

**Model 2180 Series  
Ruggedized Laser Printer  
115 Vac  
Table Top Mount**

Operation and Maintenance Manual

DataMetrics Corporation  
1717 Diplomacy Row  
Orlando, FL 32809



This manual is intended to function as an example ONLY and does not represent all configurations and options for this product.

## Data Rights Provisions

THE INFORMATION CONTAINED IN THIS MANUAL IS SUPPLIED WITH LIMITED RIGHTS ONLY. DATA SHALL NOT, WITHOUT THE WRITTEN PERMISSION OF THE CONTRACTOR, BE EITHER (A) USED, RELEASED, OR DISCLOSED IN WHOLE OR IN PART OUTSIDE THE GOVERNMENT, (B) USED IN WHOLE OR IN PART BY THE GOVERNMENT FOR MANUFACTURE OR, IN THE CASE OF COMPUTER SOFTWARE DOCUMENTATION, FOR PREPARING THE SAME OR SIMILAR COMPUTER SOFTWARE, OR (C) USED BY A PARTY OTHER THAN THE GOVERNMENT, EXCEPT FOR: (1) EMERGENCY REPAIR OR OVERHAUL WORK ONLY, BY OR FOR THE GOVERNMENT, WHERE THE ITEM OR PROCESS CONCERNED IS NOT OTHERWISE REASONABLY AVAILABLE TO ENABLE TIMELY PERFORMANCE OF THE WORK, PROVIDED THAT THE RELEASE OR DISCLOSURE HEREOF OUTSIDE THE GOVERNMENT SHALL BE MADE SUBJECT TO A PROHIBITION AGAINST FURTHER USE, RELEASE OR DISCLOSURE; OR (2) RELEASE TO A FOREIGN GOVERNMENT, AS THE INTEREST OF THE UNITED STATES MAY REQUIRE, ONLY FOR INFORMATION OR EVALUATION WITHIN SUCH GOVERNMENT OR THE CONDITIONS OF (1) ABOVE. THIS STATEMENT SHALL BE INCLUDED ON ANY REPRODUCTION HEREOF.

Date	Revision	Description of Change
040308	-	INITIAL RELEASE

## Contents

1. CONFIGURATION.....	1
1.1. Introduction .....	1
2. GENERAL INFORMATION .....	4
2.1. Scope .....	4
2.2. Applicable Documents .....	4
2.3. Printer Description .....	4
2.3.1. Power Subsystem .....	4
2.3.2. Printing Subsystem.....	5
2.3.3. Control Console.....	5
2.3.4. Cooling System .....	5
2.3.5. External Interfaces.....	5
2.4. Specifications .....	5
2.5. Options .....	5
2.5.1. Memory .....	6
2.5.2. PostScript Level 2 .....	6
2.6. Supplementary Documentation .....	6
2.7. Introduction .....	7
2.8. Chassis Installation Configuration .....	7
2.9. Unpacking .....	7
2.10. Drum Unit Assy Installation .....	7
2.11. Paper Supply .....	10
2.12. External Cable Installation.....	10
2.13. Software Installation .....	11
2.14. Limited Operation, Storage, and Transportation.....	11
3. OPERATION .....	13
3.1. Introduction .....	13
3.2. Controls and Indicators .....	13
3.3. Control Panel Menus.....	17
3.3.1. Paper Tray Nomenclature.....	17
3.3.2. Modes.....	17
3.3.3. Emulation Modes .....	17
3.3.4. List of Factory Settings .....	17
3.4. Normal Operation.....	18
3.4.1. Printing from Tray 1.....	18
3.4.2. Manual Paper Feeding .....	19
3.4.3. Stopping a Print Job .....	19
3.5. LCD Messages .....	19
3.5.1. Clearing Paper Jams .....	20
3.5.1.1. Jam Tray 1 .....	20
3.5.1.2. Jam MP Tray .....	20
3.5.1.3. Jam Inside.....	22
3.5.1.4. Jam Rear .....	22
3.5.1.5. Jam Duplexer.....	23
3.5.1.6. Paper Jam .....	23
3.6. Shutdown.....	23

- 4. FUNCTIONAL DESCRIPTION ..... 24
  - 4.1. Introduction ..... 24
  - 4.2. Printer Description ..... 24
    - 4.2.1. Power Distribution ..... 24
    - 4.2.2. Paper Movement ..... 24
    - 4.2.3. Control Console ..... 24
    - 4.2.4. Cooling ..... 24
  
- 5. MAINTENANCE ..... 26
  - 5.1. Introduction ..... 26
  - 5.2. Tools and Test Equipment ..... 26
  - 5.3. Routine Maintenance ..... 26
    - 5.3.1. Replacing the Consumables ..... 26
    - 5.3.2. Replacing Maintenance Parts ..... 26
    - 5.3.3. Cleaning ..... 26
      - 5.3.3.1. Cleaning the Printer Interior ..... 26
      - 5.3.3.2. Cleaning the Corona Wire ..... 27
  - 5.4. Replaceable Components and Subassemblies ..... 28
    - 5.4.1. Toner Cartridge Replacement ..... 28
    - 5.4.2. Control Panel Replacement ..... 29
  
- 6. SETTINGS ..... 30
  - 6.1. Introduction ..... 30
  - 6.2. Changing Factory Settings ..... 30
    - 6.2.1. Connector Location ..... 30
    - 6.2.2. Pictorial Representation ..... 30
    - 6.2.3. Connector Settings ..... 30

### Figures

Figure 3-1. Installation Dimensions ..... 9

Figure 3-2. Rear Panel..... 12

Figure 4-1. Front Panel..... 13

Figure 4-2. Control Console..... 14

Figure 4-3. Paper Jam Areas ..... 21

Figure 5-1. Chassis Interconnections ..... 25

Figure 6-1. Connector Location ..... 31

Figure 6-2. Jumper Setting Definitions ..... 32

### Tables

Table 1-1. System Configuration ..... 1

Table 1-2. Field Replaceable Units ..... 2

Table 1-3. External Cables ..... 2

Table 1-4. External Connector Signal Assignments ..... 3

Table 2-1. Physical Specifications ..... 6

Table 2-2. Electrical Specifications ..... 6

Table 2-3. Environmental Specifications ..... 6

Table 3-1. Paper Supply Specifications ..... 10

Table 4-1. Controls and Indicators ..... 15

Table 4-2. Printer Status Indications During Normal Operation ..... 16

Table 6-1. Factory Settings..... 30

Table 6-2. Jumper Settings..... 33

# 1. CONFIGURATION

## 1.1. Introduction

This chapter defines the configuration of a specific Model 2180 Series printer. Information is provided concerning system configuration (Table 1-1), field-replaceable units (Table 1-2), external cabling (Table 1-3), and external connector signal assignments (Table 1-4).

**Table 1-1. System Configuration**

Characteristic	Description
Top Assembly Part No.	117065-103
Input Power	115 VAC 50/60 Hz
Memory, No Options 1 DIMM Slot	32 Mb Standard 16, 32, 64 or 128 Mb Optional
Installation Configuration	Table Top Mount

**Table 1-2. Field Replaceable Units**

Description	Part No.	Quantity Per Chassis
Toner Cartridge		1
Drum Unit		1
Paper Cassette		1
Control Panel Assembly		1

**Table 1-3. External Cables**

Function	Part No.
Power Input Connector	



**Table 1-4. External Connector Signal Assignments**

POWER CONNECTOR (J1) P/N MS27468T13B4P MATING CONNECTOR- MS27467T13B4S	
PIN	SIGNAL
A	110 VAC
B	AC NEUTRAL
C	GND (CHASSIS)
D	GND (CHASSIS)

SERIAL CONNECTOR (J2) P/N 8225-6000 (3M) MATING CONNECTOR- 205559-2 (AMP) (OR EQUIV)	
J2-1	GROUND
-2	TRANSMITTED DATA
-3	RECEIVED DATA
-4	REQUEST TO SEND
-5	CLEAR TO SEND
-6	DATA SET READY
-7	SIGNAL GROUND
-8	DATA CARRIER DETECT
-9	SPARE
-10	SPARE
-11	SPARE
-12	SPARE
-13	SPARE
-14	SPARE
-15	SPARE
-16	SPARE
-17	SPARE
-18	SPARE
-19	SPARE
-20	DATA TERMINAL READY
-21	SPARE
-22	SPARE
-23	DATA SIGNAL RATE DETECTOR
-24	SPARE
J2-25	SPARE

FUSE (F1, F2)	
F1, F2	15 AMP, 3AB TYPE

PARALLEL CONNECTOR (J3) P/N 205559-2 (AMP) MATING CONNECTOR- 747321-2 (AMP) (OR EQUIV)	
J3-1	TRANSMITTED DATA
-2	DATA BIT 0
-3	DATA BIT 1
-4	DATA BIT 2
-5	DATA BIT 3
-6	DATA BIT 4
-7	DATA BIT 5
-8	DATA BIT 6
-9	DATA BIT 7
-10	PRINTER RECEIVED
-11	CHARACTER RECEIVED
-12	PAPER OUT
-13	ONLINE
-14	AUTO FEED
-15	PAPER OUT
-16	INITIALIZE PRINTER
-17	SELECT PRINTER
-18	GROUND
-19	GROUND
-20	GROUND
-21	GROUND
-22	GROUND
-23	GROUND
-24	GROUND
J3-25	GROUND

ETHERNET CONNECTOR (J4, J5) P/N TE14949BJ80 (TROMPETER) MATING CONNECTOR P/N TE14949PL80 (TROMPETER)	
INNER CONDUCTOR	SIGNAL
MIDDLE SHELL	SIGNAL GND
OUTER SHELL	CHASSIS GND

## 2. GENERAL INFORMATION

### 2.1. Scope

This manual provides information and instructions required for the operation and maintenance of the Model 2180 Series printer manufactured by DataMetrics Corporation.

### 2.2. Applicable Documents

#### Military Standards

MIL-STD-461e	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference
--------------	--

#### Commercial Standards

IEEE-1284B	Standard Signaling Method, Bi-directional Parallel Peripheral Interface
------------	---

RS-232C	Serial Communication Protocol
---------	-------------------------------

10Base2	Ethernet (IEEE 802.3)
---------	-----------------------

#### Brother

	Brother Laser Printer HL 1800 Series
--	--------------------------------------

### 2.3. Printer Description

The Model 2180 Series printer is a ruggedized, general-purpose laser printer that is configured in a single enclosure. The equipment is packaged using environmental management techniques that protect internal components from shock, vibration, temperature extremes, and EMI/RFI. The chassis is configured for tabletop mount operation. The printer includes the following primary functional elements:

- Power subsystem
- Printing subsystem
- Control Panel
- Cooling system
- External interfaces

#### 2.3.1. Power Subsystem

The Model 2180 Series printer operates with 115 VAC input power. The power subsystem includes an EMI filter, fuses, and power switch. DC voltages required for various printer functions are generated within the commercial print engine.

### **2.3.2. Printing Subsystem**

The Model 2180 Series printer incorporates a Brother HL 1800 print engine that provides 300 dpi, 600 dpi and Brother HQ1200 technology, which provides the best print quality while printing at full speed of 19 pages per minute. A toner saver mode and improved gray printing is also provided for within the printer. The printer formatter includes a Motorola RISC-based formatter and 32 Mb memory, which is expandable to 144 Mb. Memory Enhancement Technology (MEt) automatically compresses data, which allows printing of images that are more complex than available memory would normally permit.

The printer may be operated with any host computer that supports Windows 95/98 Me, 2000, NT 4.0, XP, Macintosh OS 8.6-9.2 and 1 X 10.1. The printer supports the PCL6 printer language, which includes 45 scalable TrueType fonts and one bitmapped line printer font. Built-in HP-GL/2 vector graphics are included to produce up to 128 shades of gray. The printer supports HP PostScript, Level 3, with 35 built-in PostScript language fonts. The printer automatically detects and switches to the appropriate language for the print job.

The printer automatically loads Letter, A4, Executive, B5, or Legal paper from the 250-sheet cassette. The toner cartridge will support printing of 6,500 A4/Letter single-sided pages at 5% coverage.

### **2.3.3. Control Panel**

The control panel is located on the center of the printer front panel. This control panel is the operator interface for print operations other than those controlled from the host computer. Controls and indicators are described in Chapter 4.

### **2.3.4. Cooling System**

The ruggedized Model 2180 Series printer utilizes the cooling mechanism of the commercial print engine. Three fans are used to cool the print engine and are part of the print engine.

### **2.3.5. External Interfaces**

The rear panel of the printer includes connectors for prime power and the host computer data interfaces. The standard printer configuration incorporates a Parallel IEEE-1284B bi-directional DB25, a Serial RS-232C DB25, and tri-axial 10Base2 Ethernet interfaces. An unused Ethernet connection (J4 or J5) must be terminated with a 50 $\Omega$  termination for proper operation.

The printer auto-detects print requests on any one of these interfaces, and prints from that port on a first come first serve basis. A chassis ground lug is located on the rear panel adjacent to the power connector and two fuse holders, F1 and F2, for current overload protection. Spare fuses are located on the inside of the hinged rear panel.

## **2.4. Specifications**

Equipment specifications for the Model 2180 Series printer are defined in Tables 2-1 through 2-3.

## **2.5. Options**

The Model 2180 Series printer may be configured with the optional features listed in the following paragraphs. Options included in a delivered configuration are defined as follows.

**2.5.1. Memory**

The printer includes provisions for one memory expansion module. The base system includes 32Mb memory, which can be expanded to a total of 144Mb. Memory modules are available in 16Mb, 32Mb, 64Mb and 128Mb configurations.

**2.5.2. PostScript Level 2**

The printer is equipped with HP PostScript Level 2 printer language emulation with 35 built-in PostScript language fonts and 8 Mb RAM.

**2.6. Supplementary Documentation**

Supplementary information pertaining to the commercial hardware and software that forms a part of the Model 2180 Series printer is provided in the Brother Laser Printer HL-1800 series User’s Guide.

**Table 2-1. Physical Specifications**

Characteristic	Description
Dimensions	See Figure 3-1.
Weight	50 LB max

**Table 2-2. Electrical Specifications**

Characteristic	Description
Input Voltage 115 VAC input or	100-120 VAC, single-phase, 50/60 Hz

**Table 2-3. Environmental Specifications**

Characteristic	Description
Temperature	
Operating	0 to 55°C
Non-operating	-40 to 70°C
Relative humidity (non-condensing)	10 to 90%
Altitude	
Operating	15,000 ft
Non-operating	50,000 ft
Random vibration (non-operating)	0.01 g <sup>2</sup> /Hz at 10 to 2,000 Hz
Shock (non-operating)	20 g, 11 ms
Acoustic noise	< 50 dBA at 1 m
EMI/EMC	MIL-STD-461, Methods CE03, CS01, CS02, CS06, RE02, RS02, and RS03.
Fungus	No fungus-nutrient materials

## 2.7. Introduction

This chapter provides information and instructions required for installation of the Model 2180 Series printer. Information is included concerning chassis installation configuration, unpacking, toner cartridge installation, paper supply provisions, connecting of external cabling, software installation, and storage.

## 2.8. Chassis Installation Configuration

The Model 2180 Series printer is shock isolated tabletop mounting configuration. Chassis dimensions applicable to the installation environment are identified in Figure 3-1.

## 2.9. Unpacking

Follow the steps listed below to unpack the Model 2180 Series printer and prepare the unit for installation. Packing materials should be retained for future use.

- a. Carefully remove the printer from the shipping container. Inspect the unit for any evidence of damage.
- b. Open the paper cassette tray access door located on the front of the unit. Slide the paper tray out of the printer and remove the shipping retainer, if any, from the tray.

## 2.10. Drum Unit Assembly Installation

The Model 2180 Series printer is shipped without the toner cartridge and drum unit installed. Follow

the procedure defined below to install the cartridge.

- a. Remove the toner cartridge from its packaging. Gently rock it from side to side five or six times.

**Caution**

To prevent damage, do not expose the cartridge to light for more than a few minutes.

- b. Remove the protective cover from the toner cartridge.
- c. Install the toner cartridge into the drum unit.
- d. Open the front door of the printer and remove the top cover.
- e. Unfasten and remove the drum unit assembly retainer located on the top of the print engine.
- f. Pull the drive locking mechanism forward into the locking position, green handle, located on the left side of the print engine.
- g. Unfasten and lower the multi-purpose tray.
- h. Insert the drum unit assembly into the print-engine.
- i. Release the drive locking mechanism to its original locking position.
- j. Raise the multi-purpose tray and fasten.
- k. Replace and fasten the drum unit assembly retainer located on the top of the print engine.
- l. Replace the top cover and close the front access door.

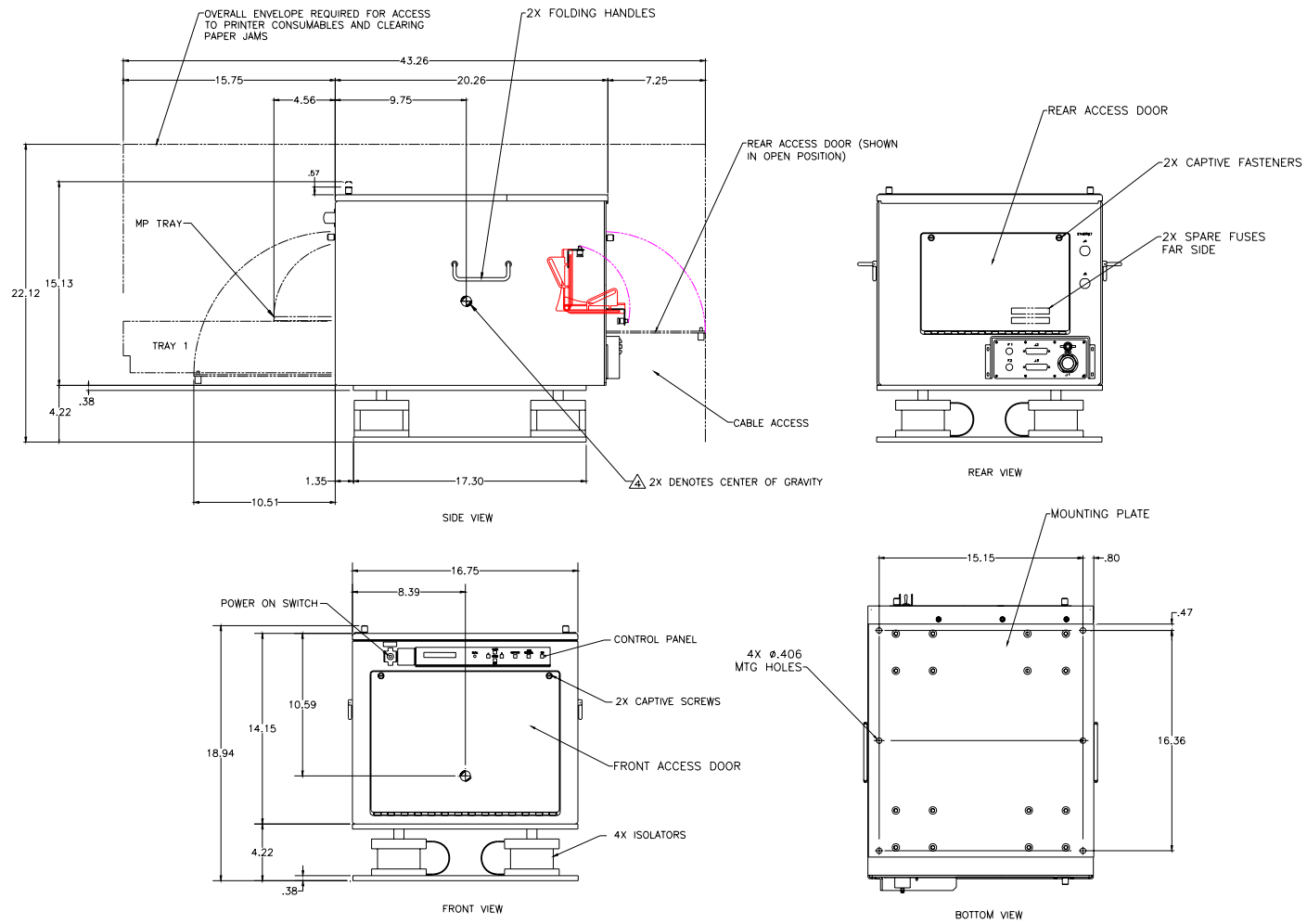


Figure 3-1. Installation Dimensions

## 2.11. Paper Supply

The paper cassette tray will accommodate approximately 250 sheets of letter, A4, executive, B5 (ISO), B5 (J15) paper. The cassette is accessible through the front access door. Cassette guides may be adjusted to accommodate the supported media sizes. Paper supply specifications are provided in Table 3-1.

**Table 3-1. Paper Supply Specifications**

Paper Type	Dimensions	Weight
Letter	8.5 x 11 in. (216 x 279 mm)	16 to 28 lb (60 to 105 g/m <sup>2</sup> )
A4	8.3 x 11.7 in. (210 x 297 mm)	
Executive	7.3 x 10.5 in. (191 x 267 mm)	
B5 (ISO)	6.9 x 9.9 in. (176 x 250 mm)	
B5 (JIS)	7.2 x 10 in. (182 x 257 mm)	

## 2.12. External Cable Installation

All external interfaces for the Model 2180 Series printer are located at the rear panel (Figure 3-2). External connector signal assignments are defined in Chapter 1. Perform the following steps to connect external cabling.

- a. Verify that the front panel switch is in the “off” position.
- b. Connect the system ground cable to the ground stud on the rear panel.
- c. Install the host computer data interface cables.
- d. Connect the power cable to the AC input connector on the rear panel.

**Caution**

Verify that the AC power source conforms to the input power configuration defined in Chapter 1.

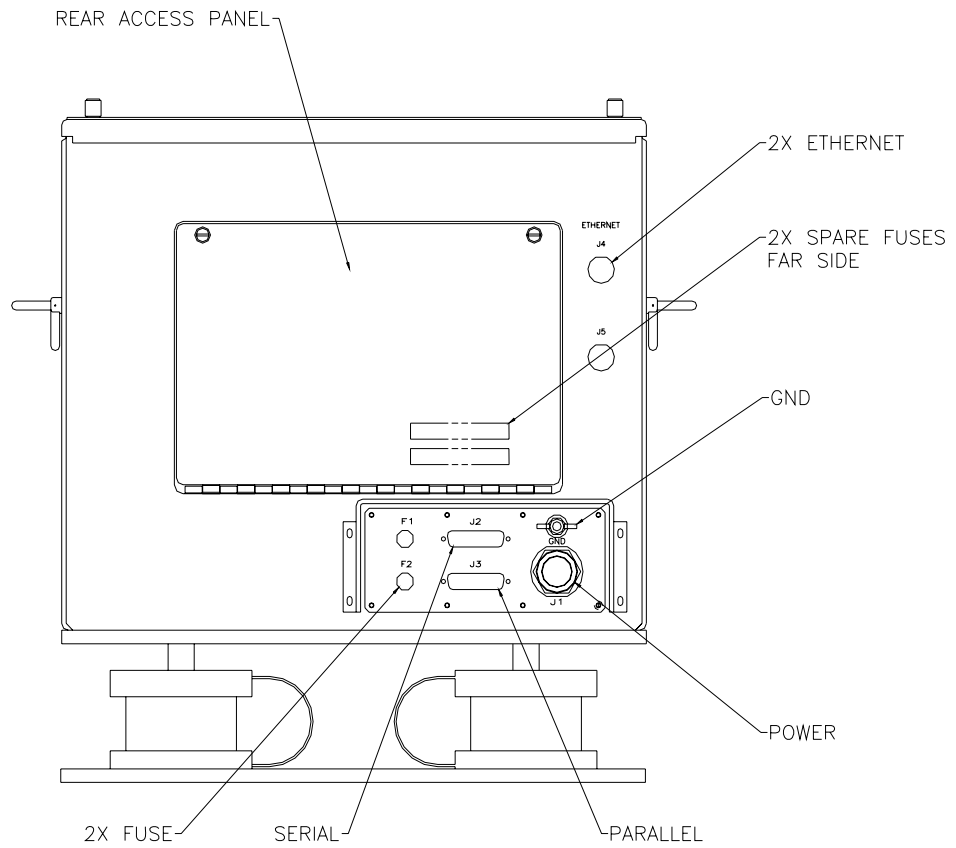


### **2.13. Software Installation**

Install the software from CD-ROM that is supplied with Model 2180 printer. Refer to the Brother Laser Printer HL-1800 series User's Guide.

### **2.14. Limited Operation, Storage, and Transportation**

If the printer is not operated for more than 1 week, the toner cartridge should be removed and stored in a humidity-controlled environment. This provision is particularly important when the equipment is used in a high-humidity environment. If the printer is to be stored or transported, the unit should be packaged as originally shipped. The printer can be stored or transported in any manner that is consistent with the environmental conditions identified in Table 2-3.



**Figure 3-2. Rear Panel**

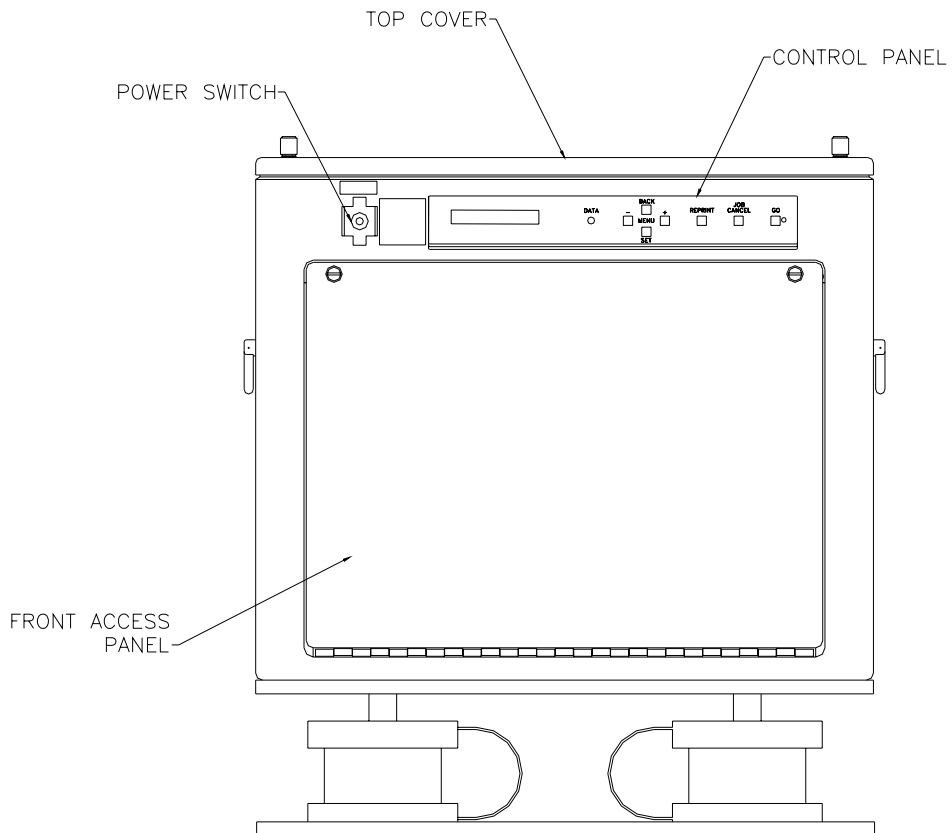
### 3. OPERATION

#### 3.1. Introduction

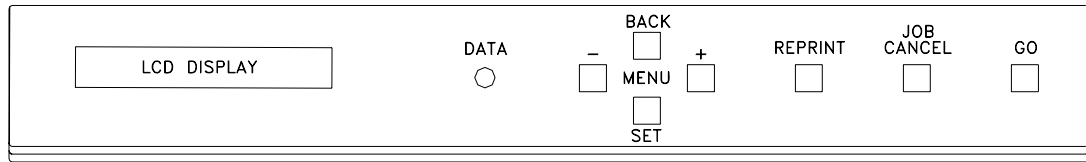
This chapter provides information concerning printer controls and indicators, test printing, normal operation, error conditions, and shutdown. Before the unit is powered up for the first time, verify that the installation procedures defined in Chapter 3 have been performed.

#### 3.2. Controls and Indicators

All controls and indicators required for operation of the Model 2180 Series printer are located at the front panel of the unit (Figure 4-1). Control panel switches and indicators are shown in Figure 4-2. Controls and indicators are described in Table 4-1. Printer status indications for normal operation are identified in Table 4-2.



**Figure 4-1. Front Panel**



**Figure 4-2. Control Panel**

**Table 4-1. Controls and Indicators**

<b>Type</b>	<b>Description</b>	<b>Function</b>
Switch	Power On	On/ off switch for prime power.
Button	Go	Exit from Control panel menu, Reprint settings and Error messages. Pause/Continue printing.
Button	Job Cancel	Stop and cancel the printer operation in progress.
Button	Reprint	Set the Reprint menu.
Button	+	Move forward and backward through menus.
Button	-	Move forward and backward through selectable options.
Button	Set	Select the displayed menu. Set the selected menus and settings.
Button	Back	Go back one level in the menu structure.
Orange LED	Data	On: Data remains in the printer buffer. Blinking: Receiving or processing data. Off: No remaining data.
LCD Display	Back lights	Off: The printer is in Sleep status. Green (General): Warming up/ Ready to print/ Printing. Red (Error): A problem has occurred with the printer. Orange (Setting): Setting Menu/ Setting reprint times/ Pause.

**Table 4-2. Printer Status Message**

<b>Printer Status Message</b>	<b>Meaning</b>
READY	Ready to print.
PROCESSING	Busy processing data.
SLEEP	In Sleep status (power save mode)
PRINTING	Printing.
SELF TEST	Performing self-diagnostic.
PAUSE	The printer has suspended feeding forms. Pressing the GO button resumes form feed.
NOW INITIALIZING	The printer is setting up.
WARMING UP	The printer is warming up.
MEMORY SIZE=XX MB	This printer has XX MB memory.
JOB CANCELLING	Canceling the job.
RESOLUTION ADAPT	Printing with reduced resolution.
PRESS SET TO PRINT	Press the SET button to start printing.
RESET TO FACTORY SETTING	The printer settings return to the factory settings.

### 3.3. Control Panel Menus

#### 3.3.1. Paper Tray Nomenclature

The Model 2180 has been designed for usage of the two paper trays provided for with the Brother Printer. Those trays are defined as follows and will appear on the LCD panel as shown below:

Tray	Description	Usage
Tray 1	Upper Paper Tray	Standard 250 sheet paper tray.
MP Tray	Multi-purpose Tray	Redesigned for single sheet feed.
Tray 2	Optional Lower Tray	Not available with current design.

#### 3.3.2. Modes

There are 8 modes. For more information about the selections available for each mode, refer to the Brother Laser Printer HL-1800 series User's Guide supplementary documentation supplied with printer.

- Information
- Paper
- Quality
- Setup
- Print Menu
- Network
- Interface
- Reset Menu

#### 3.3.3 Emulation Modes

The printer has the following emulation modes. (see User's Guide)

- HP Laser Jet Mode
- BR-Script 3 Mode
- EPSON FX-850 and IBM Proprinter XL Mode

#### 3.3.4 List of Factory Settings

For listing factory default settings refer to the Brother Laser Printer HL-1800 series User's Guide supplementary documentation.

### 3.4. Normal Operation

Follow the instructions defined below to operate the printer under normal conditions.

- a. Power-up the host computer.
- b. Place the printer power switch in the “on” position.
- c. Verify that the READY LED illuminates after completion of the self-test/warm-up sequence. Once the printer has achieved a ready state, no manual intervention is required to conduct routine print tasks. Operational parameters are not affected by normal power on/off cycles.

#### 3.4.1. Printing from Tray 1

Specifications for paper cassette media are defined in Table 3-1. Follow the instructions defined below to conduct print operations with **Tray 1**.

- a. Open the front access door.
- b. Pull the paper cassette completely out of the printer.
- c. Adjust the paper guides at the right-hand side and back of the paper cassette to match the paper size. Make sure that the tips of the paper guides fit into the slots co

Note
The 2180 printer is not designed for legal or 8.5 x 13 inch paper.

- d. Position the paper into the paper cassette. Make sure that the paper is flat in the cassette at all corners and below the limit mark

Note
Do not put more than 250 sheets of paper (80 g/m <sup>2</sup> or 21 lb.) in the cassette or the paper may jam. Paper can be loaded up to the lines on the sliding guide.

- e. Put the paper cassette back into the printer. Make sure it is completely in the printer.
- f. Close the front access door

#### 3.4.2. Manual Paper Feeding

Specifications for manual-feed media are defined in Table 3-1. Follow the instructions defined below to conduct print operations with **Multi-purpose tray**.

- a. Open the front access door.
- b. Unlatch and lower the multi-purpose tray.



- c. Slide the paper guides slightly wider than the media.
- d. Position the media in the center of the paper guides with the print side up.
- e. Move the media into the manual-feed entry point of the print engine.
- f. Verify that operational software is configured for manual feed.
- g. Initiate the print job. If the “manual feed pause” option is selected with the operational software, printing of individual pages is initiated by pressing the front panel GO switch.

Note

If you place paper in the Multi-purpose Tray and the MANUAL FEED=ON has been set in the PAPER mode from the control panel, the printer will load paper only from the Multi-purpose Tray.

- h. When manual feed operations are complete, raise and secure the front panel door.

### 3.4.3. Stopping a Print Job

A print job can be terminated from the application software, from a print queue, or by pressing the Job Cancel button. The display shows “JOB CANCELLING” until canceling is completed. After canceling the job, the printer returns to the “READY” state.

When the printer is in any state except receiving data or printing, the display shows “NO DATA !!!” And cannot cancel the job.

### 3.5. LCD Messages

When the printer incurs error and maintenance messages refer to Chapter 6 of the Brother Laser Printer HL 2180 series manual that is provided for as part of this manual.

### 3.5.1. Clearing Paper Jams

When there is a paper jam in the printer, it will stop printing and display the following messages:

- JAM TRAY1
- JAM MP TRAY
- JAM INSIDE
- JAM REAR
- JAM DUPLEXER

If you see the “PAPER JAM” error message find the location of the jammed paper and following the instructions to remove it (Figure 4-3). After you have followed the instructions, the printer will automatically resume printing.

#### 3.5.1.1. Jam Tray1

- a. Open the front access door.
- b. Remove the paper cassette tray.
- c. Pull the jammed paper out of the printer.
- d. Put the paper cassette back into the printer.
- e. Raise and secure the front access door.

#### 3.5.1.2. Jam MP Tray

- a. Remove any media from the multi-purpose Tray.
- b. Remove the jammed paper from the multi-purpose Tray.
- c. Put all the paper back into the multi-purpose Tray correctly.

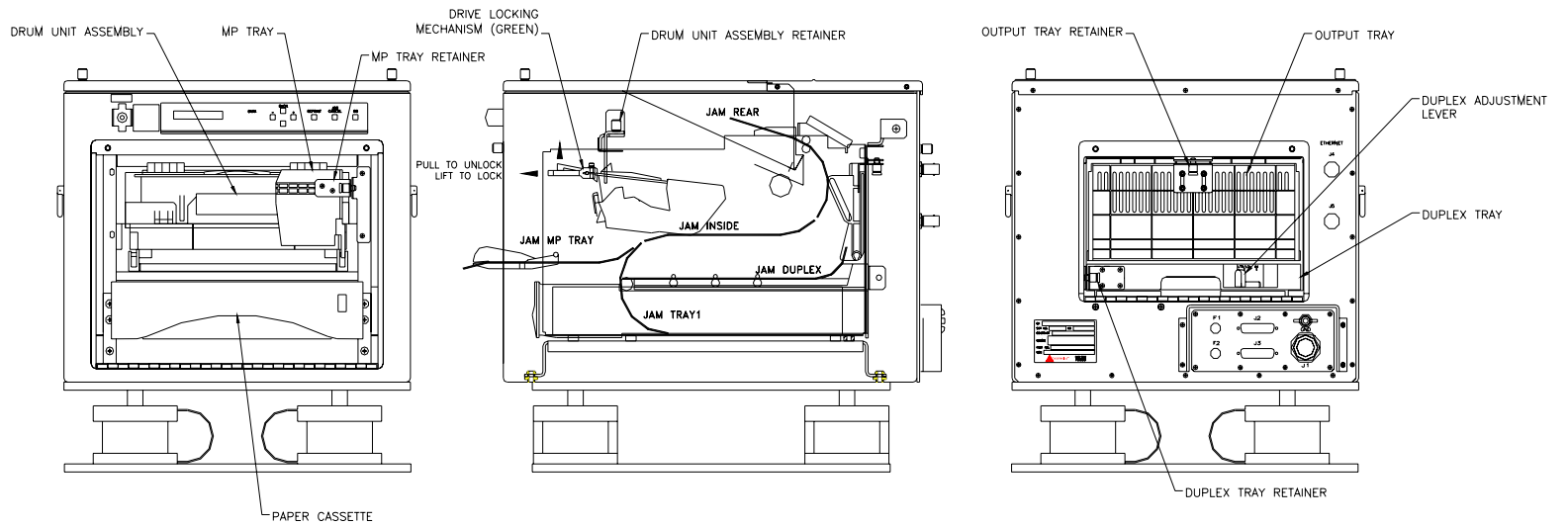
#### Note

If a paper jam message still appears after paper is removed, there is still jammed paper inside the printer.

If torn media remains in the printer and is not accessible, cycle printer power to rotate print engine rollers. Reopen the printer and remove media fragments.

#### Caution

To prevent damage, do not expose the cartridge to light for more than a few minutes.



**Figure 4-3. Paper Jam Area**

**3.5.1.3. Jam Inside**

- a. Open the front access door and remove the top cover.
- b. Unfasten and remove the drum unit assembly retainer located at the top of the print engine.
- c. Unfasten and lower the multi-purpose tray.
- d. Pull the drive locking mechanism forward into the locking position, green handle, located on the left side of the print engine.
- e. Remove the drum unit assembly from the print engine.
- f. Pull the jammed paper out of the paper cassette/fuser unit.
- g. Replace the drum unit assembly into the printer-engine.
- h. Replace and fasten the drum unit assembly retainer.
- i. Release the drive locking mechanism to its original locking position.
- j. Raise the multi-purpose tray and fasten.
- k. Replace the top cover and close the front access door.

**3.5.1.4. Jam Rear**

- a. Open the front access door and remove the top cover.
- b. Unfasten and remove the drum unit assembly retainer located on the top of the print engine.
- c. Unfasten and lower the multi-purpose tray
- d. Pull the drive locking mechanism forward into the locking position, green handle, located on the left side of the print engine.
- e. Remove the drum unit assembly from the print-engine.
- f. Pull the jammed paper out of paper cassette/fuser unit.  
If the paper jam can be cleared, go to step k.
- g. Open the rear access door.
- h. Unfasten and lower the output tray
- i. Open the Jam Clear Cover and pull the jammed paper out of the fuser unit.
- j. Close the Jam Clear Cover and raise the output tray and fasten.
- k. Replace the drum unit assembly into the printer-engine
- l. Replace and fasten the drum unit assembly retainer.
- m. Release the drive locking mechanism (green handle) to its original locking position.
- n. Raise the multi-purpose tray and fasten.

- o. Close the front access door.

#### **3.5.1.5. Jam Duplex**

- a. Unfasten and lower the rear access door.
- b. Unfasten and lower the output tray.
- c. Pull the jammed paper out of the fuser unit.
- d. Raise the output tray and fasten.

If the paper jam can be cleared, go to step h.

- e. Unfasten and remove the duplex tray from the unit.
- f. Pull the jammed paper out of the printer.
- g. Put the duplex tray back into the unit and fasten.
- h. Raise the rear access door and fasten.

#### **3.5.1.6. Paper Jam**

Follow all of the instructions, as required, for Jam Tray1, Jam MP Tray, Jam Inside, Jam Rear and Jam Duplex to clear the “paper jam” message.

### **3.6. Shutdown**

The printer enters standby mode when no data is being received from the host computer. It is not necessary to power down the printer when the unit is not used for limited periods. When the printer is to be taken out of service, perform the following shutdown sequence:

- a. Ensure that the printer is not receiving data from the host computer.
- b. Place the printer power switch in the “off” position.

## 4. FUNCTIONAL DESCRIPTION

### 4.1. Introduction

This chapter describes the major functional elements of the Model 2180 Series printer. Information is provided concerning power distribution, the printing subsystem, control console, and cooling system. Chassis interconnections are identified in Figure 5-1.

### 4.2. Printer Description

The Model 2180 Series printer provides laser hardcopy output of data received from a host computer. The standard printer configuration incorporates an IEEE-1284B bi-directional parallel interface (Centronics). The unit may be configured with optional 10base-T Ethernet. The mechanical and electrical subsystems of the printer are described in the following paragraphs.

#### 4.2.1. Power Distribution

The Model 2180 Series printer utilizes the 115Vac primary power subsystem of the commercial print engine. Prime power enters the chassis at the rear panel J1 connector. 115Vac power is sent through an EMI filter that provides attenuation of interference related to input voltage and output current. Prime power exits the filter and is routed to two 15-ampere fuses and then to the power switch at the front panel. The load side of the power switch provides AC power to the print engine input-power connector. A chassis ground stud is located on the rear panel of the unit.

#### 4.2.2. Paper Movement

The paper feed system automatically picks print media from either Tray 1 or MP TRAY and delivers it to the registration roller. Before the media reaches the registration roller, the separation pad separates any excess sheets of media and the registration shutter corrects the media's skew.

A top-of-page sensor detects the leading edge of the page. The paper is synchronized to the leading edge of the image on the photosensitive drum and transferred to the paper. After the transferring stage of the image formation process, the paper is fed to the fusing assembly and fused.

The paper exits the printer through the top or rear output bins.

#### 4.2.3. Control Console

All controls required for printer operation are located at the front panel of the unit. The control panel includes the GO, JOB CANCEL, REPRINT, +, -, SET and BACK switches. The control panel LCD displays the printer status. The power switch turns the printer power on/off. Printer controls and indicators are described in Chapter 3.

#### 4.2.4. Cooling

The ruggedized Model 2180 Series printer utilizes the cooling mechanism of the commercial print engine. Cooling air is circulated in the unit by 3 fans located on the print engine. The fans are powered by the printer's dc power subsystem. Air is forced across print engine components and exhausted at the top of the chassis. The printer has a nominal power dissipation of less than 410 watts during printing, less than 70 watts standby mode and less than 10 watts sleep mode.

**Figure 5-1. Chassis Interconnection**

## 5. MAINTENANCE

### 5.1. Introduction

This chapter provides information and instructions concerning Model 2180 Series printer tools and test equipment, routine maintenance, fault isolation, and the removal and installation of replaceable components and subassemblies.

### 5.2. Tools and Test Equipment

The following tools and test equipment are required to maintain the printer:

- Common hand tools
- TORX #10 screwdriver
- Digital voltmeter
- Host computer with compatible data interface

### 5.3. Routine Maintenance

#### 5.3.1. Replacing the Consumables

Normal print operations require consumables to be replaced regularly. The following messages will appear on the LCD panel.

- TONER LOW
- TONER EMPTY
- CHANGE DRUM SOON

Refer to the Brother Laser Printer HL-1800 series User's Guide supplemental documentation.

#### 5.3.2. Replacing Maintenance Parts

Replacement of maintenance parts to maintain print quality will cause the following messages will appear on the LCD panel.

- REPLACE FUSER
- REPLACE PF KIT
- REPLACE LASER

Refer to the Brother Laser Printer HL-1800 series User's Guide supplemental documentation.

#### 5.3.3. Cleaning

##### 5.3.3.1 Cleaning the Printer Interior

Cleaning the printer interior for if printouts are stained with toner.

- a. Open the front access door and remove the top cover.
- b. Unfasten and remove the drum unit assembly retainer located at the top of the print engine.



- c. Unfasten and lower the multi-purpose tray.
- d. Pull the drive locking mechanism forward into the locking position, green handle, located on the left side of the print engine.
- e. Remove the drum unit assembly from the print engine.
- f. Gently wipe the scanner window with a soft dry cloth.
- g. Replace the drum unit assembly into the printer-engine.
- h. Replace and fasten the drum unit assembly retainer.
- i. Release the drive locking mechanism to its original locking position.
- j. Raise the multi-purpose tray and fasten.
- k. Replace the top cover and close the front access door.

### **5.3.3.2 Cleaning the Corona Wire**

Cleaning the printer interior for if printouts are stained with toner.

- a. Open the front access door and remove the top cover.
- b. Unfasten and remove the drum unit assembly retainer located at the top of the print engine.
- c. Unfasten and lower the multi-purpose tray.
- d. Pull the drive locking mechanism forward into the locking position, green handle, located on the left side of the print engine.
- e. Remove the drum unit assembly from the print engine.
- f. Slide the blue tab that is located on the drum unit assembly from right to left several times. Return the tab to the Home position.
- g. Replace the drum unit assembly into the printer-engine.
- h. Replace and fasten the drum unit assembly retainer.
- i. Release the drive locking mechanism to its original locking position.
- j. Raise the multi-purpose tray and fasten.
- k. Replace the top cover and close the front access door.

**WARNING**

POTENTIALLY LETHAL VOLTAGES EXIST WITHIN THE PRINTER. SERIOUS INJURY MAY RESULT IF SAFETY PRECAUTIONS ARE NOT OBSERVED. FAULT DIAGNOSIS PROCEDURES REQUIRE THAT INTERNAL COMPONENTS BE TESTED WHEN PRIME POWER IS APPLIED. THESE COMPONENTS MUST ONLY BE TOUCHED WITH THE APPROPRIATE TEST EQUIPMENT.

**5.4. Replaceable Components and Sub assemblies**

The following paragraphs include information concerning replaceable components and subassemblies. The following items are replaceable within an organizational-level maintenance activity:

- Toner Cartridge
- Paper Cassette Tray
- Control Panel

**WARNING**

POTENTIALLY LETHAL VOLTAGES EXIST WITHIN THE PRINTER. SERIOUS INJURY MAY RESULT IF SAFETY PRECAUTIONS ARE NOT OBSERVED. DISCONNECT THE POWER SOURCE BEFORE PERFORMING REPAIR PROCEDURES.

**Note**

Observe precautions relating to electrostatic discharge (ESD) when handling components that include integrated circuitry.

**5.4.1. Toner Cartridge Replacement**

Removal:

- a. Open the top cover of the printer.
- b. Unfasten the toner cartridge retainer.
- c. Pull the toner cartridge toward the front panel and remove the cartridge from the chassis.

Installation:

- a. Remove the new toner cartridge from the packaging material.
- b. Gently shake the cartridge to evenly distribute the toner.
- c. Remove the sealing tape from the cartridge.
- d. Insert the cartridge in the print-engine carriage in the direction of the arrows provided on the

- cartridge. Move the cartridge into the guides until it stops securely in the printer.
- e. Fasten the toner cartridge retainer.
  - f. Close and secure the top cover of the printer.

#### **5.4.2. Control Panel Replacement**

##### Removal:

- a. Open the top cover of the printer.
- b. Disconnect the control panel harnesses.
- c. Remove the six nuts that secure the control panel to the inside of the front panel.
- d. Remove the control panel from the inside of the front panel.

##### Installation:

- a. Position the control panel on the front of the chassis.
- b. Install the hardware that secures the control panel to the front panel.
- c. Connect the control panel harness.
- d. Close and secure the top cover of the printer.

## 6. SETTINGS

### 6.1. Introduction

This chapter defines the communications parameters for the Model 2180 Series printer, baud rate, handshake, data and stop bits, parity and conversion direction. The printer parameters are set at the factory and are shown in Table 6-1.

**Table 6-1. Factory Settings**

Communication Parameters	Factory Settings
Baud Rate	9600
Handshake	XON/XOFF
Data and Stop Bits	8,1
Parity	Parity Inhibit

### 6.2. Changing Factory Settings

The following paragraphs include information concerning location of the connector that allows factory settings to be changed, a pictorial representation showing jumper settings on the connector and table showing settings.

#### 6.2.1. Connector Location

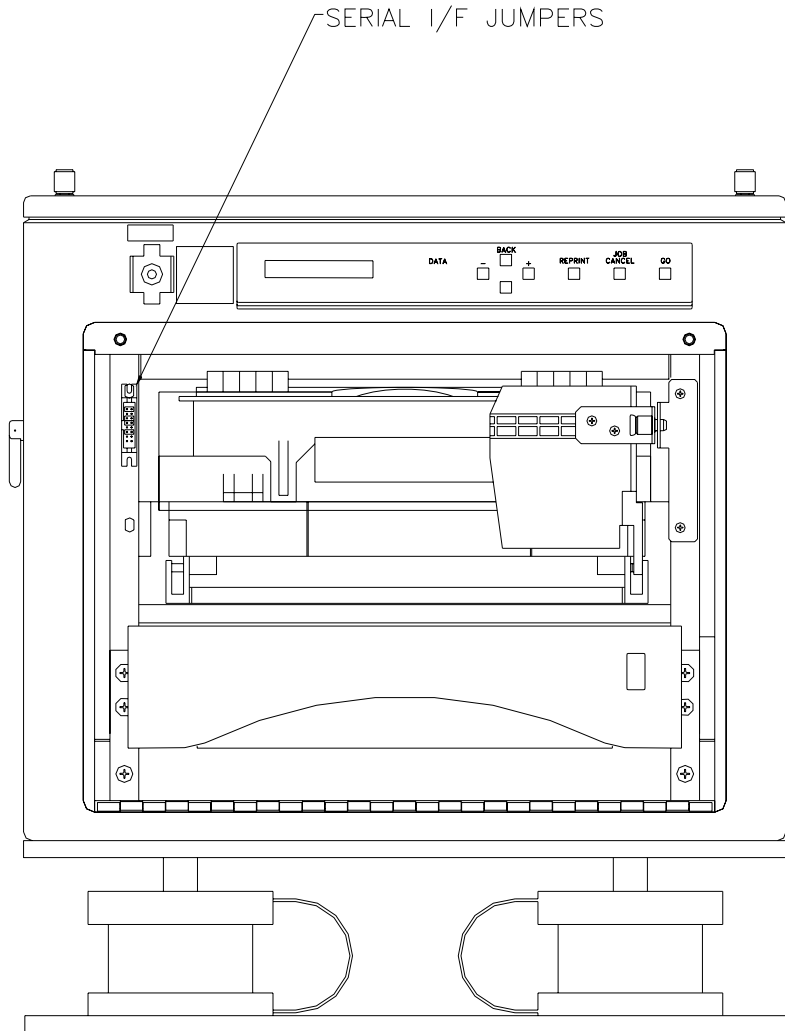
Located on the front face of the print engine, behind the front access door, is the connector where all factory settings are set and can be changed (Figure 6-1.). The connector is hard wired from the RS232 centronics converter that is located underneath the print engine. This allows factory settings to be changed with out having to disassemble the entire engine to make changes to the factory settings.

#### 6.2.2. Pictorial Representation

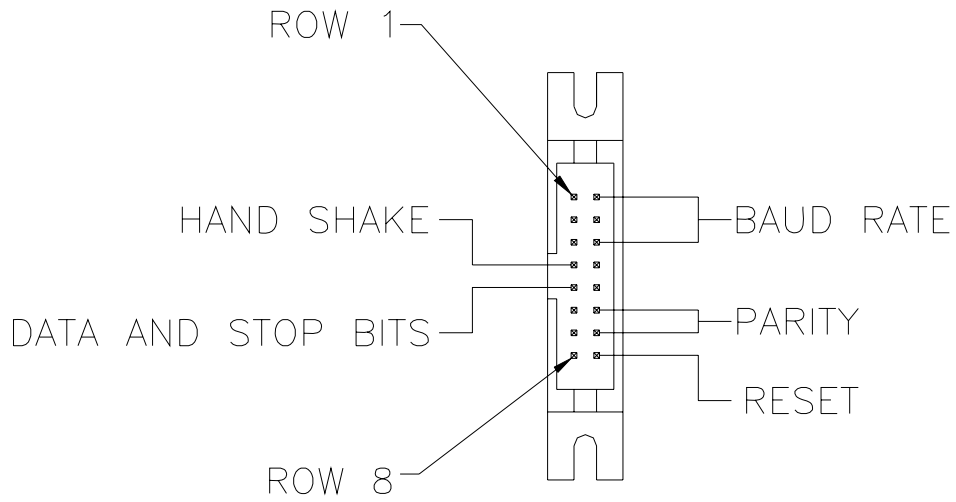
A pictorial representation of the connector showing jumper settings locations is shown in Figure 6-2.

#### 6.2.3. Jumper Settings

Changing of the factory settings can be accomplished by moving and or adding jumpers to the connector. For setting definition refer to Table 6-2.



**Figure 6-1. Connector Location**



**Figure 6-2. Jumper Setting Definitions**

JUMPER SETTING			BAUD RATE
1	2	3	
ON	ON	ON	1200
ON	ON	OFF	2400
ON	OFF	ON	9600
ON	OFF	OFF	14400
OFF	ON	ON	19200
OFF	ON	OFF	38400
OFF	OFF	ON	57600
OFF	OFF	OFF	115200

JUMPER SETTING	HAND SHAKE
4	
ON	XON/XOFF
OFF	HARDWARE

JUMPER SETTING	DATA BITS	STOP BITS
5		
ON	7	2
OFF	8	1

JUMPER SETTING		PARITY
6	7	
ON	EITHER	NONE
OFF	ON	EVEN PARITY
OFF	OFF	ODD PARITY

JUMPER SETTING	CONVERTER RESET
8	
ON	RESET
OFF	NORMAL OP.

**Table 6-2. Jumper Settings**