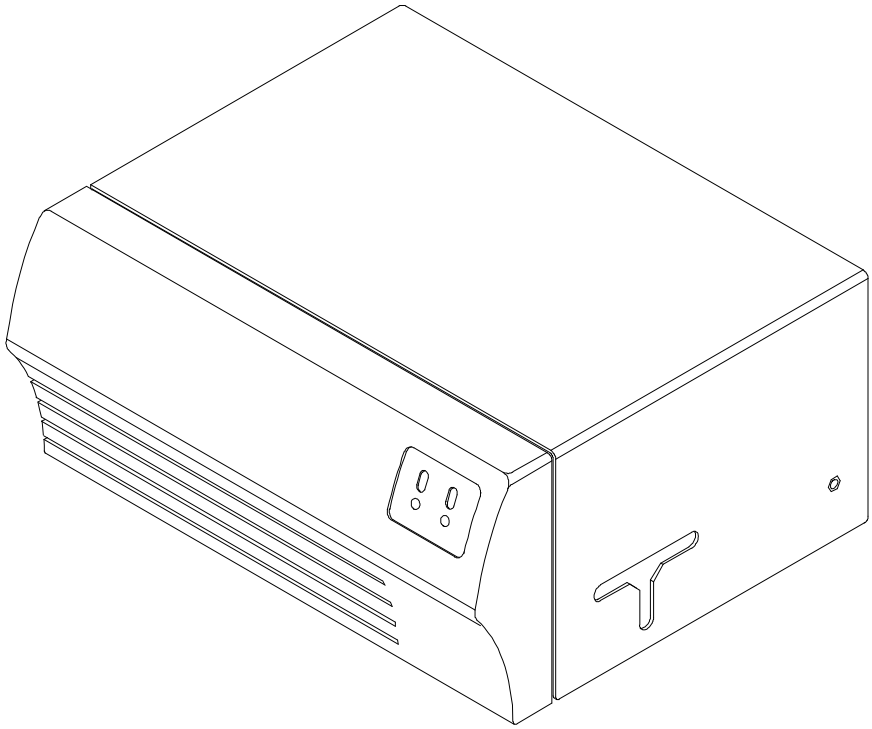
FARGO®
Card Identity Solutions



Persona® C10/M10 ID Card Printer Service Manual (Rev. 4.0)

Part Number: L000527

Persona C10/M10 ID Card Printer Service Manual (Rev. 4.0), property of FARGO Electronics, Incorporated

The revision number for this document will be updated to reflect changes, corrections, updates and enhancements to this document.

Revision Control Number	Date	Document Title
Revision 4.0	1 May 2004	Persona C10/M10 ID ID Card Printer Service Manual (Rev. 4.0)

These reference documents were thoroughly reviewed to provide FARGO with professional and international standards, requirements, guidelines and models for our technical, training and user documentation. At all times, the Copyright Protection Notice for each document was adhered to within our FARGO documentation process. This reference to other documents does not imply that FARGO is an ISO-certified company at this time.

- ANSI/ISO/ASQ Q9001-2000 American National Standard, (sub-title) Quality Management Systems - Requirements (published by the American Society of Quality, Quality Press, P.O. Box 3005, Milwaukee, Wisconsin 53201-3005)
- The ASQ ISO 9000:2000 Handbook (editors, Charles A. Cianfrani, Joseph J. Tsiakals and John E. West. Second Edition. published by the American Society of Quality, Quality Press, 600 N. Plankinton Avenue, Milwaukee, Wisconsin 53203)
- Juran's Quality Handbook (editors, Joseph M. Juran and A. Blanton Godfrey. Fifth Edition, McGraw-Hill)

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Table of Contents

Introduction

How to use the manual

The C10/M10 ID Card Printer Service Manual (Rev. 4.0) is, in fact, the troubleshooting and field service manual for the entire C10/M10 Card Printer. The manual is designed to provide installers and technicians with quick, efficient lookup of related procedures, components, and terms. The manual can be used effectively in either soft or hard copy, depending on the preference of the installer or technician.

Manual	Description
Glossary of Terms, and Technical/Functional Specifications (hyper-linked)	You can go directly to the Glossary of Terms, Technical Specifications, and Functional Specifications to learn how to use the processes, procedures, functions, and windows for the C10/M10 Card Printer within concise, correlative Tables.
Table of Contents (hyper-linked)	You can use the automated Table of Contents to quickly locate, for example, an error message, a procedure, the index, or an appendix.
Troubleshooting, Replacement, Removal, Diagnostic, and Navigation Procedures (in hyper-linked Sections)	You can go directly to Specifications, General Troubleshooting, Printer Adjustments, Parts Replacement, Printer Packing, and Board Level Diagnostics to find troubleshooting, removal, and replacement procedures. The section titles are always labeled according to their function for consistent usage.
Cross-Referencing (hyper-linked)	You can use the cross-referencing links to quickly locate, for example, an error message or a procedure.
Comprehensive Index (hyper-linked)	You can use the COMPREHENSIVE INDEX to quickly locate information on the C10/M10 Card Printer, relating to a specification, a procedural step, a window or screen, a component, a term, a qualifier, or a related feature to this printer.
Appendices	You can use Appendix A and B to locate information relating to engineering drawings and technical updates, which are specific to the C10/M10 Card Printer.

Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger: 	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair procedures, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these procedures.
Caution: 	**This device is electrostatically sensitive. It may be damaged if exposed to static electricity discharges.** Information that raises potential electrostatic safety issues is indicated by a warning symbol (as shown to the below). • **To prevent equipment or media damage**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent equipment or media damage**, observe all established Electrostatic Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. • **To prevent equipment or media damage**, always wear an appropriate personal grounding device (e.g., a high quality wrist strap grounded to avoid potential damage). • **To prevent equipment or media damage**, always remove the C10/M10 Ribbon and Cards from the printer before making any repairs, unless otherwise specified. • **To prevent equipment or media damage**, take jewelry off of fingers and hands, as well as thoroughly clean hands to remove oil and debris before working on the printer.

Section 1: Specifications

Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger: 	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair Instructions, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these Instructions.
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Technical Specifications

Term	Description
Print Method	Dye-sublimation / resin thermal transfer
Print Resolution	300 x 300 dpi
Print Speed	Approximately 40 seconds per full-color card
Colors	Up to 16.7 million or black, red, blue, green and gold spot colors
Printing Area	Standard CR-80 Card: **Card Size:** 3.375L (86mm) x 2.125W (54mm) **Print Area:** 3.375L (86mm) x 2.125W (54mm)
Accepted Card Width	2.1 to 2.13 W (53mm to 54mmW)
Accepted Card Length	3.25 to 3.37 L (82mm to 86mmL)
Accepted Card Thickness	.010 to .040 (.254mm to 1.0mm)
Card Types	PVC or Polyester cards with polished PVC finish
Card Capacity	Accepts up to 50 standard CR-80 PVC Cards. auto or manual feed
Software Driver	Windows Driver included for IBM-PC's and compatibles
Interface	Standard 8-bit Centronics-type parallel (ECP compatible)
Power Source	100/110/120 VAC, 50/60 Hz
Operating Temperature	65ºF to 80ºF (18ºC to 27ºC)
Humidity	Non-condensing 20%-60%
Dimensions	12.19 L x 10.27 W x 5.88 H (310mmL x 261mmW x 149mmH)
Weight	15 lbs. (7 kg)

Technical Specifications (continued)

Term	Description
Agency Listings	• **Electrical:** UL 1950, CUL C2.2 and TÜV-GS (IEC-950) • **EMI:** FCC Class A, CRC c1374 Class A, CISPR 22-B, TÜV- • **EMCCE:** Self-certified based on IEC 801-2-3-4,CISPR 22-B and IEC-950 certification

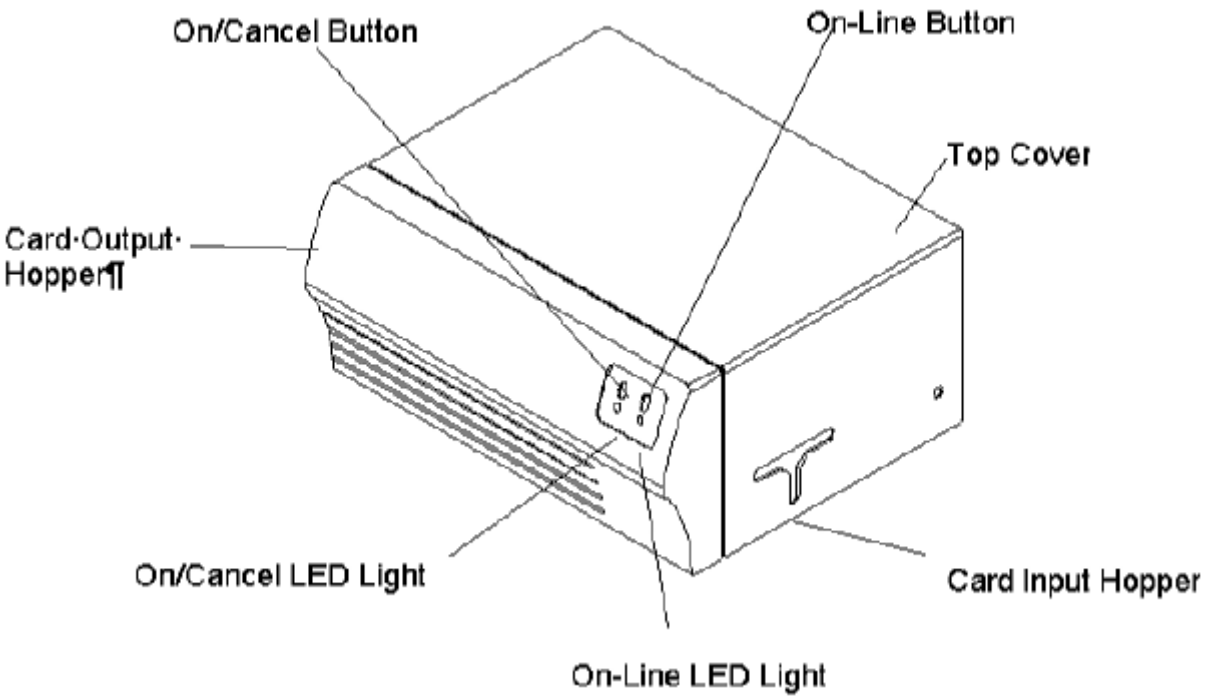
Functional Specifications

Printer Components: Buttons, Hoppers and Cover

This illustration shows the features found on the front of the Card Printer.

Term	Description
On/Cancel button	The **On/Cancel** button turns the Printer ON and OFF. • It also serves to cancel the current print job and reset the Printer for the next print job. • If a card is left within the Printer after a print job is canceled, it will automatically be ejected when the Printer is turned back ON.
On-line button	The **On-line** button takes the Printer on and off-line. • The Printer must have the on-line light illuminated in order to print. • When flashing, the on-line light also serves to indicate a print error condition.
Card Input Hopper	The **Card Input Hopper** is where blank cards are loaded.
Card Output Hopper	The **Card Output Hopper** is where printed cards eject. An Attachable Card Output Hopper is included with the Printer and serves to catch cards once they have finished printing. • To attach this hopper, simply open the Top Cover of the Printer and slip it over the edge of the Printer's baseplate. • Once the Top Cover is closed, it will hold the hopper securely in place.
Top Cover	The **Top Cover** tilts from front-to-back to open and is how you access the inside of the Printer to load cards and Ribbon. (**Note:** The Top Cover must be shut in order for the Printer to print.)

Printer Components: Buttons, Hoppers and Cover (continued)



Printer Components: Ribbons and Cards

Please note that the Printer requires specialized Ribbons in order to function properly. To order additional Ribbons, contact the authorized reseller.

 **Caution:** Watches, rings, bracelets and other jewelry can damage the Printhead if accidentally bumped against it. For best results, remove such items before installing or removing Ribbons.

The Card Printer has the following Ribbon types available for printing:

Term	Description
Standard Resin Black (K) Ribbon	Standard Resin Black (K) Ribbon with no clear overlay panel (produces 1,000 prints)
Colored Resin Ribbons	A variety of Colored Resin Ribbons with no clear overlay panel (produce 1,000 prints)
Premium Resin Black (K) Ribbon	Premium Resin Black (K) Ribbon with no clear overlay panel (produces 1,000 prints)
Metallic Resin Ribbons	Metallic Resin Ribbons with no clear overlay panel (produces 1,000 prints)
Scratch-off Resin Ribbon	Scratch-off Resin Ribbon with no clear overlay panel (produces 1,000 prints)
Dye-Sublimation Black (BO) Ribbon	Dye-Sublimation Black (BO) Ribbon with a clear overlay panel (produces 500 prints)
Full-Color (YMCBO) Ribbon	Full-Color (YMCBO) Ribbon with a dye-sublimation black panel and a clear overlay panel (produces 250 prints)
Full-Color (YMCKO) Ribbon	Full-Color (YMCKO) Ribbon with a resin black panel and a clear overlay panel (produces 250 prints)

Printer Components: Ribbons and Cards (continued)

Term	Description
Clear Overlay Panel	The Ribbons which have a clear overlay panel will print an ID card and place a clear, protective overlay over the card's printable area. All color or monochrome dye-sublimation cards must have this overlay applied to them. If it is not applied, the card's dye-sublimation image will quickly begin to wear or fade. Be sure the Overlay option within the Printer Driver setup window is selected when printing with Ribbons which have a clear overlay panel. **Note:** The only time you should not utilize a Ribbon's clear overlay panel is if you intend to apply a separate, custom overlaminate to a card immediately after printing.
Resin Black	The Ribbons which utilize a resin black, are intended for printing bar codes onto cards which can be read by both infra-red and visible light bar code scanners. • Bar codes printed with a dye-sublimation black can only be read by a visible light bar code scanner. Cards printed solely with monochrome resin text, bar codes or images do not require any type of protective overlay. • The black monochrome resin Ribbons are available in both a premium and standard quality. The premium resin black Ribbon provides maximum durability and is ideal for applications (e.g., access control where cards are repeatedly swiped through a magnetic stripe reader). • The standard resin black Ribbon provides high durability ideal for most general purpose ID card applications. In addition to a standard black resin Ribbon, several other standard resin Ribbons are available in a variety of spot colors including blue, green, red and metallic gold. • All monochrome resin Ribbons provide 1,000 prints. The blue, green and metallic Ribbons are capable of printing bar codes which can be read by visible light bar code scanners only. Bar codes printed with the red and scratch-off Ribbon are not readable.

Section 2: Setup and Installation

Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger: 	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair Instructions, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these Instructions.
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Introduction

Thank you for choosing the color Card Printer. This fast, compact Printer has been designed to print high-quality, full-color cards from virtually any Windows® application program. It offers many features which easily allow you to create durable cards complete with high resolution photos, graphics, text, bar codes and more.

To begin using the Printer, please refer to the remainder of this manual. This user's manual is the complete step-by-step guide to efficiently setting up and printing with the new Card Printer.

Choosing a Good Location

- Place unit in a location with adequate air circulation to prevent internal heat build up.
- Do not place unit near heat sources such as radiators or air ducts or in a place subject to direct sun-light, excessive dust, mechanical vibration or shock.
- Allow for adequate clearance above the unit to accommodate the height of the unit with its Top Cover and Printhead Assembly open.

About Moisture Condensation

If the unit is brought directly from a cold to a warm location or is placed in a very damp room, moisture may condense inside the unit. Should this occur, print quality may not be optimum. Leave the unit turned OFF in a warm, dry room for several hours before using. (**Note:** This will allow the moisture to evaporate.)

Unpacking and Inspection

While unpacking the Card Printer, inspect the carton to ensure that no damage occurred during shipping. Also, make sure the following items are included:

- Printer
- Power Transformer
- Attachable Card Output Hopper
- Software Installation CD
- Warranty Statement and Registration Card

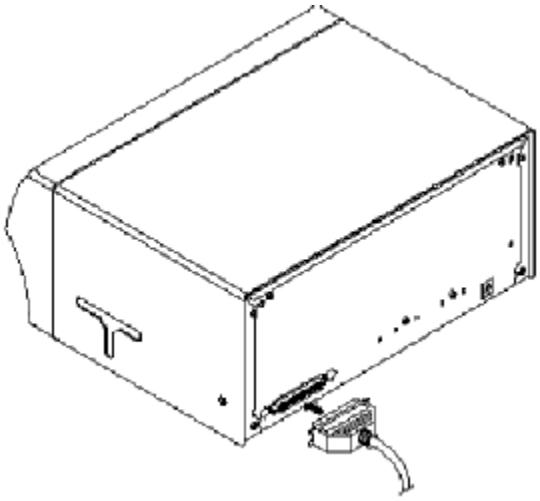
Connecting the Printer to the Computer

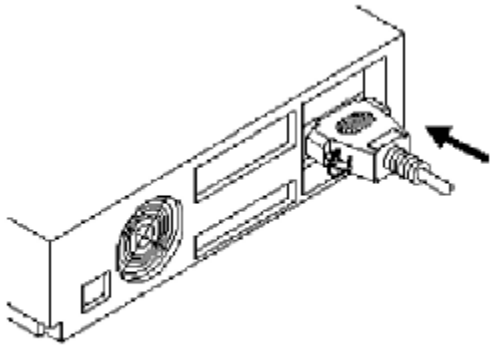
The Card Printer is designed to be used with nearly any IBM-PC or compatible running Windows 3.1x, Windows 95/98 or Windows NT. For best performance, a Pentium™ class computer with 16 MB RAM or higher is recommended.

The Printer is equipped with an ECP-compatible, high-speed Centronics parallel port. (**Note:** This port is the means through which the Printer receives data from the computer.)

Connect the Printer to the computer with a shielded, bi-directional parallel cable and refer to the following steps:

Step	Procedure
1	Connect the Centronics-type parallel side to the Printer. Snap the fastening clips into place.
2	Connect the other side to the back of the PC at the PARALLEL connector. The Printer must have its on-line light illuminated to receive data. If the light is not ON, press the on-line button.





Installing the Windows Printer Driver

The Card Printer can be used with virtually any Microsoft Windows 3.1x, Windows 95/98, Windows NT 4.0 or Windows 2000 software application program. (**Note:** This is accomplished through what is called a Printer Driver. The Printer Driver is simply software which gives the Printer all the information needed for printing.)

The Printer Driver software is located on the Software Installation CD included with the Printer.

- If you are reading this on the computer screen from the Online User's Guide, you have already installed the Printer Driver and this guide using this CD.
- If you would like to provide others with these instructions, however, the following describes how to install the Printer Driver for the first time. The latter part of this section also describes how to install Printer Driver updates.

Note: The Windows 3.1 Printer Driver is not included with the Printer or on the Software Installation CD. If you would like to use this Driver, please contact the authorized reseller.

Installing the Printer Driver from the Software Installation CD

Step	Procedure
1	To install the Printer Driver, close down all other programs and insert the Software Installation CD into the computer's CD drive. The CD will automatically open and prompt you to click on the photo of the specific Printer model to begin installation.
2	If the CD does not automatically open, use My Computer or Windows Explorer to view the contents of the CD. Then, double-click on the Setup.exe file listed on the CD. Follow the on-screen instructions to complete installation. Once installed, the icon for the specific Printer model will appear in the Printers folder.
3	The Online User's Guide will also automatically install along with the Printer Driver. An icon for this will appear in the **Start->Programs->Card Printer** folder. Select this icon to open the Online User's Guide any time you have a question about operating the Printer.

Installing the Printer Driver from the Software Installation CD (continued)

Step	Procedure
1	Click the **Start** button, point to **Settings** and select **Printers**.
2	Double-click on the **Add Printer** icon.
3	Follow the on-screen instructions to begin installation. When prompted, click on the **Have Disk** button. the Install From Disk window will appear.
4	a. Click on **Browse**, navigate to the folder containing the Printer Driver files you just downloaded and unzipped and click on **OK**. b. Click on **OK** again to close the Install From Disk window, then click on **NEXT**.
5	a. Follow the remainder of the on-screen instructions to complete installation. b. When prompted, do not have Windows print a test print, since you most likely performed a Printer self test while you were setting up the Printer. c. Once installed, the Driver's icon will appear in the Printers folder.

Installing Printer Driver Updates

Occasionally, new Printer Driver versions are released which have new or updated features. Before installing an updated Printer Driver version, always delete the existing Printer Driver version from the system.

Step	Procedure
1	To do this, select Start, Programs and point to the Card Printer folder. Then, select the **Uninstall Printer Driver** icon for the specific Printer model.
2	Once the existing Printer Driver is deleted, the updated version can be installed. The best way to get Printer Driver updates is to download them from the reseller's or the Printer manufacturer's website. The following instructions explain how to download and install updated Printer Drivers.

Downloading Printer Driver files

The downloadable Printer Driver files have names ending in .exe and are self-extracting PKZip archives. A PKZip archive is a package, containing one or more files, that has been zipped to make it smaller and provide easy downloading of numerous files simultaneously. An archive that is self-extracting is capable of unzipping itself.

Step	Procedure
1	Download the latest Printer Driver version by clicking on the Printer Driver's highlighted .exe file name on the web site.
2	Save this program to the disk when you are prompted to do so.
3	Click the **OK** button, then choose the folder in which you would like to save the Printer Driver file. (**Note:** You may wish to save it in an empty folder to prevent mingling its files with others already on the computer.)
4	Once the file has completely downloaded to the computer, unzip the contents of the file by simply double-clicking on it. (**Note:** The archive will unzip itself, revealing its contents as a new list of files within the folder.)

Installing the 32-Bit Print Spooler for Windows 95/98

The Card Printer ships with a print utility program called the 32-Bit Print Spooler. (**Note:** This print spooler is for use only with Windows 95/98.)

- Once installed, the print spooler is located on the Software Installation CD and is able to process the print jobs and send them to the Printer at consistently faster speeds than if sending print jobs through the Windows print spooler. (**Note:** This is especially true if printing with an ECP compatible parallel port or if printing off a network.)
- The 32-Bit Print Spooler is ideal for printing a large number of consecutive ID cards, for printing larger file formats (1 MB or more) or if printing on a somewhat slower computer.
- The 32-Bit Print Spooler can be installed automatically from the Software Installation CD. To do so, close down all other programs and insert the Software Installation CD into the computer's CD drive.
- The CD will automatically open and prompt you to click on the photo of the specific Printer model to begin installation. (**Note:** If the CD does not automatically open, use My Computer or Windows Explorer to view the contents of the CD. Then, double-click on the Setup.exe file listed on the CD.)
- Follow the on-screen instructions to complete installation. Once installed, the 32-Bit Print Spooler icon will appear in the **Start->Programs->Card Printer** folder. (**Note:** Before installing updated 32-Bit Print Spooler versions, always uninstall the existing print spooler version from the system. To do this, simply select 32-Bit Print Spooler from the list of programs in the Add/Remove Programs Properties window and click on the **Add/Remove** button.)
- To print with the 32-Bit Print Spooler, you must select the **Fast 32-bit Spooler** option from within the Printer Driver setup window as described in Section III. When this option is selected, the print spooler will automatically open and close with the start and finish of each print job. **Note:** You can also manually open the 32-Bit Print Spooler simply by selecting its icon from the **Start->Programs->Card Printer** folder.

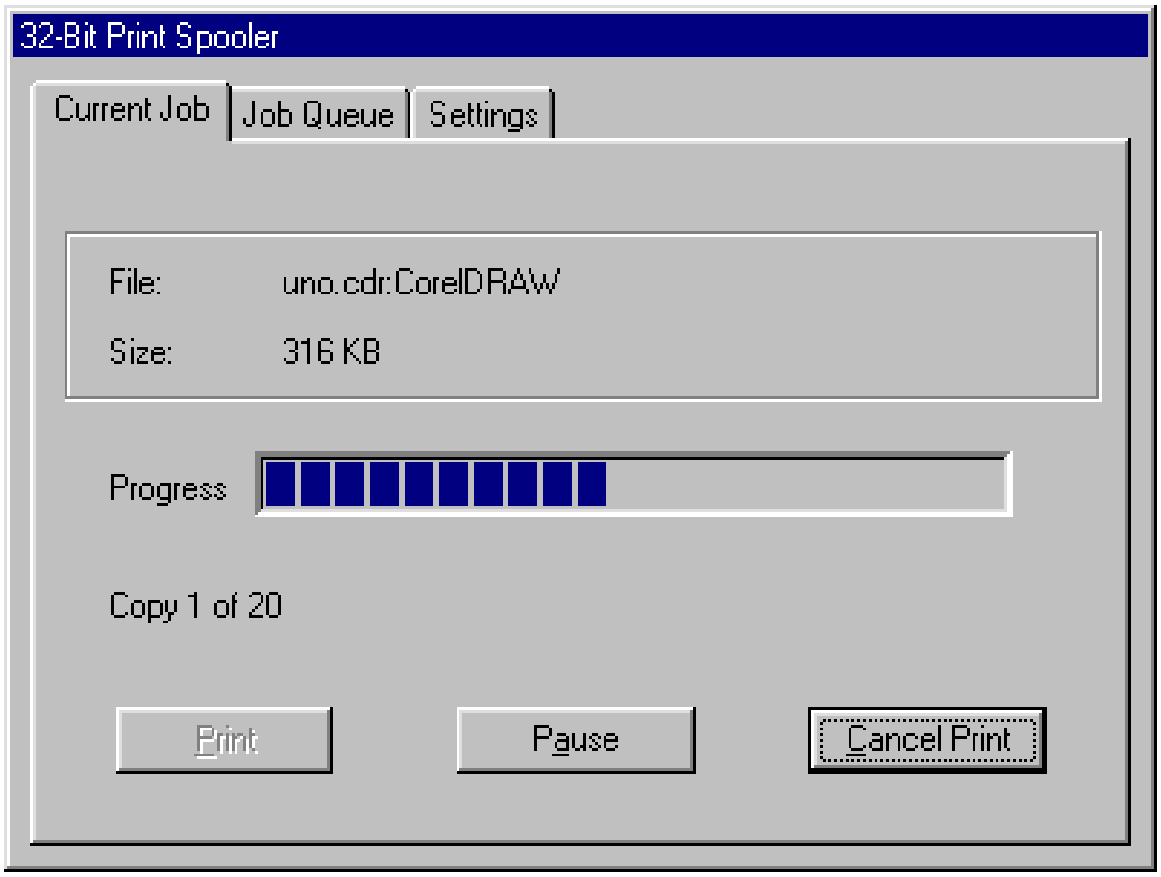

32-Bit Print Spooler

Installing the 32-Bit Print Spooler for Windows 95/98 (continued)

When the 32-Bit Print Spooler is running, its icon will appear in the Windows Task Bar. During a print job, it is sometimes helpful to click on this icon to bring the 32-Bit Print Spooler status window to the foreground of the application. This window provides a number of details about the print jobs being sent to the Printer.

Term	Description
Current Job tab	The **Current Job** tab tells you the name and size of the file printing, the progress of the overall print job, as well as the total number of copies left to print. It also provides buttons which allow you to pause or cancel the print job at any time during the printing process.
Settings tab	The **Settings** tab tells you the port and Printer to which you are printing and allows you to configure the timeout settings. In most instances, these settings will rarely need to be changed. This tab also provides two other options called **Save last job for reprint** and **Direct to Port Mode.**
Save last job for reprint option	When the **Save last job for reprint** option is selected, the 32-Bit Print Spooler will automatically save the last print job you sent to the Printer and allow you to instantly reprint the job without the delay of having to reprocess it. The print job will be saved in the spooler until another print job is sent and saved over it. If you do not wish to save the last print job for reprint, deselect this option. To print a saved job, simply select the **Print** button from the spooler's Current Job tab.
Direct to Port Mode option	The **Direct to Port Mode** option is selected by default. In most instances, this option allows the spooler to send data to the Printer at its optimum speed. If, however, you experience problems when printing with this option selected, simply deselect it and try the print job again.
Job Queue tab	The **Job Queue** tab appears only when a print job is being sent to the Printer. This tab tells you the name and status of each job in the queue and shows you the order in which the jobs will print if you have sent multiple jobs to the Printer. A control button is also provided which allows you to delete every job listed in the queue. To delete the job currently being printed, simply select the Cancel Print button under the Current Job tab.

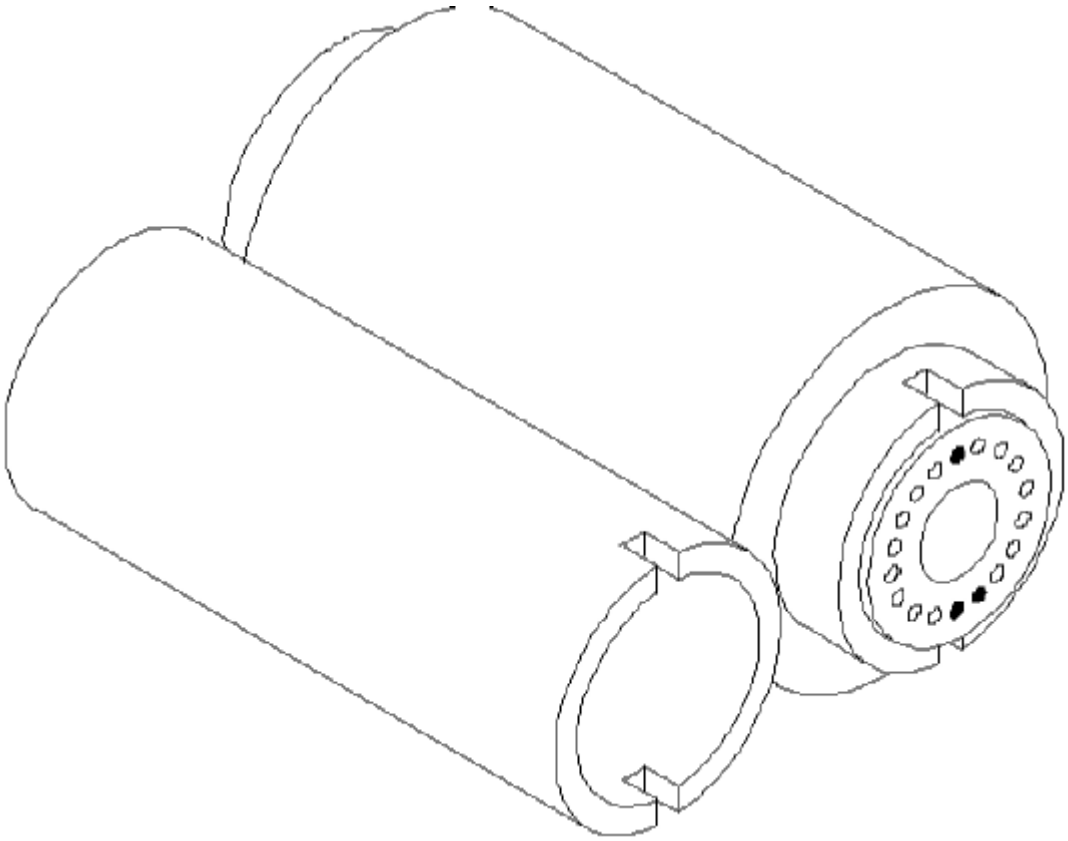
Installing the 32-Bit Print Spooler for Windows 95/98 (continued)



Loading Ribbon Into The Printer

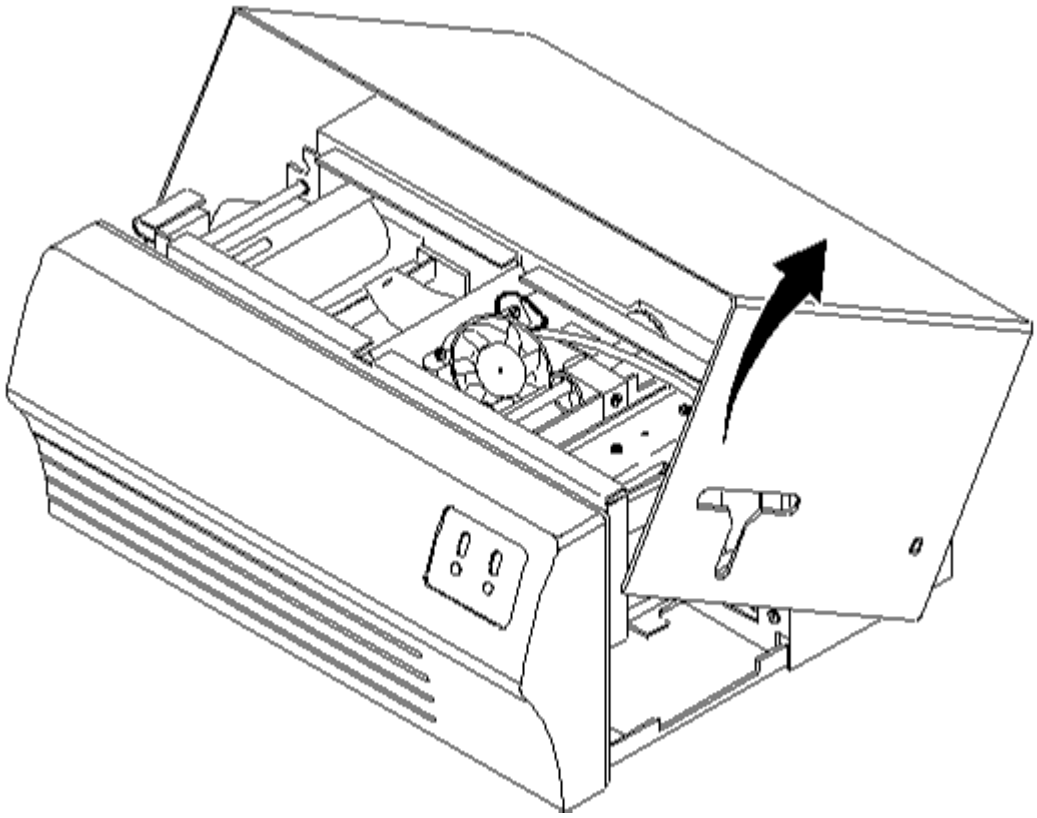
Follow these steps to load Ribbon into the Printer:

Step	Procedure
1	Remove the Ribbon from its packaging. Do not touch the colored portion of the Ribbon. Oil or dirt from the hands can impair print quality.
2	The supply end of the Ribbon is the side with the fresh, unused Ribbon on it. The Ribbon take-up is the other end. Note that the black plug in the supply Ribbon core must be present in order for the Printer to print properly.



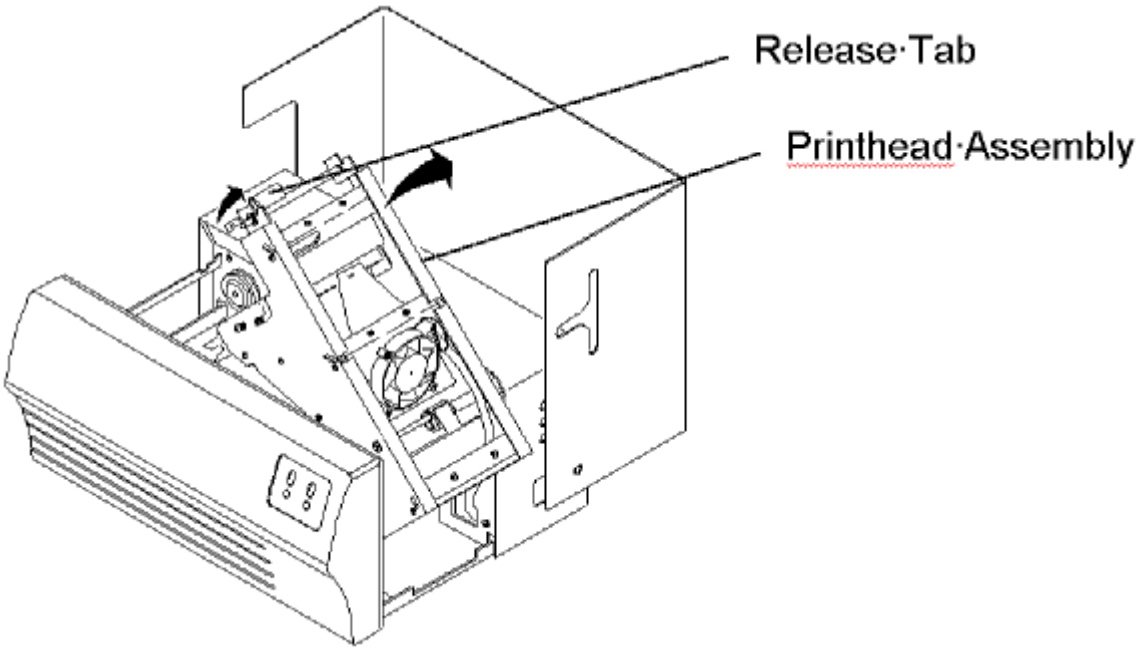
Loading Ribbon Into The Printer (continued)

Step	Procedure
3	Open the Top Cover of the Printer by gently grasping the front sides of the Cover and lifting upward. The Cover will tilt open from front-to-back.



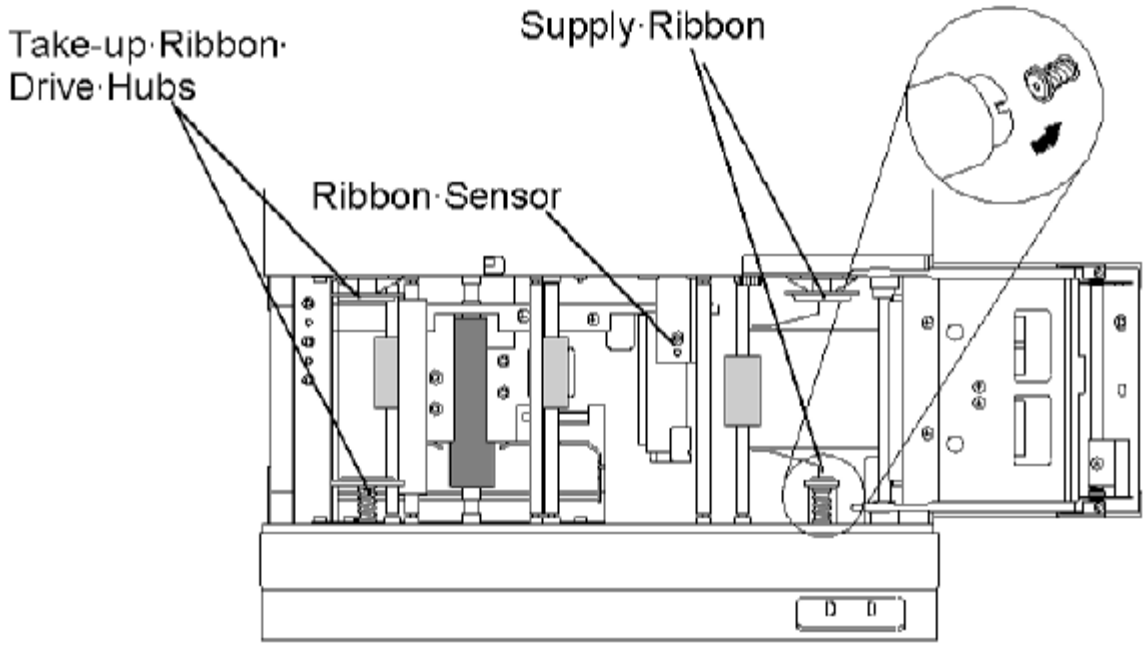
Loading Ribbon Into The Printer (continued)

Step	Procedure
4	Open the Printhead Assembly by gently pulling up on the assembly's Release Tab and lifting upward. Allow the assembly to swing completely open.



Loading Ribbon Into The Printer (continued)

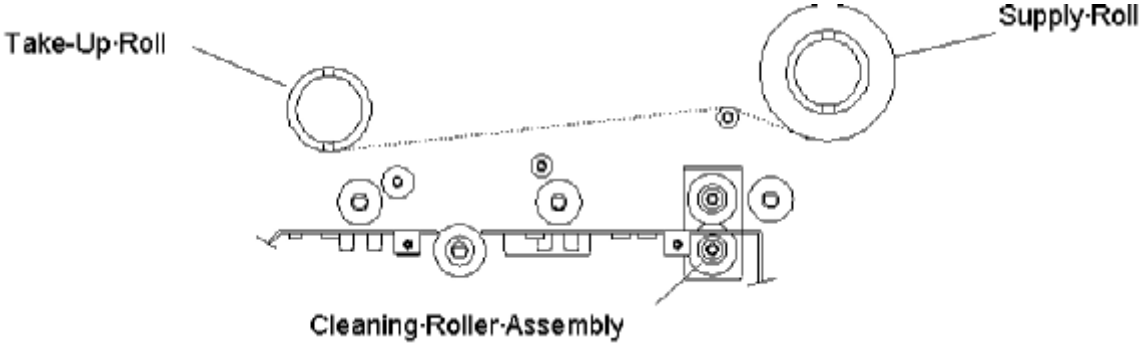
Step	Procedure
5	a. Place the supply end of the Ribbon in between the two black Ribbon Drive Hubs located on the right-hand side of the Printer's interior. b. Make certain that the Ribbon is fed from underneath the Ribbon roll. Hint: The Ribbon Drive Hub nearest you, as you are looking into the Printer from the front, is spring loaded. c. Use the end of the ribbon supply core to push in this Ribbon Drive Hub when inserting the ribbon.



Loading Ribbon Into The Printer (continued)

Step	Procedure
6	Place the take-up end of the Ribbon roll in between the two black Ribbon Drive Hubs located on the left-hand side of the Printer's interior.
7	Load the Ribbon take-up end of the Ribbon just as you loaded the Ribbon supply end.
8	When loaded properly, the Ribbon should feed underneath both ends of the Ribbon roll. Grasp the Release Tab and gently lower the Printhead Assembly to close it.
9	Lift slightly on the Release Tab to latch the assembly shut. Close the Printer's Top Cover. When you start to print, the Ribbon Drive Hubs will automatically engage the notches on both cores of the Ribbon roll.

Caution: Do not reverse the Ribbon. Damage may occur to the thermal Printhead!



Loading Cards into the Printer

The Card Printer prints onto standard CR-80 size cards (3.375L x 2.125W x .030 / 86mmL x 54mmW x .75mm), which have a clean, level, polished PVC surface.

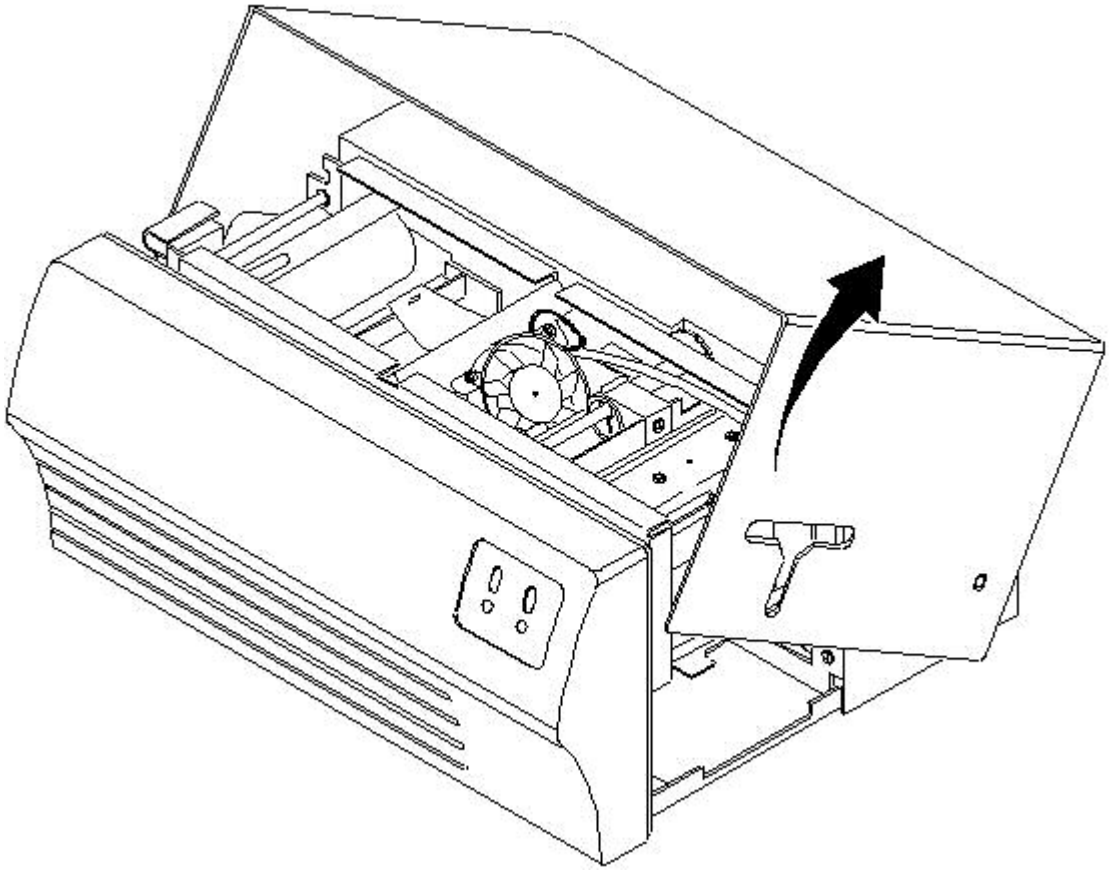
- Although the Printer is equipped with card cleaning Rollers, it is very important to always print onto cards designed for direct-to-card, thermal printing. (**Note:** For this reason, a special card stock is available which is specifically designed for printing with the Printer.)
- This card stock provides a level, polished PVC surface free of fingerprints, dust and any other types of embedded contaminants.
- In addition, this card stock is packaged and shipped in dust-free plastic bags. To order compatible card stock, contact the authorized reseller.

 **Caution:** Never run cards with a contaminated, dull or uneven surface through the Printer. Printing onto such cards will ultimately lead to poor print quality and will greatly reduce the life of the Printhead. In addition, always store the card stock in its original packaging or in a clean, dust-free environment. Do not print onto cards which have been dropped or soiled. **Printheads damaged by contaminated or poor quality cards will automatically void the** Printhead**'s factory warranty.**

Loading Cards Into the Printer (continued)

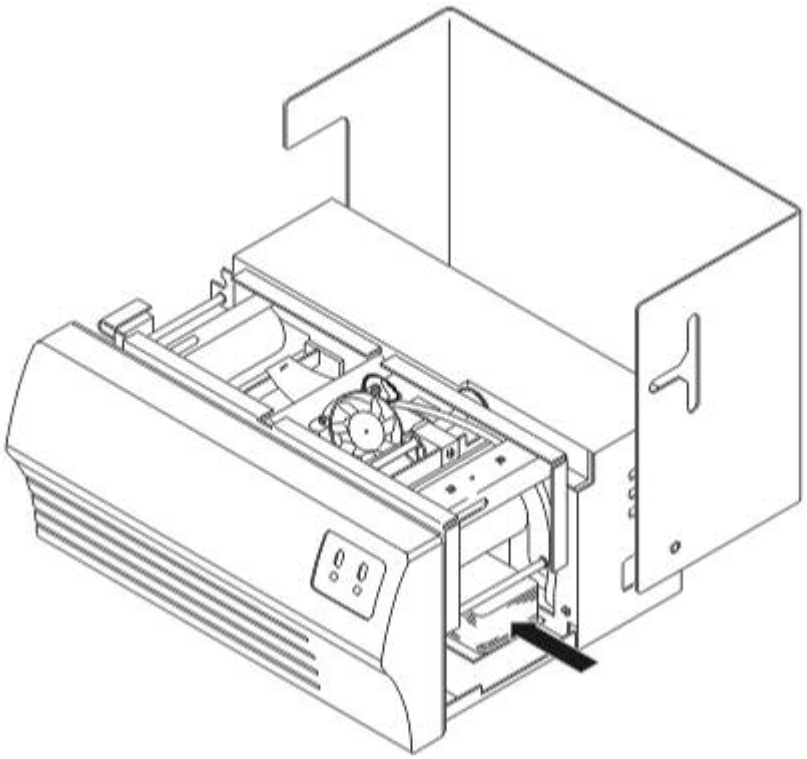
The Printer holds a maximum of 50 CR-80 size cards in its Card Input Hopper. The Printer will automatically feed each card off the top of the stack. To load the cards into the Printer, refer to the following steps:

Step	Procedure
1	Open the Top Cover of the Printer by gently grasping the front sides of the Cover and lifting upward. The Cover will tilt open from front-to-back.



Loading Cards into the Printer (continued)

Step	Procedure
	Remove a stack of 50 or fewer cards from the card packaging. Do not touch the area of the cards on which you intend to print. Oil or dirt from the hands can impair print quality. Handle cards only along the edges.
	Load the stack of cards into the Printer by depressing the spring loaded Card Input Tray and pushing the stack all the way to the front of the Card Input Hopper. Always load cards with the top or primary print side facing up. If inserting cards with a magnetic stripe, be sure the magnetic stripe is positioned downward and that the stripe is oriented toward the rear of the Printer. If inserting smart cards, be sure the end of the card containing the smart card chip is inserted first.
	Once the cards have been inserted, remove the top card and throw it away if you suspect it has been contaminated with oil from the fingertips. Close the Printer's Top Cover.



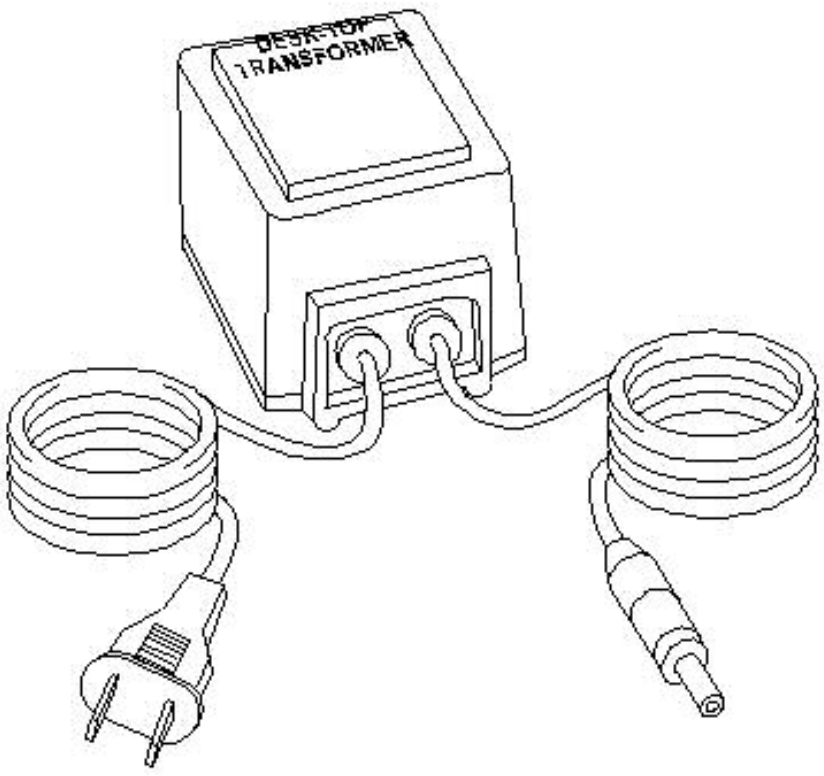
Powering-up the Printer

Applying Power

Locate the Desk-Top Transformer supplied with the system. Check that it is properly configured for the power used in the country.

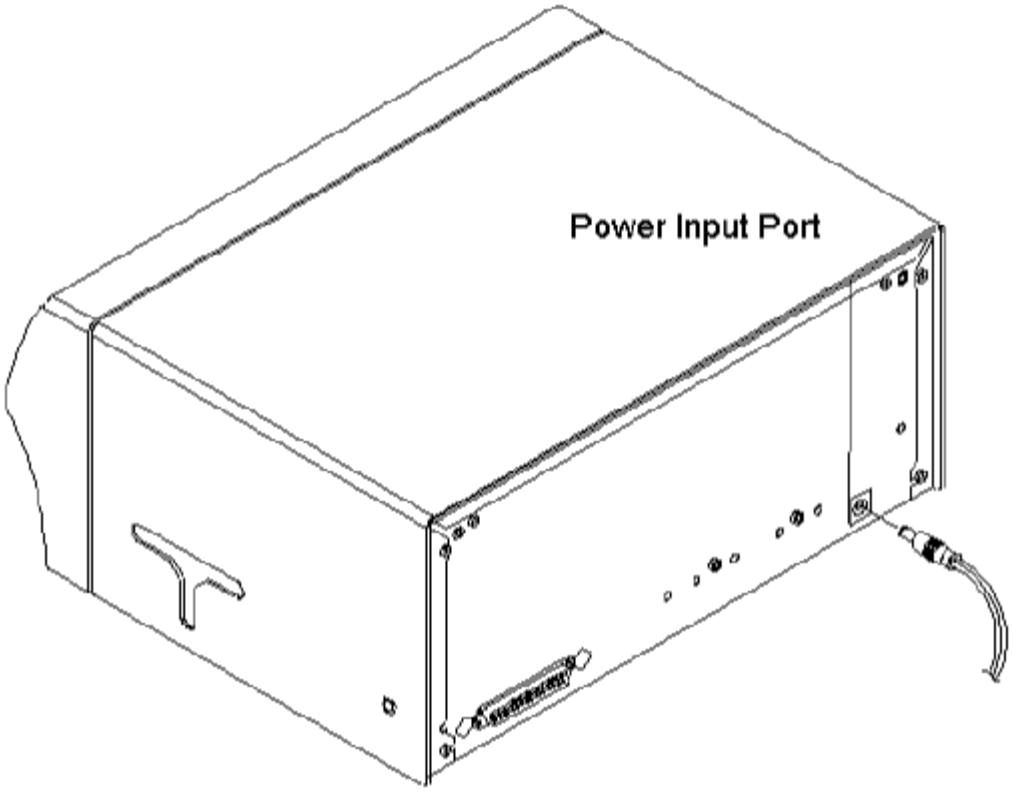
Caution No. 1: If you have any doubts about the plug configuration or the voltage, do not attempt to use the Printer. Contact the authorized reseller for information on the correct Transformer. Use the Printer only if you are certain that the plug and power rating are correct.

Caution No. 2: The Transformer is designed for desktop use only.



Applying Power (continued)

Step	Procedure
2	Plug the DC power plug end of the transformer cord into the Power Input Port on the rear panel of the Printer. (**Note:** Optional external transformer must be a Listed Class 2 device with an output rating of 16.5 volts and 3.5 amps AC (alternating current). The alternating current should be between 50 and 60 Hz.)
3	Plug the AC power plug end of the transformer cord into an available wall outlet. (**Note:** The wall outlet should be located near the Printer and should be easily accessible.) Power is automatically applied to the Printer when it is plugged in. Press the **On/Cancel** button if you wish to turn the Printer OFF.

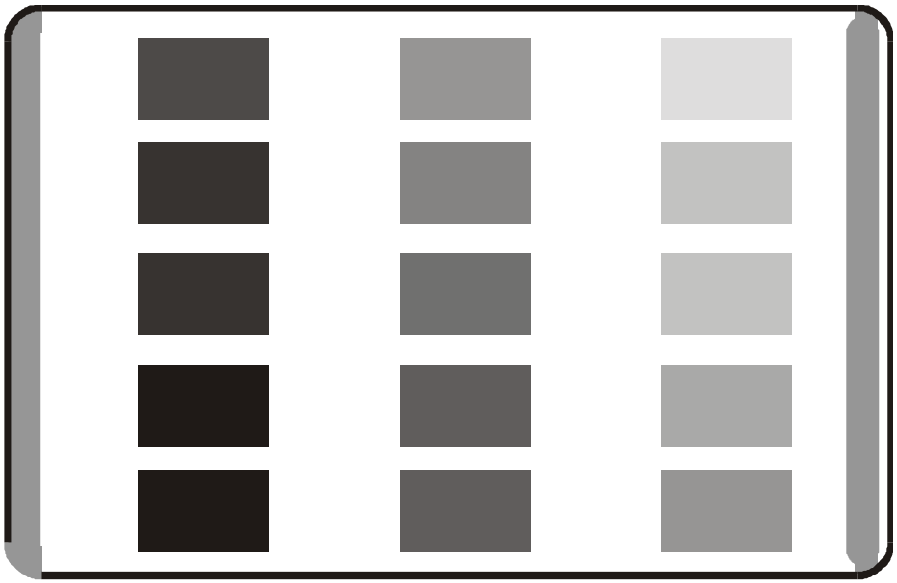


Printing a Self Test

Now that Ribbon and cards are installed, a self test should be performed to check for proper operation of the Printer. The standard self test function requires only that a full-color Ribbon and at least one card is installed. A sample of the self test pattern is shown below.

Step	Procedure
1	• If power is ON, turn it OFF now by pressing the **On/Cancel** button. (**Note:** The LED indicator lights should no longer be illuminated.) • Verify that a full-color Ribbon is installed and that cards are properly loaded.
2	Press and hold the on-line button.
3	While holding the on-line button down, turn the Printer power back ON by quickly pressing and releasing the **On/Cancel** button.
4	Release the on-line button. (**Note:** The gray scale self test pattern will begin printing approximately 10 seconds after the on-line button is released.)

Self Test Example: (Actual size)



Section 3: Troubleshooting the Printer

If you have difficulty operating the Card Printer, the troubleshooting suggestions in this section should, in most cases, solve the problem. If you still have difficulty after trying these suggestions, contact the authorized reseller for technical assistance.

Please refer to the following possible symptoms and solutions to troubleshoot the Card Printer:

Resolving problems with General Printer Operation

Symptoms: Nothing happens or an error message comes up in the Windows application program.

Step	Procedure
1	Make sure that the power cord is plugged in securely on both ends and that the Printer is turned ON. Also, be sure the Printer is on-line. The green LED below both the **On/Cancel** and the on-line buttons should be illuminated.
2	Make certain the Printer's interface cable is securely connected.
3	Make certain the Top Cover and/or Printhead Assembly is securely shut.

Resolving problems with the flashing Online LED light

This indicates a reCoverable printing error regarding the print media or supplies. Refer to the following list for possible causes to this problem.

Step	Procedure
1	Once the problem is corrected, press the on-line button to resume printing. (Or, if necessary, turn the print power ON and OFF by pressing the **On/Cancel** button and send the print job again.)
2	Check that cards and Ribbon are installed in the Printer. Also, check that cards are pushed all the way into the Printer and that the Ribbon is installed properly.
3	Check that the proper Ribbon type is installed according to the Ribbon type option selected in the Printer Driver setup window.
4	Are you using a Ribbon other than those sold specifically for use with the Card Printer? Remember, the Printer requires specialized Ribbon rolls in order to function properly.
5	Check for a Ribbon or card jam.
6	The Ribbon Sensor may need to be recalibrated.
7	**Symptom A:** If the Printer has a magnetic encoding module installed and you are attempting to encode magnetic information onto a card while printing, a flashing on-line LED can also indicate an encoding mis-verify. **Symptom B:** If information is not encoded properly or encoded onto a bad magnetic stripe, the Printer is unable to verify the encoded data. a. When this happens, the Printer will simply eject the card before printing begins and the on-line LED will begin flashing. b. Press the on-line button to resume encoding and printing with a new card.

Resolving problems with the flashing On/Cancel LED light

Step	Procedure
1	If the **On/Cancel** LED is flashing, this indicates a possible error with the Printer's memory. Contact the authorized reseller for technical assistance.

Resolving problems with Windows 95/98 printing capabilities

Print with either the **32-Bit Print Spooler** or the **Write Direct to Port** option selected from within the Printer Driver setup. In most cases, one or the other of these options will provide the best results when printing from Windows 95/98.

Due to the wide variety of PC hardware and software configurations, however, some systems may print more effectively through the Windows 95/98 print spooler.

If you choose not to print with either the 32-Bit Print Spooler or the Write Direct to Port option selected, but instead wish to print through the Windows print spooler, the following steps will help you optimize the system for printing:

Step	Procedure
1	Click the **Start** button, point to **Settings** and select **Printers**. When the Printers window appears, click on the Printer's icon using the right mouse button and select the **Properties** option.
2	Select the **Details** tab, then select the **Spool Settings** button.
3	Select the **Print directly to the Printer** option and click on **OK**.
4	Again from the Details tab, select the **Port Settings** button.
5	Deselect both the **Check Port state before printing** option and the **Spool MS-DOS print jobs** option and click on **OK**.
6	Increase the **Transmission retry** value of the Details tab from 45 to **900**. Click on **OK** to close the Properties window.

Resolving problems with Ribbon winding and printing

Symptoms: The Printer skips Ribbon panels, prints Ribbon panels out of the usual YMCK order (resulting in strangely colored output) or simply winds the Ribbon until the Printer's on-line LED light flashes.

Check that the proper Ribbon type is installed according to the Ribbon type option selected in the Printer Driver setup window. See Ribbon Type. The Ribbon Sensor needs to be recalibrated. This is a simple procedure which may be required every so often.

Refer to the following steps to recalibrate this sensor:

Step	Procedure
1	Install a Full-Color YMCKO Ribbon into the Printer and position an unused Magenta (red colored) panel across the top of the light emitting portion of the Ribbon Sensor.
2	Close the Printhead Assembly securely, but leave the Top Cover open.
3	With the Top Cover open, locate the rectangular opening on the left-hand side of the Printer. Just inside this opening are four small, white switches aligned vertically. The switches are labeled 1 through 4, with the top switch being number 1.
4	With the tip of a small flathead screw Driver, flip Switch 1 towards the rear of the Printer to turn the switch ON.
5	Disconnect the power cable from the back of the Printer and close the Printer's Top Cover.
6	Press and hold the on-line button. Then, reconnect the power cable into the back of the Printer while continuing to hold the on-line button.
7	Release the finger from the on-line button once either of the Printer's LED lights turn ON. Notice that only one LED will be lit, either the on-line or the On/Cancel.
8	On the right-hand side of the Printer, locate the three small holes toward the rear of the Top Cover. Through the center hole, there is a potentiometer labeled RP2 which adjusts the sensitivity of the Ribbon Sensor.

Continued on the next page

Resolving problems with the Card Jams

If a card becomes jammed inside the Printer, remove it through the following steps:

Step	Procedure
1	Leave the power ON and open the Printer's Top Cover by gently grasping the front sides of the Cover and lifting upward. (**Note:** The Cover will tilt open from front-to-back.)
2	a. Open the Printhead Assembly by gently pulling up on the assembly's Release Tab and lifting upward. b. Allow the assembly to swing completely open.
3	Remove the Ribbon.
4	a. Press the **On/Cancel** button to advance the card. b. Press the on-line button to reverse the card.
5	a. Once the card is cleared, re-install the Ribbon and close the Printhead Assembly and Top Cover. b. If the on-line light is flashing, press and release it. (**Note:** The Printer will save the print information and resume printing with a new card.) c. Remember, both the **On/Cancel** and on-line lights must be ON solid in order to print.

Resolving problems with the Ribbon Jams

If the Ribbon becomes jammed in the drive Roller (visible when you open the Printer), use the following procedure to correct the problem:

Step	Procedure
1	Leave the power ON.
2	Remove the Take-Up core (the side with used Ribbon on it) from in between the two black Ribbon Drive Hubs.
3	Steadily pull the Ribbon up and out of the Printer as you press and hold down the Printer's on-line button. (**Note:** This will rotate the drive Roller backwards and eject the Ribbon while you are pulling gently upwards.) If the Ribbon breaks, simply tape it back together making sure that it is fed from beneath both Ribbon cores.
4	Once the jam is cleared, re-install the Ribbon and close the Printhead Assembly and Top Cover. • If the on-line light is flashing, press and release it. (**Note:** The Printer will save the print information and resume printing with a new card. Remember, both the **On/Cancel** and on-line lights must be ON solid in order to print.) • If the drive Roller appears dirty after the jam is cleared, clean it according to the steps in Section IX.

Resolving problems (related to the Printer stopping or making strange sounds)

Symptoms: Printer makes strange sounds or stops printing and the on-line LED light is flashing.

Step	Procedure
1	**Symptom:** If the dye-sublimation Ribbon is sticking to the card, check to see that you are using a card with a polished PVC finish. A card with a dull or sticky finish can cause the Ribbon to stick to its surface causing the Ribbon to jam or even break See Card.
2	**Symptom:** If you are using an acceptable video imaging card stock and the Ribbon is still consistently being jammed down into the drive Roller, you may need to reposition the Headlift Assembly. a. To do this, open the Printer's Top Cover (do not open the Printhead Assembly). b. With the Printer powered ON, push down both the **On/Cancel** and the on-line buttons at the same time. c. You should then hear the Headlift Assembly rotate and realign itself.
3	Review the proper procedures for clearing Ribbon and card jams.

Resolving problems with Ribbon winding and printing

Step	Procedure
1	Gently insert the tip of a small flathead screw Driver into the hole so it fits into the slot of RP2. Slightly rotate RP2 in either direction until both the on-line and On/Cancel LED's turn OFF.  **Caution:** RP2 cannot be rotated all the way around. It has a stopping point in each direction. Do not rotate RP2 beyond these points.
2	Once both LED's are OFF, Ribbon Sensor calibration is complete.
3	Remove the power cable, open the Top Cover and flip Switch 1 toward the front of the Printer to turn the switch back OFF. Close the Top Cover, reconnect the power cable and try the print job again.

Resolving problems with torn or broken Ribbons

Symptoms: Printer stops printing or simply continues to wind the take-up end of the roll and the on-line LED light is flashing.

Step	Procedure
1	**Symptom:** If the dye-sublimation Ribbon is sticking to the card, check to see that you are using a card with a polished PVC finish. A card with a dull or sticky finish can cause the Ribbon to stick to its surface causing the Ribbon to jam or even break.
2	**Symptom:** If you are using an acceptable video imaging card stock and the Ribbon is still consistently being jammed down into the drive Roller, you may need to reposition the Headlift Assembly. a. To do this, simply open the Printer's Top Cover (do not open the Printhead Assembly). With the Printer powered ON, push down both the **On/Cancel** and the on-line buttons at the same time. b. You should then hear the Headlift Assembly rotate and realign itself.
3	**Symptom:** You may have tried to feed in a card that was too thick or perhaps two cards fed at once. This can sometimes cause the Ribbon to tear or break. Remember, the Printer is designed to feed and print primarily onto a standard CR-80 card size (3.375L x 2.125W x .030 / 86mmL x 54mmW x .75mm) and will not accept cards with a thickness greater than .040 (1.0mm).
4	**Symptom:** If you selected Calibrate in the Printer Driver setup window and changed the Top Adjust value to an extreme negative number, such as -10, you may have over-adjusted for the specific Printer. This can sometimes cause the Ribbon to break just as printing begins. Try entering another Top Adjust value which is not quite so extreme, such as -5.
5	**Symptom:** If the Ribbon breaks, simply tape the broken end of the supply roll directly onto the take-up roll. Then, wind a few inches worth of Ribbon from the supply roll onto the take-up roll. Be sure the Ribbon is passing beneath both the supply and take-up rolls.

Resolving problems with streaks in Prints

Symptoms: Scratches or lines travel the entire length of the printed card.

Step	Procedure
1	**Symptom:** There may be dust on the Printhead.
2	**Symptom:** There may be a scratch or a burned out element in the Printhead. Contact the authorized reseller for technical assistance.

Resolving problems with Print blotches or small voids

Symptoms: There are small spots on the print with no ink or different colors of ink.

Step	Procedure
1	Most likely due to dust inside the Printer.
2	**Symptom:** May also be caused by dust or embedded contaminants on the card. Be sure the cards you are using are clean and stored in a dust free environment. Some card stocks can have embedded contaminants in their polished surface and should not be used. Only use card stock recommended for use with the Card Printer.
3	**Symptom:** May also be caused by a filthy Cleaning Roller.

Resolving problems with pixelated Photos on ID cards

Symptoms: Photos do not look smooth or continuous, but rather grainy and unclear.

Step	Procedure
1	Some applications have selections you must enable in order for the Printer to use its own dither patterns. For best output, you should always use the Printer's dither patterns.
2	Refer to the application program's instruction manual or contact the software manufacturer for details on how such selections are enabled.
3	For best photo-realistic output, you should always use high resolution, 24-bit color images. Be sure the image capture equipment is capturing at a high enough resolution and at about the same size at which the image will be printing.
4	If you stretch or blow up a small or low resolution image, you will always get a pixelated or grainy effect when printing.

Resolving problems with card feeding and Online LED blinking

Symptoms: The Printer starts to make noise like everything is fine, but no card feeds.

Step	Procedure
1	a. Be sure the cards are inserted all the way into the Printer and that you haven't inserted more than 50 standard sized cards. You are trying to feed a card that is too thick. b. Be sure the cards you are using fall within the .010 to .040 (.254mm to 1.0mm) accepted card thickness range. c. The gray card Feed Rollers are extremely dirty. Clean these Rollers according to the directions in Chapter 5, Section VIII.
2	a. Be sure the top card is not sticking to the one below it. Manually separate the cards if you suspect they are sticking to one another. b. If separating cards, remember not to touch the surface of the card where you intend to print, since dirt or oil from the hands will impair print quality. The printing gets cut off or is not centered on the card.
3	Check that the correct card size is selected in the Printer Driver setup. Improper card size settings will always send the image to the wrong area of the card. Two or more cards feed at the same time.
4	a. Be sure the cards you are using are not sticking together. b. Manually separate the cards if you suspect they are sticking to one another. c. If separating cards, remember not to touch the surface of the card where you intend to print, since dirt or oil from the hands will impair print quality.

Section 4: Printer Driver Setup

Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger: 	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair procedures, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these procedures.
Caution: 	**This device is electrostatically sensitive. It may be damaged if exposed to static electricity discharges.** Information that raises potential electrostatic safety issues is indicated by a warning symbol (as shown to the below). • **To prevent equipment or media damage**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent equipment or media damage**, observe all established Electrostatic Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. • **To prevent equipment or media damage**, always wear an appropriate personal grounding device (e.g., a high quality wrist strap grounded to avoid potential damage). • **To prevent equipment or media damage**, always remove the Ribbon and Cards from the Printer before making any repairs, unless otherwise specified. • **To prevent equipment or media damage**, take jewelry off of fingers and hands, as well as thoroughly clean hands to remove oil and debris before working on the Printer.

Installing the Printer Driver

Once the appropriate Printer Driver has been installed, you will need to set the Driver up with the proper print options. Although each of the included Printer Drivers displays the print options in a slightly different format, the basic options are the same.

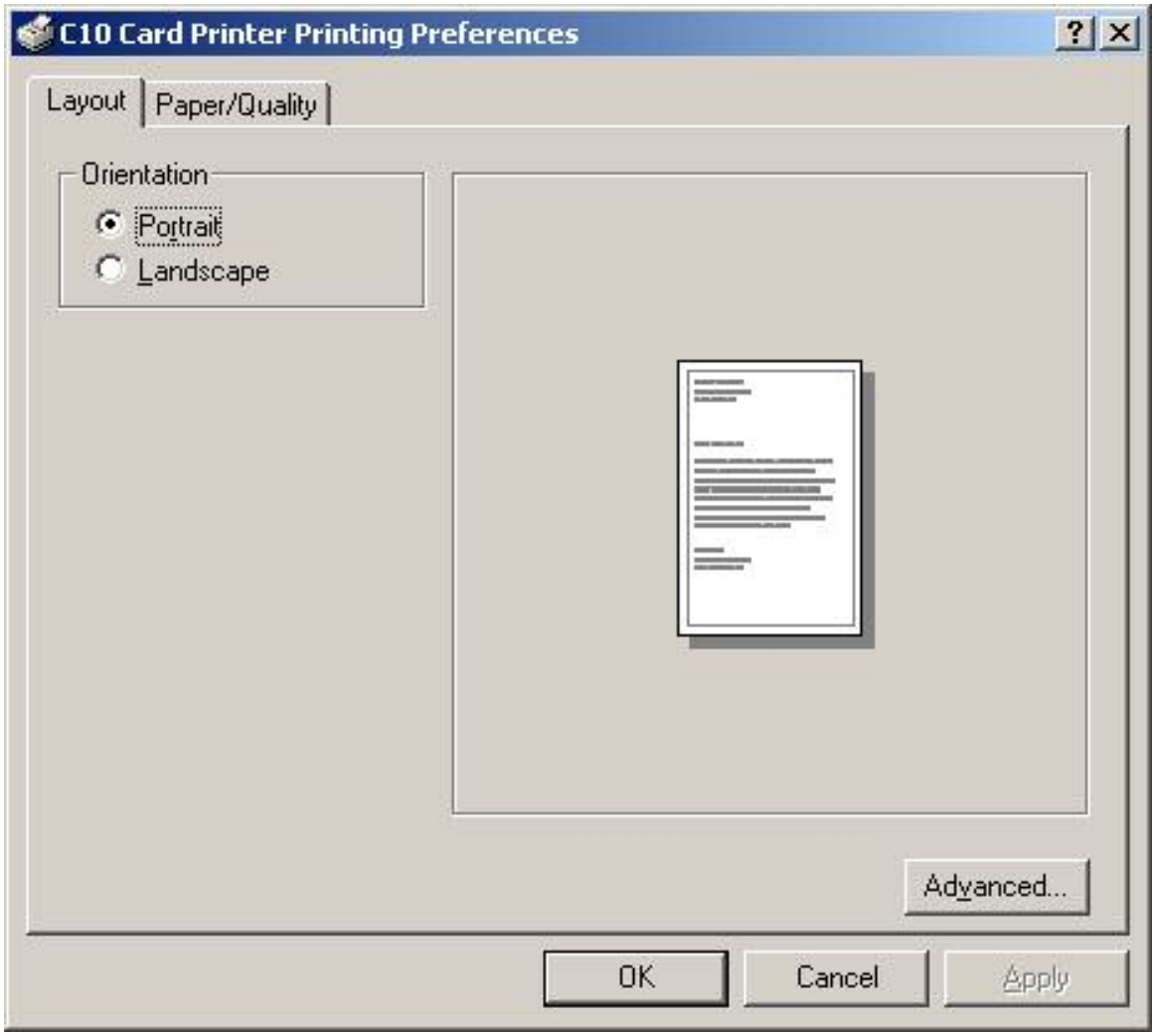
For this reason, **this section lists and describes each of the Printer driver options in alphabetical order,** rather than displaying them in the order in which they appear within any one of the Printer Drivers.

To open the Printer Driver setup window, please refer to the following steps for the specific operating system:

Step	Procedure
1	**Windows 95/98** Click the **Start** button, point to **Settings** and select **Printers**.
2	**Windows NT** Click on the Card Printer icon with the right mouse button and select **Properties**.
3	Click the **Start** button, point to **Settings** and select **Printers**.
4	Click on the Card Printer icon with the right mouse button and select **Document Defaults**.
5	Click on the **Advanced** tab of the Document Settings window. (**Note:** Most applications allow you to change these same Printer Driver options from their own Print screens. This means that you don't have to go back to the main Printer setup window each time you want to change a setting or option in the Printer Driver. These applications will usually give you the same choices and options, but in a slightly altered format.
6	To change or verify the appropriate Printer Driver options for the print job, please refer to the following descriptions given in alphabetical order:

Using the Color ID Card II Printer Advanced Document Settings

Access the Color ID Card II Printing Preferences window via Start > Settings > Printers > C10/M10 Card Printer (icon) > Color ID Card Printer Printer Preferences window > **Advanced** button (which brings up the Advanced Document Settings window).

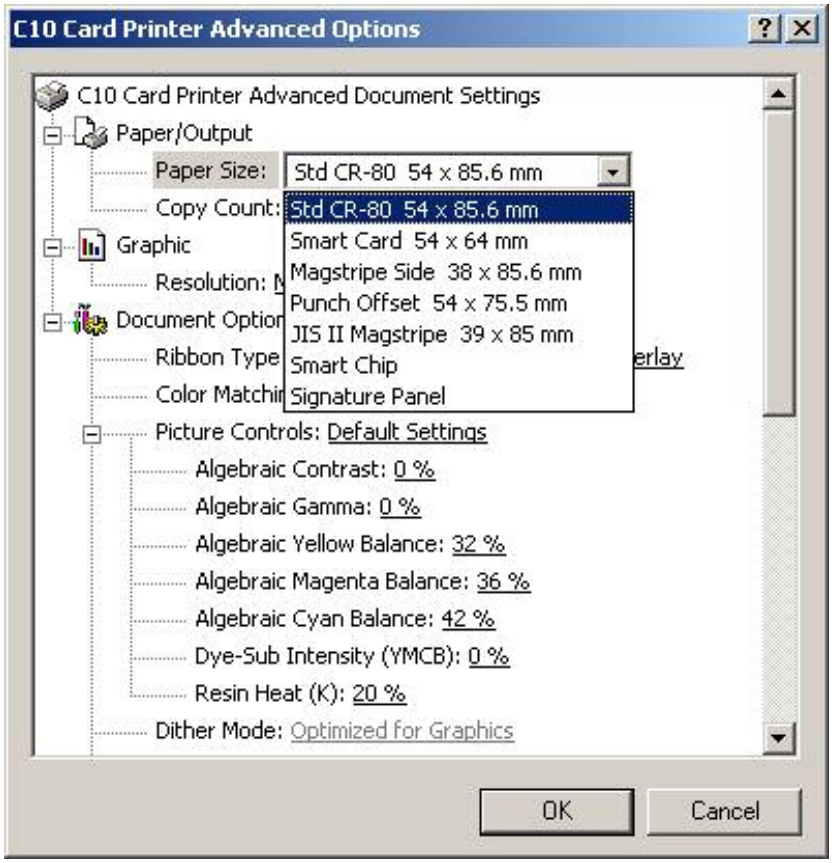


Selecting Paper/Output

Selecting Card Size

This option displays a list of the available card size selections. These selections prevent you from printing over or damaging the area of the card containing the magnetic stripe, IC chip or punched slot. Select the card size option that's appropriate for the type of card you are using.

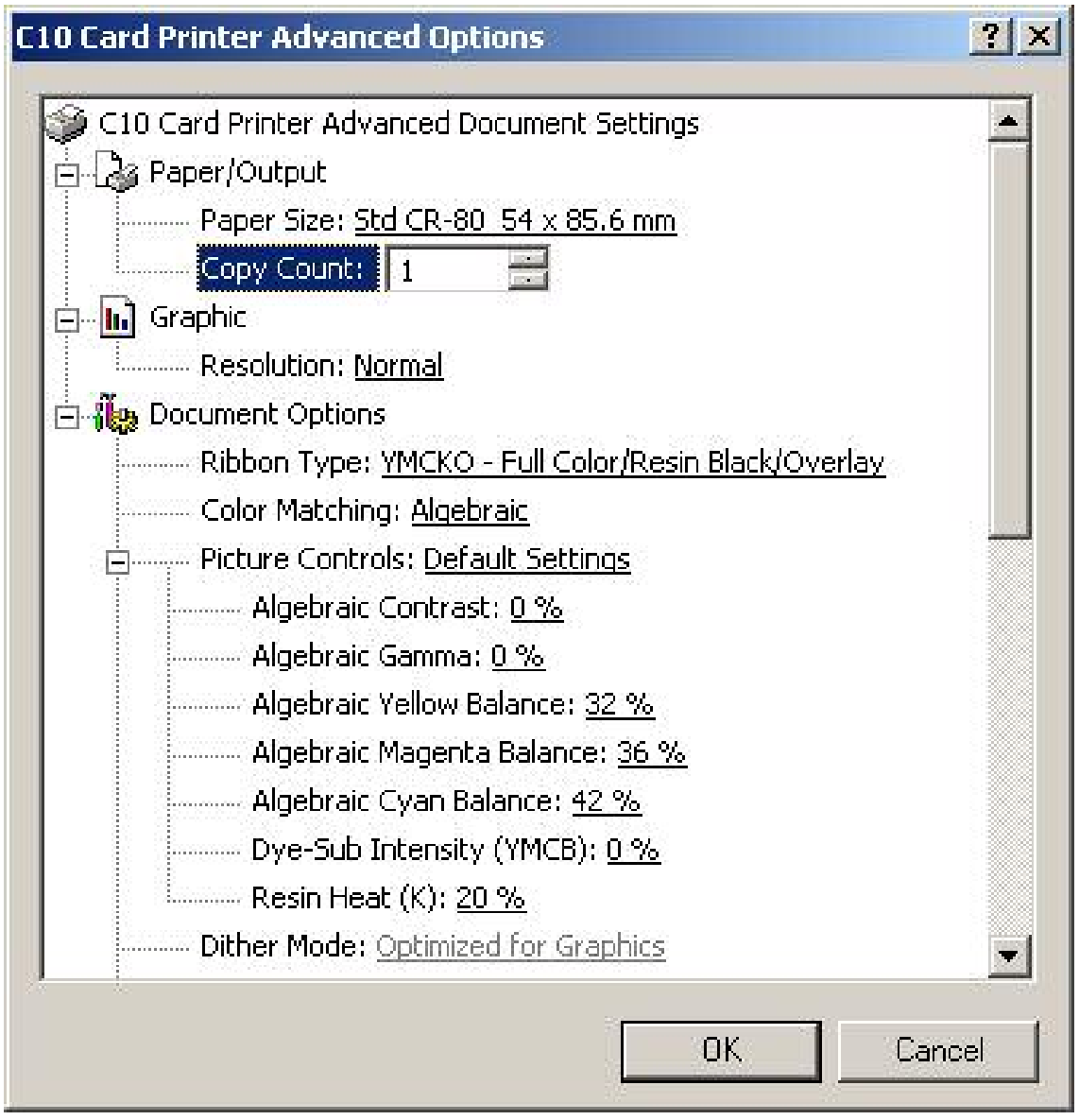
Step	Description
1	The **Std CR-80** selection allows you to print and overlay the entire printable area of a standard CR-80 size card. The **Smart Card, Magstripe** and **Punch Offset** selections allow you to print and overlay only within the given card areas. The **Smart Chip** selection allows you to print and overlay anywhere on a card except over the immediate location of a standard smart card chip or signature panel.



Determining the number of Copies

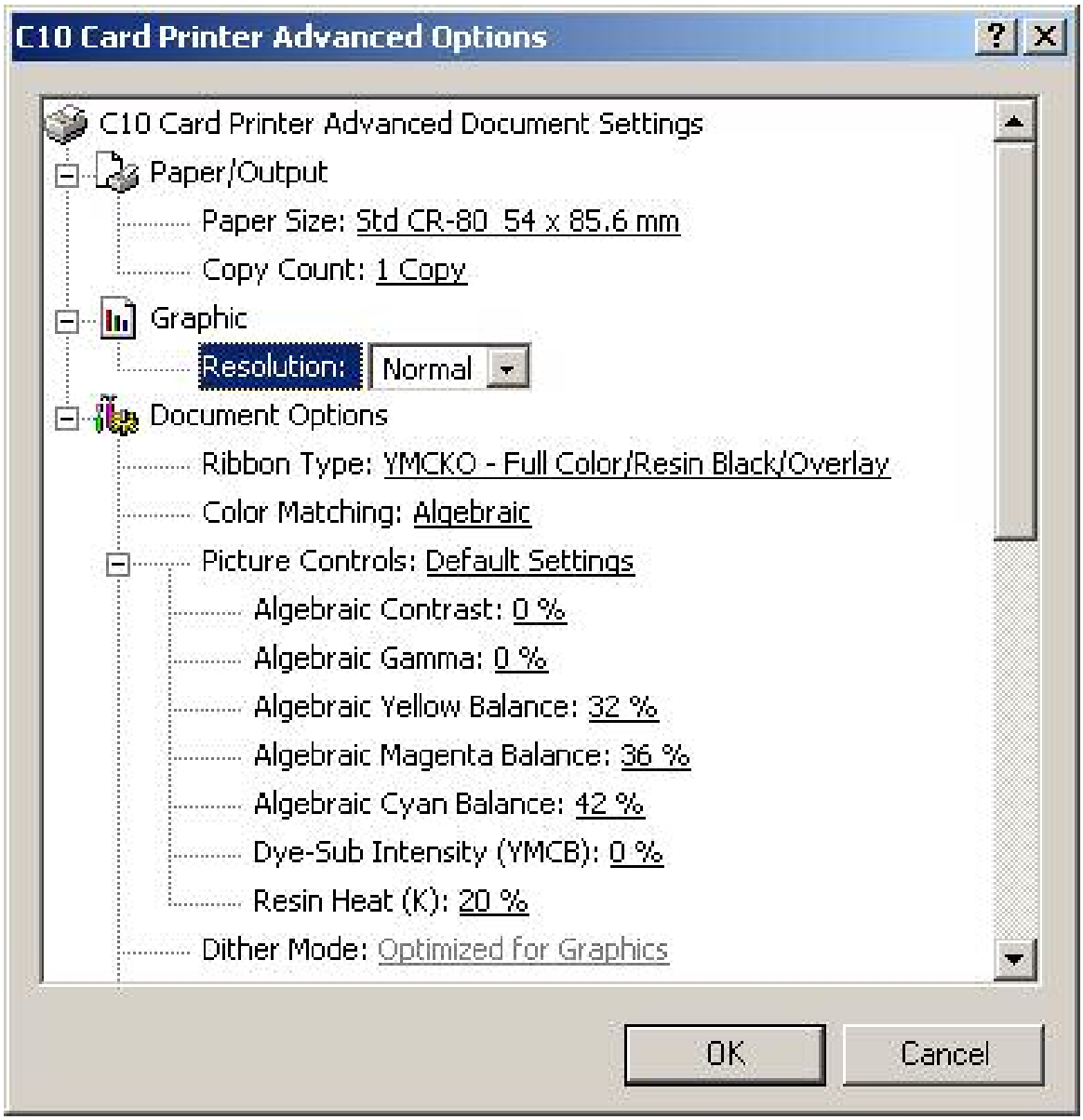
Use this function to indicate copies required.

Step	Procedure
1	Specify the number of copies to be printed by clicking on the up or down arrows.



Selecting the Default Graphic Resolution

This is a default selection.

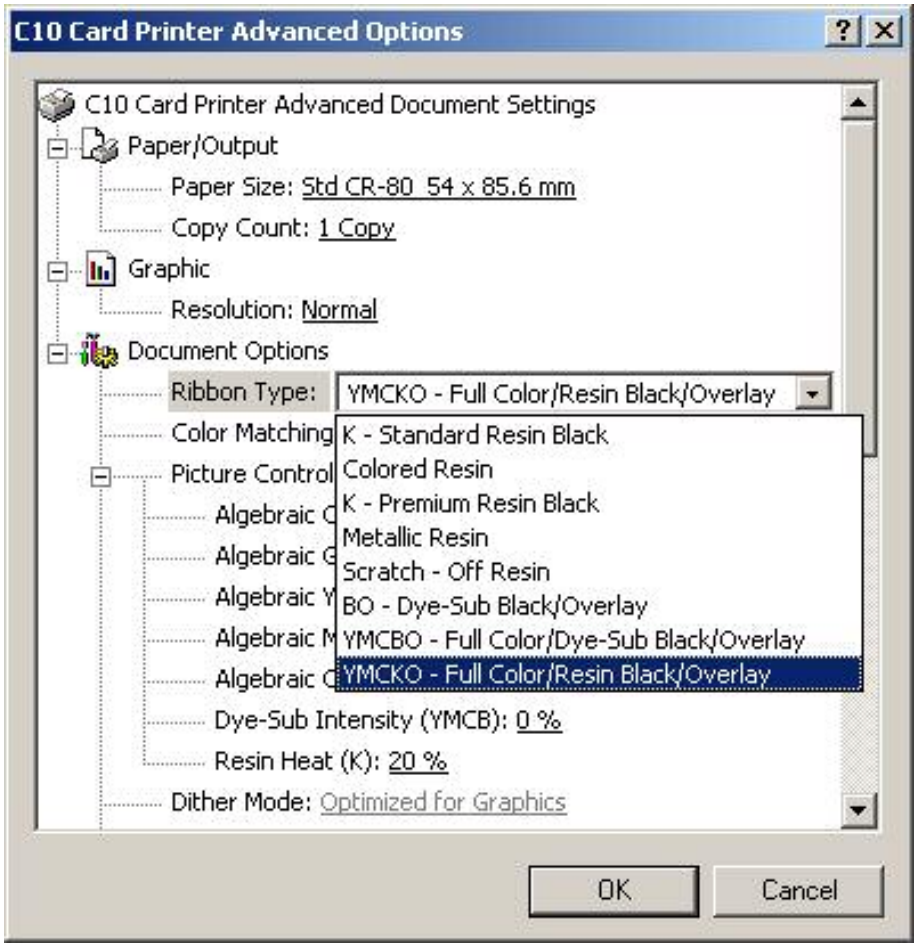


Document Options

Step	Procedure
1	Use the Device options tab to select options that control the Printer's functions.

Selecting Ribbon Type

Step	Procedure
1	Use this option to select the Ribbon type option that is appropriate for the type of Ribbon you are using.

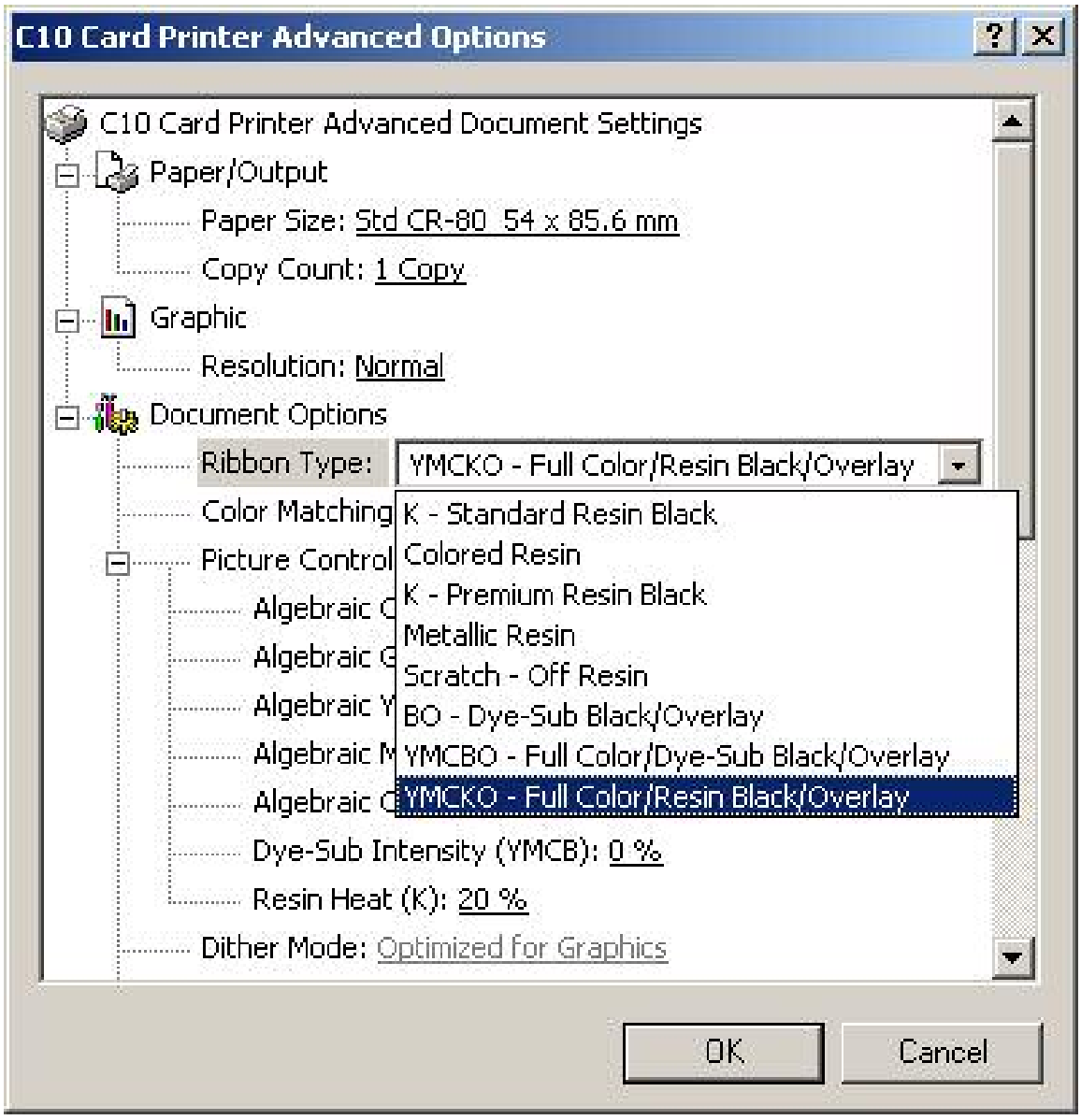


Selecting from the Ribbon Type options

Use the Ribbon Type dropdown menu to select the correct ribbon type.

Step	Procedure
1	Select Ribbon Type under Document options to change the setting.
2	Select the correct Print Ribbon Type, as shown below. Adjust to match the Ribbon Type selection with the Ribbon Type already loaded in the Printer. • K - Standard Resin Black • Colored Resin: Colored Resin is available in Red, Blue, Green, or White • K - Premium Resin Black • Metallic Resin: Metallic Resin is available in Gold or Silver • Scratch-Off Resin • BO: Dye Sub Black, Overlay • YMCBO - Full Color/Dye-Sub Black/Overlay • YMCKO - Full Color/Resin Black/Overly • YMCKOK – Full Color/2 Resin Black/Overlay

Selecting from the Ribbon Type options (continued)

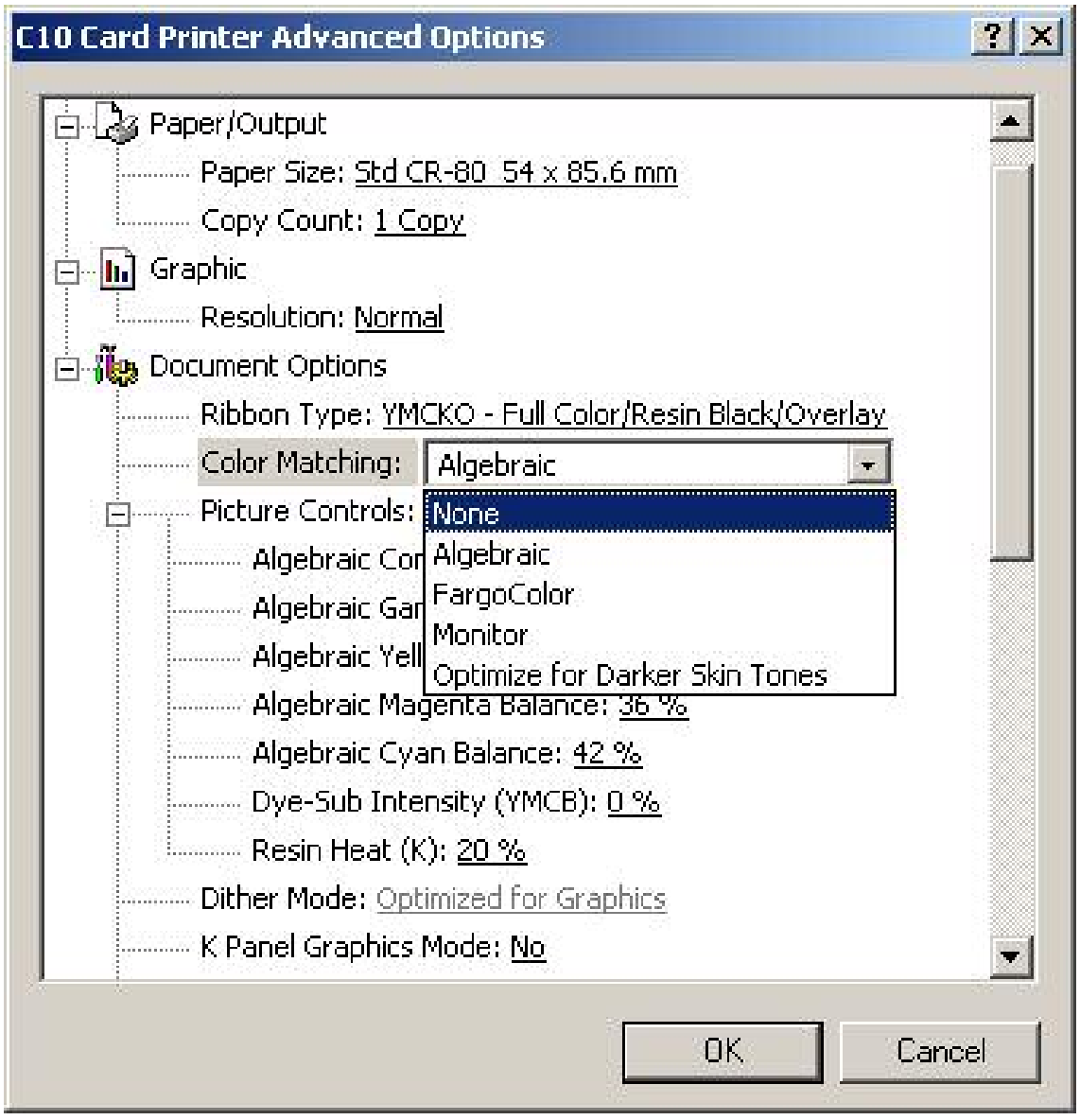


Selecting from the Color Matching options

Use this option to control where the resin black (K) panel of a full-color ribbon is printed. When printing with a resin-only ribbon type or a ribbon type that does not have a K panel, all K Panel Resin options will be grayed out. (**Note:** Resin black text is desirable due to its sharp, saturated black coloring and resin black bar codes are often required to ensure readability when scanned.)

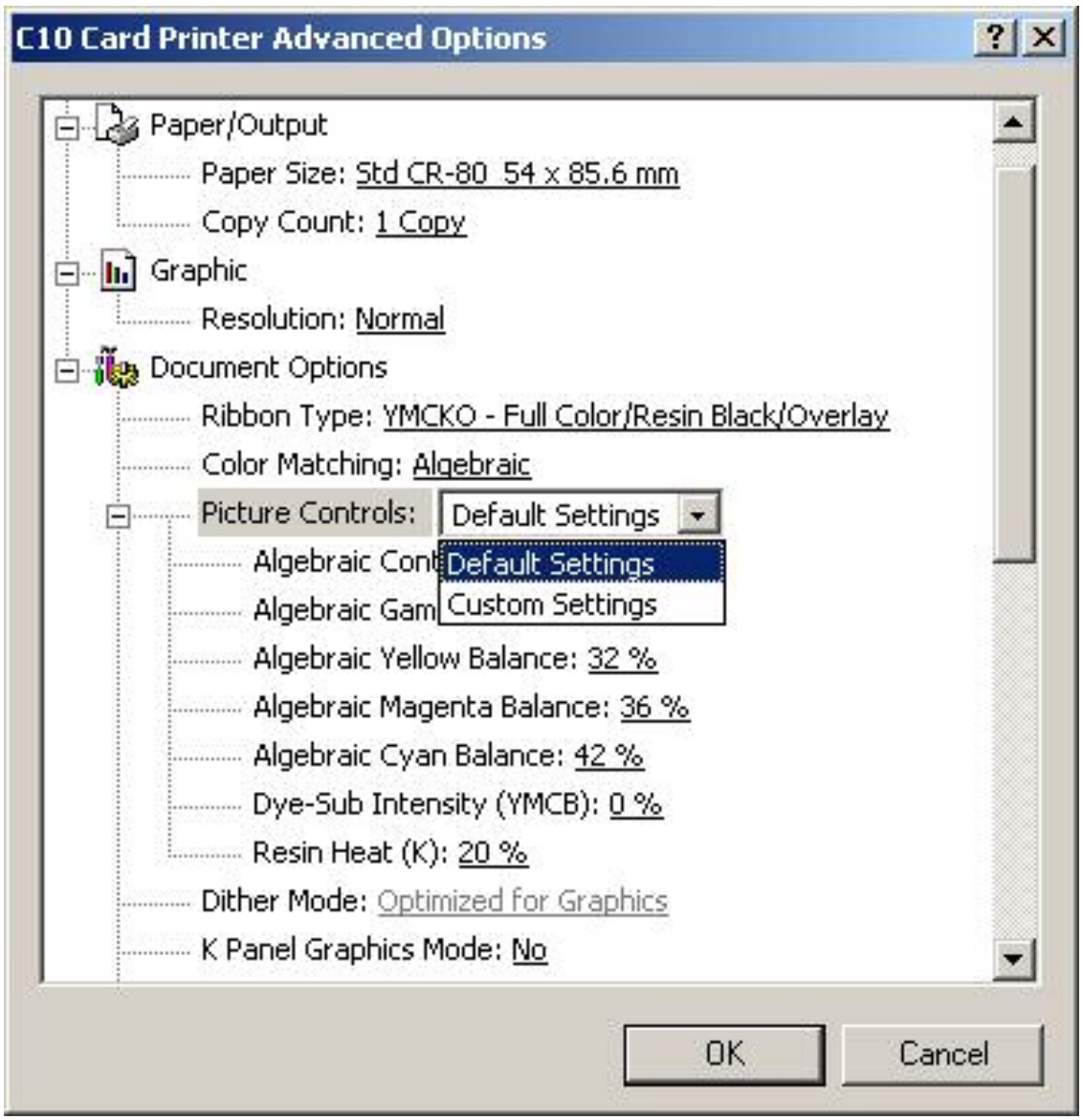
Step	Procedure
1	Select **None** for print speed versus print color or for use of third party color matching software. **OR** Select **Algebraic** to control the **Contrast** and **Gamma** of the printed image, as well as the individual color balance of **Yellow**, **Magenta** and **Cyan**. (**Note:** In most cases, the default settings of these options will suffice. When the **Algebraic color matching** option is selected, all control options will display and can be adjusted.) **OR** Select **FargoColor** to make appropriate adjustments.

Selecting from the Color Matching options (continued)



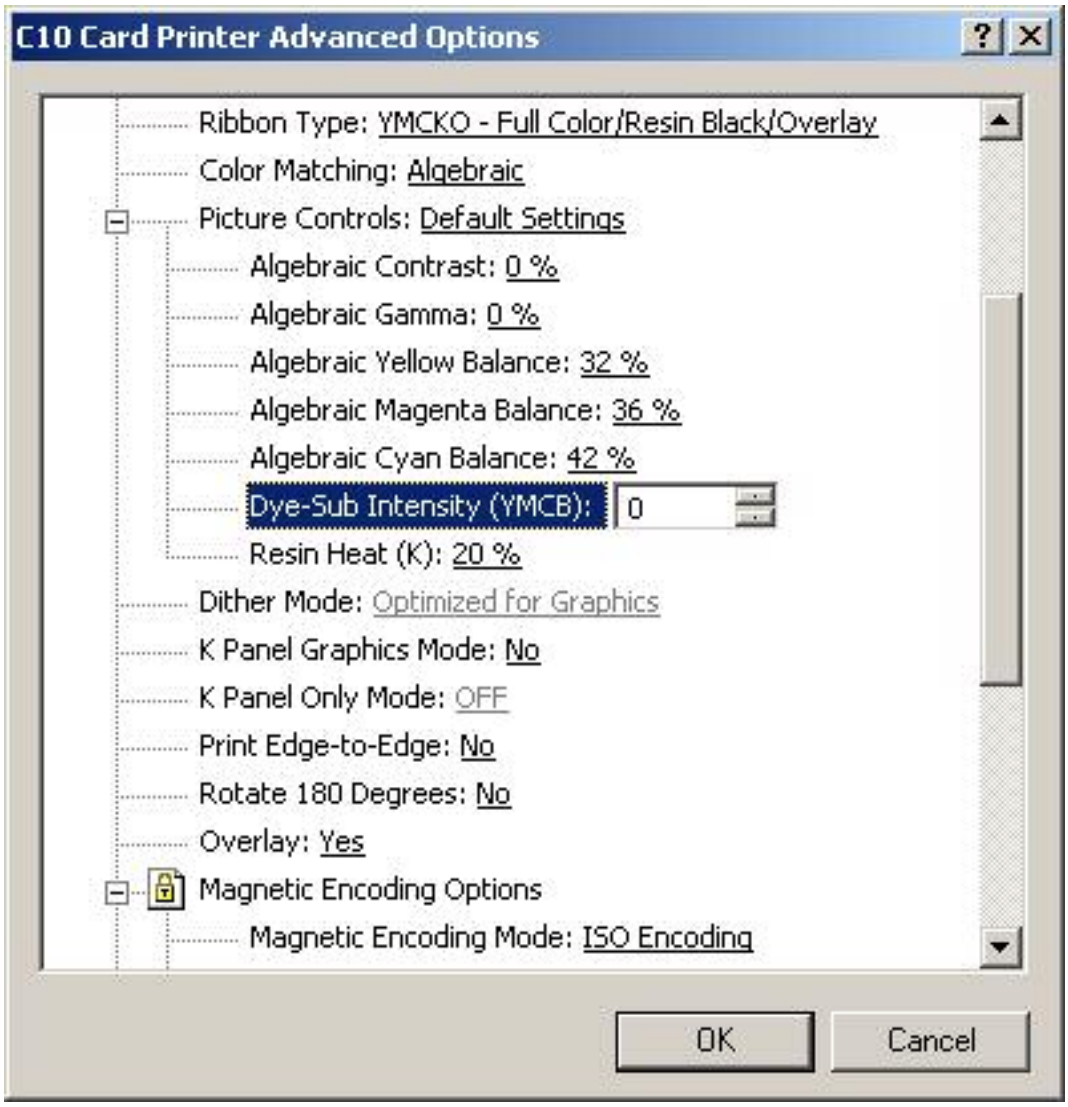
Using the Image Controls

Use the Custom Settings option under Image Controls to control the **Contrast** and **Gamma** of the printed image, as well as the individual color balance of **Yellow Balance**, **Magenta Balance** and **Cyan Balance**. (**Note:** In most cases, the default settings of these options will suffice.)



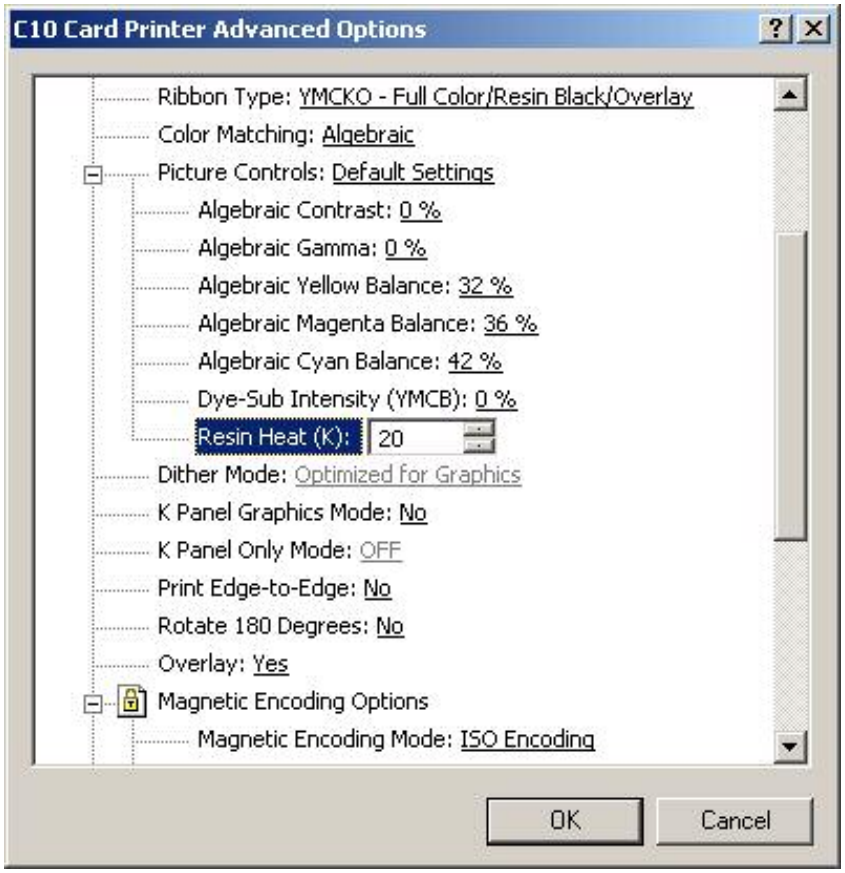
Controlling the Dye-Sub Intensity (YMCB)

Step	Procedure
1	Control the overall darkness and lightness of the printed image by adjusting the **Dye-Sub Intensity** slide by clicking and dragging the slide's box or by clicking on the left and right arrows.



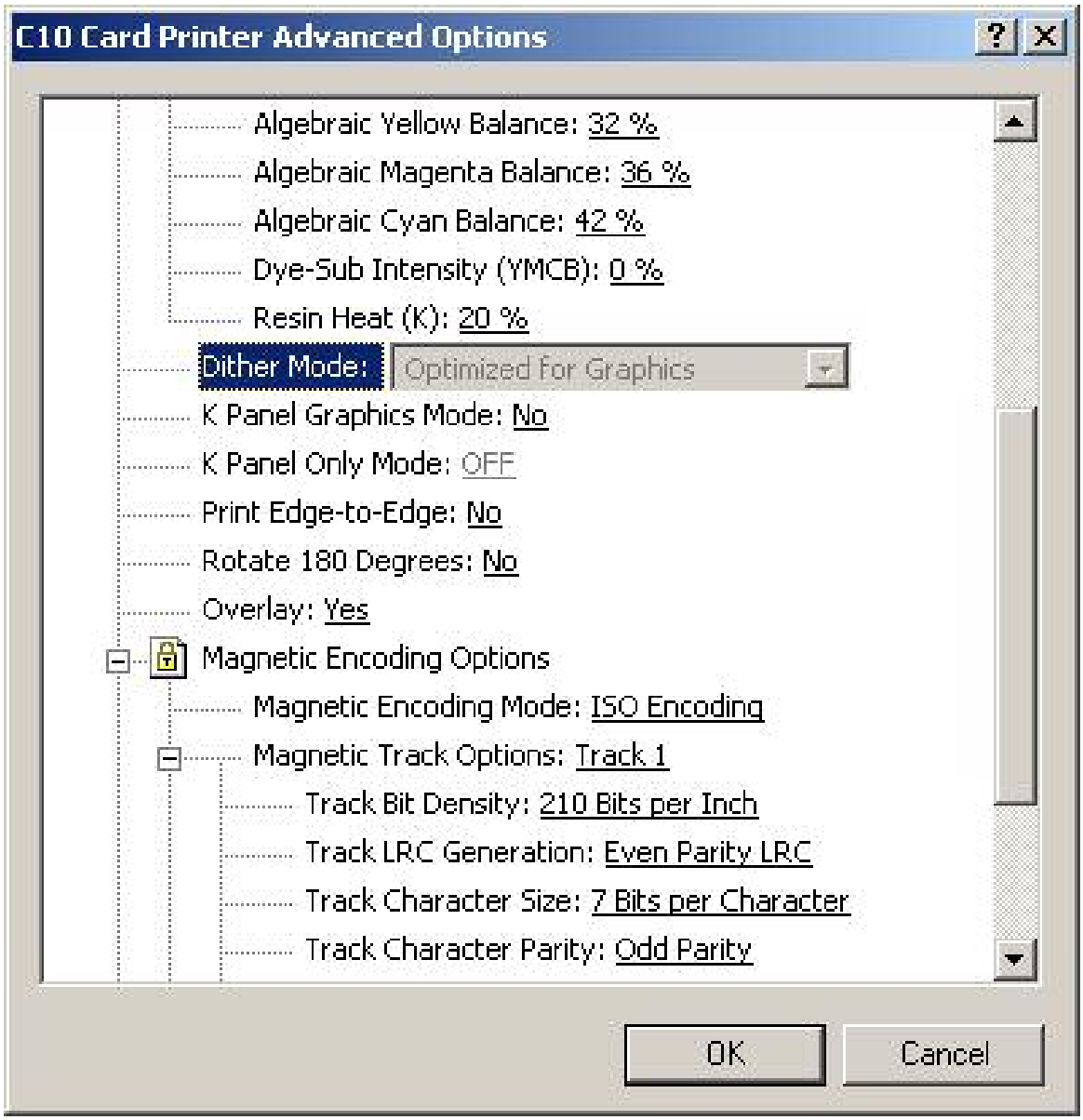
Controlling the Resin Heat

Step	Procedure
1	Control the amount of heat the Printer uses when printing with the resin black panel(s) of a full-color ribbon or when printing with a resin-only ribbon by adjusting the **Resin Heat**. **Note #1:** This control can be helpful for fine-tuning the saturation of resin text and bar codes.) Adjust the Resin Heat (K) setting (as needed), as shown below. **Note #2:** This option only effects objects printed with a resin-only print ribbon or those objects printed on the back side of a card with the resin black panel of a YMCKO, YMCKOK, or YMCKK print ribbon. **Note #3:** Use this option to control the amount of heat the Printer uses when printing with the resin black panel(s) of a full-color ribbon or when printing with a resin-only ribbon, adjust the **Resin Heat** slide.



Using the default Dither Mode

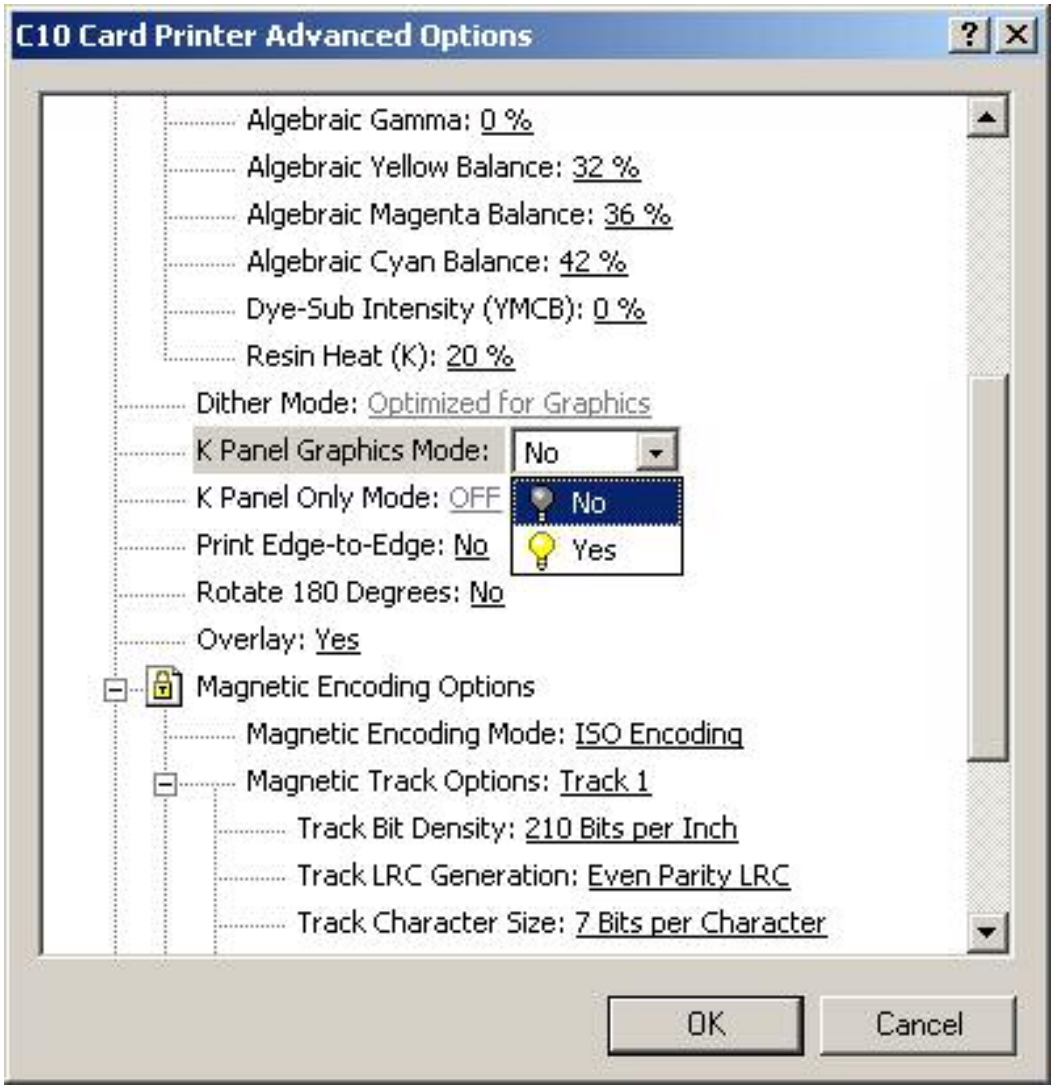
This is a default selection.



Selecting the K Panel Graphics Mode option

Use this option to control where the resin black (K) panel of a full-color ribbon is printed.

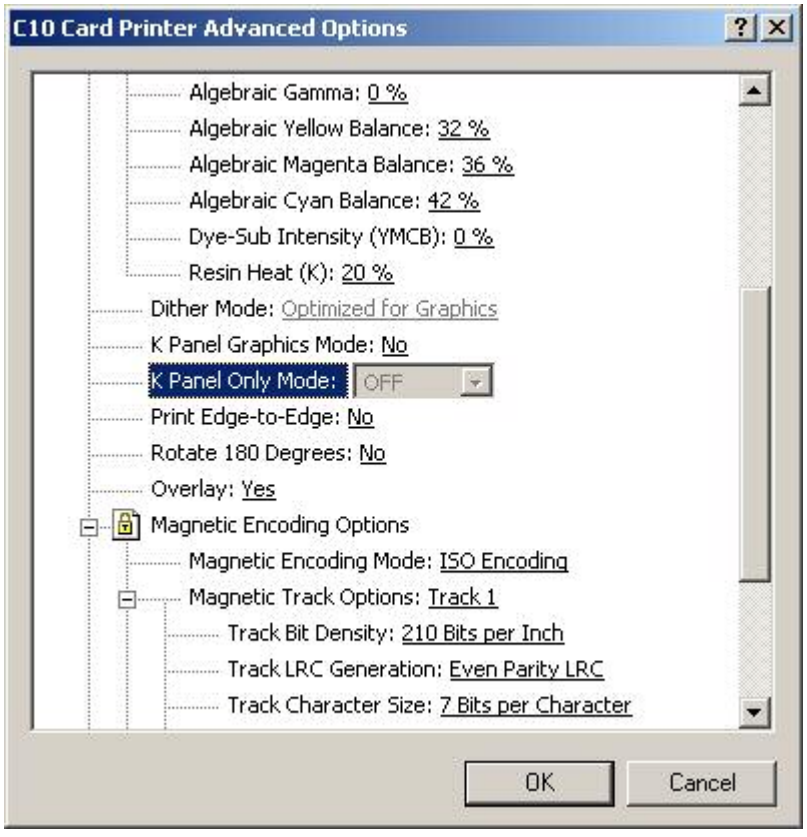
Step	Procedure
1	Select the **K Panel Graphics Mode** option to control where the resin black (K) panel of a full-color ribbon is printed. (**Note:** If printing with a resin-only ribbon type or a ribbon type that does not have a K panel, all K Panel Resin options will be grayed out. Resin black text is desirable due to its sharp, saturated black coloring and resin black bar codes are often required to ensure readability when scanned.)



Selecting K Panel Only (95%) / (99%)

These option are only active when the K Panel Graphics options is selected.

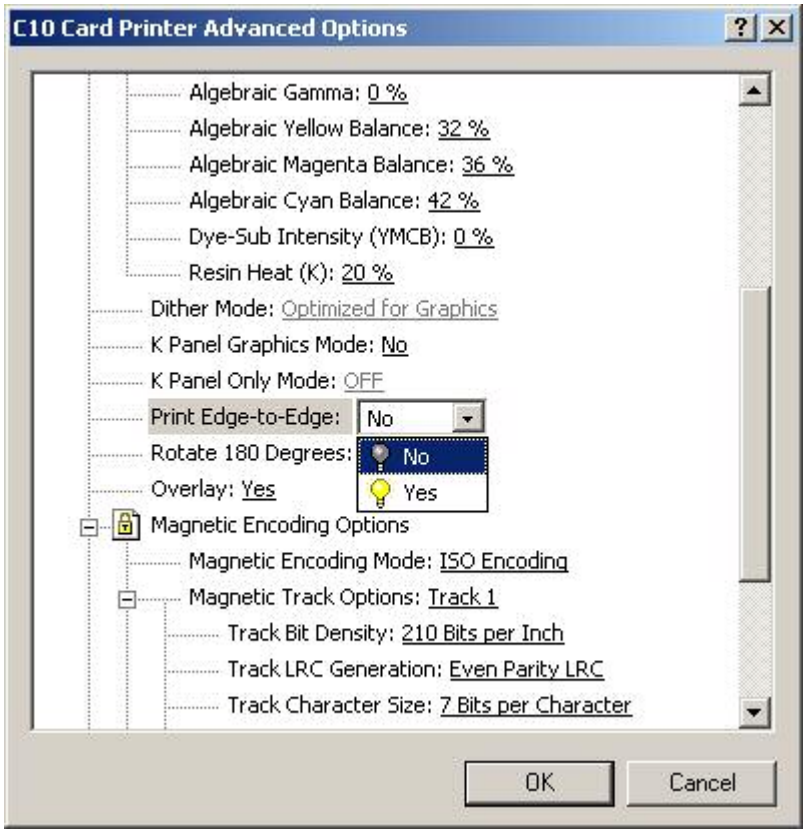
- Selecting either of the K Panel Only options forces all of the black within text bar codes or bitmap images to be printed only with the Ribbon's resin black (K) panel (i.e. without the YMC composite black underneath). (**Note:** This increases the precision of printed bitmap bar codes, there by assuring greater accuracy when read by a bar code scanner.)
- The difference between these two option is that when **K Panel Only (95%)** is selected, all 95% black (or higher) bitmapped image pixels will be printed using only the Ribbon's resin black (K) panel. (**Note:** When the **K Panel Only (99%)** is selected, all 99% black (or higher) bitmapped image pixels will be printed using only the resin black (K) panel.)
- These options are useful if, for example, you have a bitmapped photograph with dark areas in which you do not wish the resin black panel to print.
- In this case, the K Panel Only (99%) mode will eliminate the greatest amount of unwanted resin black printing. (**Note:** Be sure, however, the object you do wish to print with resin black has a black density of at least 99%.)



Selecting the Print Edge-to-Edge option

Use this option for Edge-to-Edge type printing.

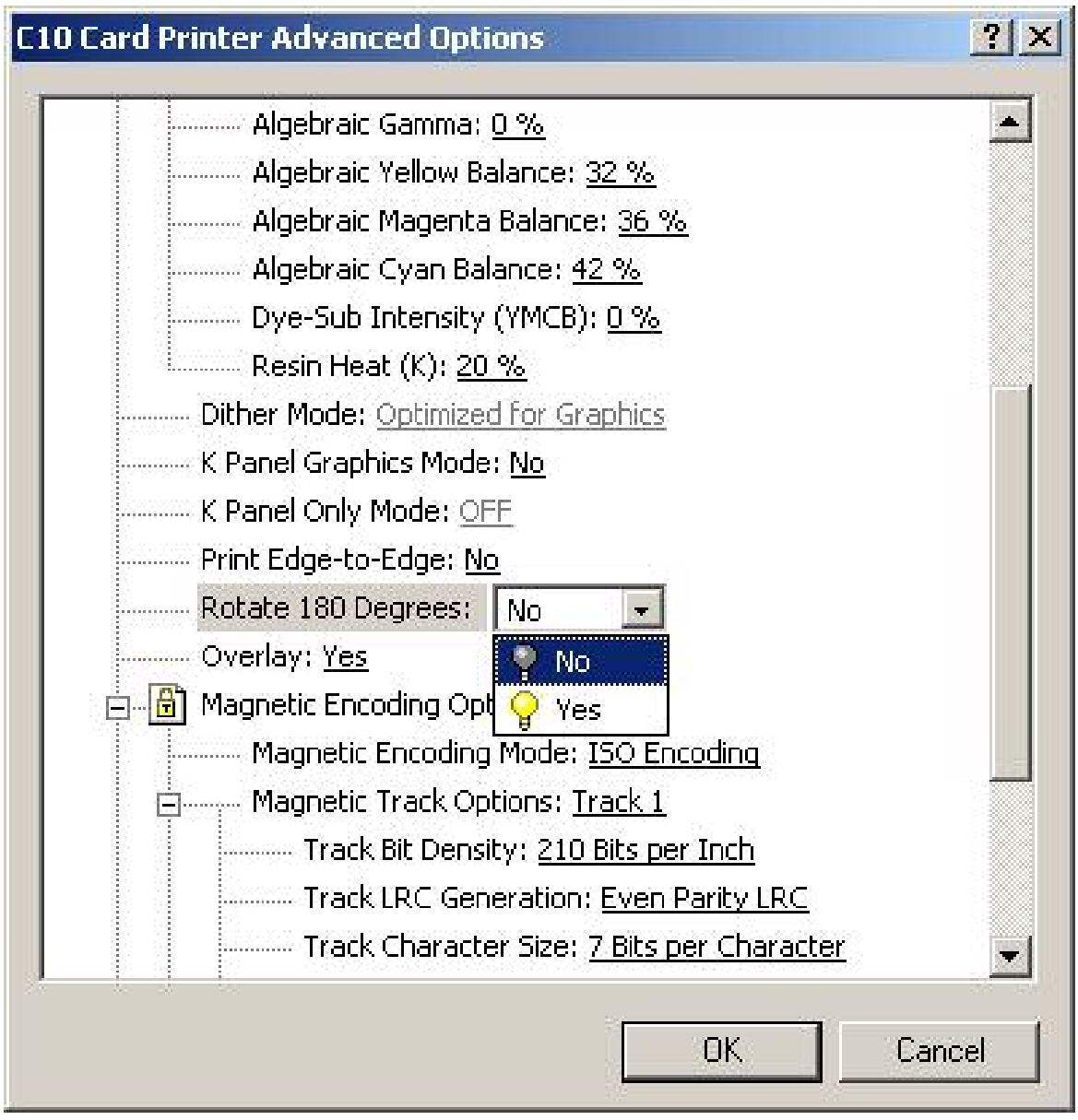
Step	Procedure
1	Select this option to adjust the maximum printable area on a card, which results in printed cards with virtually no border.



Selecting the Rotate 180 Degrees option

Use this option to rotate the image on the front of the card 180 degrees when printed.

Step	Description
1	Select this option to change the position of the printed image in relation to the set location of a card's Magnetic Stripe or smart chip.

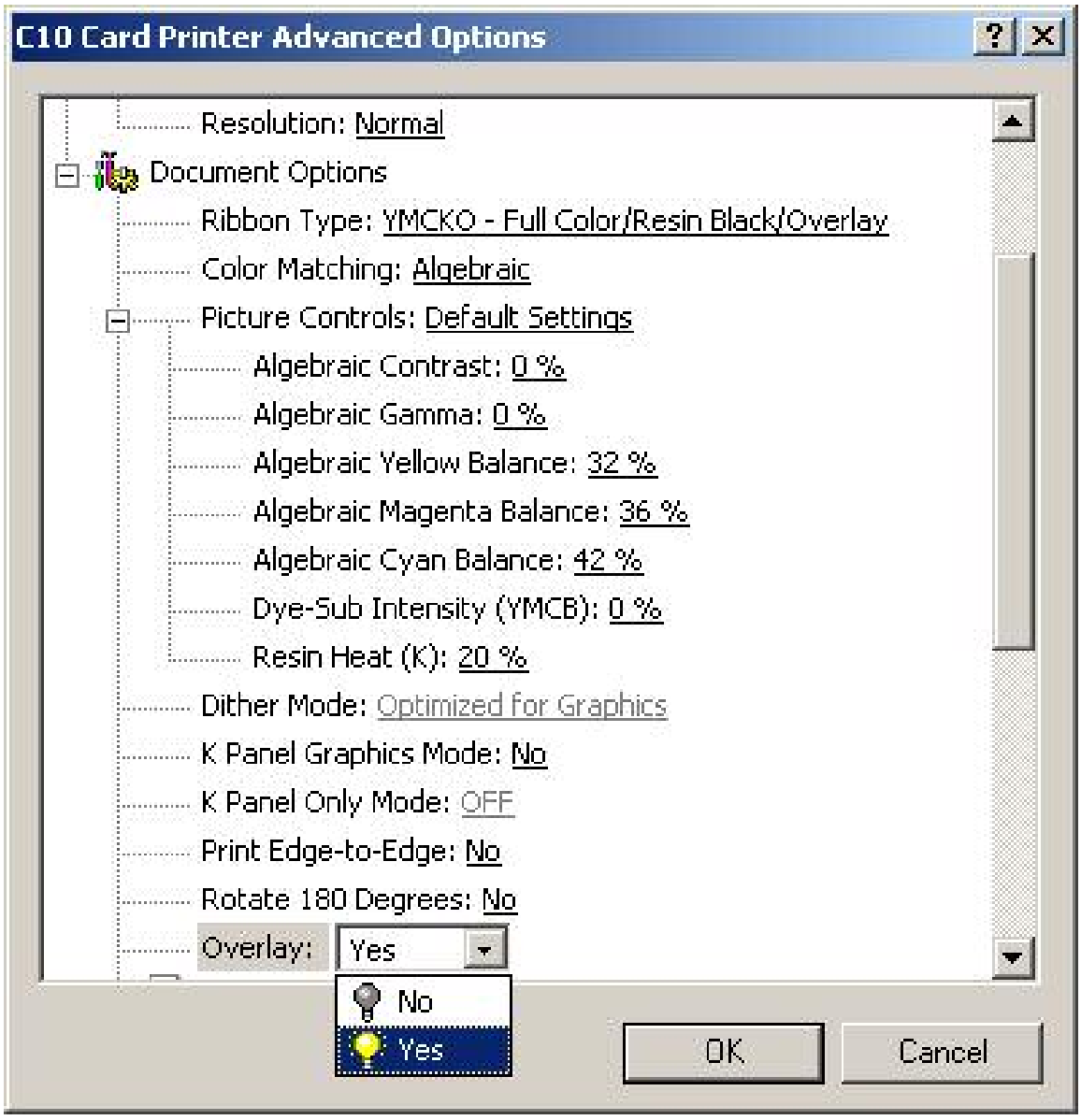


Selecting the Overlay option

Use this option to automatically print **Neither Side**, **Back Side Only**, **Front Side Only**, or **Both Sides** of a card.

Step	Procedure
1	Select this option in conjunction with any application program that supports a multiple page document. (**Note:** In other words, the program must be able to send down two or more separate pages to be printed within the same document.) • Select **Neither Side** for non-use of the Overlay option. • Select the **Front Side Only**, **Back Side Only**, or **Both Sides** setting to designate the side or sides of the card for the image to print on. **Note #1:** Print a full-color ID format on the front of the card and monochrome text or bar codes on the back by creating the full-color front side of the card (on page 1) of the document and the monochrome backside (on page 2). (**Note:** The Printer Driver always places the odd numbered pages on the front side of the card and the even numbered pages on the backside.) **Note #2:** To customize the overlay and/or print area, select one of the options listed under Overlay. Use this option to control the overlay (O) panel and/or the print area appearing on a card; also, use it to omit or block out the overlay or printing around a card's smart chip or Magnetic Stripe. By default, this option is set to print and overlay the entire card.

Selecting the Overlay option (continued)

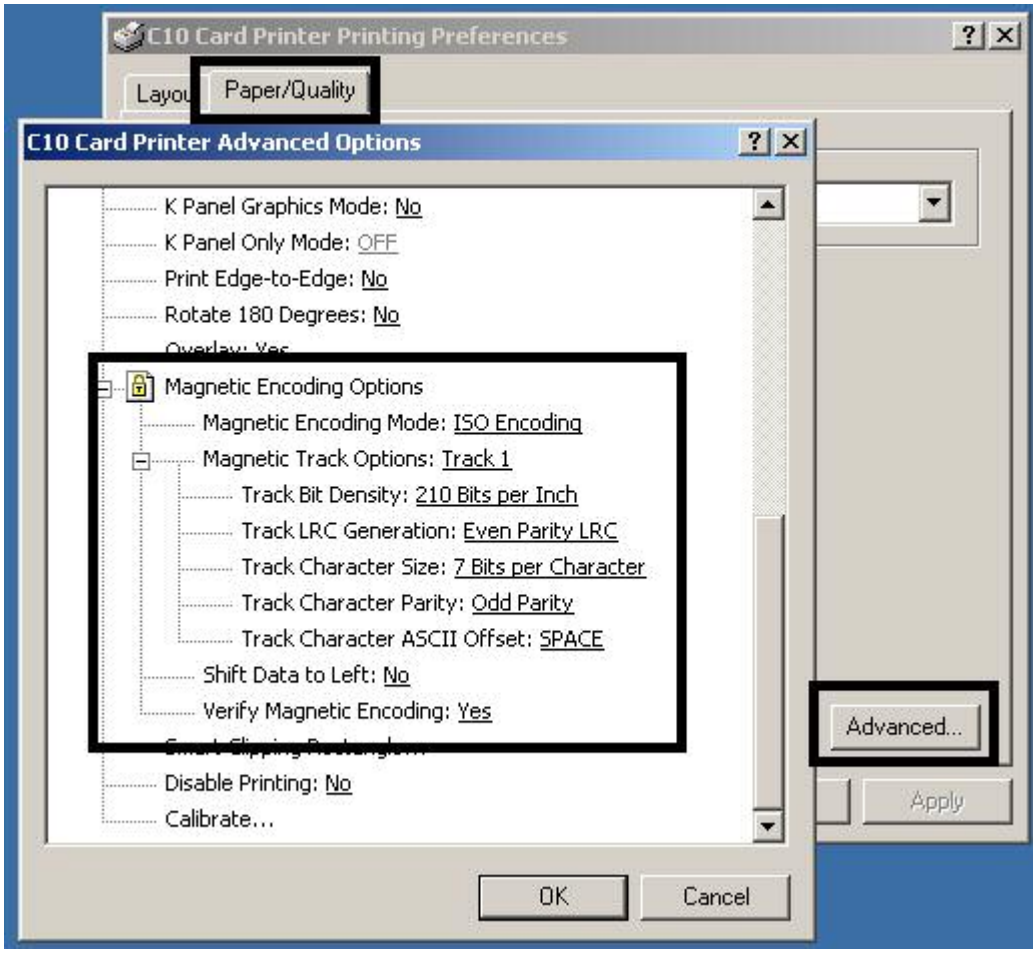


Using the Magnetic Encoding Options

Use this option only if the Printer has an optional Magnetic Stripe Encoding Module installed. (**Note:** This section describes these options and the Printer's Magnetic Encoding process.)

Step	Procedure
1	Select the Magnetic Encoding Options to change the encoding mode, coercivity setting, or to modify the ISO Standards for Tracks 1, 2 and 3. (**Note:** By default, the Printer Driver is set to encode according to ISO Standards onto high-coercivity Magnetic Stripes.)

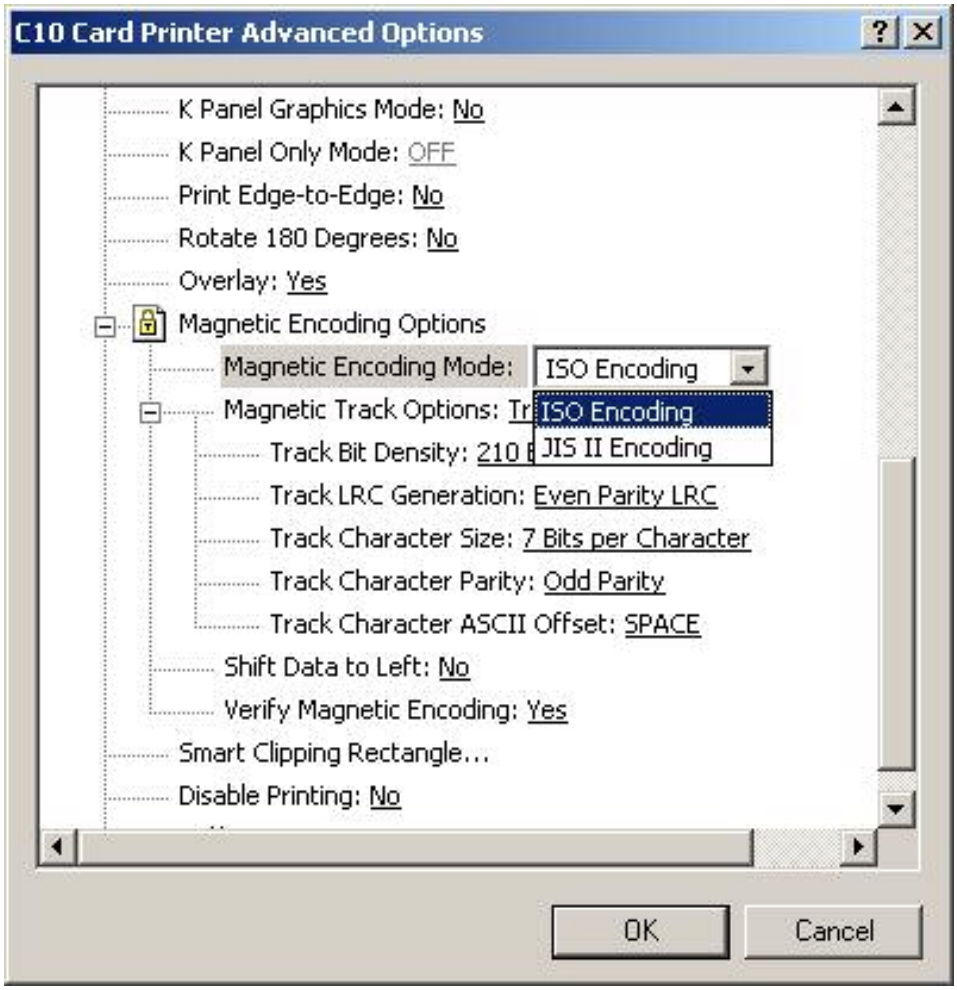
Continued on the next page



Using the Magnetic Encoding Mode option

Use the Magnetic Encoding Mode option to specify the desired, Magnetic Encoding standard.

Step	Procedure
1	Select the **ISO** option provides encoding capability for either high or low-coercivity cards on Tracks 1, 2 and 3. (**Note:** The **ISO** option is the industry's most standard mode of Magnetic Encoding.) **OR** Select the **JIS II** mode provides encoding compatibility with the JIS C 6220 Type II cards commonly used in Japan. When the **JIS II** mode is selected, only Track 2 will be encoded. (**Note:** No encoding customization options are available with the JIS II mode.)



Selecting the Magnetic Track Options

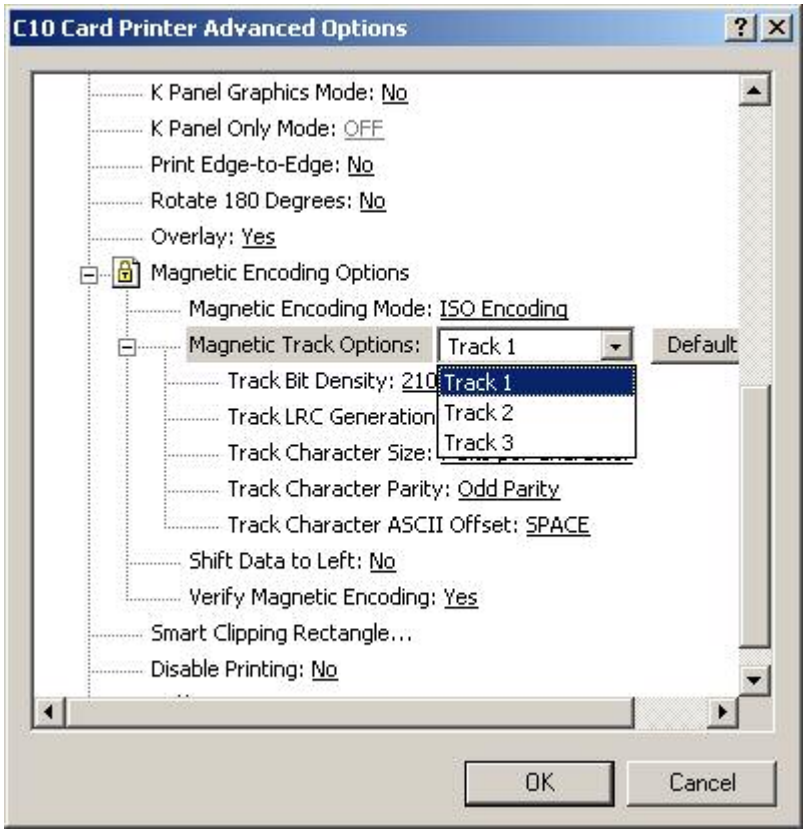
Use the **Magnetic Track** options for these purposes:

- Customize the ISO encoded data format for each of the Magnetic Stripe's three Tracks.
- Customize each Track independently of the other two.
- Specify which of the three Tracks to customize by selecting one of the three Track options.)

(**Note #1:** After making the required selection, the Magnetic Track options box displays the current set of customization options for the selected Track.)

(**Note #2:** For most applications, the default settings for these options do not need to be changed.)

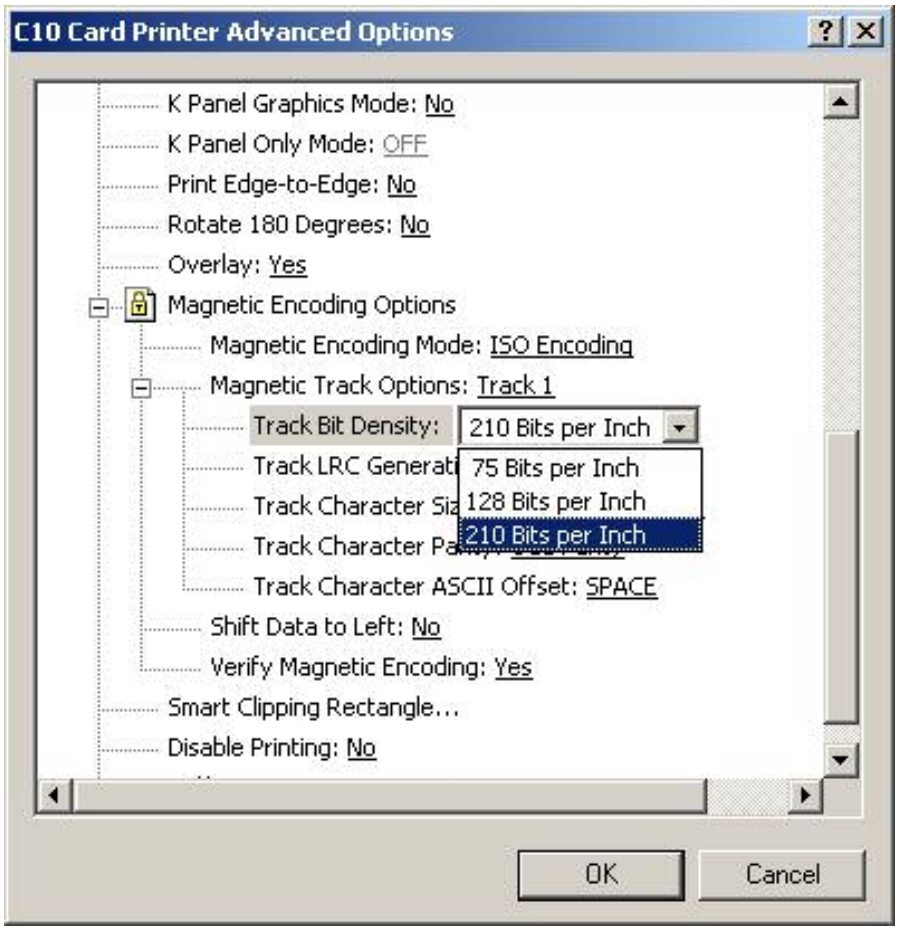
Step	Procedure
1	Properly adjust the Magnetic Encoding options to change the ISO Standards for Tracks 1, 2 and 3.



Selecting the Track Bit Density option

Use this option to customize the Bit Recording Density (Bits per Inch) used to encode the magnetic data on the currently selected Track. (**Note:** The default ISO Standard selections for this option are Track 1: 210 BPI, Track 2: 75 BPI and Track 3: 210 BPI.)

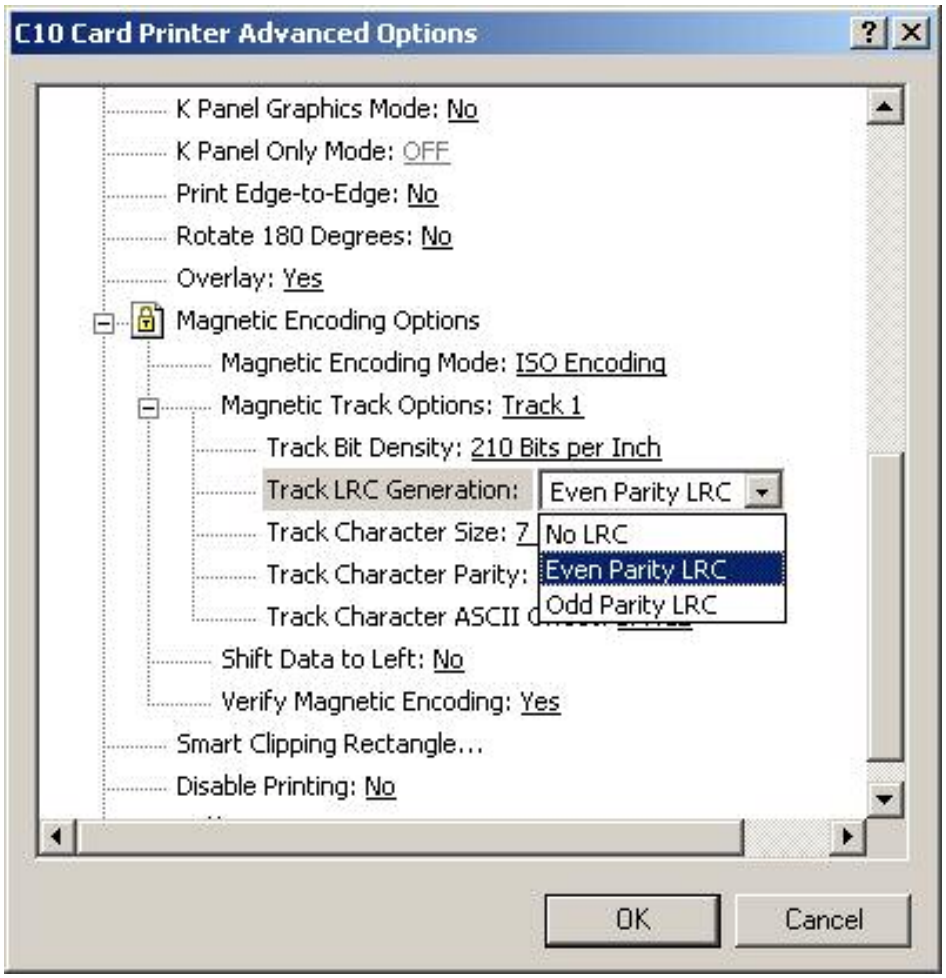
Step	Procedure
1	Select 75 BPI to change the bits per inch to 75 BPI. **OR** Select 128 BPI to change the bits per inch to 128 BPI. **OR** Select 210 BPI to change the bits per inch to 210 BPI.



Selecting the Track LRC Generation option

Use this option to customize the LRC Generation Mode (used to encode the magnetic data on the currently selected Track). (**Note:** The default ISO Standard selections for this option are Track 1: EVEN, Track 2: EVEN and Track 3: EVEN.)

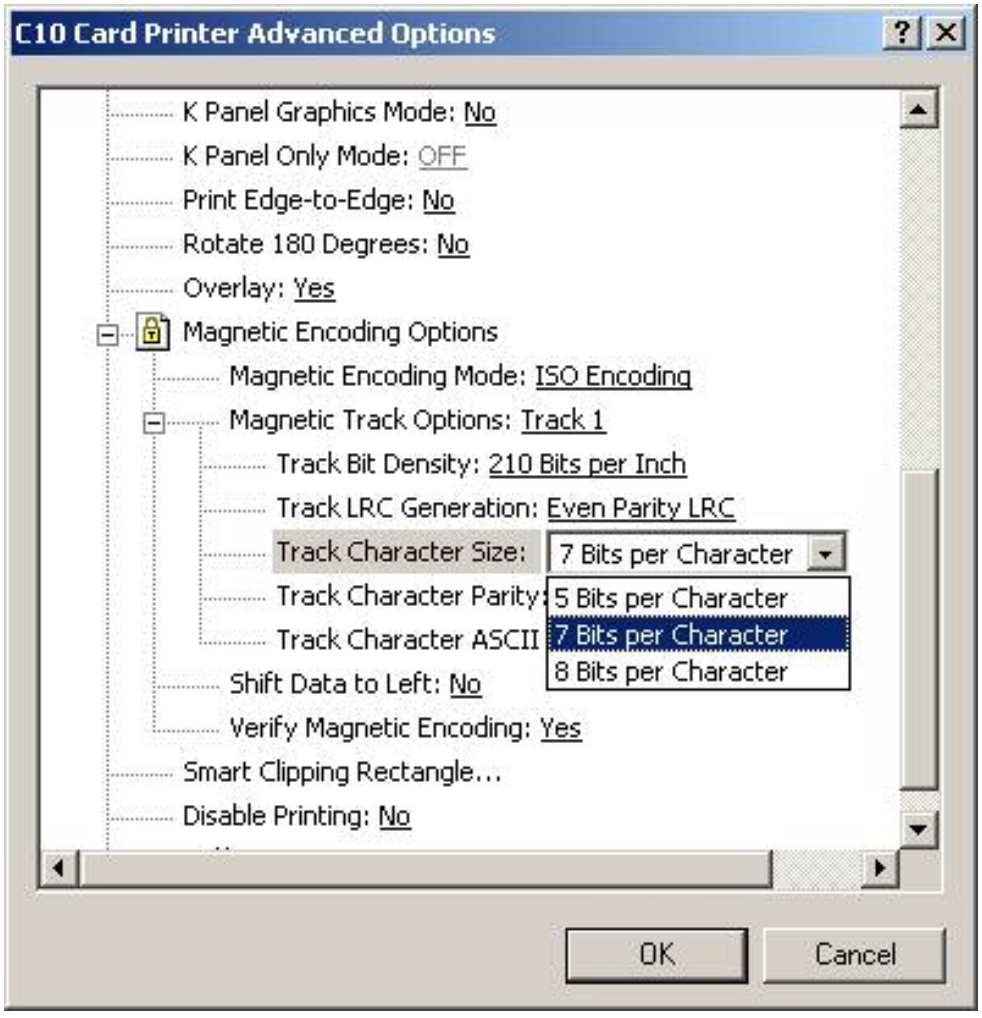
Step	Procedure
1	Select NO LRC to change the LRC Generation to none. **OR** Select Even Parity to change the LRC Generation to Even Parity. **OR** Select Odd Parity to change the LRC Generation to Odd Parity.



Selecting the Track Character Size option

Use this option to customize the Character Data Size (Bits per Character) used to encode the magnetic data on the currently selected Track. (**Note:** This character size includes the parity bit, if enabled.) (**Note:** The default ISO Standard selections for this option are Track 1: 7 BPC, Track 2: 5 BPC and Track 3: 5 BPC.)

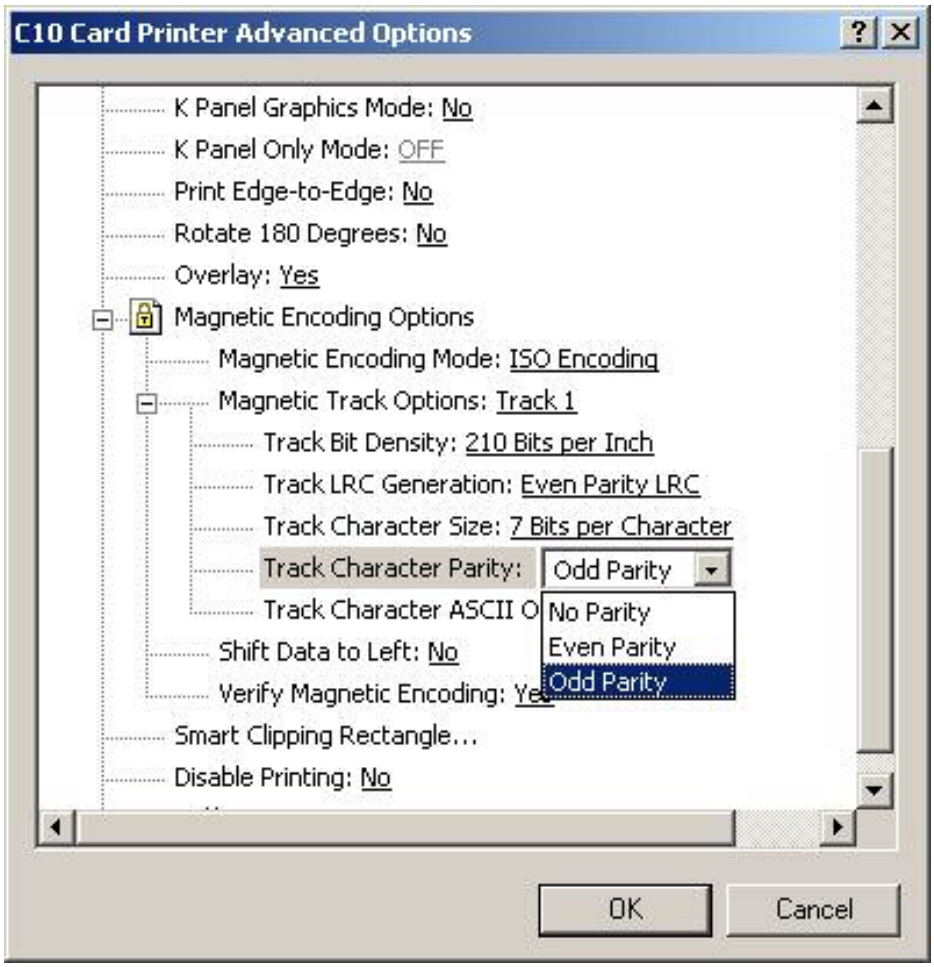
Step	Procedure
1	Select 5 Bits to change the bits per character to 5 BPC. **OR** Select 7 BPI to change the bits per character to 7 BPC. **OR** Select 8 BPI to change the bits per character to 8 BPC.



Selecting the Track Character Parity option

Use this option to customize the Character Data Parity (used to encode the magnetic data on the currently selected Track). (**Note:** The default ISO Standard selections for this option are Track 1: ODD, Track 2: ODD and Track 3: ODD.)

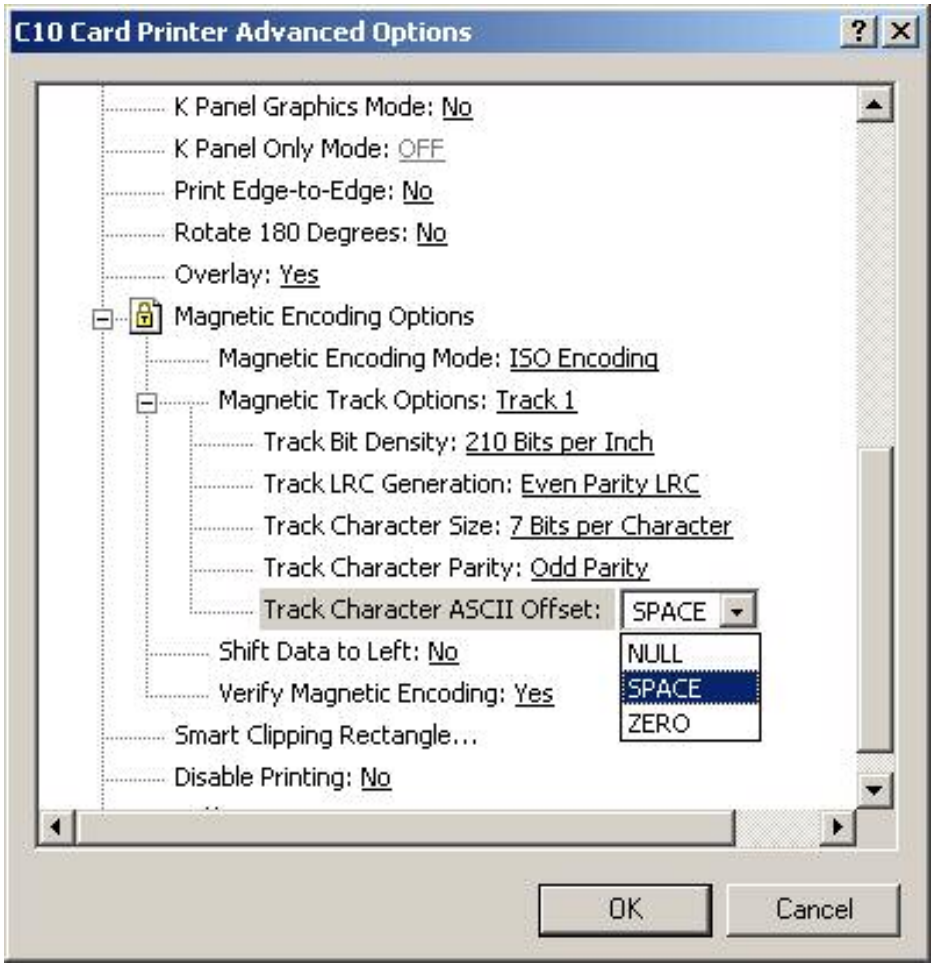
Step	Procedure
1	Select No Parity to change the Character Parity to none. **OR** Select Even Parity to change the Character Parity to Even Parity. **OR** Select Odd Parity to change the Character Parity to Odd Parity



Selecting the Track Character ASCII Offset option

Use this option to customize the Character ASCII Offset used to encode the magnetic data on the currently selected Track. This character offset value is subtracted from the ASCII value of each Magnetic Stripe data character prior to encoding on the Track. (**Note:** The default ISO Standard selections for this option are Track 1: SPACE, Track 2: ZERO and Track 3: ZERO.)

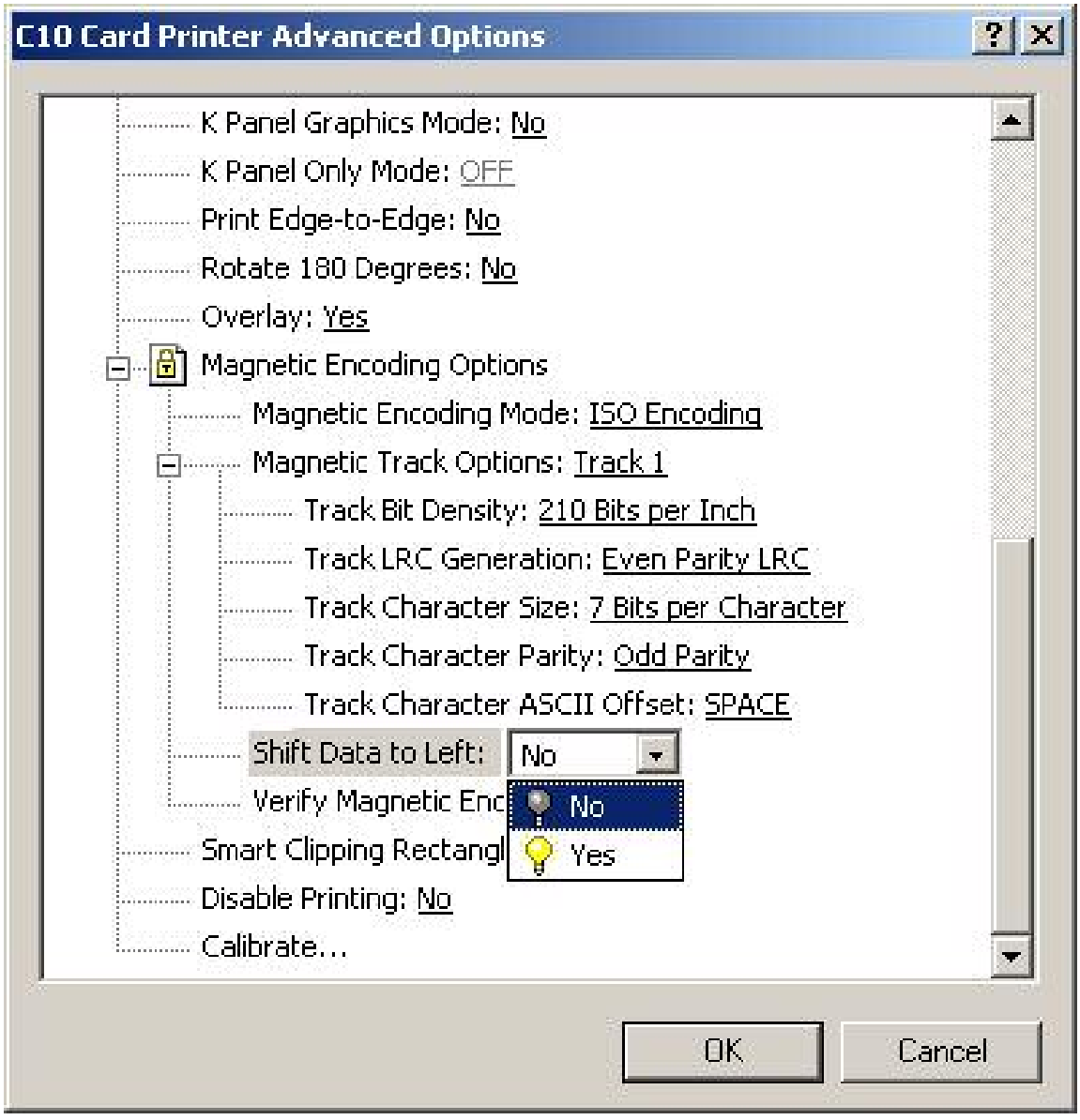
Step	Procedure
1	Select NULL to change the ASCII Offset to NULL. **OR** Select SPACE to change the ASCII Offset to SPACE. **OR** Select ZERO to change the ASCII Offset to ZERO.



Selecting the Shift Data Left option

Use this option to shift the recorded magnetic data to the left-hand side of the card's Magnetic Stripe. (**Note:** This is useful in situations that require cards to be readable with insert type readers that may not be able to read the right-hand side of the card.)

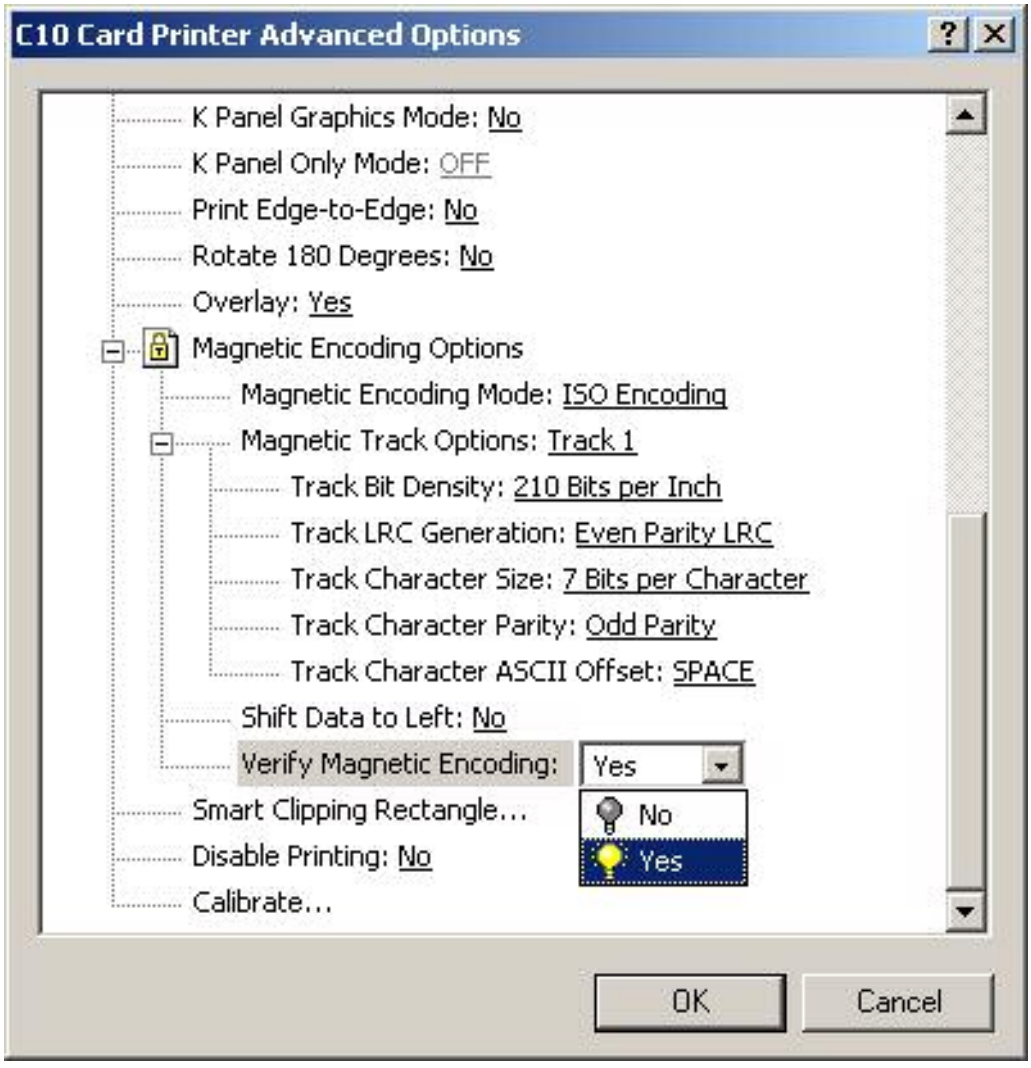
Step	Procedure
1	Select the **Shift Data Left** option to apply to all Tracks.



Selecting the Verify Magnetic Encoding option

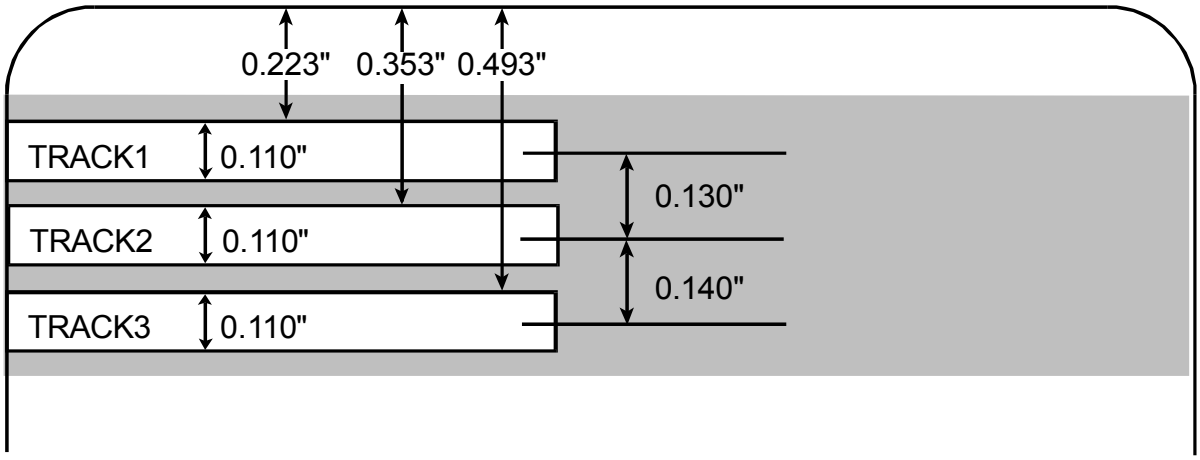
Use this option to verify the encoding settings.

Step	Procedure
1	Select this option to instruct the Printer to verify that all magnetic data has been correctly encoded on each card. (**Note:** This option is selecTable for both ISO and JIS II encoding modes.) • If this option is selected, any verify errors will cause the Printer to signal an error condition. • If this option is not selected, the verify pass will not be executed.



Reviewing ISO Track Locations

Review the Magnetic Encoding module, which encodes onto Tracks in accordance with an ISO 7811-2 Magnetic Stripe. Refer to the diagram (below) for Track locations. (**Note:** All standard Card Printers are capable of printing onto oversized cards; however, a special version of the Printer is required to encode the Magnetic Stripe of oversized cards.)



Sending Track Information

Magnetic Track data is sent in the form of text strings from the application software to the Printer Driver along with all of the other printable objects within the card design.

- **Magnetic Track Data added:** In order for the Printer Driver to differentiate between magnetic Track data and the rest of the printable objects, the magnetic Track data strings must be uniquely tagged or added.
- **Specific Characters added:** In other words, specific characters must be added to the magnetic Track data in order for the Printer Driver to know which data is to be encoded, which Tracks to encode, when the Track data stops and starts and so forth.
- **Manually or automatically added:** In some cases, these specific characters are automatically added to the string of Track data by customized ID software applications. In most cases, however, the User must manually add these characters to the string of magnetic Track data.

Entering Track Information

(**Note:** If these characters are not added to the Track data, the text intended for the magnetic Track will most likely appear as printed text on the card.)

Step	Procedure
1	To avoid this symptom, Track information must be entered as follows. When entering Track data, the "~" character is entered first, followed by the desired Track number (1, 2, or 3) used to encode the data. • The data to be encoded should then follow. (**Note:** The first character of this data string must be the Track's specific Start Sentinel (SS) and the last character must be the specific End Sentinel (ES).) • The characters or data in between the SS and ES can include all of the valid characters specific to each Track. (**Note:** The number of these characters is limited by each Track's maximum character capacity.)  **Caution:** When segmenting Track data, strictly use the appropriate Field Separator (FS).

Reviewing Tracks 1, 2, and 3 (in Table format)

Review this Table, which displays the SS, ES, FS and the valid characters defined for each Track.

	Start Sentinel	End Sentinel	Field Separator	Valid Characters	Maximum Number of Characters
Track 1	%	?	^	0-9, A-Z, Punct. (ASCII 32-95) (See the Table below.)	78
Track 2	;	?	=	0-9, ;, =, ? (ASCII 48-63) (See the Table below.)	39
Track 3	;	?	=	0-9, ;, =, ? (ASCII 48-63) (See the Table below.)	106

Reviewing the Track Data Note

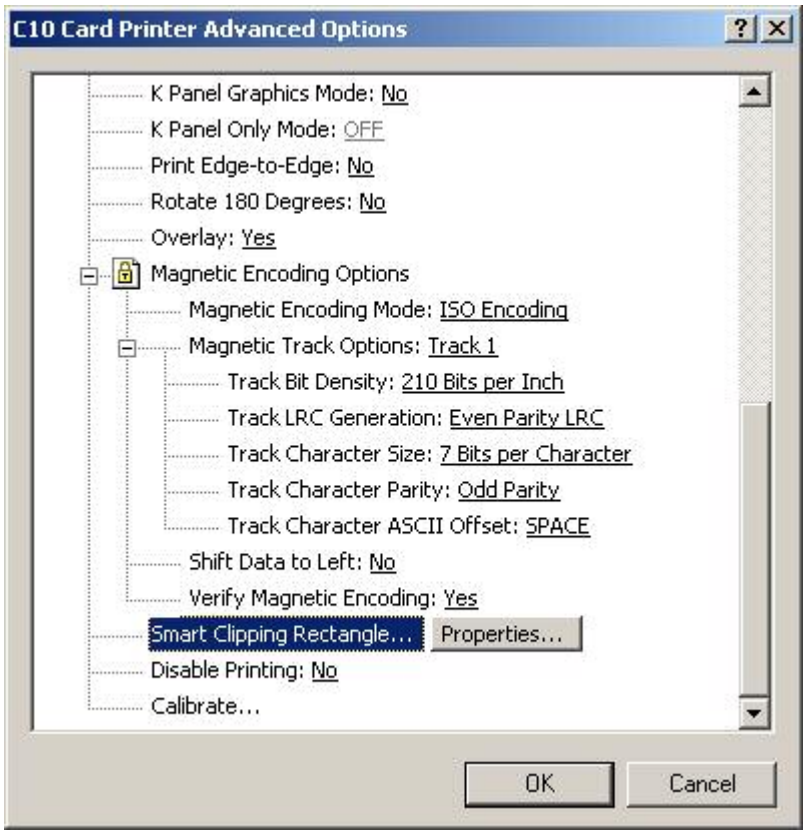
Review this Table, which displays how Track Data should be entered for Tracks 1, 2 and 3.

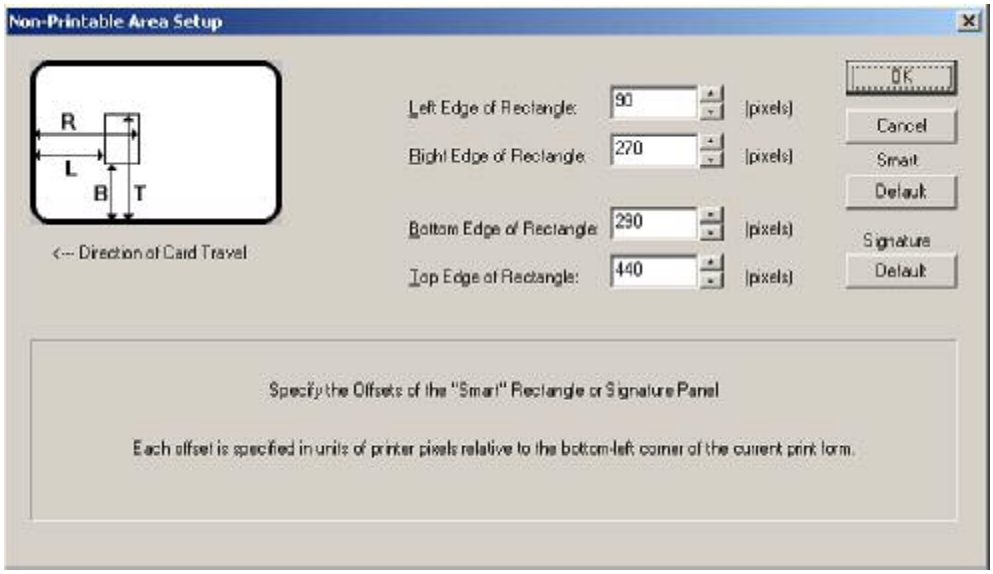
Track	Data Entry
Sending data to Track 1	**~1%JULIE ANDERSON^623-85-1253?**
Sending data to Track 2	**~2;0123456789?**
Sending data to Track 3	**~3;0123456789?**

Reviewing the ASCII Code and Character Table

ASCII Code	Character	ASCII Code	Character	ASCII Code	Character
32	space	56	8	80	P
33	!	57	9	81	Q
34	"	58	:	82	R
35	#	59	;	83	S
36	$	60	<	84	T
37	%	61	=	85	U
38	&	62	>	86	V
39	'	63	?	87	W
40	(	64	@	88	X
41	)	65	A	89	Y
42	*	66	B	90	Z
43	+	67	C	91	[
44	'	68	D	92	\
45	-	69	E	93	]
46	.	70	F	94	^
47	/	71	G	95	_
48	0	72	H		
49	1	73	I		
50	2	74	J		
51	3	75	K		
52	4	76	L		
53	5	77	M		
54	6	78	N		
55	7	79	O		

Selecting Smart Clipping Rectangle

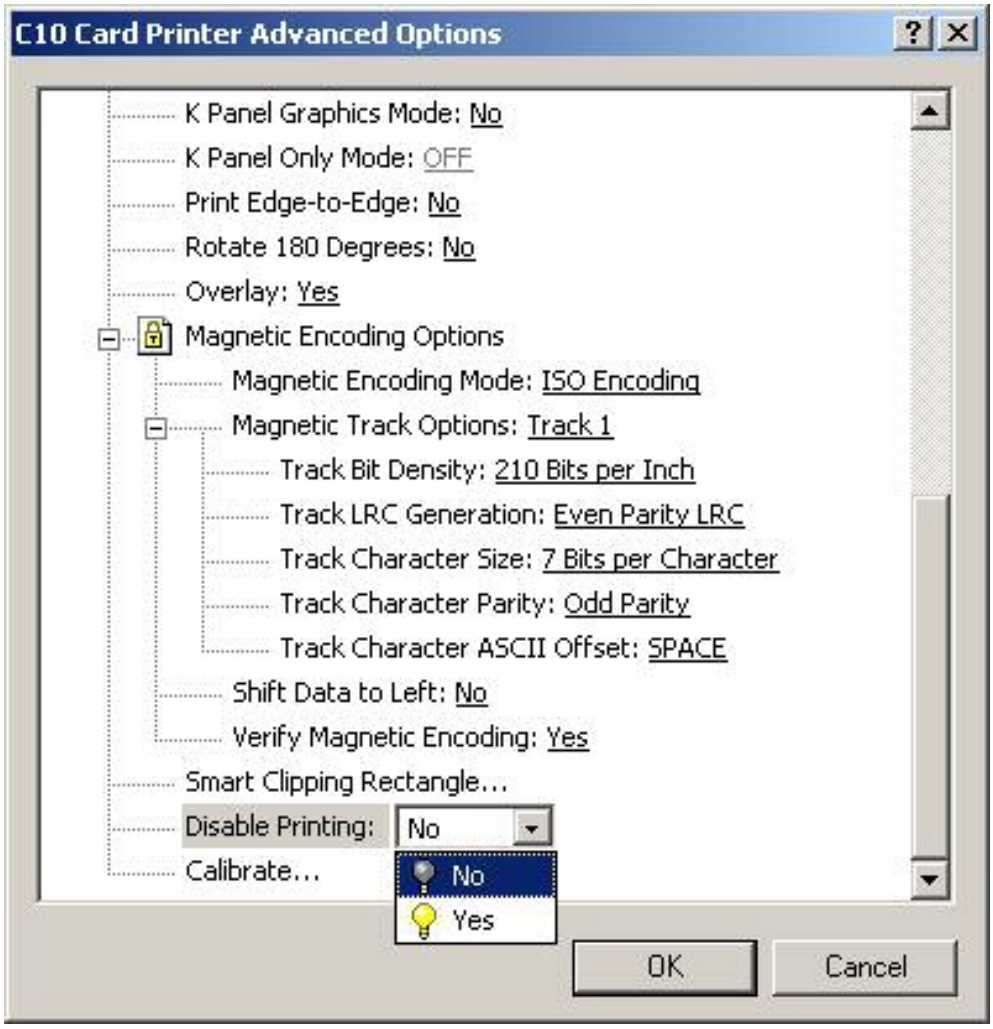




Selecting the Disable Printing option

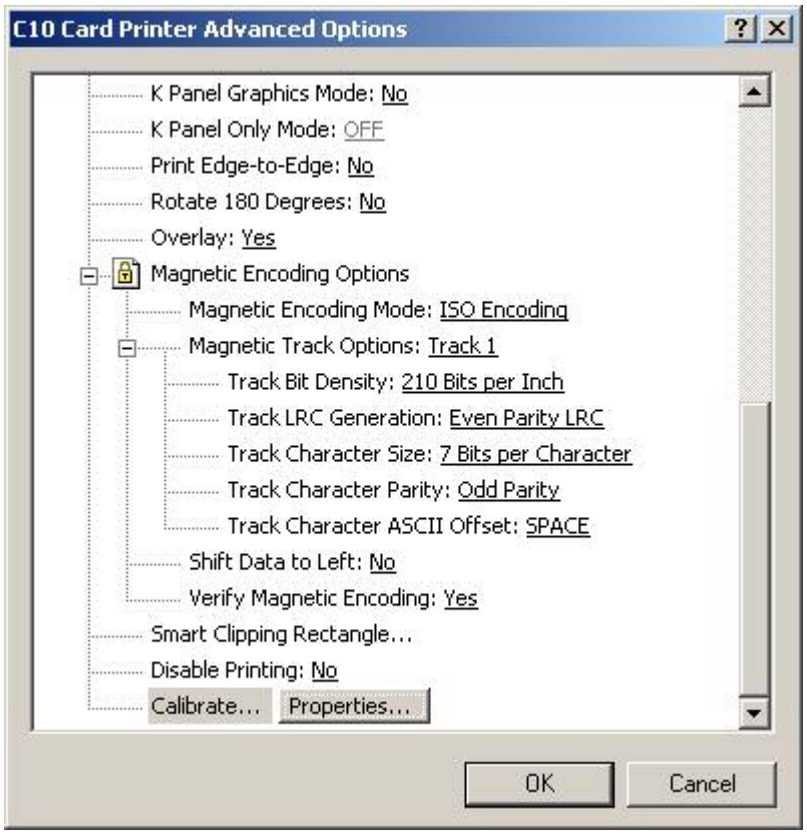
Use this option to disable the printing capabilities of the Printer and still allow the Printer to encode cards.

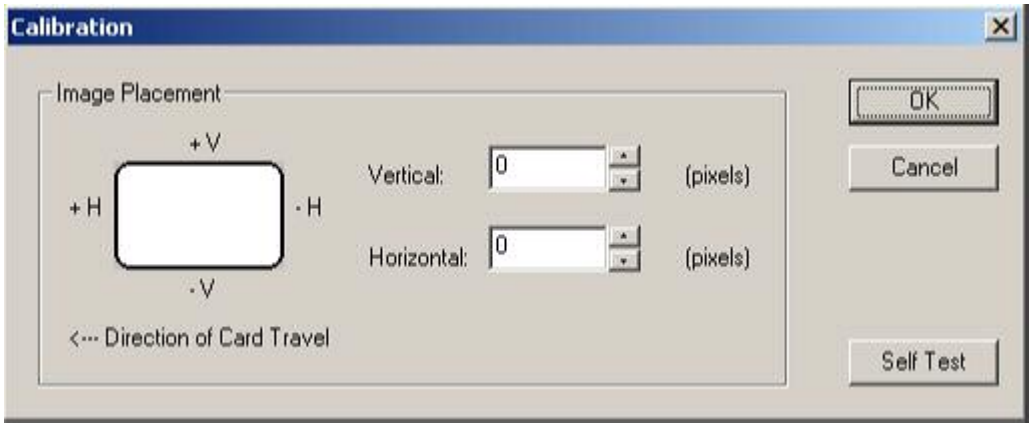
Step	Procedure
1	Select this option: • To encode or re-encode preprinted cards without wasting additional time, effort, or printing supplies. • To ensure that all encoding instructions will be sent according to how they are configured within the software (even though all print data will not be sent to the Printer).



Selecting the Calibration window

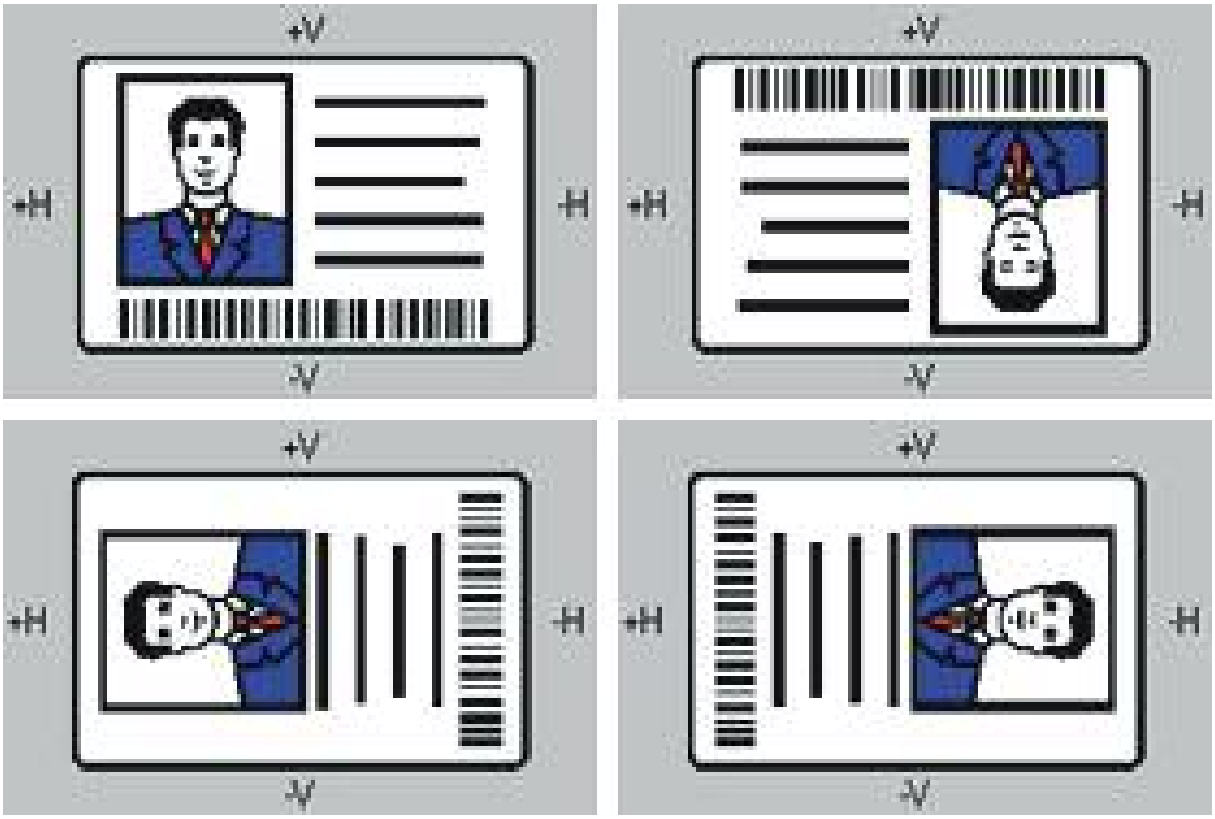
Use this option to (a) control the position of the printable area in relation to the card, (b) calibrate Sensors and (c) adjust the internal Printer settings.





Using the Image Placement controls

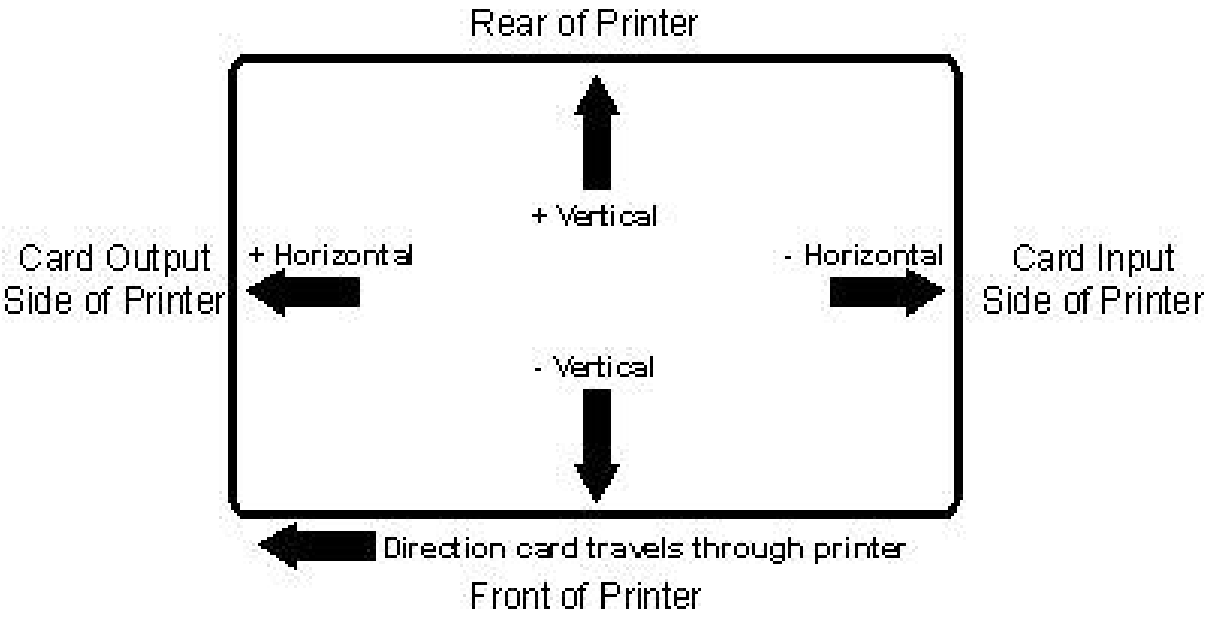
Step	Procedure
1	Click on the **Vertical** and **Horizontal** adjustment arrows to adjust the Image Position values. • When adjusting these values, keep in mind that cards always remain in the same position while moving through the Printer, regardless of image orientation. • To illustrate this, the card illustration shown in the Image Position box will flip and rotate according to the **Portrait**, **Landscape**, or **Rotate 180 Degrees** selection. • The outline around the illustration will always remain in the same **Landscape** orientation.



Using Image Placement controls (continued)

Review the Image Position diagram, which displays how the printed image will move in relation to the fixed card position as positive and negative image placement values are entered.

Step	Procedure
2	Use the **Vertical** adjustment to move the image: • Move toward the rear of the Printer if a positive number is entered. • Move toward the front of the Printer if a negative number is entered. **OR** Use the **Horizontal** adjustment to move the image: • Move toward the card output side of the Printer if a positive number is entered. • Move toward the card input side of the Printer if a negative number is entered. (**Note #1:** The maximum value for the **Vertical** and **Horizontal** adjustments is ±100 pixels (10 pixels = about .03"/. 8mm).) (**Note #2:** The **Vertical** and **Horizontal** adjustment arrows point to within the Image Position window, which represents the direction that the printed image moves.



Selecting the Self Test button

Use this option to send a Self Test page to the Printer.

Step	Procedure
1	Click on the **Self Test** button to print out a test page and ensure that the computer is effectively communicating with the Printer and that the Printer is functioning properly.

Selecting Write Direct to Port

Selecting this option provides the fastest print processing when printing exclusively from Windows 3.1x.

- When selected, this option allows the Printer Driver to bypass the Windows 3.1x Print Manager and to send all print data directly to the Printer.
- This option devotes all of the system resources to the current print job, thereby increasing overall print speed.

Step	Procedure
1	When the print job is finished, the system resources will again be released and devoted to the normal function of the on-screen applications.
2	Depending upon the processing speed and brand of the computer, you may or may not need to select this option when printing.
3	For most computers with a non-ECP compatible parallel port, selecting this option will enhance the speed of the rasterizing and printing process. In this case, the **Write Direct to Port** option should be selected.
4	For some computers, however, this option may either not be supported by the particular brand of PC or simply may not be necessary due to the PC's fast processing speed. In this case, the **Write Direct to Port** option should not be selected.
5	This option will not function properly if using any type of external Printer buffer. When using a Printer buffer, all print jobs should be sent through the system print spooler or through the Printer's 32-Bit Print Spooler for Windows 95/98.

Printing a Card

Now that you have set up the Printer, loaded media and installed the Printer Driver, you are ready to print an ID card. Follow these steps to print the first card:

Step	Procedure
1	Go to the Windows application program in which you will be creating the cards and open it or create a card format.
2	a. Once you are ready to print, select **Print Setup** (or the equivalent) from the program's File menu to verify that the Printer Driver settings are correct for the card design. b. Remember to select the proper card size and Ribbon type and, if applicable, to verify that the proper magnetic encoding settings are selected. c. After you have properly configured the Driver, select the **Print** button from the application's Print screen.
3	The Printer's RIP (raster image processing) begins. (**Note:** The image processing time will vary depending upon the complexity of the image and the processing speed of the computer. In most cases, this will only take a few seconds.)
4	a. After the image is processed and sent to the Printer, the Printer will feed in a card, print and then eject the card. b. If everything looks good, you have successfully completed set-up, initial testing and printing with the Card Printer.

Section 5: Diagnostic Tools, Calibration, and Interface Information

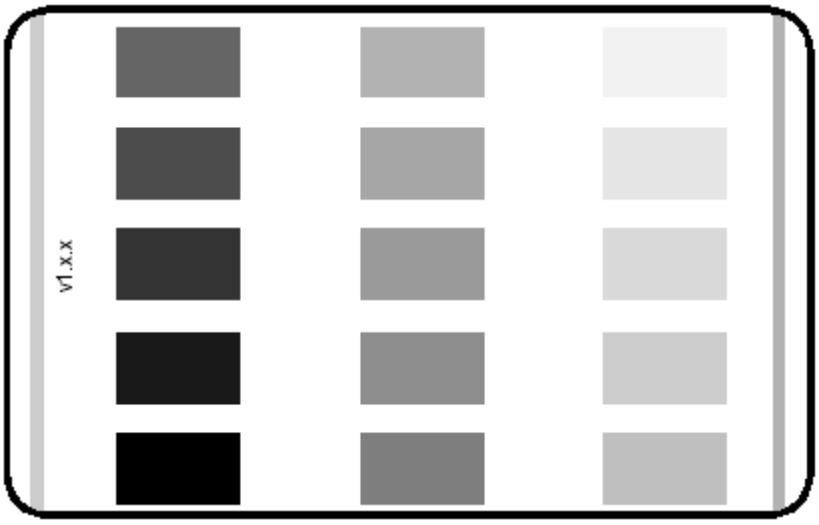
Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger: 	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair Instructions, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these Instructions.
Caution: 	**This device is electrostatically sensitive. It may be damaged if exposed to static electricity discharges.** Information that raises potential electrostatic safety issues is indicated by a warning symbol (as shown to the below). • **To prevent equipment or media damage**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent equipment or media damage**, observe all established Electrostatic Discharge (ESD) Instructions while handling cables in or near the Circuit Board and Printhead Assemblies. • **To prevent equipment or media damage**, always wear an appropriate personal grounding device (e.g., a high quality wrist strap grounded to avoid potential damage). • **To prevent equipment or media damage**, always remove the Ribbon and Cards from the Printer before making any repairs, unless otherwise specified. • **To prevent equipment or media damage**, take jewelry off of fingers and hands, as well as thoroughly clean hands to remove oil and debris before working on the Printer.

Diagnostic Tools – Start by running a Self-Test

Perform a self test after initial setup of the printer, after a calibration procedure has been conducted, or after a part has been replaced. The self test checks for proper operation of the printer. The procedure described below is an alternative to method found in the User's Manual. A sample of the self test print is shown below.

Step	Procedure
1	Unplug the power cord from the rear panel.
2	Install a full-color ribbon and cards in the Card Printer.
3	Press and hold the on-line button; plug the power cord back into the rear panel connection while holding down the on-line button.
4	Release the on-line button once the printer begins to cycle the drive motor.



Calibrating the Printhead

 **Caution No. 1:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static

 **Caution No. 2:** Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Adjusting the RP1 Potentiometer

The RP1 potentiometer controls the lightness and darkness of the printed image. When a new printhead is installed, it may need to be adjusted. Follow the steps below to perform this minor adjustment.

When the Printhead Harness is replaced (along with the power and data cables for the printhead), the Board Assembly, Ribbon Sensor, and Headlift Sensor Switch are also terminated in the Upper Imaging Assembly.

To calibrate the Ribbon Sensor, see **Calibrate the Ribbon Sensor. (Note:** Do not over-tighten the mounting screw when installing the Headlift Sensor Switch. The screw should be snug up to the plastic housing of the switch.)

Step	Procedure
1	Locate the three small holes on the right-hand side of the printer. RP1 is located within the first hole down from the top.
2	Run a self test. The self test will print 15 gray scale boxes.
3	Turn RP1 clockwise in 1/8-turn increments if the output is too dark. Adjust RP1 counterclockwise in 1/8-turn increments if it is too light. Continue to adjust RP1and run self tests until the desired intensity is achieved. Consult **Make Mechanical Adjustments to the Printhead** if mechanical adjustments are needed to achieve the correct intensity level.

Aligning the Headlift Sensor

Step	Procedure
1	Close the Upper Imaging Assembly; leave the Top Cover open.
2	Apply power to the printer; press both the on-line and on/cancel buttons at the same time. You will hear the Headlift motor energize for a moment and then stop — it sounds like a low-pitched winding noise.

Positioning the Headlift Cam

Step	Procedure
1	Examine the eccentric cam in the middle of the Headlift Shaft Assembly. The cam is a black, semi-round cylinder ¾-inch wide positioned midway across the width of the Upper Imaging Assembly, riding against the Cam Lift Plate and a thin metal plate called a Cam Follower Spring.
2	Run the Headlift Alignment procedure above.
3	Watch the rotation of the eccentric cam. • The **eccentric cam** will make one complete rotation (360°) counterclockwise; it should come to rest with the fattest portion of the cam face down, pushing the Cam Lift Plate to its lowest position. • The **lifter arm of the Headlift Switch** should be depressed, opening the contacts of the Headlift Switch. (It should be an open contact when depressed; with the arm released the contacts will close.) The Headlift Switch could be malfunctioning if the fat portion of the cam stops at the highest point. Adjust the mounting screw of the Headlift Switch; it may be too tight. • Ensure that the switch is positioned correctly on the Print Assembly Sideplate. Make sure the switch activates when the lifter arm is depressed. This can be measured with an ohmmeter for continuity. • Check the rotation of the cam during the Headlift Alignment procedure if difficulty persists. Normally, the cam should rotate counterclockwise (from the front of the printer). • If the camis rotating clockwise, the HeadliftMotor cable connection (J15 on the Print Circuit Board) is reversed.

Making Mechanical Adjustments to the Printhead

Refer to the following troubleshooting tips if you feel the Printhead Assembly requires additional adjustment.

 **Caution No. 1:** DO NOT make mechanical adjustments to the Printhead unless one of these troubleshooting symptoms is present. Keep close track of all adjustments so you can reset the assembly to its original settings if needed. The adjustments described below are very minute; be sure to turn the adjustment screws only the amount suggested.

 **Caution No. 2:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies.

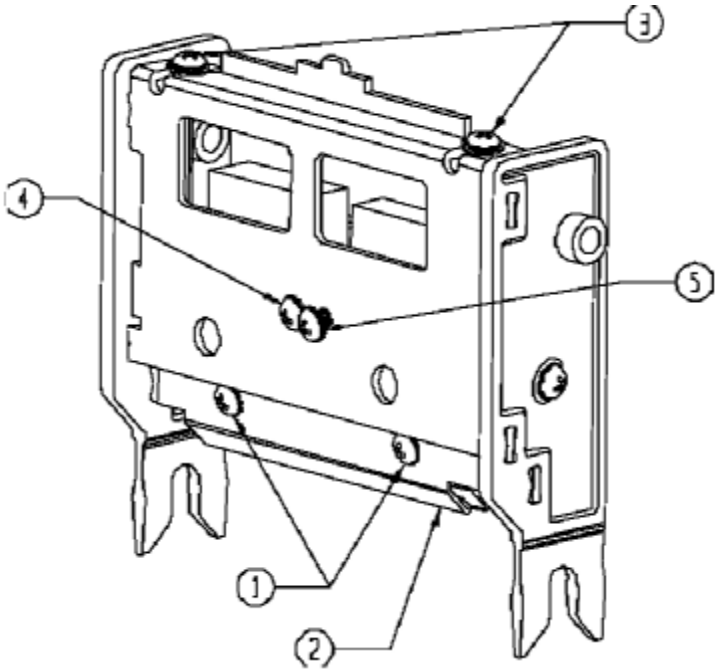
 **Caution No. 3:** Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Making Mechanical Adjustments to the Printhead (continued)

Symptom Overall printed image looks broken up and/or faded.

Solution: The ribbon deflector on the Printhead may be too low.

Step	Procedure
1	Open the Top Cover.
2	Loosen the two Screws (Item 1, below) that hold the ribbon deflector (Item 2, below) in place.
3	Locate the adjustment screws for the ribbon deflector (Item 3, below).
4	Turn each adjustment screw 1/8-turn clockwise if the entire card is faded. Turn each screw the same amount. If one side of the card is faded, turn the adjustment screw on that side of the card 1/8-turn clockwise.
5	Tighten the screws loosened in step 2. Do not overtighten them.
6	Close the Top Cover.
7	Print a sample card.
8	Repeat steps 1-7 until the image is correct.

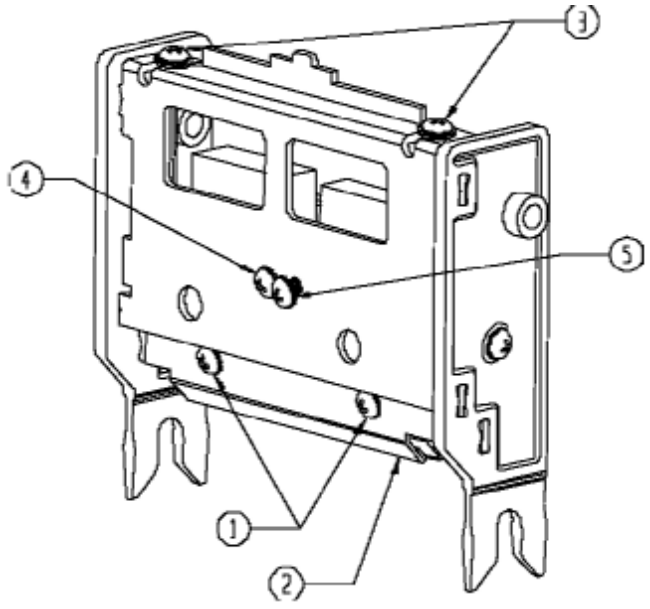


Making Mechanical Adjustments to the Printhead (continued)

Symptom: Printed image has a dark band across the card, about 1/8 in. (3mm) from the card leading edge.

Solution: The ribbon deflector on the Printhead may be too low.

Step	Procedure
1	Open the Top Cover.
2	Loosen the two Screws (Item 1, below) that hold the ribbon deflector (Item 2, below) in place.
3	Locate the adjustment screws for the ribbon deflector (Item 3, below).
4	Turn each adjustment screw 1/8-turn clockwise. Turn each screw the same amount.
5	Tighten the screws loosened in step 2. Do not overtighten them.
6	Close the Top Cover.
7	Print a sample card.
8	Repeat steps 1-7 until the image is correct.

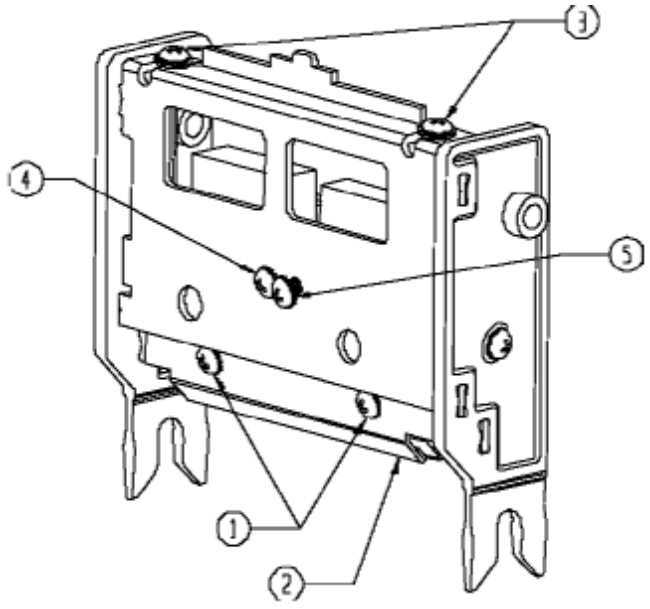


Making Mechanical Adjustments to the Printhead (continued)

Symptom: Printed image has discolored arcs across the card.

Solution: The ribbon deflector on the Printhead may be too high.

Step	Procedure
1	Open the Top Cover.
2	Loosen the two Screws (Item 1, below) that hold the ribbon deflector (Item 2, below) in place.
3	Locate the adjustment screws for the ribbon deflector (Item 3, below).
4	Turn each adjustment screw 1/8-turn counterclockwise if the entire card has arcs. Turn each screw the same amount. If one side of the card has arcs, turn the adjustment screw on that side of the card 1/8-turn counterclockwise.
5	Tighten the screws loosened in step 2. Do not overtighten them.
6	Close the Top Cover.
7	Print a sample card.
8	Repeat steps 1-7 until the image is correct.



Making Mechanical Adjustments to the Printhead (continued)

 **Caution:** In order for the printer to function properly with the new Printhead Assembly, you MUST have firmware version 1.0.7. The firmware version of the printer is shown on the edge of the Self Test print.

Contact FARGO Technical Support for a firmware update at (952) 941-0050 or FAX (952) 941-1852.

Note: Be sure to record the total number of passes the printer has made to date. This is necessary for warranty purposes in order to accurately count the total number of passes made by each new printhead. To have the printer report the total number of passes made to date, press and hold the on-line button for 12 seconds. A card will be printed showing this number. Store this card in a safe place so you can accurately determine the pass count of the printhead if the need arises.

Calibrating the Ribbon Sensor

Use this procedure (a) when colors on the printed card are out of alignment, (b) when a black bar appears on the leading edge of the card or covers the entire card where the clear overlay should be placed, or (c) when too many color panels are passed without being used.

Tools Needed

(1) Small standard screwdriver

(1) Full-color ribbon

(1) Dark colored note pad (or similar object)

Note: The Ribbon Sensor array can be affected by exposure to direct light. To ensure proper operation, the Top Cover should be kept closed during normal operation. As it is necessary to have the Top Cover open during the calibration procedure, place a dark colored object such as a cardboard note pad over the Printhead Assembly to block light from entering the printer.

Adjusting the RP2 Potentiometer

Step	Procedure
1	Install the full-color ribbon in the printer.
2	Position the Magenta panel, from the supply spool, across the top of the Light Emitting portion of the Ribbon Sensor Array. (This is the short metal bar protruding from the rear chassis wall just to the left of the ribbon supply spool.)
3	Close the Printhead Assembly securely and leave the Top Cover open.
4	Locate the rectangular opening on the left side of the machine. Just inside the opening are four small white switches aligned in a row vertically. The switches are labeled 1 through 4; the top switch is number one.
5	Use the tip of the standard screwdriver to click switch number 1 towards the rear of the printer; this turns the switch on.
6	Locate the Lid Switch at the top and middle of the printer, just to the rear of the Printhead Assembly.
7	Use a piece of clear tape to secure the Lid Switch down.
8	Disconnect all cables from the back of the printer.
9	Place the note pad over the Printhead Assembly to shield the sensor array from light.
10	Hold the on-line button down.
11	Plug in the power cable while continuing to hold the on-line button.
12	Release from the on-line button once the LED lights come on. You will notice that one LED will be lit, either the on-line or the on/cancel.
13	Locate the RP2 Potentiometer on the right side of the printer, through the opening in the middle.
14	Use the standard screwdriver to turn the RP2 potentiometer until both LEDs are turned OFF.

Adjusting the RP2 Potentiometer

Note: RP2 has two stops; do not turn the screw beyond these stops.

Once both LEDs are OFF, the ribbon sensor calibration is completed. Then, follow these steps.

Step	Procedure
1	Remove the POWER cable, the tape from over the Lid Switch, and the note pad.
2	Return Switch number one to the OFF position; move it towards the front of the printer.
3	Replace the ribbon (if necessary).
4	Close the Top Lid.
5	Apply power when ready.

Calibrating the Left Card Sensor

When this part is moved or replaced, the lengthwise print position on cards can be affected. This sensor provides the precise position of the cards leading edge as it is presented to the printhead. If the position is incorrect, it may cause ribbon breakage between the yellow and clear panels of the ribbon.

Adjusting the RP3 Potentiometer

Step	Procedure
1	Locate RP3 by finding the three small holes on the right-hand side of the printer; RP3 is located within the third hole down from the top.
2	Install a full-color ribbon in the printer.
3	Run a self test print.
4	Measure the width of the colored bars at each end of the self test print. The width of each bar should be close to equal.
5	Adjust RP3 counterclockwise in 1/8-turn increments if the green bar on the leading edge appears thinner. If the red bar on the trailing edge appears thinner, adjust RP3 clockwise in 1/8-turn increments.
6	Repeat steps 1-7 until the lines are of equal width.

Troubleshooting Tips

The slots of the Card Sensor may be obscured if the printer behaves as if a card is in the feed path — the main stepper motor is activating when power is applied and then the on-line light blinks.

To remove dust or debris from the card sensor, use a can of compressed air to blow between the upper and lower portions of the Left Card Sensor.

Aligning the Stepper Motor

The Stepper Motor Assembly may require alignment when replaced.

Step	Procedure
1	Examine the teeth on the pinion gear of the Stepper Motor. They should make positive contact with the teeth of the idler gear. **Note:** The amount of contact between the pinion gear and the idler gear is controlled by the positioning of the Stepper Motor. Continue to step 2 if alignment is needed.
2	Loosen the mounting screws that secure the Stepper Motor to the chassis.
3	Adjust the Stepper Motor so the the pinion gear rests into the teeth of the idler gear.
4	Tighten the mounting screws.
5	Turn the idler gear by hand; it should turn with relative ease. There should be slight tension and positive contact from the Stepper Motor as the axle rotates.
6	Apply a small amount of grease to the pinion gear for lubrication.

Calibrating the Ribbon ID Sensor Board

The replacement Ribbon ID Sensor Board is calibrated by the factory; the procedure below is not necessary in most cases. Because extreme precision is required, this procedure should only be completed by a qualified electronics technician.

The printer will have difficulty reading the supply ribbon identification core if the Ribbon ID Sensor is not calibrated correctly. It may print the first card in a series, but the second card may stall in the printer and the on-line light will blink. If the on-line button is pressed, the second card may print fine. (**Note:** This symptom is also identical to what occurs when the wrong Ribbon Type is selected in the Printer Driver. Make sure the Ribbon Type selected in the Printer Driver matches the ribbon installed in the printer.)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Tools Needed

(1) Digital volt meter

(1) Exacto knife (Precision-bladed knife)

(1) Phillips-head screwdriver

Continued on the next page

Calibrating the Ribbon ID Sensor Board

Step	Procedure
1	Remove all external cables from the back of the printer.
2	Remove the ribbon from the printer.
3	Detach the print circuit board, RIP, power boards, and backplate from the printer baseplate.
4	Remove the two exterior, bottom corner Screws from the backplate and the two Screws from each side of the power board.
5	Guide the Circuit Board carefully away from the baseplate.
6	Rest the circuit board assembly on the back plate; the connecting wires should be long enough to accommodate this procedure. Keep the bottom side of the power board from touching any bare metal of the printer's chassis. Use a piece of masking tape against the edge of the baseplate if necessary.
7	Attach the printer Desktop Transformer to a switched power strip; turn the power strip off.
8	Attach the Desk Top Transformer output cable to the printer. See related Safety Messages.
9	Locate the J10 connector on the Print Circuit Board Assembly.
10	Set the digital volt meter to measure low-level dc voltage — in the range of + 0.01 to + 1.00 V dc.
11	Attach the black test lead of the meter to the bare metal back plate of the circuit board.
12	Touch the red test lead to the lead on the left side on the R35 resistor.
13	Turn on the switched power strip to apply power to the printer.

Continued on the next page

Calibrating the Ribbon ID Sensor Board

Step	Procedure
14	Read the voltage at R35; it should read + 0.75 V dc. **Note:** If the voltage is lower than + 0.75, the magnet of the ID sensor is too close to the hall - effect sensor.
15	Use the blade tip of the exacto knife to slide the magnetic cylinder held by the plastic housing at the Ribbon ID Sensor Board. This process requires moderate- to high-level coordination and dexterity. Patience and concentration are key.
16	Place the tip of the exacto blade at the forward side (towards the ribbon hub) of the magnetic cylinder; slide it towards the front of the printer. The amount of movement needed is very small, half the thickness of the exacto blade.
17	Remove the knife from the Ribbon ID Sensor Board.
18	Measure the voltage at R35. If the voltage is higher than + 0.75, the magnetic cylinder is too far from the hall - effect sensor. The magnetic cylinder should be moved towards the ribbon hub.

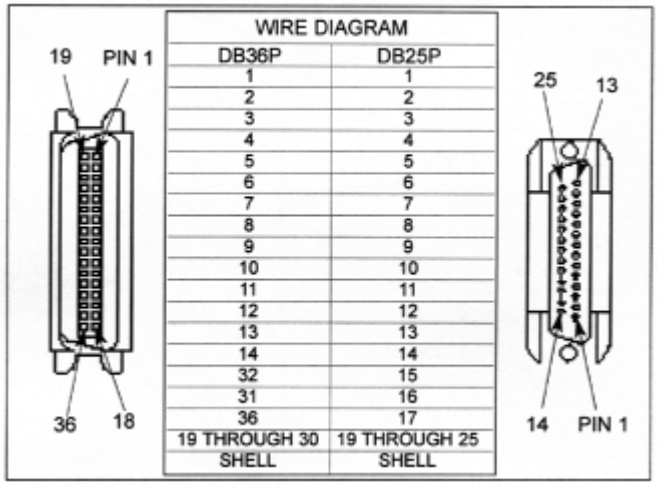
Interfacing Information

The Card Printer is equipped with a standard 8-bit Centronics-type parallel data communications port. This is the means by which the Printer receives data from the computer. No options for serial data are available. This section describes the pin assignments, protocol and signal specifications for the parallel data input port.

Centronics-type Parallel Interface

The Centronics-type parallel interface is the most widely used Printer interface due to its simplicity, speed and standardization throughout the PC industry. The Printer's parallel interface connector is a standard 36-pin Amp type with two metal-wire retaining clips and is ECP (Extended Capabilities Port) compatible. It mates with a shielded, bi-directional PC to Printer parallel cable. Try to keep the interface cable to under 6 feet if possible.

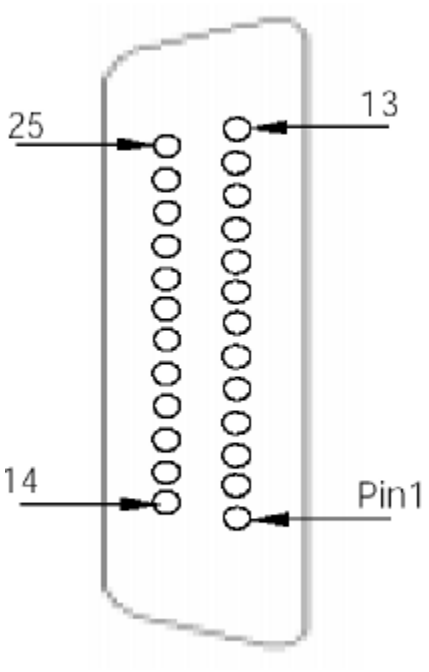
Pin assignments are as follows:

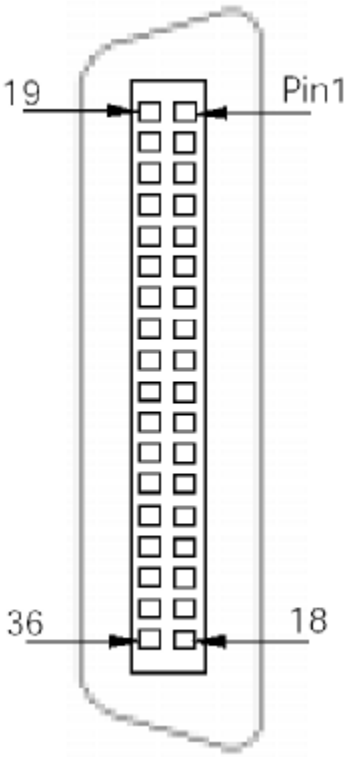


WIRE DIAGRAM	
DB36P	DB25P
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
32	15
31	16
36	17
19 THROUGH 30	19 THROUGH 25
SHELL	SHELL

Centronics-type Parallel Interface (continued)

Wire Diagram of DB36P and DB25P





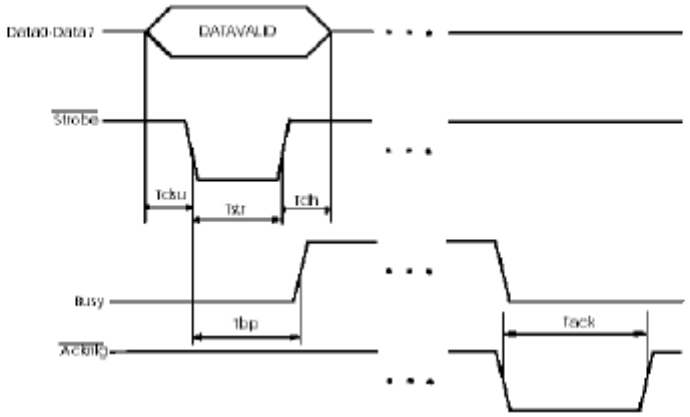
Centronics-type Parallel Interface (continued)

Centronics Parallel Pin Assignments

Pin No.	Signal	Direction	Description
1	Strobe	In	A LOW pulse greater than 1 µs causes the printer to read one byte of data.
2	Data 0	In	Data Bit 0.
3	Data 1	In	Data Bit 1.
4	Data 2	In	Data Bit 2.
5	Data 3	In	Data Bit 3.
6	Data 4	In	Data Bit 4.
7	Data 5	In	Data Bit 5.
8	Data 6	In	Data Bit 6.
9	Data 7	In	Data Bit 7.
10	Acknlg	Out	A LOW pulse is sent by the printer to indicate that a byte of data has been accepted and that it is ready for more data.
11	Busy	Out	A HIGH logic level is sent to the printer to indicate to the host that it cannot receive data due to data entry, error status, or a full buffer.
12	Paper Error	Out	Low = OK, High = Media Error.
13	Ready	Out	Low = Off-Line, High = On-Line.
14, 15	—	—	Not Used.
16	Sig Gnd	—	—
17	Chassis Gnd	—	—
18	HI	Not Used	—
19 to 30	Sig Gnd	—	—
31	Reset/Input Clean	Not Used	—
32	Error	Out	Low = Printer Error. High = OK.
33 to 36	—	Not Used	—

Centronics-type Parallel Interface (continued)

Printer Timing Diagram.



Printer Timing.

Interval	Description	Minimum Value	Typical Value
Tdsu	Data setup time.	0.5 µs	—
Tstr	Data strobe width.	1 µs	—
Tack	Acknlg pulse width.	—	3.75 µs
Tdh	Data hold time.	0.5 µs	—
Tsb	Busy delay time from data strobe.	0.5 µs (max.)	

Section 6: Parts Replacement

Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger: 	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair Instructions, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these Instructions.
Caution: 	**This device is electrostatically sensitive. It may be damaged if exposed to static electricity discharges.** Information that raises potential electrostatic safety issues is indicated by a warning symbol (as shown to the below). • **To prevent equipment or media damage**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent equipment or media damage**, observe all established Electrostatic Discharge (ESD) Instructions while handling cables in or near the Circuit Board and Printhead Assemblies. • **To prevent equipment or media damage**, always wear an appropriate personal grounding device (e.g., a high quality wrist strap grounded to avoid potential damage). • **To prevent equipment or media damage**, always remove the Ribbon and Cards from the Printer before making any repairs, unless otherwise specified. • **To prevent equipment or media damage**, take jewelry off of fingers and hands, as well as thoroughly clean hands to remove oil and debris before working on the Printer.

Reviewing the Part Number/Description and Drawing Number Table

This section guides you through replacement of key components of the card printer. It includes disassembly, part removal, replacement, and installation. Be sure to reverse the disassembly steps to reassemble the card printer.

A complete listing for each part is found below: part number, part description, quantity needed, drawing reference number, page number, and TTR (Time to Repair).

Part #	Part Description (Description on drawing)	Quantity Needed	Drawing Reference #	TTR
140300	Print Circuit Board (Circuit Board - Print) (1)	1	830179	10
140303	Power Circuit Board (Circuit Board - Power)	1	830179	15
820102	Printhead Assembly (Assembly - Printhead) (1)	1	830119-XX	5
830162-XX	Printhead Harness Assembly (Assembly - Printhead Harness) (1)	1	830119-XX	15
830151	Ribbon Sensor Board Assembly (Assembly - Board, Ribbon Sensor) (1)	1	830119-XX	15
830177	Cleaning Roller Assembly (Assembly - Cleaning Roller)	1	830177	1
830164	Front Panel Board Assembly (Assembly - Board, Front Panel)	1	SK1741	15
830135	Left Card Sensor Assembly (Assembly - Left Card Sensor) (1)	1	830117-XX	15
830143	Headlift Motor Assembly (Assembly - Headlift Motor) (1)	1	830117-XX	10
830145	Card Feed Assembly (Assembly - Card Feed)	1	830117-XX	10
830147	Ribbon Drive Assembly (Assembly - Ribbon Drive)	1	830117-XX	10
830149	Slotted Sensor Mount Assembly (Assembly - Slotted Sensor Mount)	1	830117-XX	5
830150	Lid Sensor Assembly (Assembly - Lid Sensor)	1	830117-XX	5
810113	Stepper Motor Assembly (Assembly - Stepper Motor) (1)	1	830117-XX	5
763173-2	Ribbon ID Sensor Board Assembly (Assembly - Board, Ribbon ID Sensor) (1)	1	830117-XX	15
830136	Card Feed Switch Assembly (Assembly - Card Feed Switch)	1	830118-XX	N/A
830133	LED Board Assembly (Assembly - Board, LED) (1)	1	830118-XX	15
810261	Platen Roller (Roller - Platen)	1	830118-XX	15
810262	Card Input Roller (Roller - Card Input)	2	830118-XX	15 (each)
810304	Card Feed Roller (Roller - Card Feed)	1	830118-XX	15
830190	Low-Coercivity Magnetic Head Assembly (1)	1	SK1707	10
830191	High-Coercivity Magnetic Head Assembly (1)	1	SK1707	10

Reviewing the Drawing Index

Drawing Index.

Drawing Description	Drawing Number	Drawing Description	Drawing Number
Final Mechanism Assembly	8301XX	Lid Sensor Assembly	830150
Rear Pivot Cover Assembly	830168	Stepper Motor Assembly	D000033
Backplate Assembly	830179	Ribbon ID Sensor Board Assembly	763173-X
Upper Imaging Assembly	830119-XX	Chassis Assembly	830118-XX
Ribbon Sensor Board Assembly	830151	Card Separator Assembly	830131
Cleaning Rollers Assembly	830177	Card Feed Switch Assembly	830136
Front Cover Assembly	SK1741	Lower Ribbon Sensor Assembly	830126
Front Panel Board Assembly	830164	LED Board Assembly	830133
Mechanism Assembly	830117-XX	Magnetic Head Position	SK1707
Left Card Sensor Assembly	830135	Low-Coercivity Magnetic Head	830190
Headlift Motor Assembly	830143	High-Coercivity Magnetic Head	830191
Card Feed Assembly	830145	Baseplate Assembly	830171
Ribbon Drive Assembly	830147	Print Board	same
Slotted Sensor Mount Assembly	830149	Power Board	same

Reviewing the Print Circuit Board Cable Connector Locations

Print Circuit Board Cable Connector Locations.

Location	Cable Connection
J5 Card Out	Not Used.
J4 Cover	Lid Sensor Assembly (830150); 2-Pin Connector.
J9 Card Feed	Card Feed Assembly (830145); 4-Pin/2-Wire Connector.
J8 Card Position	Left Card Sensor Assembly (830135); 5-Pin/4-Wire Connector.
J10 Ribbon Core	Ribbon ID Sensor Board Assembly (763173-2) 3-Pin/3-Wire Connector.
J15 Headlift Motor	Headlift Motor Assembly (830143); 4-Pin/2-Wire Connector.
J18	Magnetic Head Assembly (830190 or 830191) 10-Pin/10-Wire Connector.
J24 Test	Not Used.
J7 Ribbon Encoder	Slotted Sensor Mount (Assembly 830149) 5-Pin/4-Wire Connector.
J12 Ribbon Color	LED Board Assembly (830133) and Ribbon Sensor Board Assembly (830151); 4-Pin/2-Pin Connector each.
J6 Headlift	Printhead Harness Assembly (830162-00); 3-Pin/2-Wire (Headlift Sensor Switch).
J16 Card Motor	Card Feed Assembly (830145); 3-Pin/2-Wire Connector.
J13 Printhead	Printhead Harness Assembly (830162-00); 14-Pin Data Cable Connector.
J3 Fan	Printhead Harness Assembly (830162-00); 2-Pin Connector, Cooling Fan.
J2 Front Panel	Front Panel Board Assembly (830164); 6-Pin Connector.
J20	20-Pin Connector; Connects to J20 on the Power Circuit Board.
J19	20-Pin Connector; Connects to J19 on the Power Circuit Board.

Replacing the Rear Pivot Cover (830168)

It may be necessary to remove the Rear Pivot Cover or the Front Cover for many of the replacement procedures in this section.

Refer To Drawing 8301XX.

TTR: 5 minutes.

Step	Procedure
1	Unplug the power cord from the printer.
2	Stand at the rear of the printer and remove the top two corner Screws (130971); loosen the bottom two corner Screws (130971).
3	Raise the Rear Pivot Cover and open the Upper Imaging Assembly.
4	Remove the top two mid-section Screws (130971); see drawing 830168.
5	Close the Upper Imaging Assembly.
6	Loosen the Screw (130971) by the Card Hopper and the Screw (130971) by the Card Exit Ramp; see drawing 830168.
7	Grasp the bottom lip of either side of the Rear Pivot Cover, spread the sides carefully past the remaining loosened Screws (130971), and lift the cover assembly from the printer.

Replacing the Front Cover Assembly (830182-02)

Refer To Drawing 8301XX.

TTR: 5 minutes.

Step	Procedure
1	Unplug the power cord from the printer.
2	Raise the Rear Pivot Cover and open the Upper Imaging Assembly.
3	Loosen the top two corner Screws (130987) found just behind the top edge of the Front Cover.
4	Close the Upper Imaging Assembly.
5	Remove the Screw (130987) by the Card Hopper and the Screw (130987) by the Card Exit Ramp.
6	Lift the front cover just enough so the top screws come away from the printer chassis.
7	Lay the front cover down.

Replacing the Print Circuit Board (140300)

Refer To Drawing 830179.

TTR: 10 minutes

Step	Procedure
1	Unplug the power cord and any external cables from the printer.
2	Refer to drawing 8301XX to remove the Screw (130971), Screw (130939), Washer (130949), and Cable Clamp (140013) from the Power Circuit Board Power (drawing 830179).
3	Lift up on the Backplate; guide the Power Circuit Board over the lip of the printer baseplate.
4	Place a small piece of tape on each cable; write the cable connection location on that tape.
5	Remove all of the cables from the Circuit Boards.
6	Remove the two Screws (130971) that secure the Print Circuit Board to the two Standoff Screws (140047).
7	Use the thumb and index fingers of both hands to carefully pry the Print Circuit Board from the Power Circuit Board. (**Note:** Attach the cables. Be sure to calibrate the printer so it functions properly. See related Safety Messages.)

Replacing the Power Circuit Board (140302)

Refer To Drawing 830179.

TTR: 20 minutes.

Step	Procedure
1	Unplug the power cord and any external cables from the printer.
2	Refer to drawing 8301XX to remove the Screw (130971), Screw (130939),Washer (130949), and Cable Clamp (140013) from the Power Circuit Board Power (drawing 830179).
3	Lift up on the Backplate; guide the Power Circuit Board over the lip of the printer baseplate.
4	Place a small piece of tape on each cable; write the cable connection location on that tape.
5	Remove all of the cables from the Circuit Boards.
6	Remove the two Screws (130971) that secure the Print Circuit Board to the two Standoff Screws (140047).
7	Use the thumb and index fingers of both hands to carefully pry the Print Circuit Board from the Power Circuit Board.
8	Take the two Screws (130971) screws from the heatsink and the two corner Screws (130971).
9	Remove the Power Circuit Board from the backplate. (**Note:** Apply a thin layer of heatsink compound to the back of the heatsink for optimal heat transfer into the backplate when replacing the Power Circuit Board. Attach the cables. Be sure to calibrate the printer so it functions properly.)

Replacing the Printhead Assembly (820102)

Refer To Drawing 830119-XX.

TTR: 5 minutes

 **Caution:** If oil or debris makes contact with the Printhead elements, wipe the glasscoated area of the printhead immediately with a clean cloth dampened with 99% pure alcohol.

Step	Procedure
1	Unplug the power cord from the printer.
2	Raise the Rear Pivot Cover.
3	Lift the Head Latch Lever and raise the Upper Imaging Assembly.
4	Unscrew the two Thumb Screws (130887).
5	Remove the Head Cover Plate (820253).
6	Raise the tip of Head Spring (810214) about ¼-inch above the Printhead Assembly (820199).
7	Grasp the two plastic forks on each side of the Printhead Assembly, pivot them upward, and release the Head Spring.
8	Disconnect the two cables from the printhead. Make a note as to how the cables are oriented for installing the replacement Printhead.
9	Guide the Printhead Assembly between the sideplates and out of the printer. See related Safety Messages.

Replacing the Printhead Harness Assembly (830162-00)

Refer To Drawing 830119-XX.

TTR: 15 minutes.

Note: The Printhead Harness Assembly includes the following cables: Data and Power Bus cables for the Printhead, Cooling Fan, Ribbon Sensor Board Assembly, and the Headlift Sensor Switch.

Step	Procedure
1	Unplug the power cord from the printer.
2	Raise the Rear Pivot Cover.
3	Lift the Head Latch Lever and raise the Upper Imaging Assembly.
4	Unscrew the two Thumb Screws (130887).
5	Remove the Head Cover Plate (820253).
6	Raise the tip of the Head Spring (810214) about ¼-inch above the Printhead Assembly (820199).
7	Grasp the two plastic forks on each side of the Printhead Assembly, pivot them upward, and release the Head Spring.
8	Disconnect the two cables from the printhead. Make a note as to how the cables are oriented for installing the replacement Printhead.
9	Pivot the Printhead Assembly back to its normal position.
10	Take the two Screws (130990) from the Fan Guard (150312); lift the fan out of the printer.
11	Remove the two Screws (130971) that secure the Shield Sensor (810303) to the Sensor Mount Bracket (810221).
12	Take the Ribbon Sensor Assembly from the printer.

Replacing the Printhead Harness Assembly (830162-00) (cont.)

Step	Procedure
13	Remove the Screw (130972) that secures the Headlift Sensor Switch to the Front Plate/Print Assembly Sideplate (830302).
14	Lift the Headlift Sensor Switch out of the printer.
15	Cut the Tie Wrap (140013) that attaches the Head Harness Assembly to the Back Plate/Print Assembly Sideplate (830303).
16	Remove the Rear Pivot Cover.
17	Refer to drawing 8301XX to remove the Screw (130971), Screw (130939), Washer (130949), and Cable Clamp (140013) from the Power Circuit Board Power (drawing 830179).
18	Lift up on the Backplate; guide the Power Circuit Board over the lip of the printer baseplate.
19	Locate the cable connections.
20	Place a small piece of tape on each cable; write the cable connection location on that tape.
21	Disconnect the cable connections.
22	Take the Printhead Harness Assembly from the printer.

Replacing the Ribbon Sensor Board Assembly (830151)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Sub-assembly of the Printhead Harness Assembly 830162-00.

Refer To Drawing 830119-XX.

TTR: 15 minutes.

Step	Procedure
1	Unplug the power cord from the printer.
2	Raise the Rear Pivot Cover.
3	Take the two Screws (130990) from the Fan Guard (150312); lift the fan out of the printer.
4	Remove the two Screws (130971) that secure the Shield Sensor (810303) to the Sensor Mount Bracket (810221).
5	Take the Ribbon Sensor Assembly from the printer.
6	Use a wire cutting tool to severe the wires of the Ribbon Sensor Assembly, near the opening of the Head Harness Assembly. Take care not to nick any other wires.
7	Remove the Print Circuit Board.
8	Disconnect the Ribbon Sensor cable from J12, pins 3 and 4 on the Print Circuit Board.
9	Sever the wires of the Ribbon Sensor cable near the opening of the Printhead Harness Assembly.
10	Use wire wraps to secure the Ribbon Sensor cable next to the Printhead Harness Assembly.
11	Take the Ribbons Sensor Board Assembly from the printer.

Replacing the Cleaning Roller Assembly (830177)

Refer To Drawing 830177.

TTR: 1 minute.

Step	Procedure
1	Unplug the power cord from the printer.
2	Lift the Head Latch Lever (830312, drawing 830119-XX) and raise the Upper Imaging Assembly.
3	Locate the Cleaning Roller Assembly in the Card Feed Path beneath the Lower Ribbon Sensor Assembly (drawing 830126). The Cleaning Roller Assembly is held in place by two magnetic catches (130200, drawing 830131).
4	Grasp the front corner of the Cleaning Roller Assembly and lift it from the printer.

Replacing the Front Panel Board Assembly (830164)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Refer To Drawing SK1741.

TTR: 15 minutes.

Step	Procedure
1	Unplug the power cord from the printer.
2	Take the Front Cover Assembly.
3	Remove the Screw that secures the Front Panel Board Assembly (830164) to the Front Cover (SK1741).
4	Lay the Front Cover face down.
5	Lift and remove the Front Panel Board Assembly from the Front Cover.
6	Remove the two control buttons (771617) are loose; remove and set them aside.
7	Remove the item Panel Mount Bracket (830384) from the Front Panel Board.
8	Remove the Rear Pivot Cover.
9	Detach the Print Circuit Board.
10	Disconnect the cable from J2 on the Print Circuit Board.
11	Attach a piece of string to the end of the cable; use it as a means to feed the new cable through the chassis. (See Drawing 830164 for specifications.)
12	Take the Front Panel Board Assembly from the printer.

Replacing the Left Card Sensor Assembly (830135)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Refer To Drawing 830117-XX.

TTR: 15 minutes.

Step	Procedure
1	Unplug the power cord from the printer.
2	Remove the Rear Pivot Cover.
3	Detach the Print Circuit Board from the chassis without the removing wire connectors.
4	Remove the Screw (130939) from the Left Card Sensor Assembly (830135).
5	Disconnect the cable connection from J8 on the Print Circuit Board.
6	Attach a string to the cable connector; carefully draw it through the wire path.
7	Take the Left Card Sensor Assembly from the printer. **Note:** Use the string as a means of guiding the new Left Card Sensor Assembly cable through the printer.

Replacing the Headlift Motor Assembly (830143)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Refer To Drawing 830117-XX.

TTR: 10 minutes.

Step	Procedure
1	Unplug the power cord from the printer.
2	Remove the two Screws (130938) from the Headlift Motor Assembly. (**Note:** The Headlift Motor Assembly is connected to the Headlift Motor Spacer and the Headlift Gear; they will be loose once the Headlift Motor Assembly is removed.)
3	Disconnect the cable connection from J15 on the Print Circuit Board. See Drawing 830145 for specifications.
4	Take the Headlift Motor Assembly from the printer. (**Note:** Apply a liberal amount of grease to the teeth of the worm gear when installing the new Headlift Motor Assembly. Be sure the dimples of the Headlift Motor Spacer are fitted to the associated openings on the Chassis Assembly. Also be sure the end Shafts of the Headlift Gear fit properly into the associated openings in the Chassis Assembly, Headlift Motor Spacer, and the Headlift Motor Assembly before tightening the two Screws.)

Replacing the Card Feed Assembly (830145)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Refer To Drawing 830117-XX.

TTR: 10 minutes.

Step	Procedure
1	Unplug the power cord from the printer.
2	Remove the three Screws (130938) from the Card Feed Assembly.
3	Slide the Retainer Clip from the Card Feed Roller Shaft.
4	Disconnect the cable connector from J16 on the Print Circuit Board. See Drawing 830145 for specifications.
5	Take the Card Feed Assembly from the printer. (**Note:** Take care to keep the Card Feed Roller Shaft from binding with the casing of the Card Feed Assembly before tightening the three Screws.)

Replacing the Ribbon Drive Assembly (830147)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Refer To Drawing 830117-XX.

TTR: 10 minutes.

Step	Procedure
1	Unplug the power cord from the printer.
2	Remove the three Screws (130938) from the Ribbon Drive Assembly.
3	Disconnect the cable connector from J14 on the Power Circuit Board. See Drawing 830147 for specifications.
4	Take the Ribbon Drive Assembly from the printer. (**Note:** Take care to keep the Shaft from binding with the casing of the Ribbon Drive Assembly before tightening the three Screws.)

Replacing the Slotted Sensor Mount Assembly (830149)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Refer To Drawing 830117-XX.

TTR: 5 minutes.

Step	Procedure
1	Unplug the power cord from the printer.
2	Remove the Screw (130938) from the Slotted Sensor Mount Assembly.
3	Disconnect the cable connector from J7 on the Print Circuit Board. See Drawing 830149 for specifications.
4	Take the Slotted Sensor Mount Assembly from the printer.

Replacing the Lid Sensor Assembly (830150)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Refer To Drawing 830117-XX.

TTR: 5 minutes.

Step	Procedure
1	Unplug the power cord from the printer.
2	Remove the Screw (130972) from the Lid Sensor Assembly.
3	Disconnect the cable connector from J4 on the Print Circuit Board. See Drawing 830150 for specifications.
4	Take the Lid Sensor Assembly from the printer.

Replacing the Stepper Motor Assembly (810113)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Refer To Drawing 830117-XX.

TTR: 5 minutes.

Step	Procedure
1	Unplug the power cord from the printer.
2	Remove two Screws (130938) from the Stepper Motor Assembly that secures the assembly to the printer chassis.
3	Disconnect the cable connector from J17 on the Power Circuit Board. See Drawing 810113 for specifications.
4	Take the Stepper Motor Assembly from the printer. (**Note:** Be sure there is adequate grease applied to the pinion gear of the Stepper Motor Assembly. Also ensure that the gear mates properly with the Idler Gear before tightening the two Screws.)

Replacing the Ribbon ID Sensor Board Assembly (763173-2)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Refer To Drawing 830117-XX.

TTR: 15 minutes

Step	Procedure
1	Unplug the power cord from the printer.
2	Take the Front Cover off.
3	Remove the Retaining Ring (140009). Use a replacement Retaining Ring when installing the new Ribbon ID Sensor Board Assembly.
4	Extract the Right Ribbon Hub (763345) and the Clutch Spacer (760386) off of the Hub Linkage Assembly (810115).
5	Move the Ribbon ID Sensor Board Assembly off of the Hub Linkage Assembly. Take care not to misplace the Spring; it can remain on the Hub Linkage Assembly.
6	Disconnect the cable connection from J10 on the Print Circuit Board. See Drawing 763173-X for specifications.
7	Tie a string to the cable connector and draw the string through the wire path. Use the string as a means of routing the the new Ribbon ID Sensor Board Assembly cable through the printer chassis.
8	Take the Ribbon ID Sensor Board ASsembly from the printer.

Replacing the Card Feed Switch Assembly (830136)

Refer To Drawing 830131, Item 12.

TTR: NA

In the unlikely event of failure, this cable is not field serviceable. Please contact the FARGO Technical Support Group at (952) 941-0050 for assistance.

Replacing the LED Board Assembly (830133)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Sub-assembly of 830126, Item 13.

Refer To Drawing 830118-XX.

TTR: 15 minutes

Step	Procedure
1	Unplug the power cord from the printer.
2	Take off the Rear Pivot Cover.
3	Detach the Print Circuit Board from the chassis. Do not remove any wire connectors unless indicated.
4	Remove the Screw (130971) that holds the Lower Ribbon Sensor Assembly to the Rear Side Plate. Refer to Drawing 830126.
5	Disconnect the cable connector from J12, pins 1and 2 on the Print Circuit Board.
6	Remove the LED Board Assembly from the Bottom Sensor Bracket and the printer. See Drawing 830133 for specifications.

Replacing the Platen Roller (810261)

Refer To Drawing 830118-XX.

TTR: 15 minutes

Step	Procedure
1	Unplug the power cord from the printer.
2	Remove the Front Cover.
3	Take off the Rear Pivot Cover.
4	Detach the Print Circuit Board from the chassis. Do not remove any wire connectors unless indicated.
5	Stand at the front of the Chassis Assembly; remove the Retaining Ring (140048) from the Platen Roller Shaft.
6	Remove the Platen Card Drive Gear. Be sure to note that the wide part of the gear hub faces the Sideplate. Remember this when reinstalling it.
7	Take off the Washer Spring (130951). Be sure to note that the wave of the spring faces the Platen Card Drive Gear. Remember this when reinstalling it.
8	Stand at the rear of the Chassis Assembly; remove the Retaining Ring (140048) from the Platen Roller Shaft.
9	Remove the Right Roller Gear (760400). Be sure to note that the flat part on the gear hub faces away from the Sideplate. Remember this when reinstalling it.
10	Stand at the front of the Chassis Assembly; remove the two Screws (130971) that secure the Card Guide Assembly. The Card Guide Assembly does not need to be removed; allow it to “float” so the Platen Roller can be removed from the chassis.
11	Remove the two Drive Roller Bearings (760343) from the Platen Roller Shaft.
12	Guide the Platen Roller through the access opening in the front Sideplate and out of the printer.

Replacing the Card Input Roller (810262)

Refer To Drawing 830118-XX.

TTR: 15 minutes each roller.

Note: The following instructions are for the Card Input Roller near the center of the printer. Use appropriate instructions for removing the Left Card Input Roller.

Step	Procedure
1	Unplug the power cord from the printer.
2	Take off the Rear Pivot Cover.
3	Detach the Print Circuit Board from the chassis. Do not remove any wire connectors unless indicated.
4	Stand at the front of the Chassis Assembly; remove the item; remove the Retaining Ring (140048) from the Card Input Roller Shaft.
5	Take the Transport Roller Gear (810266) out of the printer. Be sure to note that the wide part of the gear hub faces the Sideplate. Remember this when reinstalling it.
6	Remove the Washer Spring (130951). Be sure to note that the wave of the spring faces the Transport Roller Gear. Remember this when reinstalling it.
7	Stand at the rear of the Chassis Assembly; remove the Retaining Ring (140048) from the Platen Roller Shaft; this is necessary for the removal of the Idler Gear.
8	Take the Right Roller Gear from the printer. Be sure to note that the flat area on the gear hub faces away from the Sideplate. Remember this when reinstalling it.
9	Remove the Retaining Ring (140063) from the Idler Pivot Post Shaft.
10	Take out the Idler Gear (760401). Be sure to note that the gear teeth of the center hub face away from the Chassis Assembly. Remember this when reinstalling it.
11	Remove the Retaining Ring (140062) from the Card Input Roller Shaft.
12	Take the two Drive Roller Bearings (7603433) from the Card Input Roller.
13	Guide the Shaft forward and out of the rear Sideplate.
14	Angle the Card Input Roller up.
15	Slide the Shaft out of the front Sideplate.
16	Take the Card Input Roller from the printer

Replacing the Left Card Input Roller

Step	Procedure
1	Unplug the power cord from the printer.
2	Take off the Rear Pivot Cover.
3	Detach the Print Circuit Board from the chassis. Do not remove any wire connectors unless indicated.
4	Stand at the front of the Chassis Assembly; remove the Retaining Ring (140048) from the Card Input Roller Shaft.
5	Remove the Transport Roller Gear.Be sure to note that the wide part of the gear hub faces the Sideplate. Remember this when reinstalling it.
6	Remove the Washer Spring (130951). Be sure to note that the wave of the spring faces out. Remember this when reinstalling it.
7	Stand at the rear of the Chassis Assembly; remove the Ribbon Drive Assembly.
8	Remove the Retaining Ring (140062) from the Card Input Roller Shaft.
9	Remove the two Drive Roller Bearings (760343) from the Card Input Roller.
10	Guide the Shaft forward and out of the rear Sideplate.
11	Angle the Card Input Roller up.
12	Slide the Shaft out of the front Sideplate.
13	Take the Card Input Roller out of the printer.

Replacing the Card Feed Roller (810304)

Refer To Drawing 830118-XX.

TTR: 15 minutes.

Step	Procedure
1	Unplug the power cord from the printer.
2	Take off the Rear Pivot Cover.
3	Detach the Print Circuit Board from the chassis. Do not remove any wire connectors unless indicated.
4	Stand at the front of the Chassis Assembly; remove the Retaining Ring (140062) from the Card Feed Roller Shaft.
5	Remove the Drive Roller Bearing (760343) from the front Sideplate.
6	Stand at the rear of the Chassis Assembly; remove the Retainer Clip (130950) from the Card Feed Roller Shaft. Refer to Drawing 830117-XX.
7	Slide the Card Feed Roller forward — away from the rear Sideplate. (**Note:** The Card Feed Shaft Gear and Drive Roller Bearing are attached at the rear Sideplate; they will be loose when the Card Feed Roller is removed. When replacing the Card Feed Roller, hold the Card Feed Shaft Gear in place so the notched end of the Shaft slides easily into the Card Feed Shaft Gear.)

Replacing the Magnetic Head Assembly (High-Coercivity: 83019012 or Low Coercivity: 83019012)

 **Caution:** This device is electrostatic sensitive. It may be damaged if exposed to static electrical discharges. (Discharges may be generated by various means, such as walking on a carpeted floor.) Be sure to observe all established Electro-Static Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. Always wear an appropriate personal grounding device, such as a wrist strap with integral resistor, connected to an ESD ground to avoid potential damage. At a minimum, make positive contact with the bare metal chassis of the printer with the hand before proceeding with the procedure.

Refer To Drawing SK1707.

TTR: 10 minutes

Step	Procedure
1	Unplug the power cord form the printer.
2	Turn the printer upside down.
3	Remove the two Screws attached to the Bottom Access Plate. Refer to Drawing 830171.
4	Take out the two Screws that secure the Magnetic Head in place.
5	Move the Magnetic Head out of position.
6	Set the two Magnetic Head Spacers aside for replacement.
7	Turn the printer upright.
8	Take off the Rear Pivot Cover.
9	Detach the Print Circuit Board fromthe baseplate. Do not remove any wire connectors unless indicated.
10	Disconnect the cable connector from J18 on the Print Circuit Board.
11	Place the printer on the input end.
12	Work the cable connector through the opening to the Access Plate area.
14	Remove the Magnetic Head Assembly from the printer.

Installing the New Magnetic Head Assembly

Step	Procedure
1	Position the new magnetic head in the Access Plate area.
2	Work the cable connector through the opening to the baseplate area.
3	Connect the cable connector at J18 on the Print Circuit Board.
4	Attach the Print Circuit Board to the baseplate.
5	Replace the Rear Pivot Cover.
6	Turn the printer upside down.
7	Position the two Magnetic Head Spacers if using 30 mil thick cards; they can be removed for 10 mil thick cards.
8	Remove the plastic cover from the Magnetic Head Assembly.
9	Position the Magnetic Head Assembly in place.
10	Secure it with the two Screws.

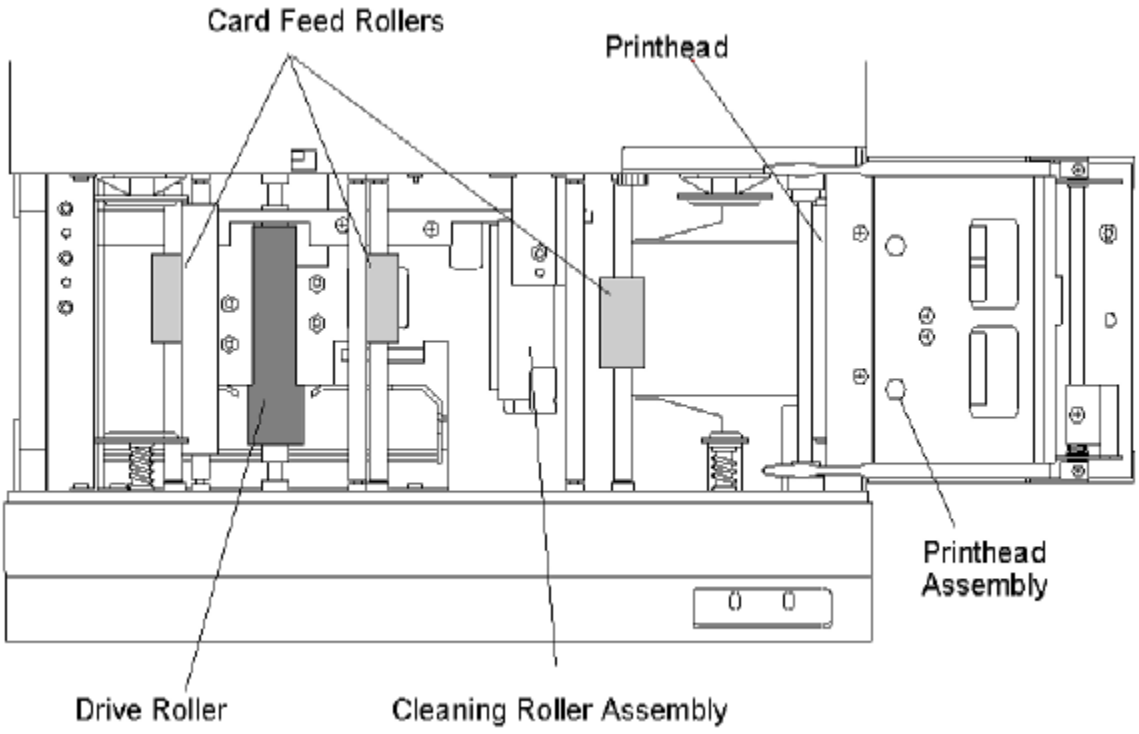
Section 7: Maintenance and Cleaning

Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger: 	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair Instructions, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these Instructions.
Caution: 	**This device is electrostatically sensitive. It may be damaged if exposed to static electricity discharges.** Information that raises potential electrostatic safety issues is indicated by a warning symbol (as shown to the below). • **To prevent equipment or media damage**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent equipment or media damage**, observe all established Electrostatic Discharge (ESD) Instructions while handling cables in or near the Circuit Board and Printhead Assemblies. • **To prevent equipment or media damage**, always wear an appropriate personal grounding device (e.g., a high quality wrist strap grounded to avoid potential damage). • **To prevent equipment or media damage**, always remove the Ribbon and Cards from the Printer before making any repairs, unless otherwise specified. • **To prevent equipment or media damage**, take jewelry off of fingers and hands, as well as thoroughly clean hands to remove oil and debris before working on the Printer.

Section 7: Maintenance and Cleaning (continued)

The Card Printer is built to require a minimum amount of maintenance. Nevertheless, there are a few procedures you can perform on a regular basis or as needed to ensure the best possible performance. Use the illustration below to locate the items discussed within this section.



Supplies Required

For the maintenance procedures outlined in this section, you will need the following items:

- Isopropyl alcohol
- Acetone
- Standard clear adhesive tape or masking tape
- Soft, lint-free cloth

Or, to make these maintenance procedures more convenient, a Printer Cleaning Kit is available from the authorized reseller. This optional kit includes the following:

- **Printhead Cleaning Pens** pre-moistened with 99.99% isopropyl alcohol for cleaning the Printer's Printhead.
- **Cleaning Cards** with an adhesive backing for automatically cleaning the Printer's gray card Feed Rollers and cleaning Rollers.
- **Cleaning Pads** pre-moistened with 99.99% isopropyl alcohol for cleaning the Printer's drive Roller and general inside area.

Step	Procedure
1	Unplug the Printer's main power cord before performing any type of maintenance procedure unless otherwise indicated. Also, never use a sharp tool or a metal object of any kind to clean the Printhead. You will damage the Printhead!
2	Watches, rings, bracelets and other jewelry can damage the Printhead if accidentally bumped against it. For best results, remove such items before touching any internal components of Printer.
3	Internal components of the Printer, such as the Printhead, may be damaged if exposed to static electrical discharges generated by various means, such as walking on a carpeted floor. To avoid potential damage, always wear an appropriate personal grounding device, such as a wrist strap (w/ integral resistor) connected to an ESD ground. Or, at a minimum, make positive contact with the bare metal chassis of the Printer with the hand prior to touching any internal electrical components.

Standard Printhead Cleaning

This procedure should be performed if you notice a streak on the card where color was not transferred. This procedure should also be performed during every Ribbon change or after every 250 prints in order to maintain consistent print quality.

Step	Procedure
1	Open the Top Cover of the Printer by gently grasping the front sides of the Cover and lifting upward. The Cover will tilt open from front-to-back.
2	Open the Printhead Assembly by gently pulling up on the assembly's Release Tab and lifting upward. Allow the assembly to swing completely open.
3	If you observe dust and/or other particles laying on the top surface of the Ribbon, manually roll it up into the take-up roll. Occasionally, dust may settle on the top surface of the Ribbon and cause print quality problems.
4	Use a Printhead Cleaning Pen from the Printer Cleaning Kit or a soft, lint-free cloth slightly moistened with isopropyl alcohol to wipe dust and other accumulated particles off the surface of the Printhead. If using a cloth, be extremely careful not to use too much alcohol. It must not be allowed to drip into the Printer!
5	Once the Printhead is completely dry, shut the Printhead Assembly and Top Cover. If a streak persists, perform the steps in Section III.

Expanded Printhead Cleaning

Perform if you have a streak on the printed output that can't be solved by the Standard Printhead Cleaning procedure. To maintain the Printer's high quality of printing, this procedure should also be performed approximately every 2,500 prints as part of the Printer's general maintenance program.

Step	Procedure
1	Open the Top Cover of the Printer by gently grasping the front sides of the Cover and lifting upward. (**Note:** The Cover will tilt open from front-to-back._
2	Open the Printhead Assembly by gently pulling up on the assembly's Release Tab and lifting upward. Allow the assembly to swing completely open.
3	Use a soft, lint-free cloth slightly moistened with acetone to wipe off the surface of the Printhead. Be extremely careful not to use too much acetone. It must not be allowed to drip into the Printer!  **Caution:** Acetone is a very powerful solvent. Do not apply acetone to any other area of the Printer, since it will destroy the finish of the paint, rubber and plastic.
4	Allow the Printhead to thoroughly dry before closing the Printhead Assembly and Top Cover. If a streak persists, contact the authorized reseller for further assistance.

Cleaning the Printer Case

The Printer has a durable casing that should retain its luster and appearance for many years. Clean it only with a soft cloth slightly moistened with water or a mild soap.

Do not use excess water or cleaning solvents of any kind. Never spray the cabinet with a cleaner. Rather, spray the cloth first, then wipe down the Printer.

Cleaning the Inside of the Printer

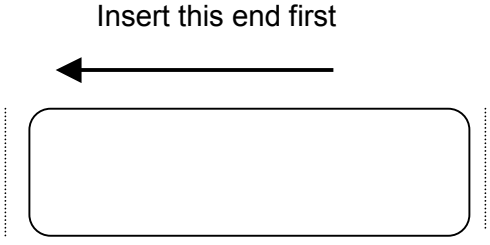
Step	Procedure
1	As you use the Printer, dust and other foreign particles may accumulate inside the Printer's case. (**Note:** These particles are attracted to the underside of the Ribbon by static produced during printing and can cause voids on the printed image. Periodically, use the following procedure to remove dust and other foreign particles:
2	Open the Top Cover of the Printer by gently grasping the front sides of the Cover and lifting upward. (**Note:** The Cover will tilt open from front-to-back.
3	Open the Printhead Assembly by gently pulling up on the assembly's Release Tab and lifting upward. Allow the assembly to swing completely open.
4	Remove the Ribbon from the Printer and set it on the ends of its Ribbon cores.
5	Use a Cleaning Pad from the Printer Cleaning Kit or a soft, lint-free cloth slightly moistened with isopropyl alcohol to wipe out all visible areas inside the Printer. Remove any debris that may be inside. Be extremely careful not to let any alcohol drip inside the Printer's case!
6	Once the cleaned areas are completely dry and free of foreign debris, re-install the Ribbon and close the Printhead Assembly and Top Cover.

Cleaning the Card Feed Rollers

To assure consistent Printer operation, all of the gray card Feed Rollers within the Printer should be cleaned during every Ribbon change (every 250 prints) or if the Rollers are noticeably dirty.

To clean these Rollers, use the special adhesive-backed Cleaning Cards from the Printer Cleaning Kit. Refer to the following steps to run a Cleaning Card through the Printer:

Step	Procedure
1	Remove the Ribbon and cards from the Printer. (**Note:** The Cleaning Roller Assembly can remain within the Printer during this cleaning process.)
2	With the Printer power ON, open the Top Cover, but leave the Printhead Assembly latched shut.
3	Remove the Cleaning Card's adhesive backing paper.
4	Press and hold the **On/Cancel** button down. You will hear the Feed Rollers begin to turn.
5	While holding down the **On/Cancel** button, insert the Cleaning Card into the Card Input Hopper and manually push it into the Printer until you feel the Printer's middle Feed Roller grab and begin feeding the card. When inserting the cleaning card, be sure that the shortest non-adhesive end of the Cleaning Card enters the Printer first and that the side of the cleaning card with the adhesive backing removed (the sticky side) is facing upward. If the card is inserted with the sticky side facing downward, it will stick to the Card Input Tray and will not feed.
6	Keep pressing the **On/Cancel** button until the Cleaning Card has fed completely through the Printer. Repeat this cleaning procedure if necessary. After the cleaning procedure is finished, re-install Ribbon and cards and turn the Printer power OFF and ON to reset the Printer. (**Note:** Once you have completed the above cleaning procedure, you should also clean the Printer's Drive Roller according to the steps in the following section.)



Cleaning the Drive Roller

The Drive Roller should be cleaned during every Ribbon change or after every 250 prints. This helps to prevent jams and maintain uninterrupted service. Also perform this procedure if the Roller is noticeably dirty.

Use the following steps to clean the Roller:

Step	Procedure
1	Leave the power ON and open the Printer's Top Cover by gently grasping the front sides of the Cover and lifting upward. (**Note:** The Cover will tilt open from front-to-back.)
2	a. Open the Printhead Assembly by gently pulling up on the assembly's Release Tab and lifting upward. b. Allow the assembly to swing completely open.
3	Remove the Ribbon and locate the Drive Roller.
4	a. Use a Cleaning Pad from the Printer Cleaning Kit or a soft, lint-free cloth slightly moistened with isopropyl alcohol to wipe the Roller clean. b. Press the **On/Cancel** and on-line buttons to move the Roller back and forth while cleaning.
5	After the Roller is clean and completely dry, re-install the Ribbon and close the Printhead Assembly and Top Cover.

Maintaining the Cleaning Rollers

The Cleaning Rollers remove dust particles from a blank card as it feeds into the Printer. Cleaning these Rollers will help prevent contaminated cards from passing beneath the Printhead, thus extending the Printhead's life and allowing for higher quality output. The Cleaning Rollers should be cleaned during every Ribbon change or after every 250 prints.

Use the following steps to clean the Rollers:

Step	Procedure
1	Open the Top Cover of the Printer by gently grasping the front sides of the Cover and lifting upward. (**Note:** The Cover will tilt open from front-to-back.)
2	a. Open the Printhead Assembly by gently pulling up on the assembly's Release Tab and lifting upward. b. Allow the assembly to swing completely open.
3	Remove the Ribbon.
4	Locate the assembly labeled Cleaning Roller.
5	a. Reach down and grasp the end of the Cleaning Roller Assembly which is closest to the front of the Printer. b. Lift this end first and gently maneuver the assembly out of the Printer.
6	a. Once the Cleaning Roller Assembly is removed, clean the Rollers using one of the adhesive-backed Cleaning Cards from the Printer Cleaning Kit. b. With the card's adhesive backing paper removed, slide the card between the Rollers until all dust particles are removed. c. If you do not have a Cleaning Card, use a piece of standard clear adhesive tape. Use the sticky side of the tape to lift dust from the Rollers.
7	Once all debris is removed from the Rollers, place the Roller assembly back into the Printer, replace the Ribbon and close the Printer's Printhead Assembly and Top Cover.

Section 8: Packing the C10/M10 Card Printer

The purpose of this section to provide the User with a specific packing procedure for the C10/M10 Card Printer.

Follow this instruction to pack the Card Printer for transport.

Step	Procedure
1	Clean the inside of the Printer with deionized air. Wipe it down with a lint-free cloth.
2	Clean the Printhead with a Printhead pen.
3	Pack the Printer in the original carton and packing materials.
4	Be sure to enclose any necessary paperwork, test cards, etc.

Section 9: Board Level Diagnostics

The purpose of this section to provide the User with specific Board Level Diagnostic procedures for Board Errors and Sensor Testing for the C10/M10 Card Printer.

Sensor Testing

Step	Procedure
1	Check the voltage to determine if a Sensor is working.
2	a. Test the voltage of each Sensor using ground (GRD = Chassis) to the correct pin on each connector. See the Sensor Location and Voltages table on the next page. b. Block a Slot Sensor with a card. c. Cover a reflective Sensor with a card.

Reviewing the Motor Voltages (when active)

Use this table as a reference tool for Board Level Diagnostics.

Motor	Location	Pin	VDC
Print Drive Stepper	J22	4	5
Print Headlift	J27	1	17.0
Card Feed	J28	4	20
Ribbon Drive	J25	2	5

Section 10: FARGO Technical Support

The purpose of this section to provide the User with an efficient, step-by-step procedure to be used when contacting Fargo Technical Support as needed for the C10/M10 Card Printer.

Contacting FARGO Technical Support

Step	Procedure
1	Read the suggested Sections of the service manual in order to troubleshoot a C10/M10 Card Printer. As needed, contact the Fargo Technical Support Group by phone at (952) 941-0050 or by fax at (952) 941-1852 for additional, technical assistance. **OR** Contact Fargo Technical Support via the Web: http://www.fargo.com/tech_support/contact_tech_support.asp
2	Position a phone near the Printer and Computer so Fargo technicians can help to help troubleshoot the Printer(s).
3	Please have a self-test and a sample card ready when calling Fargo Technical Support.

Section 11: Reviewing C10 and M10 Spare Parts List

C10 and M10 ID Card Printer
Recommended Spare Parts List
Effective Date: April 2004
For current pricing see http://www.fargopartner.com/support_services/

Glossary of Terms

Term	Definition
24-bit color	A color depth for an image that uses 8 bits for each color (red, blue, green) combining the possible 256 shades to provide a color depth of 16.7 million colors.
AC - Alternating Current	An electrical current that reverses its direction at regular intervals (typically 50 - 60 times a second).
Access Card	The card for the SmartGuard security system. A cared with embedded electronics that can be removed from the Printer, locking the Printer and preventing unauthorized use.
Adhesion	The firm attachment of a material to the card surface, confirmed by using the Tape Test -pulling an applied piece of adhesive tape (Scotch 600 or equivelent) off the card at 1 sec/in to see if any material is pulled off by the tape.
Algebraic	A type of color matching that takes the colors value of pixels and applies them to an algebraic equation to adjust the levels of hue, saturation and brightness.
ANSI (American National Standards Institute)	The United States Representative to ISO, providing standardization for U.S. Manufactures prior, or in addition, to acceptance by ISO.
AS400	An IBM operating system running on a main frame. DTC500 Fargo Printers are built with fonts saved in the Printer memory so users of AS400 can write escape codes and print from the Printer.
ASCII (American Standard Code for Information Interchange)	A standard for processing information in computer processors. An 8-bit character set of 255 decimal numbers, each assigned to numbers, letters, punctuation and special characters.
AT	Refers to an IBM standard in early computing with regard to the chipset and function of the Parallel Port, set up in the BIOS.
B (Black)	Black Dye-Sublimation panels are distinguished from the black panel using resin by the use of B for dye-sublimation black. K denotes resin black.

Continued on the next page

Reviewing the Glossary of Terms (continued)

Term	Definition
Barcodes	A series of alternating black and white stripes, of varying widths (each character denoted by a set number and width of black stripes) that allows characters to be optically read by a computer.
Batch print	A file sent down from the computer that contains commands to print a number of cards, sequentially.
Battery Back-up	A power supply that can keep AC electronic equipment running for a short time when power is interrupted, allowing enough time for the user to save data and close the machine properly.
Bi-directional	A communication standard that allows two-way data transfer between PC and Printer.
BIOS (Basic Input/Output System)	The part of the operating system in a computer that handles communication between the PC mainboard and its peripherals. Typically residing in chip-based, non-volatile memory.
Bit	An abbreviation for binary digital. Each bit is an element of information that can have two states: off and on.
Bit map	A graphic produced by an array of pixel elements with the color hue, brightness and saturation information stored in bits. The more bits, the more values and thus the greater variety. 1 bit color is black and white, 8-bit color produces 256 shades of gray and 24-bit color can produce 16.7 million colors.
Board	A term used for the circuit board, a hard Mylar plate made of many layers, that holds the electronic circuit elements and wire traces.
Boot-up	A series of operations that the Printer runs through when power is first applied including a series of initializing, status testing and a diagnostics program to ensure a ready state.
Buffer	A block of memory, in the Printer or PC, that holds print files until the processor is ready to print them.
Cable	A set of conductors wrapped together and often concealed within insulation, used for signal transfer from one device to another, with connectors on either end that allows the cable to be removed.

Continued on the next page

Reviewing the Glossary of Terms (continued)

Term	Definition
Cache	A type of memory buffer to store data temporarily, used to hold information that is most often exchanged between contRoller and peripheral, to expedite data transfer.
Calibrating	A procedure to adjust an electro-mechanical device so that it operates within established parameters.
Cleaning Roller	High tack Rollers positioned just after the input Hopper to lift debris off the card as it rolls over it. A clean card surface improves print quality.
CD (Compact Disc)	A 4.75-inch (12 cm) optical disk that stores data, written too and read from using a laser.
DMA (Direct Memory Access)	Channels designated within the Windows operating environment that are used for dedicated high-speed communication between the PC and the Printer port.
Centronics	A parallel communications interface that has become the standard for connections to Printers, designed by the Centronics Corp.
Coercivity	The property of a Magnetic Stripe that indicates the amount of force needed before magnetic saturation, measured in Oersted (Oe).
Color matching	The process of adjusting color hue, saturation and brightness, to duplicate a desired color. An algorithm within the Driver, which adjusts the color balance and provides output with the desired color, automates this process.
Compressed air	Air stored in a tank or produced by an aerosol can, delivered by through nozzle at a high speed. Used in the Printer to blow out debris.
Contrast	The degree of difference in luminance of two areas.
Control panel	The panel on the Printer from which the user can control Printer functions. The Printer is usually composed of the control buttons and an LED or LCD display.

Continued on the next page

Reviewing the Glossary of Terms (continued)

Term	Definition
CR-79	A card dimension standard of 2.0625" L X 3.3125" W (+/-0.002" W, +/-0.005" L) or 52.400 X 84.150 mm.
CR-80	A card dimension standard of 2.125" X 3.370" (+/-0.002" W, +/-0.005" L) or 53.975 X 85.598 mm.
CR-90	A card dimension standard of 2.375" X 3.625" (+/-0.002" W, +/-0.005" L) or 60.325 X 92.075 mm.
CR-100	A card dimension standard of 2.625" X 3.875" (+/-0.002" W, +/-0.005" L) or 66.675 X 98.425 mm.
Cursor	The marker in the LCD Display Window that indicates the active selection.
Darkness	A reference to color saturation.
DB-9	A 9 pin, D-shaped connector, typically used in serial port interfaces.
DC Motor	A Motor that works on DC with continuous motion.
DC (Direct Current)	Electronic flow that is unidirectional, flowing from the positive (+) to negative (-) of a power source.
Default	A setting or parameter that comes preset from the factory in Driver or firmware. Performance parameters may be customized in the Driver, but can be reset to the factory values usually through the push of the default button. The default values for the firmware are usually denoted on a label attached to the Printer.
Defrag	Abbreviation for defragmenting. The process of reformatting data on a hard drive so that it uses space more efficiently.
DIP switches (Dual In-line Package Switches)	A small array of mechanical switches installed on the board that can be configured to change Printer operations including providing a variety of self-tests.

Continued on the next page

Reviewing the Glossary of Terms (continued)

Term	Definition
Direct-to-Card (DTC) Printing	The Direct-to-Card printing process prints digital images directly onto any plastic card with a smooth, clean, glossy PVC surface.
Dither	A system of distributing dots to control the hue, brightness and/or saturation. In monochrome printing, this controls the brightness. In color printing, dithering can supply a larger color gamut than non-dithering. In the Driver, dither modes can be selected to provide better image quality depending on the type of image to be printed.
Dongle	A peripheral that attaches to a port to act as a key for an installed application. The PC is able to run that application only when the dongle is installed. Typically, it works as a pass-through device and is connected in serial to the parallel cable.
Dot	The smallest unit of an image that the Printer is able to produce. The smaller the dot, see dot pitch, the sharper the image.
Dot pitch	A measurement of image sharpness denoting the width of the dots that makes up a pixel. The smaller the pitch, the sharper the image.
Download	The transfer of a data file from one device to the other over a network or cable, typically from the Internet to a PC.
DPI (Dot Per Inch)	A measurement of the Printer resolution indicating how many dots a Printer can produce in a linear inch.
DRAM (Dynamic Random Access Memory)	A microchip based volatile memory storage device. The Printer uses this to buffer a print job, transferred from the PC, until the Printer contRoller is able to process the packet.
Driver	Software utility installed in Windows, that interfaces an application to rasterize image data and include command codes so the Printer can process the file.
Duplex Printing	Printing on the front and the back of the card.

Continued on the next page

Reviewing the Glossary of Terms (continued)

Term	Definition
Dwell Time	The speed at which the card moves across the lam Roller, measured in seconds/inch (sec/in). This may be adjusted in the Driver to ensure adhesion and card flatness.
Dye Migration	The diffusion of dye out of the card surface and into another receptive surface, such as a vinyl pouch card holder, resulting in a faded image.
Dye-Sublimation	Also called dye diffusion/thermal transfer, it is the process of heating a dye suspended in a cellulous substrate until the dye can flow, diffusing into the dye receptive surface of the card or InTM. This produces the image in the surface of the card.
E-card	An abbreviation for electronic card. A generic term used to reference any card with built-in electronic devices such as smart cards or prox cards.
E-card Docking Station	The device in the Printer that accepts smart cards with an ISO smart card contact station. This allows the user to write to the smart card chip with a standard RS-232 interface in the back of the Printer or with the optional built-in encoder.
Edge-to-Edge	Refers to the maximum printable area on a card resulting in printed cards with virtually no border.
ECP Mode (Enhanced Capabilities Port Mode)	A type of Parallel Port mode, developed by Microsoft, to increase the port throughput and improve performance.
EE Memory	An abbreviation for EEPROM.
EEPROM (Electrically Erasable Programmable Read Only Memory)	A microchip based non-volatile memory storage device that can be rewritten in the field. The chip can hold new values as the Printer adapts its operational parameters.
Encoder (smart card)	An electro-mechanical interface to transfer data from the PC to a chip or Magnetic Stripe built into the card.

Continued on the next page

Reviewing the Glossary of Terms (continued)

Term	Definition
Encoder (wheel)	An electromechanical device, attached to a shaft that detects the change in rotational position, incremented to count ticks per revolution. The Printer's encoder wheel both detects motion and measures the amount of rotation in the movement of the ribbon.
Engine	A generic term for a collection of systems and mechanisms that is dedicated to executing a specific function. A Printer that also laminates would have both a print engine and a engine.
EOF (End Of Form)	The trailing edge of the card, detected to indicate when the Printer should stop printing.
EPP (Enhanced Parallel Port)	A type of Parallel Port mode, developed by Intel, to increase the port throughput.
EPROM (Electronically Programmable Read Only Memory)	A microchip based non-volatile memory storage device that cannot be rewritten in the field. Firmware for many Fargo Printers is stored on these chips and so a change of the chip is necessary for an upgrade.
Escape sequence	A string or control character that indicates to the processor that what follows is a command and not data.
ESD (ElectroStatic Discharge)	The discharge of static electricity (high voltage, low current) that can damage electronic devices.
Ethernet	A system of networking a series of computers for the sharing of data or peripherals.
Film	A thin flexible transparent sheet used to carry dye-impregnated material or resin to be transferred to the card.
Firmware	The instruction set, stored in chip memory, inside the Printer that controls functional and operational data. Some models require a chip change for updates; some firmware can be changed by reprogramming from the PC.

Continued on the next page

Reviewing the Glossary of Terms (continued)

Term	Definition
Flash Memory	A microchip based non-volatile memory device that holds its data when power is removed. This allows for field reprogramming of the Printer commands, such as Printer firmware upgrades, without the necessity of changing chips.
Font	A character set similar in style and form. Fonts can be graphical or mathematical constructs, represented by a series of dots or an assembly of curves and lines.
FPGA (Field Programmable Gate Array)	A microchip with configurable logic circuits installed that is programmed to act as the Printer's central processor.
Full bleed	Printing that covers the entire card surface.
Gamma	The degree of contrast of an image or the display of a monitor determined by the slope of a characteristic curve relating optical density to relative log exposure.
Glossy / Matte	A smooth polished surface in comparison to a rougher matte surface. Fargo matte cards have a surface index (Ra) of approximately 65 micro inches while glossy have a Ra = 3.
Glossy PVC	A card made of PVC with a smooth polished surface (Surface roughness of approximately 0 - 10 micro-inches). This is required for direct to card dye-sublimation printing.
Graphical Device Interface (GDI)	A Windows standard for protocol between Drivers and applications and the Windows interface. An application uses a Driver to rasterize the data in the format necessary for the Printer but also for the Windows interface to execute the print commands.
Gray Scale	A graduation through the various brightness levels from white to black.
Halftoning	A process in monochrome printing that simulates continuous tone by using changes to the distribution of single dots. Increasing the number of dots in a given area increases the darkness even though the individual dots stay the same size.

Continued on the next page

Reviewing the Glossary of Terms (continued)

Term	Definition
Hard Drive	A high capacity storage device in a PC consisting of non-removable magnetically encodable platters.
Hardware	Physical components of a system such as the Printer, the PC, the power supply.
HDP (High Definition Printing™)	The High-Definition Printing process prints full-color images onto clear HDP transfer film (InTM). The HDP film is then fused to the card through heat and pressure via a heated Roller. The printhead is capable of 256 shades with a sharper print and better color match.
Head	Abbreviation for printhead.
Heat sink	A device used to dissipate heat into the ambient.
Heat Seal	A resinous film transferred by the printhead onto the back of an HDP intermediate transfer film to facilitate adhesion.
HiCo (High Coercivity)	The coercivity value of magnetic media between 2500 - 4000 Oe (ISO 7811-6). Fargo's High Coercivity encodes at 2750 Oe.
HTML (HyperText Markup Language)	A standard protocol used to format text files for use in a browser or on the Internet.
HTTP (HyperText Transfer Protocol)	A standard protocol by which computers can transfer data, compatible through multiple platforms.
IC (Integrated Circuit)	An electronic device that contains many individual circuits interconnected and placed within a discrete package.
ID (Identification)	An abbreviation for identification.

Continued on the next page

Reviewing the Glossary of Terms (continued)

Term	Definition
IEEE 1284 (Institute of Electrical and Electronics Engineers 1284)	A standard method of signaling for a bi-directional parallel interface on personal computers. To ensure proper Printer communications and image output, Fargo recommends a parallel interface cable that complies with this specification.
Image	A collection of pictures or graphical elements that compose the visual features on a card. Also refers to the digital representation.
Input	Any data or material being transferred to the Printer.
Input Hopper	The area of the Printer that stores the blank cards, ready to print.
Intermediate Transfer Media (InTM)	A thin flexible material coated with a resin material into which the dye is transferred from the ribbon by the printhead. The film is then transferred to the card surface by the hot Roller.
ISO	For the Greek, "iso", meaning same. Used to represent data from the International Organization for Standardization.
JIS II (Japanese Industrial Standard)	The standard for encoding to a Magnetic Stripe provided by the Japan Standards Association. The single Track is as wide as ISO Tracks 1 and 2 combined and in the same approximate location as those Tracks but on the front of the card. The coercivity level is 600 Oe.
K Panel	An area of a multicolored ribbon (e.g., YMCK) that contains black resin for transfer to the card surface. Also used in reference to the application of preference to items printed on the card - those using the black panel in lieu of a process (YMC) black.
Lamination	The application of a film or resinous substance, fused by heat and pressure, to the surface of a card.
LAN (Local Area Network)	An array of several computers connected through a series of data transfer cables for the sharing of data and peripherals.

Continued on the next page

Reviewing the Glossary of Terms (continued)

Term	Definition
Landscape	A document layout that is viewed with the document's long axis in a horizontal orientation.
LCD (Liquid Crystal Display)	A device that contains a liquid crystal between two pieces of polarized film through which reflected or ambient light can pass. When a current is applied, the liquid's polarity changes and blocks the passage of the light resulting in an opaque area of the display. The areas are arrayed to form characters.
LED (Light Emitting Diode)	A semiconductor that emits light when a current is applied.
Media	A generic reference to anything onto which the Printer can transfer an image including cards, ribbon and film.
LoCo (Low Coercivity)	The coercivity value of magnetic media between 250 - 600 Oe (ISO 7811-2). Fargo's Low Coercivity encodes at 300 Oe.
LPT Port (Line Printer Port)	The system abbreviation for a PC's parallel Printer port.
Mag encoding	The process of orienting successive magnetic bits to produce a serial data string.
Magnetic Stripe	An area of the card with an applied or impregnated ferrous material that may hold encoded data through a series of prescribed polarity changes.
Mag Track	An area of a magnetic strip running the length of the card, with a given width and position, constitutes a Track. This is the area dedicated to one data string, restricted to specific rules of format. ISO Standards specify three magnetic Tracks on the back of a card. The JIS standard specifies one Track on the front.
Mag Verify	A process to confirm proper Magnetic Encoding. After encoding, the information is read off back and compared to the intended string.

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Reviewing the Glossary of Terms (continued)

Term	Definition
MB (Megabyte)	A unit of storage that equals 1,048,576 bytes.
Memory	A generic term for any device that stores digital information using magnetic media or digital chip storage device.
Menu	A descriptive list of headings above nested functions that aid navigation to a specific operation. These are found in computer applications, with the heading at the top of a subset of like functions. They are also on the Printer LCD control panel.
Monochrome	An image composed of a single color.
Network	A series of computers connected by data transfer cable for communication and sharing of functions and peripherals.
Oersted (Oe)	The unit of magnetic field strength named after Dutch scientist Hans Christian Oersted who found the science of electromagnetism.
Offset	The prescribed distance between a reference point and the target point. The offset in card printing may refer to the position of the image relative to the leading edge or the distance of the start of Magnetic Encoding from the leading edge of the card.
O-Ring	A rubber ring used as a belt in several media driving applications.
OS (Operating System)	The instructions installed on the computer hard drive that run the computer's operations and applications. The Driver used for any given OS will differ from other platforms. The correct version Driver must be loaded for the Printer to interface with the OS and the application to print.
Output	Any product of the Printer including card image, encoded data and lamination.
Output Hopper	The portion of the Printer that accepts the completed cards.
Overlay	A resin-like substance that is transferred by the printhead to the card surface over a printed dye image to prevent image fading, increase abrasion durability and prevent dye migration.

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Reviewing the Glossary of Terms (continued)

Term	Definition
Oversized Cards	Oversized cards are used for more efficient visual identification and are available in many non-standard sizes. The most popular sizes are CR-90 (3.63" x 2.37"/92mm x 60mm) and CR-100 (3.88" x 2.63"/98.5mm x 67mm).
Overlaminate	Protective clear or holographic material to increase security and durability applied over the printed surface with a hot Roller.
Parallel	A method of data transfer in which serial data is divided into sections and sent simultaneously down parallel wires to speed transfer rate.
Parallel Port	A communication socket on a device that allows for parallel data transfer.
PC (Personal Computer)	A stand-alone, programmable, electronic device that can store, retrieve and process data consisting of a CPU, mouse, keyboard and monitor.
PCB (Printed Circuit Board)	A solid, multi-layered plate on which electronic elements are attached, either through the board or on the surface.
Peel	The removal of a film or ribbon from a card surface (at a perpendicular angle) to ensure proper transfer, then separation, from the card surface.
Peel-Off	A bar on the section that holds the film at the correct position and provides proper peel angle.
Peripheral	Any device that is attached externally to a PC. These often share the same data cable or port as a Printer and may be the source of communication problem.

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Reviewing the Glossary of Terms (continued)

Term	Definition
Pinch Roller	A free spinning (non-driven) Roller that presses the card against the drive Roller, on the opposite side, to ensure an adequate normal force for proper traction.
Pixel	Short for picture element. The smallest element of a graphic.
Platen	The hard rubber Roller that drives the media through the Printer, providing support to the backside of the media during printing or laminating.
PET	Abbreviation for polyester terephthalate, often called polyester. Sheets of PET are laminated with sheets of PVC to produce thermal acceptance composite cards.
Port	A communication interface, serial or parallel, used for the transference of data.
PolyGuard Overlaminate	A 1-mil or .6-mil thick polyester material that enhances card security and durability applied over the printed surface with a hot Roller. Available as clear or with embedded holographic-type security images.
Portrait	A document layout that is viewed with the document's long axis in a vertical orientation.
Potentiometer	An electronic resistor with a variable resistance value that can be mechanically set.
Print Driver	A software utility that serves as an interface between the Printer and the Windows GDI (Graphical Device Interface), making the Printer's functions available through the software application. It also provides the format information for the rasterizing of the print file including any necessary escape or function commands.
Print Job	A file of one or more cards for the Printer to print, including image data and Printer functions, transmitted through the parallel interface and at times stored temporarily in the print buffer and spooler.
Print Server	A device used to connect and control a Printer on a network.

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Reviewing the Glossary of Terms (continued)

Term	Definition
Printhead	The device on a Printer that produces the image on the media.
PVC	Abbreviation for polyvinyl chloride, often called vinyl. PVC is the component of the 0.002" thick clear, dye receptive film on the surface of the identification card and is the primary component of the identification card cores.
Queue	A sequence of files or sets of data, awaiting transmission or processing.
Proximity (“Prox”) Card	Proximity cards allow access and Tracking utilizing contactless technology, usually by communicating through a built-in antenna.
Prox Card Encoder	The Fargo prox card encoder uses an HID ProxPoint® Plus reader mounted on the e-card docking station inside the Printer/encoder. The ProxPoint is a "read only" device producing a Wiegand signal that is converted to RS-232 using a Cypress Computer Systems CVT-2232. Application programs can read information from HID prox cards via a RS-232 signal through a dedicated DB-9 port on the outside of the Printer labeled "Prox."
RAM (Random Access Memory)	A storage device for digital information to be held temporarily, to facilitate processing.
Rasterize	The process of converting the elements of a graphic into a bitmap to be printed.
Reboot	Cycling the power to the Printer so that it resets and reinitializes.
Registration	The quality of the alignment of the separate primary-color images: YMCK.
Resident Font	A set of characters loaded into the Printer memory that can be programmed to print those characters on the card without rasterizing the image.
Resin	A semi-solid material.

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Reviewing the Glossary of Terms (continued)

Term	Definition
Resolution	The number of individual pixels in a graphic, taken over a given length, used to indicate the sharpness of the picture and the level of detail. The number of elements in the printhead determines Fargo Printer resolution.
RFI (Radio Frequency Interference)	Electromagnetic waves radiated by poorly shielded cables or electronic devices that interferes with the operation or data transfer of another device.
RFID (Radio Frequency Identification)	Indicates a way of transmitting information via radio frequency. Data is sent from an RFID transceiver to an RFID tag that is embedded in a Resin Ribbon.
RGB (Red/Green/Blue)	The three primary colors of the luminance, or additive, model. Combinations of these three colors can produce practically all the colors of the spectrum that humans can detect. Computer monitors operate on an RGB model.
Ribbon	The dye impregnated film that is used for color printing.
Ribbon cable	Parallel wires held flat in a row by plastic insulation.
RibbonTraq	A Fargo Electronics method of placing bar code-like marks on the transition area between color panels. These marks are arranged for detection by a reflective Sensor array for the identification of ribbon type and the ribbon position.
RMA number (Return Merchandise Authorization number)	A number, acquired from Fargo Support, which authorizes the return of merchandise for repair or credit.
Roller	Elements of the Printer used for the transport of media consisting of a rotating steel shaft (for ribbon) or a rotating steel shaft with a rubber cylinder installed at the shaft midpoint (for moving cards).

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Reviewing the Glossary of Terms (continued)

Term	Definition
RS-232	An interface standard, established in 1969 by the Electronic Industries Association, regarding the connecting of computer peripherals.
Saturation	A measure of the degree of color, from gray, with the same brightness.
Self-test	A pre-determined print file used to confirm Printer operation typically sent from the Driver or stored in the Printer's memory.
Sensor	An electro-mechanical/electro-optical device used to indicate a change in state in the Printer such as when a card reaches a certain location.
Serial communications	The transfer of data, one bit at a time and in sequential order, using a single wire.
Serial interface	A sub D 9 pin input/output port on the Printer, used for serial communication with the PC for AS400 operating systems or for e card encoding.
SIMM (Single In-Line Memory Module)	An array of memory chips, attached to a printed circuit board that installs in a slot on the main board.
Simplex	Single-sided printing.
SmartGuard	An application from Fargo Electronics that allows users to prevent access to the Printer through the use of a personally encoded smart card.
SmartGuard™	SmartGuard is a Printer security option that uses a custom access card and a built-in reader to restrict Printer access. Only a valid access card can enable the Printer to print cards.
SmartShield™	This option allows the Printer to print custom, security images on the card that reflect under a black or UV light source.
Smart Card	Smart cards have an embedded computer circuit that contains either a memory chip or a microprocessor chip. There are several types of smart cards: Memory, Contact, Contactless, Hybrid (Twin), Combi (Dual Interface), Proximity and Vicinity.

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Reviewing the Glossary of Terms (continued)

Term	Definition
Software	Instructions saved in computer memory that directs the computer to perform certain tasks and functions.
Spooler	A computer application that allows the spooling of print jobs.
Spooling	Rather than moving a print job directly to the Printer, the job is written to the disk so that the user can access the application faster while Windows takes care of printing in the background.
SS (Start Sentinel)	The character denoting the end of a magnetic data string.
Stacker	The device that moves the finished cards onto the output column, ordering them First In, First Out.
Stepper Motor	A Motor whose shaft turns in discrete steps, rather than continuously.
String	A sequence of characters that form a line of data.
Surface mount	A method of mounting circuit elements onto the surface of a circuit board, attached at solder pads, rather than through holes in the board.
Surge Protector	An electronic device, placed in serial to the Printer's power supply, that prevents damage to the Printer from electronic surges and electrical current that is outside of the normal parameters.
Switch box	An electromechanical device to which a user may connect several peripheral devices to the Parallel Port simultaneously, yet using the selector switch to designate the active port.
TAC	Thermal Acceptance Composite cards. Card stock produced by laminating sheets of PVC with sheets of PET for better thermal distortion resistance. Ultra III cards.
Temp file	A temporary file, generated automatically by Windows, to store the information for an active document. Windows should delete these files when the application is closed.

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Reviewing the Glossary of Terms (continued)

Term	Definition
Test-print	A file stored in or generated through windows that is sent to the Printer to test basic functionality.
Thermistor	An electronic resistor on the printhead with a resistance value that varies in proportion to the heat to which it is exposed.
Thermocouple	A device for measuring temperature using a junction of two wires of dissimilar metals that produce a voltage when heated that varies proportionally with the temperature.
Thin Film Overlaminate	A 0.25-mil thick resin material that enhances card security and durability applied over the printed surface with a hot Roller. Available as clear or with embedded holographic-type security images.
Through-hole	A method of mounting circuit elements with the leads passing through holes in the circuit board and soldered on the opposite side.
Timeout	An interruption of a print job that occurs when a function is not completed in the time allotted by the operating system.
TOF (Top of Form)	The leading edge of the card, as it travels through the Printer.
Track	The area on a mag stripe designated to contain the magnetic data string.
Troubleshooting	The process of investigating and determining the cause of a problem.
TrueType (TT)	A font format that produces each character using a mathematical equation, rather than a graphical representation, resulting in a much sharper, cleaner image.
UltraCard	The Fargo brand of card stock recommended for use in Fargo Printers, with the necessary glossy surface and composed of PVC.
UltraCard III	The Fargo brand of card stock, recommended for use in Fargo Printers that laminate, with the necessary glossy surface and composed of PVC and PET to prevent heat distortion.

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Reviewing the Glossary of Terms (continued)

Term	Definition
Update	The process of installing a new revision of software or firmware to implement new changes to the Printer's command codes and procedures.
UPS (Un-interruptible Power Supply)	An AC power supply, typically powered by batteries, which provides temporary power to the PC or Printer during an interruption of the supply voltage.
USB (Universal Serial Bus)	A 1.5M/sec (12Mbit/sec) serial communication interface that can support 127 separate devices consisting of 4 wires: power, ground, data in and data out.
Virtual Memory	A technique used by Windows when chip memory is exhausted, in which data is written to the hard to hold data temporarily and support Window's operations.
Wrinkle	The appearance in the card image of wavy or arched lines, either colored or clear, caused by improper film or ribbon tension.
Write Direct to Port	UI function for specific, older operating systems where it is necessary to bypass the layers of the operating system in order to connect directly to the Printer port. Do not use this option for newer operating systems because it will disable the Printer Management function.
YMC	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M) and Cyan (C).
YMCK	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C) and Black (K).
YMCKH	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K) and Heat Seal (H).

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Reviewing the Glossary of Terms (continued)

Term	Definition
YMCKK	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K), Black (K) (the second K is for backside, black only printing).
YMCKO	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K) and Overlay (O).
YMCKOK	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K), Overlay (O) and Black (K) (used for backside, black only printing).

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