Output
17	Stop Relay Output
18	Power Supply Ground
19	Encoder Positive or Single Ended Input
20	Encoder Negative Input
21	Power Supply Ground
22	Photocell Input
23	Spare
24	Spare
25	Spare
26	Spare

J5 - Chain Connector

PART NUMBER:	On Board
DESCRIPTION:	Connector that interconnects multiple Driver Boards. If two boards are installed, then Driver Board #1 and #2 must be interconnected. If three boards are installed, then Driver Board #1, #2 and #3 must be interconnected.
ТҮРЕ:	10 Pin AMP connector
REFERENCE:	AMP #102159-1
ORIGIN:	Jet Driver Board #1
DESTINATION:	Jet Driver Board #2, #3

Table C.5 - Chain Connector J5 Pin Assignment

Pin	Function
1	Encoder /2
2	Spare
3	Analog Convertor Clock (.5 Mhz)
4	Encoder
5	Material Detected
6	Spare
7	Spare
8	Spare
9	Spare
10	Spare

Driver Board Chip Set

The Jet Driver Board consists of a series of chips, which together permit the inkjet process to function. Some of the chips on the board are more important than others or may require replacement from time to time as the software is updated. All of the chips that have a *Lateral Visions* label on them are programmed chips and are identified with shading in *Table C.6.* Programmed chips may have to be replaced as new software versions become available. *Refer to Figure C.2 - Jet Driver Board chipset location for an illustration of the chip locations.* Each Driver Board mounted in the computer's bus slots will differ from the next one through the use of different chips for U37, U38. The chips are mounted on the board using a unique orientation whereby Pin #1, which is identified by a dimple on the chip's surface, is located on the lower left corner (*See Figure C.2*).

Designation	Description
U1	Fire Control PAL
U8	Analog to Digital Chip (ADC Chip)
U10	8 K Byte FIFO Memory
U11	8 K Byte FIFO Memory
U16	Fire Control PAL
U25	Encoder/Clock Divider PAL
U34	Microcontroller
U36	1 K Byte Dual Port Memory
U37	FIFO Address PAL
U38	Dual Port Memory Address PAL
U39	JetDrive Eprom

Table C.6 - Important Driver Board Chips



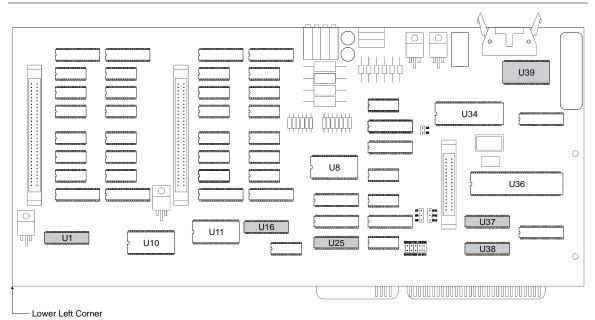


Figure C.2 - Jet Driver Board chipset location

Driver Board Jumpers

A series of jumpers exist on the Jet Driver Board for the purposes of configuring it so that it may be compatible with other components of the system. A jumper is identified as a small plastic cap encasing a metallic piece, which when installed on adjacent 0.2" header pins, straddles and connects them. *Refer to Figure C.3 - Jet Driver Board jumper locations for additional details*. Basically, the jumpers permit the configuration of the following items :

- Photocue sensor type
- Shaft Encoder type
- Additional Boards
- Interrupt Signal of the board

Table C.7 - Driver Board Jumper locations and their function

Jumper	Function
E1-E2	Sets Driver Board for Interrupt 12 (3 rd Board)
E3-E4	Sets Driver Board for Interrupt 11 (2 nd Board)
E5-E6	Always open, Spare
E7-E8	Installed for Normally Closed Photo Cue Detector
E8-E9	Installed for Normally Open Photo Cue Detector
E10-E11	Sets Driver Board for Interrupt 10 (1 St Board)
E12-E13	Installed for Differential Shaft Encoder
E13-E14	Installed for Single-Ended Shaft Encoder
E15-E16	Installed on Board 1 for shaft encoder source
E17-E18	Sets Driver Board for Interrupt 15 (4 th Board)

Note : Jet Driver Board #1 should have jumpers installed on E10-E11, E7-E8, E12-E13, E15-E16.

Jet Driver Board #2 should have jumpers installed on E3-E4 only.

Jet Driver Board #3 should have jumpers installed on E1-E2 only.

Jet Driver Board #2 should have jumpers installed on E17-E18 only.

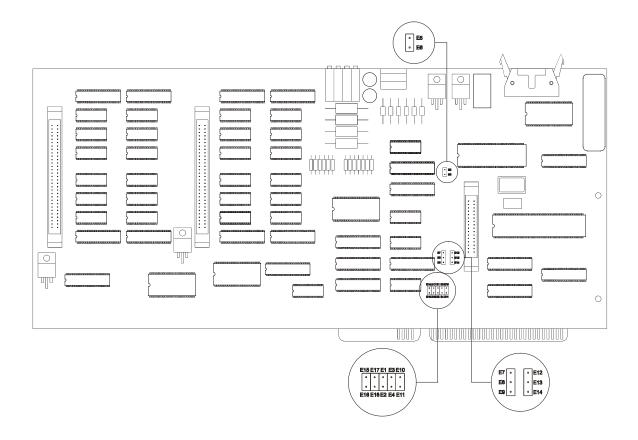


Figure C.3 - Jet Driver Board jumper locations

Printbar Voltage

The Driver Board comes equipped with 4 trim pots that adjust the incoming 130 VDC to a suitable voltage level for the type of printbar used. Printbar selection is made in the *Setup* menu (*See Compose User's Guide*) which causes the voltage relay *K1* to switch between the HiDef/VersaPrint and AllWrite/FastDri trim pots. Please refer to the *Compose User's Guide* for instructions on displaying the voltage settings in Compose. This voltage level must be set each time a new printbar is installed since each individual printbar has its own unique voltage requirements. The combination of this printbar resistor with that of the trim pot should result in a desirable voltage level required for optimal print. (*See Figure C.4 - Jet Driver Board voltage adjustment components for details on the location of the trim pots and resistors*). For the desired voltage setting, refer to the printbar's ink reservoir.

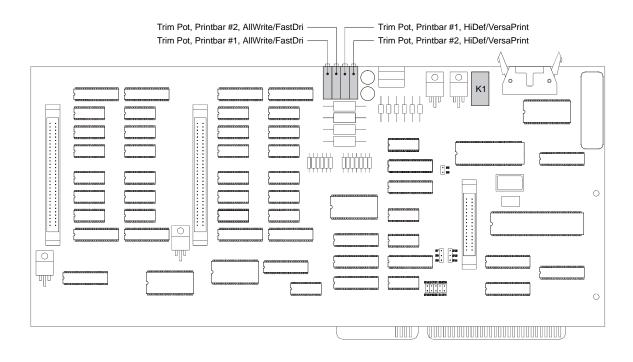


Figure C.4 - Jet Driver Board voltage adjustment components

To Set Printbar Voltage

The printbar voltage must be checked after installing a new printbar. To perform this task a small screw driver will be required. It is recommended that a trim pot adjustment tool be used instead of a screw driver as it facilitates the task immensely.

- 1. After the printbar(s) has been attached via the printbar connector, turn on the computer to invoke the Compose Inkjet program.
- 2. If using Compose V2.XX, from the Compose Operator Window, select the *Diagnostics* menu from the menu bar. Once the pull down menu appears, select the *Head Status* item to display the Head Status Dialog Box. The voltage for printbar 1 will be shown in the Voltage Text Box associated with printbar 1. A voltage level commensurate with the rated voltage on the side of the ink reservoir.

- OR -

- 2. If using Compose V3.XX, from the Compose Operator Window, click on the *Test* button from the toolbar. The voltage for printbar 1 will be shown in the Text Box associated with printbar 1. A voltage level commensurate with the rated voltage on the side of the ink reservoir.
- 3. If the voltage is not within the acceptable limits previously mentioned, adjustment of this voltage using the trim pot for printbar 1 will be necessary. With a trim pot adjustment tool or a small screw driver, carefully rotate the trim pot screw.
- 4. After trim pot adjustment, review the voltage as in step 2. Repeat step 3 if the voltage requires more adjustment.
- 5. Repeat steps 2 to 4 for printbar 2.
- 6. If additional printbars are present adjust the voltage levels on the other Jet Driver Boards.
- 7. To check for an appropriate voltage level of the printbar, request a print of the test label pattern to check the print image. Once a satisfactory image is attained the printbar voltage will be deemed correct. *(See Compose User's Guide for test label printing)*

Additional Driver Boards

If the application requires more than two printbars, additional Driver Board(s) will be required to control the extra printbar(s). The following steps should be taken to configure additional Driver Boards.

To Configure Driver Board #2

- 1. Install jumper *E3-E4* only. Remove jumper *E10-E11* if present.
- 2. Remove the Photocue detector jumper (*E7/E8/E9*) and Shaft Encoder jumper (*E12/E13E14*), if present.
- 3. Replace the chip U37-FIFO Address 1 (or Compose) with U37-FIFO Address 2.
- 4. Replace the chip U38-DP Address 1 with U38-DP Address 2.
- 5. Install the chain connector (J5) between Driver Board #1 and Driver Board #2.

Note : In order to be configured as a Driver Board #2, chips U37 and U38 must be labeled FIFO Address 2 and DP Address 2, respectively..

To Configure Driver Board #3

- 1. Install jumper *E3-E4* only. Remove jumper *E10-E11* if present.
- 2. Remove the Photocue detector jumper (*E7/E8/E9*) and Shaft Encoder jumper (*E12/E13E14*), if present.
- 3. Replace the chip U37-FIFO Address 1 (or Compose) with U37-FIFO Address 3.
- 4. Replace the chip U38-DP Address 1 with U38-DP Address 3.
- 5. Install the chain connector (J5) between Driver Board #1 and Driver Board #2.

Note : In order to be configured as a Driver Board #2, chips U37 and U38 must be labeled FIFO Address **3** and DP Address **3**, respectively..

Driver Board Installation Procedure

If the Jet Driver Board requires replacement due to a malfunctioning condition, the following steps should be taken to install a new board.

E Removal of the Jet Driver Board

- 1. The board is located in one of the computer board's bus slots. Open the Computer Cabinet Door using the key provided with the system. You should be able to view the Driver board mounted in one of the bus slots.
- 2. Remove the Orange colored Power connector (*J3*).
- 3. Using the ejector pins located on both sides of all the Amp connectors, detach the printbar Connector(s) (*J1 & J2*), the Input/Output Connector (*J4*), and the Chain Connector (*J5*) if applicable.
- 4. With a screw driver, loosen the 6-32 UNF screw which holds the board's metal clamping bracket to the computer's case.
- 5. Slide the metal clamping bracket laterally to completely remove the slot from the aforementioned retaining screw. Pull the Driver Board out of the motherboard's slot.
- 6. Try and handle the Jet Driver Board from its edges as much as possible to reduce the chance of static damage being produced. Place it in a Static-Free bag and seal it for shipping and/or storage.

Installation of the Jet Driver Board

- 1. Remove the Jet Driver Board from its Static-Free bag by handling it from its edges as much as possible to reduce the chances of static damage occuring.
- 2. Choose an available motherboard slot and check to ensure tha there are no obstructions. Place the Driver board into the motherboard's slot by gently pushing in the Board's edge connector into the bus slot. Upon successful installation, the Driver Board's metal clamping bracket will rest against the computer's case.
- 3. With a screw driver, secure the board by tightening the 6-32 UNF screw against the metal clamping bracket.
- 4. Re-attach all the connectors to the Driver Board including the printbar Connector (*J1 & J2*), the Input/Output Connector (*J4*), the Power Connector (*J3*), and the Chain Connector (*J5*) if applicable. Note, all connectors are keyed and as such can only go in one way; the correct way.
- 5. After checking that everything appears to be in order, start up the computer to permit tuning of the printbar voltage (*See I To Set Printbar Voltage*) to ensure optimal printing of the printbars.

Jet Memory/Interface Board Specifications



Features

Physical Specifications

Jet Memory/Interface Board Connectors

- J1 Parallel (Centronics) Connector
- J2 Serial Connector
- J3 Keypad Connector

Chip Set

Jet Memory/Interface Board Installation Procedure

Jet Memory/Interface Board

The Jet memory/interface board is used on all BK400 inkjet systems to provide all the control features of the inkjet system including the keypad functions and the data flow control. It provides connection for either serial or parallel data input and a seperate connector for the interface of the keypad via a rear mounted connector plate. In addition, this board is fully compatible with any AT type keyboard.

Features

- Mounts directly in one of the motherboard's AT bus slots.
- Provides serial communication up to 19,200 Baud.
- Provides parallel data communication.
- Compatible with standard AT type keyboard.
- Optional zip sort module for mail sorting on conveyor.
- Optional extended font module provides an additional 8 fonts including a 3 of 9 barcode.
- Capable of accepting a maximum of 10 fields of data per record for a total of 500 characters.
- Stores the 50 most recent data records in a reprint buffer.

Physical Specifications

Table E.1 - Physical Jet memory/Interface board specifications

Mounting Arrangement :	16 bit, AT expansion slot
Slot Location :	Any available slot, normally leftmost slot
Board Length :	13.25" (337 mm)
Board Height :	4" (101 mm)
Board Weight :	250 gr

Jet Memory/Interface Board Connectors

A series of connectors are situated at the top of the board and oriented outward when seated in the motherboard's bus slot. The connectors are identified as :

- J1 Parallel port (40 pin connector)
- J2 Serial Port (16 pin connector)
- J3 Keyboard (26 pin connector)

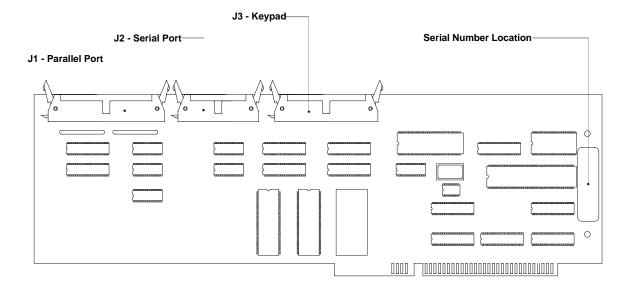


Figure E.1 - Jet Memory/Interface Board connector locations

J1 - Parallel (Centronics) Connector

PART NUMBER:	On Board
DESCRIPTION:	Connector that provides parallel communication for the transfer of data between the computer and BK400 inkjet system. The high speed communications possible makes this configuration the best choice to attain substantial speeds with the inkjet system.
TYPE: REFERENCE: ORIGIN: DESTINATION:	40 Pin AMP connector N/A Jet Memory/Interface Board Centronics Connector on Communications Plate

Table E.2 - J1-Parallel Port Pin Assignment.

PIN	FUNCTION
01	/Strobe(In)
02	Ground
03	Data 0(In)
04	Ground
05	Data 1(In)
06	Ground
07	Data 2(In)
08	Ground
09	Data 3(In)
10	Ground
11	Data 4(In)
12	Ground
13	Data 5(In)
14	Ground
15	Data 6(In)
16	Ground
17	Data 7(In)
18	Ground
19	/Acknowledge(Out)
20	Ground
21	Busy(Out)
22	Ground
23	Out of Forms(Out)
24	Ground
25	Select(Out)
26	/Printer Init(In)
27	N.C.
28	/Error(Out)
29	N.C.
30	Ground
31	Ground
32	N.C.
33	Ground
34	Pulled to +5V
35	N.C.
36	N.C.
37	N.C.
38	N.C.
39	N.C.
40	N.C.

J2 - Serial Connector

PART NUMBER:	On Board	
DESCRIPTION:	Connector that provides serial communication for the transfer of data between the computer and BK400 inkjet system. This type of communication is used mostly if you wish to communicate over large distances (in excess of 100 ft), however, depending on the baud rate chosen, the data transfer is much slower resulting in lower production rates from the inkjet system.	
TYPE: REFERENCE: ORIGIN: DESTINATION:	16 Pin AMP connector N/A Jet Memory/Interface Board Serial Connector on Communications Plate	

 Table E.3 - J2-Serial Connector Pin Assignment.

PIN	FUNCTION
01	N.C.
02	N.C.
03	Transmit Data Output from Printer (TXD)
04	N.C.
05	Received Data Input to Printer (RXD)
06	N.C.
07	Request To Send Output from Printer (RTS)
08	N.C.
09	N.C.
10	N.C.
11	N.C.
12	N.C.
13	Signal Ground (GND)
14	Data Terminal Ready Output from Printer (DTR)
15	N.C.
16	N.C.

J3 - Keyboard Connector

PART NUMBER:	On Board
DESCRIPTION:	Connector that provides a connection for the controller's keypad which may be remotely located. All operator keypad functions including the keys and display are provided by this connector.
TYPE: REFERENCE: ORIGIN: DESTINATION:	26 Pin AMP connector N/A Jet Memory/Interface Board Keyboard Connector on Communications Plate

Table E.4 - J3-Keyboard Connector Pin Assignment.

PIN	FUNCTION
01	N.C.
02	Keypad Scan Select 0
03	Keypad Scan Select 1
04	Keypad Scan Select 2
05	/Beeper
06	/LED 1
07	/LED 2
08	/LED 3
09	/LED 4
10	Keypad Scan Input 0
11	Keypad Scan Input 1
12	Keypad Scan Input 2
13	Keypad Scan Input 3
14	+5 VDC
15	Ground
16	LCD Register Select
17	LCD Register Enable
18	LCD Data 1
19	LCD Data 0
20	LCD Data 3
21	LCD Data 2
22	LCD Data 5
23	LCD Data 4
24	LCD Data 7
25	LCD Data 6
26	N.C.

Chip Set

The Jet Memory/Interface board consists of a series of chips, which together, permit the inkjet controller to work. Chips which may necessitate replacement in the field have been socketed to facilitate this procedure and they come in three distinct categories :

- Programmed chips (Identified with white labels)
- Processor Chips
- Driver Chips

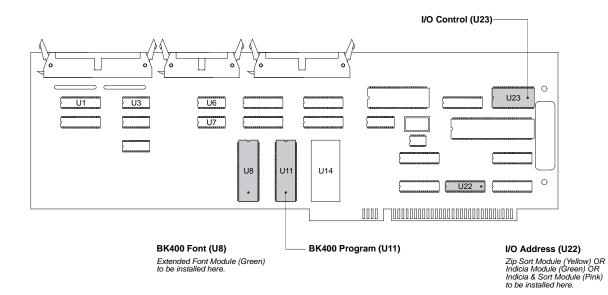


Figure E.2 - Jet Memory/Interface Board chip set location

Programmed chips may have to be upgraded as they become available or need replacing when a chip upgrade/option is ordered. These chips can be identified on the board as they have a white sticker with Lateral Visions printed on them.

The processor chips (U15 and U21) seldom require any change, however, the driver chips (U1,U3,U6,U7) may sometimes become damaged due to the presence of excessive voltage levels on the serial or parallel interface cables.

Designation	Description	Part Number
U1		74ALS574BN
U3		74LS05N
U6	RS232 Receiver IC	75189 or 1489
U7	RS232 Driver IC	75188 or 1488
U8	BK400 Font Chip	Lateral Visions U8
U11	BK400 Program	Lateral Visions U11
U14	8 KB battery backed RAM module	Dallas, DS1230Y-120
U15	Microcontroller	Intel, P8032
U21	1KB dual port memory	9451P
U22	I/O Address	Lateral Visions U22
U23	I/O Control	Lateral Visions U23

Table E 5 - Jet Memory/Interface Board Chip Set

Note : All programmed chips have been identified by light shading.

To facilitate the identification of the various option chips, they have been color-coded according to the following table. Refer to *Figure E.2 - Jet Memory/Interface Board chip set location* for the location of the options chips.

Table E.6 - Jet Memory/Interface	Board option chip	set color coding
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Color	Description	Color	Part Number
U8	Extended Font Module	Green	640308
U22	Zip Sort Module	Yellow	640307
U22	Indicia Module	Green	640316
U22	Indicia & Sort Module	Pink	640317

Note : Only one of the U22 option chips listed above can be installed on the Jet Memory/Interface Board.

To Install the Extended Font Module (U8)

The *Extended Font* module, a 32 pin DIP chip, is identified by its *green* color code and the designation U8. Lateral Visions and BK400 Font should also be printed on the label. Refer to the figure of the Jet Memory/Interface board provided with this documentation for additional information.

- 1. Turn off the power to the inkjet controller by placing the power switch, located on the keypad, Off.
- 2. Disconnect the Parallel, Serial, and Keypad ribbon cable/connector assemblies by prying open the ejector pins situated on the board's J1, J2 and J3 connectors.
- 3. Using a small Phillips screw driver, loosen and remove the 4-40 UNF screw which fastens the board to the computer cage.
- 4. Pull the Jet Memory/Interface board out of the motherboards bus slot.
- 5. Carefully handle the board by its edges and place it on a table with the chips facing upward. With a small flat screw driver, gently remove *U8* from its socket.
- 6. Place the *green* Extended Font module chip into socket *U8* with the small divot orientated to the top of the board in a similar manner as U11, the BK400 Program chip. (*See Figure E.2 Jet Memory/Interface Board chip set location*). Align one side of the chip's pins in the socket and gently rock the chip until the other side of the chip's pins are also aligned with the socket. Press down firmly until the chip is fully seated in the socket. It is extremely important that the correct orientation is used; If you are unsure, please contact the factory.
- 7. Inspect the seated chip to ensure that no pins were bent in the installation. If a pin appears bent, carefully remove the chip again as per step 6, unbend the pin and repeat the insertion procedure.
- 8. Replace the board back into the motherboard's slot by aligning it and firmly pushing it back into place. The attachment bracket should be flush with the computer cage.
- 9. With the Phillips screwdriver, insert and retighten the 4-40 UNF fastening screw such that the board is firmly held into place in the motherboard slot.
- 10. Reconnect all three connectors into their respective locations. The connectors are keyed and will only fit in one direction.
- 11. Inspect the board seating and the three connections made for correct installation.
- 12. Turn the power On and ensure that the system's display indicates a normal condition. If not immediately turn off the power, re-inspect the connections and seating as per the previous step and retry the procedure. If the system does not return to normal at this point, please contact the factory.

To Install Zip Sort Module (U22)

The *Zip Sort* module, a 20 pin DIP chip, is identified by its *yellow* color code and the designation U22. Lateral Visions and IO Address should also be printed on the label. Refer to *Figure E.2 - Jet Memory/Interface Board chip set location* for additional information.

- 1. Turn off the power to the inkjet controller by placing the power switch, located on the keypad, Off.
- 2. Disconnect the Parallel, Serial, and Keypad ribbon cable/connector assemblies by prying open the ejector pins situated on the board's J1, J2 and J3 connectors.
- 3. Using a small Phillips screw driver, loosen and remove the 4-40 UNF screw which fastens the board to the computer cage.
- 4. Pull the Jet Memory/Interface board out of the motherboards bus slot.
- 5. Carefully handle the board by its edges and place it on a table with the chips facing upward. With a small flat screw driver, gently remove *U22* from its socket.
- 6. Place the *yellow* Zip Sort module chip into socket *U22* with the small divot orientated to the back of the board in a similar manner as all other chips on the board. (*See Figure E.2 Jet Memory/Interface Board chip set location*). Align one side of the chip's pins in the socket and gently rock the chip until the other side of the chip's pins are also aligned with the socket. Press down firmly until the chip is fully seated in the socket. It is extremely important that the correct orientation is used; If you are unsure, please contact the factory.
- 7. Inspect the seated chip to ensure that no pins were bent in the installation. If a pin appears bent, carefully remove the chip again as per step 6, unbend the pin and repeat the insertion procedure.
- 8. Replace the board back into the motherboard's slot by aligning it and firmly pushing it back into place. The attachment bracket should be flush with the computer cage.
- 9. With the Phillips screwdriver, insert and retighten the 4-40 UNF fastening screw such that the board is firmly held into place in the motherboard slot.
- 10. Reconnect all three connectors into their respective locations. The connectors are keyed and will only fit in one direction.
- 11. Inspect the board seating and the three connections made for correct installation.
- 12. Turn the power On and ensure that the system's display indicates a normal condition. If not immediately turn off the power, re-inspect the connections and seating as per the previous step and retry the procedure. If the system does not return to normal at this point, please contact the factory.

To Install Indicia Module (U22)

The *Indicia* module, a 20 pin DIP chip, is identified by its *green* color code and the designation U22. Lateral Visions and IO Address should also be printed on the label. Refer to *Figure E.2 - Jet Memory/Interface Board chip set location* for additional information.

- 1. Turn off the power to the inkjet controller by placing the power switch, located on the keypad, Off.
- 2. Disconnect the Parallel, Serial, and Keypad ribbon cable/connector assemblies by prying open the ejector pins situated on the board's J1, J2 and J3 connectors.
- 3. Using a small Phillips screw driver, loosen and remove the 4-40 UNF screw which fastens the board to the computer cage.
- 4. Pull the Jet Memory/Interface board out of the motherboards bus slot.
- 5. Carefully handle the board by its edges and place it on a table with the chips facing upward. With a small flat screw driver, gently remove *U22* from its socket.
- 6. Place the *green* Indicia module chip into socket *U22* with the small divot orientated to the back of the board in a similar manner as all other chips on the board. (*See Figure E.2 Jet Memory/Interface Board chip set location*). Align one side of the chip's pins in the socket and gently rock the chip until the other side of the chip's pins are also aligned with the socket. Press down firmly until the chip is fully seated in the socket. It is extremely important that the correct orientation is used; If you are unsure, please contact the factory.
- 7. Inspect the seated chip to ensure that no pins were bent in the installation. If a pin appears bent, carefully remove the chip again as per step 6, unbend the pin and repeat the insertion procedure.
- 8. Replace the board back into the motherboard's slot by aligning it and firmly pushing it back into place. The attachment bracket should be flush with the computer cage.
- 9. With the Phillips screwdriver, insert and retighten the 4-40 UNF fastening screw such that the board is firmly held into place in the motherboard slot.
- 10. Reconnect all three connectors into their respective locations. The connectors are keyed and will only fit in one direction.
- 11. Inspect the board seating and the three connections made for correct installation.
- 12. Turn the power On and ensure that the system's display indicates a normal condition. If not immediately turn off the power, re-inspect the connections and seating as per the previous step and retry the procedure. If the system does not return to normal at this point, please contact the factory.

To Install Indicia & Sort Module (U22)

The *Indicia & Sort* module, a 20 pin DIP chip, is identified by its *pink* color code and the designation U22. Lateral Visions and IO Address should also be printed on the label. Refer to *Figure E.2 - Jet Memory/Interface Board chip set location* for additional information.

- 1. Turn off the power to the inkjet controller by placing the power switch, located on the keypad, Off.
- 2. Disconnect the Parallel, Serial, and Keypad ribbon cable/connector assemblies by prying open the ejector pins situated on the board's J1,J2 and J3 connectors.
- 3. Using a small Phillips screw driver, loosen and remove the 4-40 UNF screw which fastens the board to the computer cage.
- 4. Pull the Jet Memory/Interface board out of the motherboards bus slot.
- 5. Carefully handle the board by its edges and place it on a table with the chips facing upward. With a small flat screw driver, gently remove *U22* from its socket.
- 6. Place the *pink* Indicia & Sort module chip into socket *U22* with the small divot orientated to the back of the board in a similar manner as all other chips on the board. (*See Figure E.2 Jet Memory/Interface Board chip set location*). Align one side of the chip's pins in the socket and gently rock the chip until the other side of the chip's pins are also aligned with the socket. Press down firmly until the chip is fully seated in the socket. It is extremely important that the correct orientation is used; If you are unsure, please contact the factory.
- 7. Inspect the seated chip to ensure that no pins were bent in the installation. If a pin appears bent, carefully remove the chip again as per step 6, unbend the pin and repeat the insertion procedure.
- 8. Replace the board back into the motherboard's slot by aligning it and firmly pushing it back into place. The attachment bracket should be flush with the computer cage.
- 9. With the Phillips screwdriver, insert and retighten the 4-40 UNF fastening screw such that the board is firmly held into place in the motherboard slot.
- 10. Reconnect all three connectors into their respective locations. The connectors are keyed and will only fit in one direction.
- 11. Inspect the board seating and the three connections made for correct installation.
- 12. Turn the power On and ensure that the system's display indicates a normal condition. If not immediately turn off the power, re-inspect the connections and seating as per the previous step and retry the procedure. If the system does not return to normal at this point, please contact the factory.

Jet Memory/Interface Board Installation Procedure

If the Jet Memory/Interface Board requires replacement due to a malfunctioning condition or chip installation, the following steps should be taken to install a new board.

E Removal of the Jet Memory/Interface Board

- 1. The board is located in one of the computer board's bus slots. Open the Cabinet Door using the key provided with the system. You should be able to view the board mounted in one of the bus slots.
- 2. Using the ejector pins located on both sides of all the Amp connectors, detach the Parallel connector (JI), the Serial connector (J2), and the Keyboard connector (J3).
- 3. With a screw driver, loosen the 6-32 UNF screw which holds the board's metal clamping bracket to the computer's case.
- 4. Slide the metal clamping bracket laterally to completely remove the slot from the aforementioned retaining screw. Pull the Jet Memory/Interface Board out of the motherboard's slot.
- 5. Try and handle the Jet Memory/Interface Board from its edges as much as possible to reduce the chance of static damage being produced. Place it in a Static-Free bag and seal it for shipping and/or storage.

Installation of the Jet Memory/Interface Board

- 1. Remove the Jet Memory/Interface Board from its Static-Free bag by handling it from its edges as much as possible to reduce the chances of static damage occurring.
- 2. Choose an available motherboard slot and check to ensure there are no obstructions. Place the Jet Memory/Interface Board into the motherboard's slot by gently pushing in the Board's edge connector into the bus slot. Upon successful installation, the Jet Memory/Interface Board'smetal clamping bracket will rest against the computer's case.
- 3. With a screw driver, secure the board by tightening the 6-32 UNF screw against the metal clamping bracket.
- 4. Re-attach all the connectors to the Driver Board including Parallel connector (*J1*), the Serial connector (*J2*), and the Keyboard connector (*J3*). *Note:* All connectors are keyed and as such can only go in one way; the correct way.
- 5. After checking that everything appears to be in order, start up the computer by turning on the controller power switch.