AMT Datasouth

DOCUMAX 3300 SERIES

User's Guide

Part No. 104431 Rev. G

Documax 3300 Series
Impact Printer

User's Guide

Document No. 104431 Revision G

AMT Datasouth Corp.

www.amtdatasouth.com

Preface

Thank you for selecting the Documax printer. There are four standard models available. Some sections of this manual are not applicable to all models. The models are:

- Single Tractor V-Throat
- Single Tractor with Top Pinch Rollers
- Dual Tractor with Top Pinch Rollers
- Dual Path, Tractor and Friction Feed (for Cut Sheet) with Top Pinch Rollers

Some of the procedures in this guide contain special notices that highlight important information:

NOTES Indicate information that you should know to help your printer run properly and efficiently.

CAUTIONS Indicate guidelines that, if not followed, can cause damage to equipment.

WARNINGS Indicate a situation where there may be a danger to yourself.

The use of the terms *right* and *left* assume that you are looking at the front of the printer.

Compliance

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

WARNING

CHANGES OR MODIFICATIONS TO THIS UNIT NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE

When connecting the printer to a host computer system, always use shielded interface cables. The use of non-shielded interface cables is a violation of the FCC emissions limits for a Class A computing device. Do not leave unterminated interface cables connected to the printer.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Cet appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le Brouillage Radioélectrique édicté par le Ministére des Communications canadien.

Ob gesetzliche Bestimmungen eingehatten werden, hängt von der Anwendung geschirmter Kabel ab. Der Anwender ist für die Anschaffung der passenden Kabel selbst verantwortlich.

DIESES GERÄT WURDE IM HINBLICK AUF DIE EINHALTUNG DER FUNKENTSTÖRBESTIMMUNGEN SOWOHL ALS EINZELGERÄT ALS AUCH IM SYSTEM (ZUR SIMULATION NORMALER EINSATZBEDINGUNGEN) ÜBERPRÜFF. DENNOCH IST ES MÖGLICH, DAß DIESEN FUNKENTSTÖRBESTIMMUNGEN UNTER GEWISSEN UNVORTEIILHAFFEN BEDINGUNGEN IN SYSTEMEN NICHT ENTSPROCHEN WIRD. DER ANWENDER IST SELBST FÜR DIE EINHALTUNG DER GESETZLICHEN BESTIMMUNGEN BEIM BETRIEB SEINER ANLAGE VERANTWORTLICH.

BESCHEINIOUNG DES HERSTELLERS/IMPORTEURS

Hiermit wird bescheinigt, daß der/die/das
Documax Model A3300
(Gerdt, Typ, Bezeichnung)
in Übereinstimmung mit den Bestimmungen der Vfg 1046
(DIN-DVE-Norm bzw, EN-Norm bzw, BMPT-AmstblVfg 242/1991, 46/1992) funkentstört ist.
Dem Bundesamt für Zulassungen in der Telekommunikation wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprufung der Serie auf die Einhaltung der Bestimmungen eingeräumt.
AMT Datasouth Corporation
(Name and Anschrift des Herstellers/Importeurs)
Diese Anzeige kann bei Geräten, die der EN 55014 bzw.
55015 entsprechen, entfallen

WARNING

Any alteration or modification to this equipment may cause non-compliance to:

WARNUNG

Jede Abdnderung oder Modifizierung dieses Gerdts kann eine Zuwiderhandlung gegen folgende Bestimmungen darstellen:

ADVERTENCIA

Cualquier alteración o modificación de este equipo podría resultar en la infracción de:

ATTENTION

Tout changement ou modification apporté à cet équipement peut entraîner sa non conformité au:

UL Safety Standard 1950
CSA Safety Standard C22.2 No. 950
FCC Regulations for Class A Computing Devices
VDE EMI Regulations Vfg 1046, Class A (GS marked units only)
EN50082-1 Class A Limits
EN60950

CAUTION

The printer must have the correct line fuse installed for the selected input voltage.

VORSICHT

Im Drucker muß eine, der gewählten Eingangsspannung entsprechende Sicherung installiert sein.

PRECAUCION

El fusible instalado en la línea de la impresora debe ser el apropriado para la tensíon de entrada.

ADVERTISSEMENT

L'imprimante doit être munie d'un fusible adapté au voltage d'entrée choisi.

****

WARNING

The operator must disconnect the printer from the A.C. power supply before performing any corrective action procedure that requires reaching into the printer.

WARNUNG

Die Stromzufuhr zum Drucker muß unterbrochen werden, bevor irgendwelche korrektiven MaBnahman im Inneren des Geräts vorgenommen werden.

ADVENTERCIA

El usuario debe desconectar la impresora de la corriente altema AC antes de proceder con cualquier arregio que requiera meter la mano dentro de la impresora.

ATTENTION

L' opérateur doit débrancher l'imprimante de la source d'alimentation C.A avant de réaliser toute procédure de correction manuelle dans l'imprimante.

WARNING

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

WARNUNG

Abänderungen oder Modifizierungen dieses Geräts dürfen nur mit ausdrücklicher Genehmigung der für die Zulassung verantwortlichen Stelle vorgenommen werden. Verstöße dagegen könnten den Widerruf der Zulassung des Geräts zur Folge haben.

ADVERTENCIA

Los cambios o modificaciones llievados a cabo en esta unidad, no aprobados explicitamente por la parte responsable de cumplir con el regiamento, podrían invalidar la autoridad del usuario para utilizar el equipo.

ATTENTION

Les changements ou modifications apportés cette unité non expressément approuvés par la parte responsable de la conformité peuvent annuler I'autorité de l' utilisateur à operér 1' équipement.

****

WARNING

Connect 115v (230v) units to 115v (230v) outlets only!

WARNUNG

115v (230v)-Geräte nur an 115v (230v)-Steckdosen anschließen!

ADVERTENCIA

¡Conecte unidades de 115v (230v) unicamente a tomas de 115v (230v)!

ATTENTION

Brancher les unités 115v (230v) uniquement sur des prises 115v (230v)!

WARNING

The printhead gets hot during use. Wait until the printhead is cool before handling the printhead.

WARNUNG

Der Druckkopf erhitzt sich, während das Gerät in Betrieb ist. Bevor Arbeiten am Druckkopf durchgeführt werden, warten, bis dieser abgekühlt ist.

ADVERTENCIA

La cabeza impresora se recalienta con el uso. Esperar hasta que se enfríe antes de tocarta.

ATTENTION

La tête d' impression chauffe pendant l' usage. Attendre que la tête d'impression soit froide avant de la manipuler.

****

WARNING

Connecting this equipment to an ungrounded power receptacle can result in the risk of electrical shock.

WARNUNG

Dieses Gerät darf keinesfalls an eine ungeerdete Steckdose angeschlossen werden. Es besteht Elektroschockgefahr.

ADVERTENCIA

El enchufar este equipo a una toma de corriente no conectada a tierra podría resultar en riesgo de una descarga eléctrica.

ATTENTION

Brancher cet équipement á une prise non reliée à la terre peut provoquer une électrocution.

WARNING

Make certain the printer is disconnected from the A.C. power supply before reaching into the printer to perform any cleaning or maintenance task.

WARNUNG

Die Stromversorgung des Druckers muß unterbrochen sein, ebe irgendwelche Reinigungs- oder Wartungsarbeiten vorgenommen werden.

ADVERTENCIA

Asegúrese de que la impresora esta desconectada de la corriente altema AC antes de introducer la mano en su interior para cualquier labor de limpieza o mantenimiento.

ATTENTION

S' assurer que l' imprimante soit débranchée de la source d'alimentation C.A avant de réaliser des tâches de nettoyage ou d'entretien manuelles.

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1. Installation and Start Up

1.1 Introduction

This dot matrix impact printer provides high-speed performance, plus a rugged, round-the-clock duty cycle, and flexibility to handle a number of printing applications.

Feature Highlights

- Straight through pin feed paper path for optimum forms handling.
- Nine wire ballistic printhead and flat metal print platen to assure legibility on every copy.
- Demand document printing.
- Automatic Form Thickness adjustment.
- Forms parking and reloading at the touch of a key.
- Four user-defined profiles for quick forms set up.
- Paper path selection by profile.
- Emulations: Epson FX, DEC LA 120, IBM Graphics, IBM Proprinter XL
- Options:
    a. Second pin feed paper path
    b. Cut sheet paper path
    c. IBM Coax, IBM Twinax interfaces
    d. Quiet cover set
    e. Barcodes
    f. Network Interface

1.2 Quick Start Up Procedure

The following is an abbreviated installation and start up procedure provided for users who are already familiar with printer products. If you are not experienced with printers, follow all the instructions in Chapter 1 for setting up the printer.

1. Place the printer on a suitable stand or countertop.
2. Install ribbon cartridge and power cord.

> **WARNING**
>
> **CONNECT 115V UNITS TO 115V OUTLETS ONLY! PRINTER DAMAGE WILL RESULT!**

3. Turn printer on
4. Position left tractor with 'Alignment' mark on printer. Position front paper guides and rear paper supports equally across the width of the form. Load 8 ½" paper into tractors. (For cut sheet forms, set the left cut sheet guide to "0" and insert 8 ½" paper).
5. Press the **Load Key**(unnecessary for cut sheet path).
6. Open **Keypad Door** to enter Setup Mode.
7. Use the **Quick Access Key,** the **Value ▲▼** keys, and the **Enter Key** to set margins.
8. Close the **Keypad Door.**
9. Press the **Profile Key** to save settings.
10. Open **Keypad Door.**

CAUTION

IMPROPER MARGIN SETTING CAN LEAD TO PRINTHEAD DAMAGE! DO NOT PRINT OFF THE EDGE OF THE FORM.

11. Press the **Feature ▲ Key.** LCD should display "Self Test".
12. Press the **Enter Key.**

When the Enter Key is pressed, the self test will begin printing. The self test may be stopped by closing the Keypad Door or pressing the Enter Key.

1.3 Unpack the Printer

Remove the following from the shipping carton:

- Dot Matrix Printer
- Ribbon Cartridge
- Power Cord
- Accessory Kit: User's Manual
  Warranty Card

If any items are missing, please contact your distributor. Save the shipping carton and all packing materials. These items will be needed in the event the printer must be shipped.

CAUTION

SHIPPING THE PRINTER IN ANY CONTAINER OTHER THAN ITS ORIGINAL PACKAGING MAY RESULT IN SHIPPING DAMAGE AND MAY VOID THE PRINTER WARRANTY.

1.4 Choosing a Place for the Printer

The printer weighs approximately 45 pounds. Its dimensions are:

- 17.0 inches (431 mm) wide x 15.7 inches (398 mm) deep x 12.3 (312 mm) inches high (Dual tractor, top roller versions).
- 17.0 inches (431 mm) wide x 15.7 inches (398 mm) deep x 11.3 inches (287 mm) high (Standard model).
- 17.0 inches (431 mm) wide x 16.7 inches (424 mm) deep x 12.3 inches (312 mm) high (Cut Sheet model).

Location

1. To permit air flow and proper cooling, do not place anything closer than 2 inches (50mm) to the printer.
2. Allow 6 inches to the right of the printer for access to the Form Thickness Adjustment knob.
3. For continuous printing and accumulation of forms, allow sufficient room behind the printer for cables and stacking forms.
4. Place the printer on a sturdy level surface and align lower front edge of printer with table edge.
5. Locate the printer near a grounded power receptacle and use the power cord provided. Do not use an extension cord to connect the printer.
6. Avoid the following:
    - Direct sunlight or excessively illuminated areas
    - Direct placement in front of air conditioning or heating vents
    - Extreme high or low temperatures
    - Exposure to excessive dirt or dust
    - Exposure to vibration or mechanical shock
    - Excessive humidity or condensation

1.5 Printer Parts

Four basic models of the printer are available:

- Standard straight tractor paper path with standard access cover.
- Straight tractor paper path with top roller set and sound reduction access cover.
- Dual tractor path (straight and 45°) with top roller set and sound reduction access cover.
- Straight tractor path and cut sheet (Friction Feed) path with top roller set and sound reduction access cover.

Use the following illustrations to locate the major printer parts for each model. The standard model is used to illustrate most of the procedures in this manual.

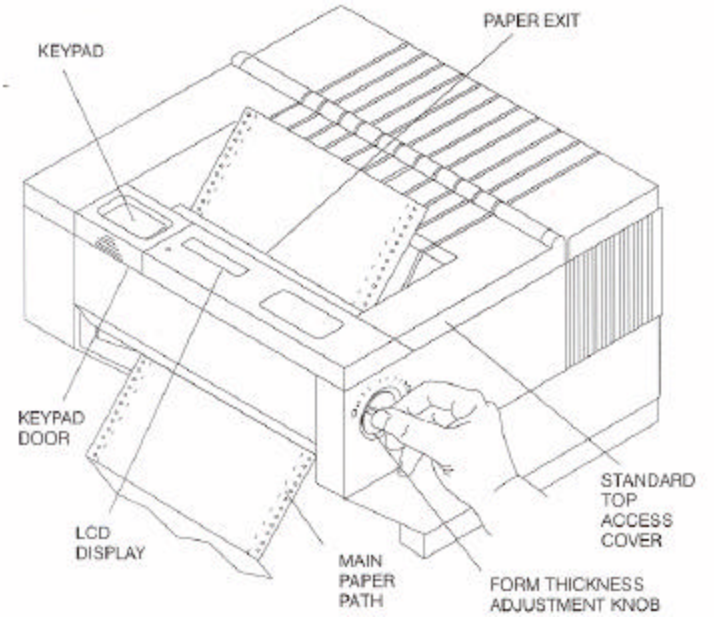


Figure 1-1: External Printer Parts (Standard Model) (Sheet 1 of 2)

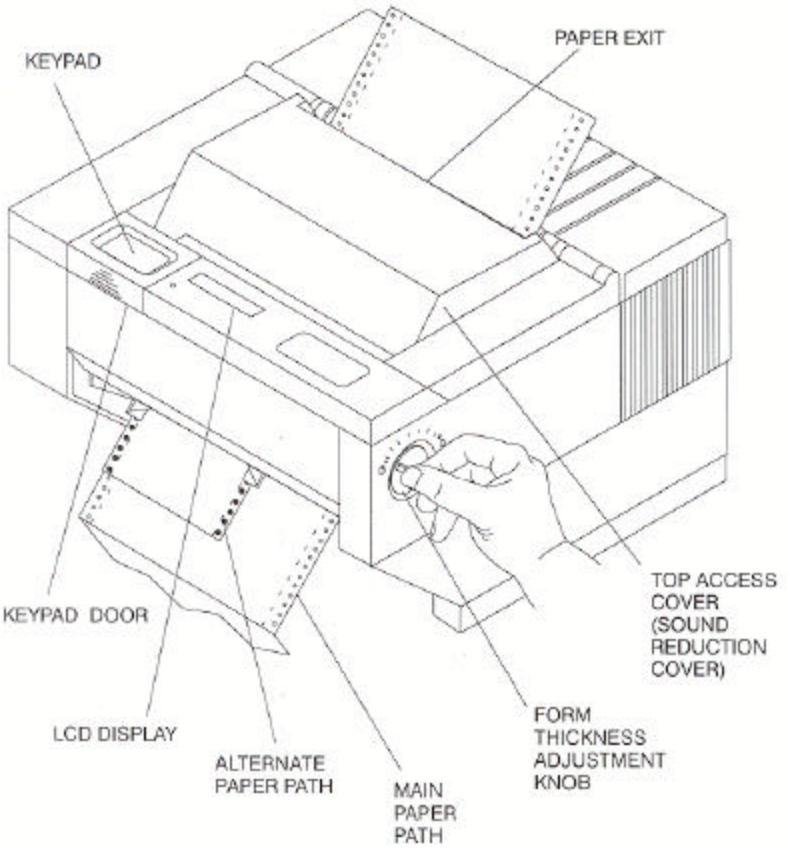
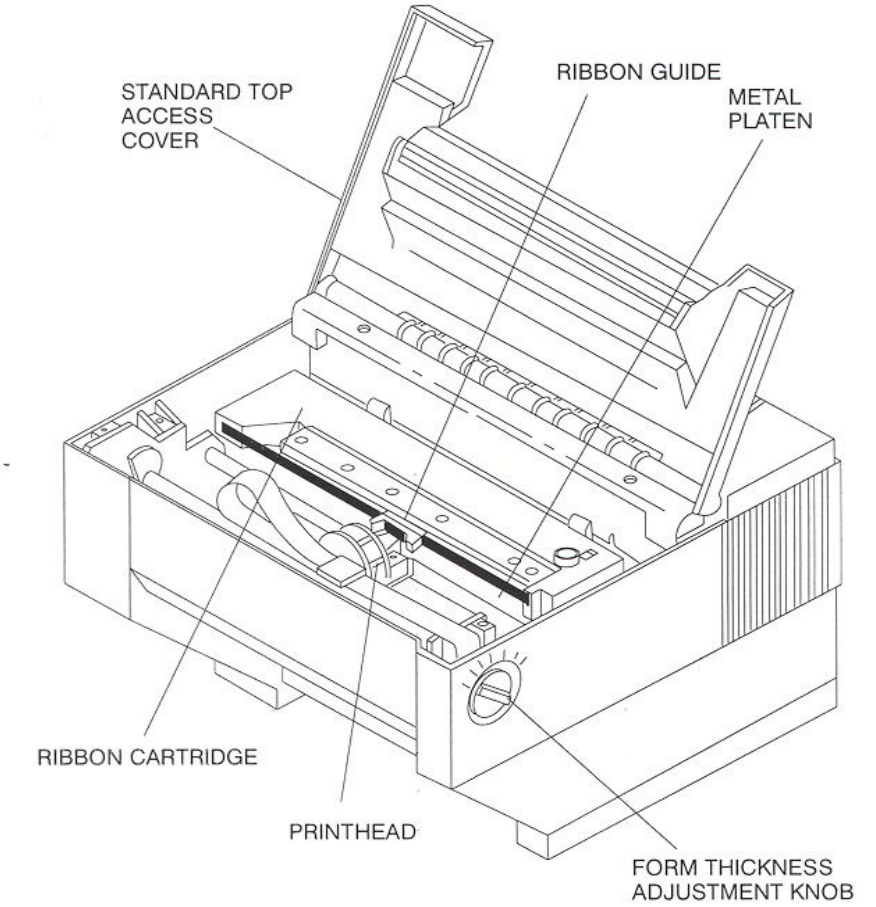


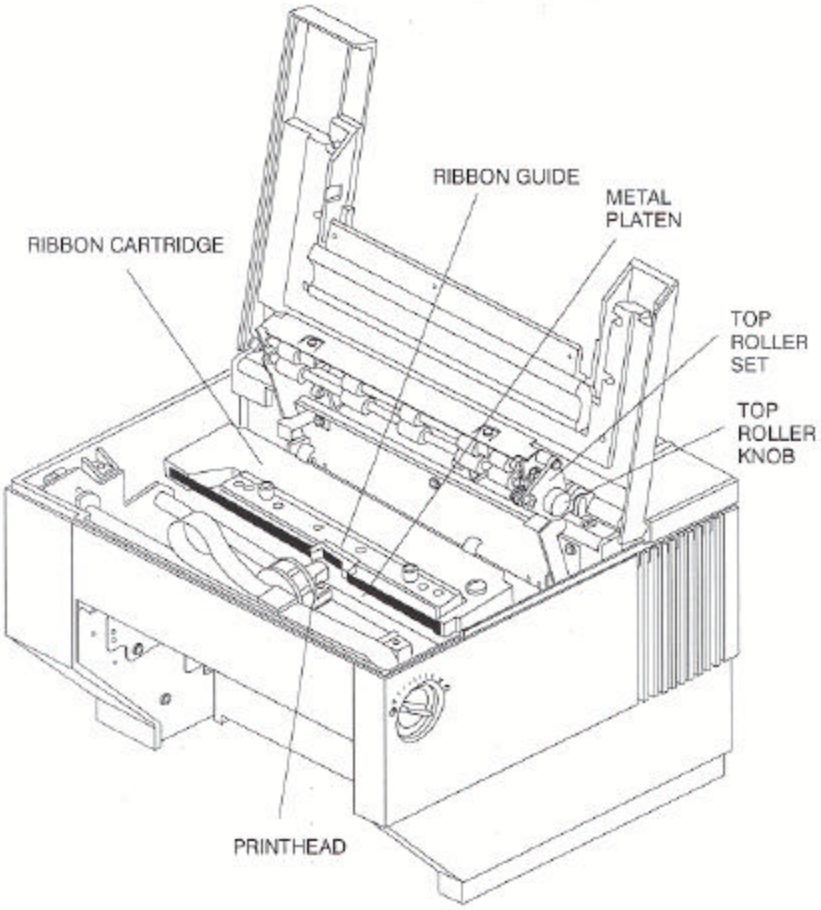
Figure 1-1: External Printer Parts (Dual Path and Sound Reduction Access Cover) (Sheet 2 of 2)



NOTE

Keypad assembly is not shown in order to identify the printhead.

Figure 1-2: Internal Printer Parts (Standard Model) (Sheet 1 of 2)



NOTE

Keypad assembly is not shown in order to identify the printhead.

Figure 1-2: Internal Printer Parts (w/Top Roller Option) (Sheet 2 of 2)

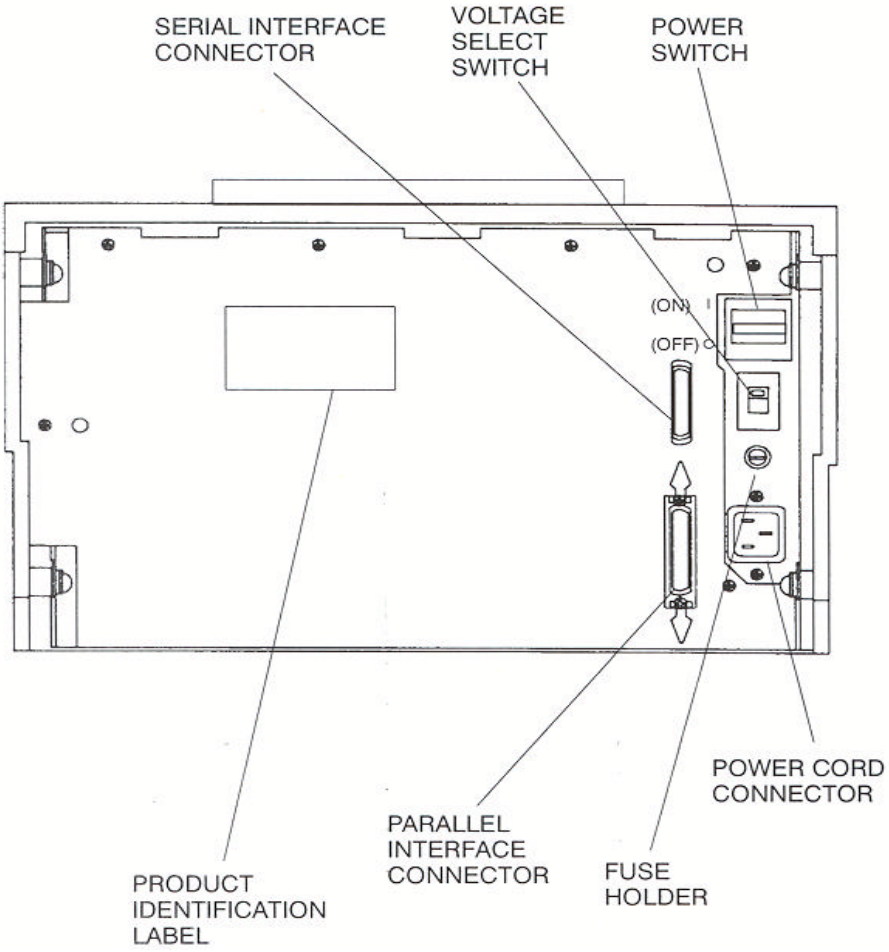


Figure 1-3: Back Printer Parts

1.6 Install the Power Cord

1. Set the power switch to Off. (See Figure 1-4).
2. Install the power cord into the printer as shown in Figure 1-4.
3. Verify that voltage setting is correct for the application (115V-U.S.) (See Figure 1-4).

WARNING

CONNECTING THIS EQUIPMENT TO AN UNGROUNDED POWER RECEPTACLE CAN RESULT IN ELECTRICAL SHOCK.

4. Install the plug end of the power cord into a grounded AC outlet. The voltage of the AC power receptacle must match the voltage rating on the power cord receptacle label. A grounded outlet must be used. Plugging the printer into an ungrounded outlet may result in increased radio frequency noise generation, erratic printer operation, or electrical shock.
5. Set the power switch to ON. The alarm will sound 3 short tones and the printer will display:

Paper Out: Main

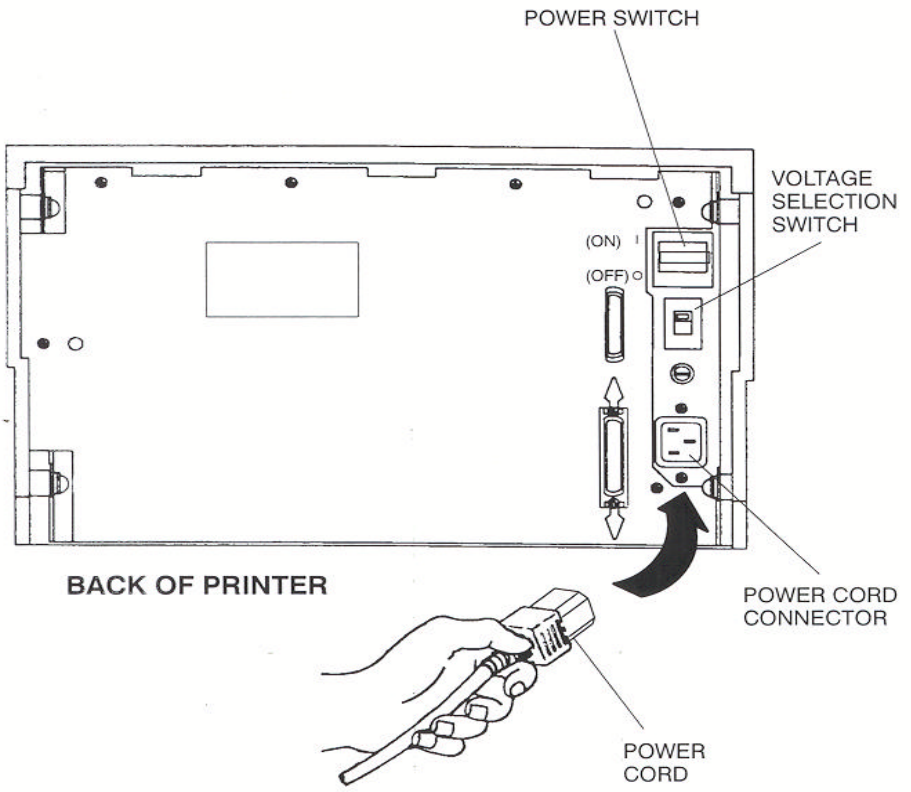


Figure 1-4: Install Power Cord

1.7 Install the Ribbon Cartridge

To prolong ribbon life, the printer is shipped without the cartridge installed. The following procedure is written for both initial installation and ribbon replacement.

1. Press the On/Off Line key to display "off line" status.

NOTE

If paper is loaded, press PARK key to park the form in the tractors.

2. Open top access cover and lift roller assembly on models so equipped.

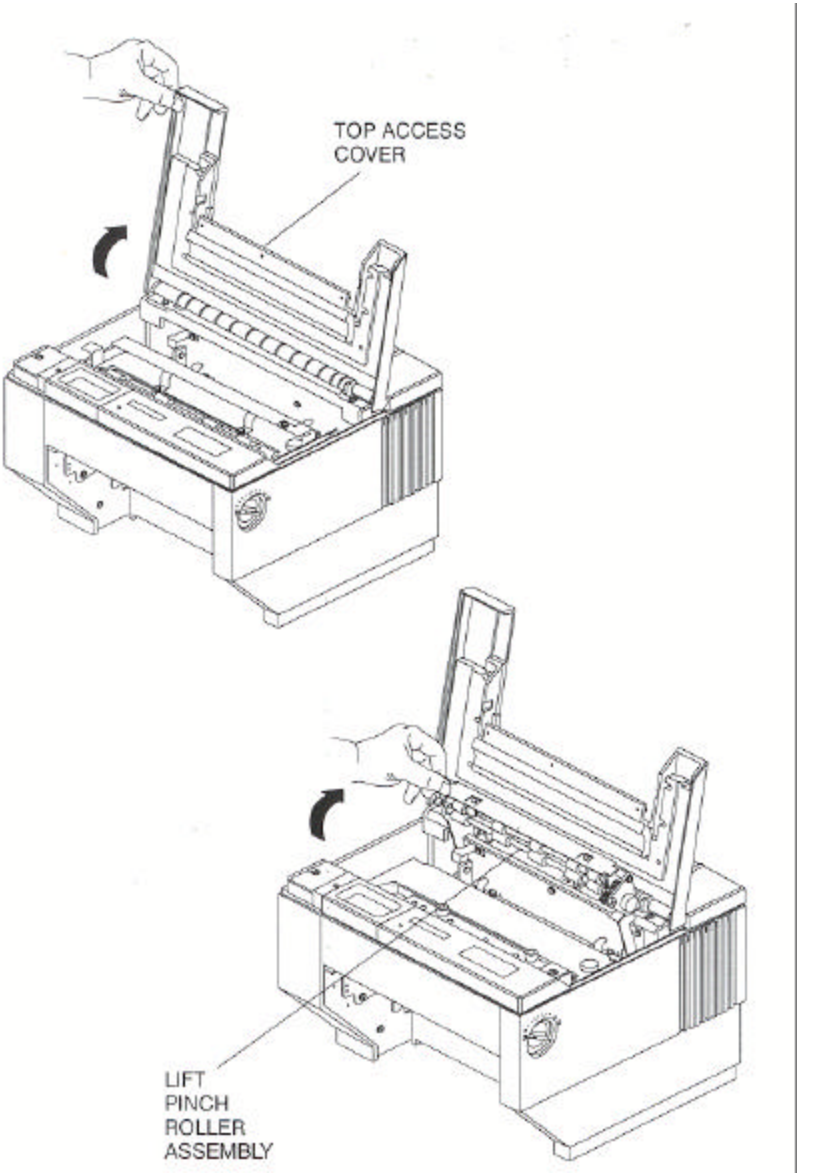


Figure 1-5: Open Access Cover (Both Options)

3. Check the Form Thickness Adjustment Knob to be sure that it is in the first position as shown in Figure 1-6.

NOTE

If replacing the ribbon, the Form Thickness Adjustment Knob will automatically move away from the form when the paper is parked in the tractors.

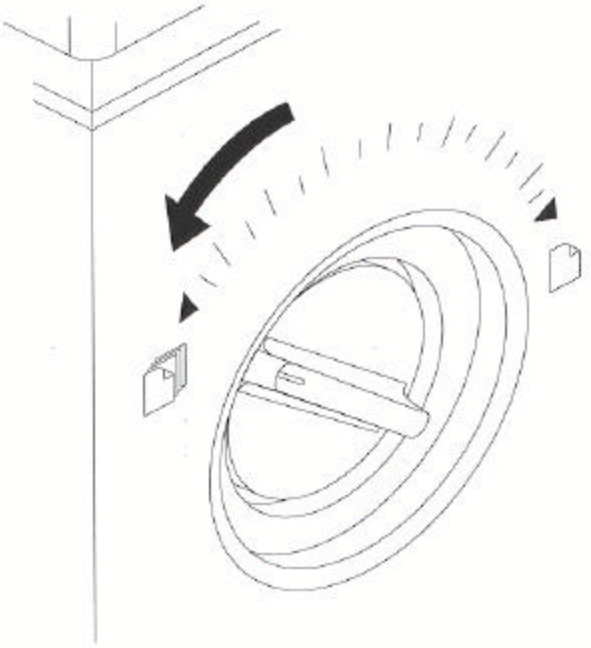


Figure 1-6: Form Thickness Adjustment Knob

NOTE

Steps 4 and 5 are not required for initial ribbon installation.

4. Remove the ribbon guide from printhead (lift up and rotate towards front).
5. Remove ribbon cartridge from printer.

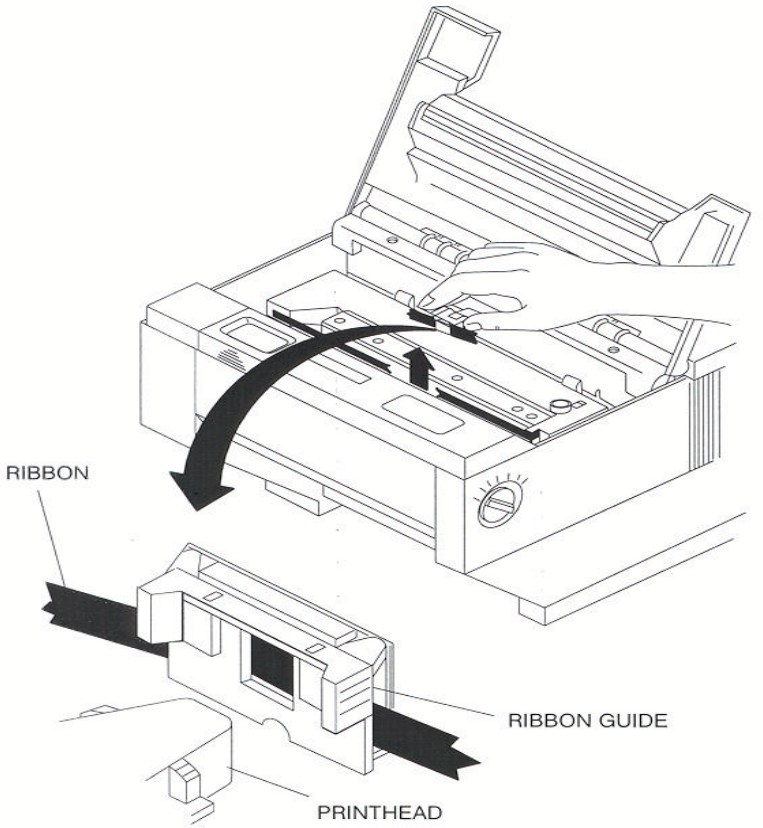


Figure 1-7: Remove Ribbon Guide

6. Move the printhead to the center of the printer.

WARNING

PRINTHEAD GETS HOT DURING USE. USE CAUTION WHEN HANDLING THE PRINTHEAD.

7. Tighten ribbon.
8. Snap on ribbon guide.
9. Remove slack from ribbon.

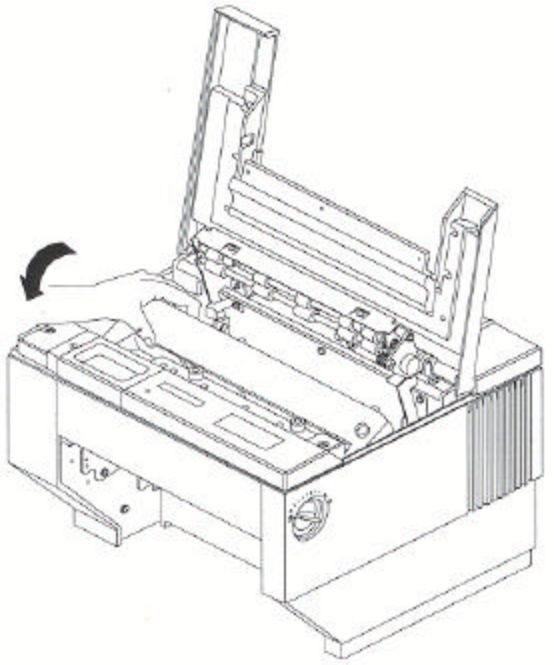


Figure 1-8: Position Ribbon Cartridge In Printer

10. Lower ribbon cartridge towards slots in printer. Ensure that ribbon loop is in front of platen and that ribbon is not twisted.
11. Drop the ribbon cartridge into the ribbon alignment slots.
12. If the ribbon cartridge does not seat squarely on the ribbon drive, rotate the Ribbon Advance Knob in the direction indicated by the arrow on the knob until the cartridge drops into place on the ribbon drive. See Figure 1-9.
13. With ribbon guide tilted to front of printer, place the guide on printhead nose. Push down on ribbon guide until it snaps into place.
14. Remove any slack from the ribbon by turning the Ribbon Advance Knob in the direction of the arrow marked on the knob.

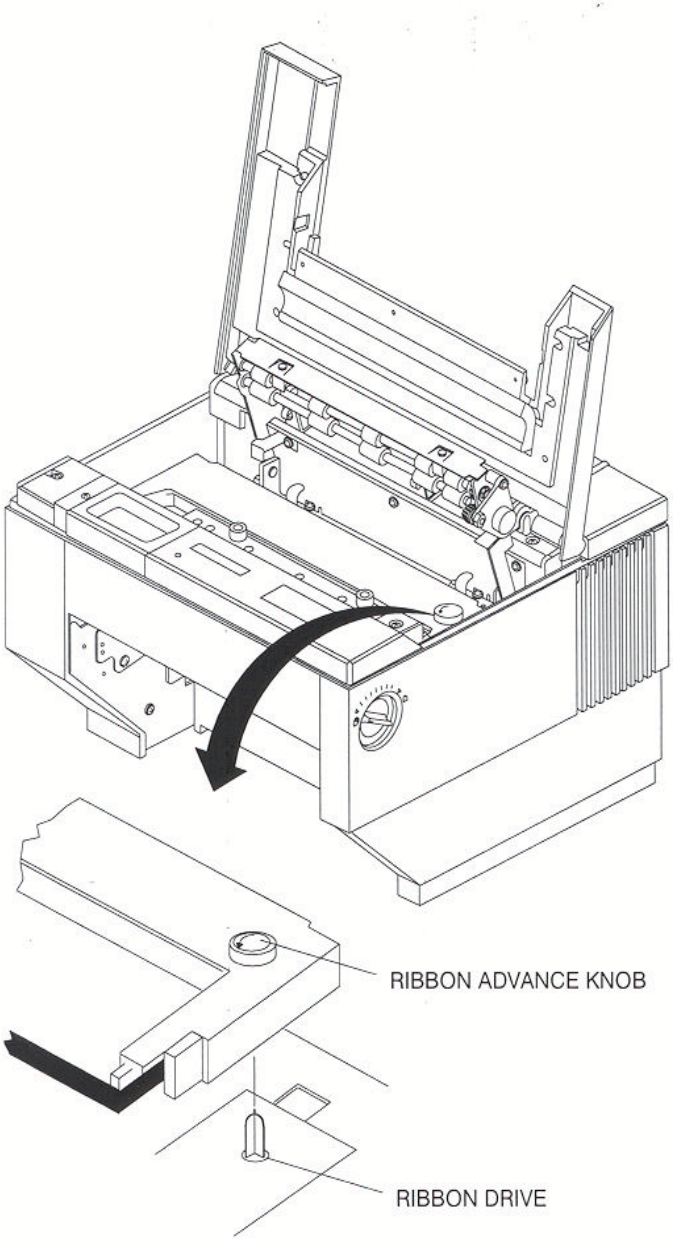


Figure 1-9: Install Ribbon Cartridge

1.8 Printer Self Test

This test is used to verify printer operation. Before performing the printer self-test, refer to Section 3.3 Load Forms Page 3-3 for instructions on loading paper in the printer.

To start the test:

CAUTION

MARGINS ARE SET FOR 8.5" PAPER. PRINTING OFF OF FORM WILL LEAD TO PRINTER DAMAGE.

1. Load 8-1/2" forms.
2. Open the **Keypad Door**.
3. Press the **Feature ▲ Key** once. LCD will show "RUN SELF TEST".
4. Press the **Enter Key**. Printer self test will start (Figure 1-10). The display will alternate between the following:

<Diagnostics>

'Enter' To Stop

5. The self-test may be stopped by pressing the Enter key or by closing the **Keypad Door**.

Figure 1-10: Self-Test Sample

1.9 Interfacing

The three types of interfaces offered by the printer are RS-232 serial, RS-422 serial, and TTL level 8-bit PC compatible, parallel interface. Serial and parallel interface connectors are provided on the rear of the printer. The 25-pin serial connector is compatible for both RS-232 and RS-422.

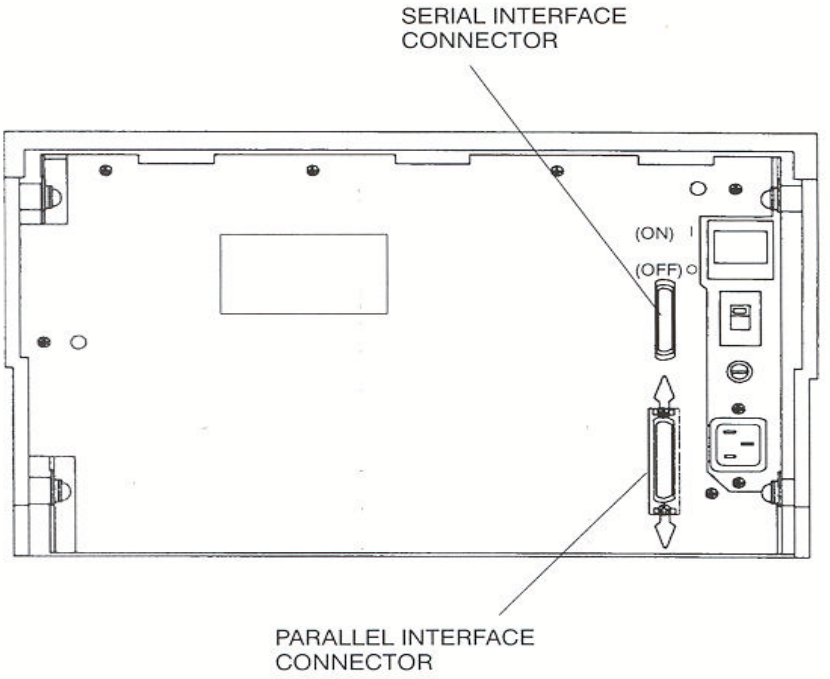


Figure 1-11: Interface Connectors

Refer to the documentation for your computer to determine the type of shielded interface cable needed and any unique pin-out configuration that may be required. This information should be given to your dealer or distributor to determine the correct cable for your use.

WARNING

BEFORE CONNECTING THE CABLE, MAKE CERTAIN BOTH THE HOST COMPUTER AND THE PRINTER ARE POWERED OFF.

Attach one end of the cable to the proper connector on the printer and the other end to the host computer. Secure the interface cable to the connector with the screws or wire clips provided.

1.10 RS-232 and RS-422 Serial Interface Configuration

1. Set the power switch to On.
2. Open the Keypad Door. The first menu will appear on the display.

M1 PAGE FORMAT

3. Press the Next Menu key until you have accessed Menu 5

M5 SERIAL CNTRL

4. Press the Feature ▲ Key one time to select Baud Rate Feature.
5. Press the Value ▲ or Value ▼ to change baud rate to match host computer.
6. Press the Enter Key to save your selection.
7. Press the Feature ▼ key to select Serial RS-232.
8. Press the Value ▲ ▼ keys to select the desired serial mode [RS-232, RS-422, NONE]. Select NONE to disable the serial port.
9. Press the Enter key to save your selection.
10. Use the Feature ▼, Value ▲ ▼, and Enter keys to change any other required features in this menu.
    - Parity
    - Data Bits
    - DTR
    - HANDSHK
    - X-ON CTRL ROBUST
    - X-OFF CTRL ROBUST
    - MODEM CTRL

11. Close the Keypad Door to exit Setup Mode. Display will alternate:

Press 'Profile'

To Save Settings

12. Press the **Profile key** to permanently save the profile setting.
13. Press the **On/Off Line Key** to place the printer back on line.

On Line Profile 1

2. Keypad Configuration

2.1 Keypad Configuration

This chapter describes the keypad, Ready LED, and LCD display. The locations of all keys and their functions are illustrated below.

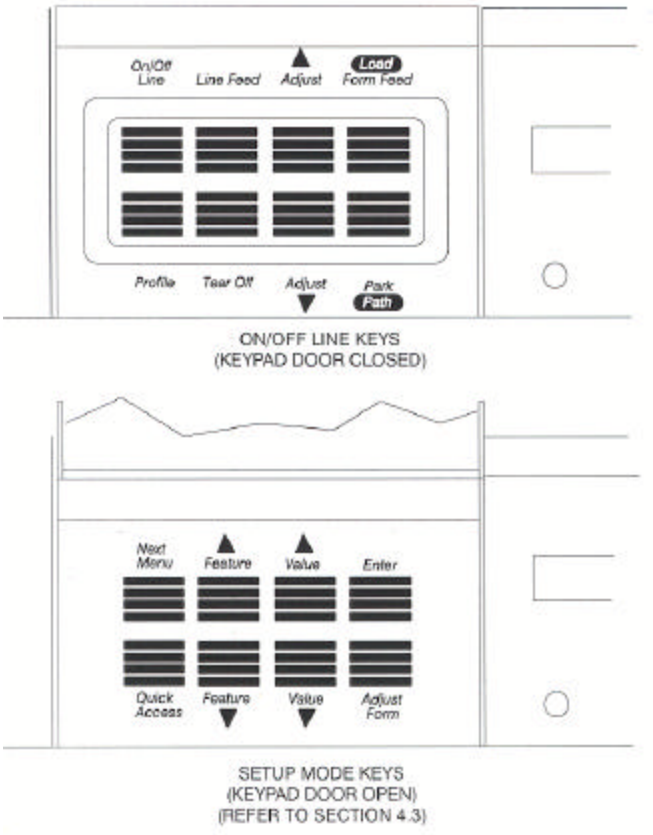


Figure 2-1: Keypad Configuration

2.2 Ready LED

The printer is equipped with one green LED indicator to signify READY status. Function of the Ready indicator is as follows:

- On – Printer is on line and ready to accept data.
- Off – Printer cannot accept data for any of the following reasons:
    a. Printer is off line.
    b. Printer is in an error condition.
    c. Printer FIFO is full.
    d. Printer is powered off.
- Blinking – Printer is receiving data and printing. This light indicates the Ready/Busy state of the interface.

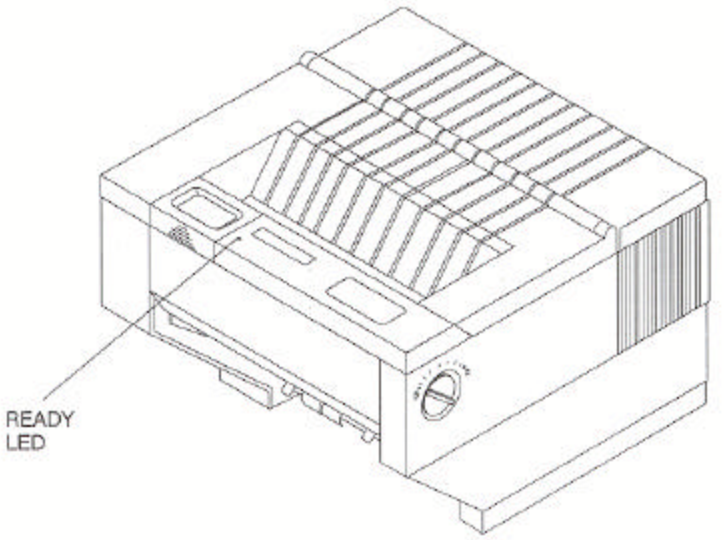
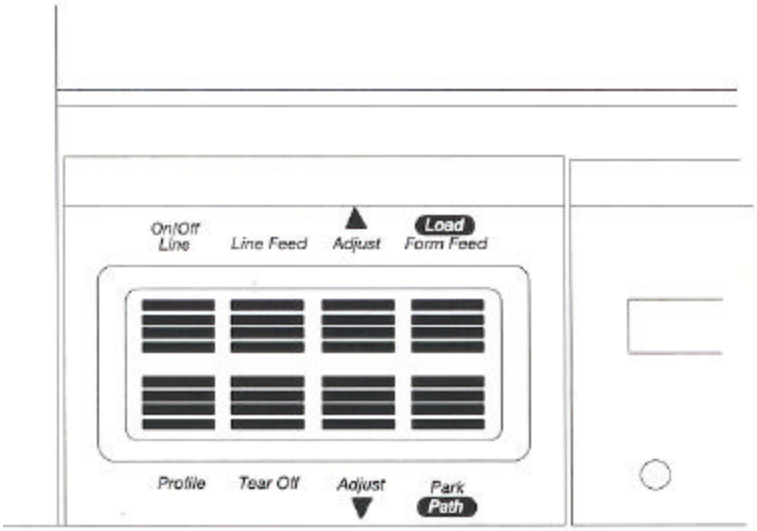


Figure 2-2: Ready LED

2.3 On/Off Line Key Function

On/Off Line key functions are the functions printed on the Keypad Door encircling the keypad. Primary key functions are used for normal operation. Setup Mode functions are active when the Keypad Door is raised and are explained in Chapter 4.



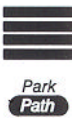
ON/OFF LINE KEYS
(KEYPAD DOOR CLOSED)

Figure 2-3: Primary Keys

Pressing this key switches the printer between on line and off line status. This key is used in conjunction with the LCD display. The On/Off Line key is also used to continue after clearing an error condition or to acknowledge tearing off a form on a paper path change.

Pressing this key will load paper into the main or alternate feed paths when paper is not already loaded.

When continuous forms are loaded, pressing this key advances the paper to the top of the next form.

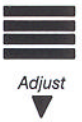


When paper is loaded, pressing the Park/Path key 'parks' paper into the tractors.

When paper is not loaded and the printer is off line, pressing the Park/Path key changes the paper path and attempts to load paper (on dual path units). Either Main or Alternate paper path can be selected using this key.

The Path key is only valid if the Path feature is set to "Either". Paper paths can also be selected by setting the path feature in a profile and selecting that profile. For additional instructions, see 3.8 – 3.13.

Pressing this key moves the form upward 1/144 inch for precise form alignment. When the key is pressed for more than ½ second, the paper advances continuously until the key is released.



Pressing this key moves the form downward 1/144 inch for precise form alignment. When the key is pressed for more than ½ second, the paper reverse feeds continuously until the key is released.

Pressing this key advances forms up to the tear bar so that the last printed form can easily be removed. Pressing the key a second time moves the form back into print position.

To change the tear off position, press the Tear Off key, press Adjust ▲ or ▼, and press the Tear Off key again. The new distance will be automatically saved in the current profile.

Pressing this key once advances the paper by one line. When the key is pressed for more than ½ second, continuous line feeds are performed until the key is released.

This key allows you to select one of four user-defined profiles. To use this key, place the printer off line; then press the Profile key. Available profile names will be shown in the display window each time the Profile key is pressed. This key can be used only when the printer is off line. For more information about profiles see Chapter 4.

After changing profiles, the user should park and reload the paper to reset top-of-form. The printer will automatically change paper paths or request a form to be loaded depending on the Path feature setting. See Section 3.12 for details on selecting paper paths using the Profile key.

2.4 LCD Display

The printer signals various messages through the LCD display. Examples are shown below:

Features and Values:

On Line Display:

Off Line Display:

Paper Out Conditions:

Initial Display when Keypad Door is open:

3. Forms Handling

3.1 Recommended Types and Sizes

The following are guidelines for recommended paper types and sizes for use with the printer.

Continuous Forms (Main Paper Path)

Width – 3 ½ to 10 5/8 inches (88.9mm to 269.8 mm)

Individual Part Thickness - .005 inch maximum (.127mm)

Total Form Thickness - .028 inch maximum (.711mm)

Number of copies – 1 original plus 8 copies

Maximum Printable Width – 8.8 inches (223 mm)

Continuous Forms (Alternate Paper Path)

Width – 3 to 10 ½ inches (76.2 mm to 266 mm)

Individual Part Thickness - .005 inch maximum (.127 mm)

Total Form Thickness - .028 inch maximum (.711 mm)

Number of copies – 1 original plus 8 copies

Maximum Printable Width – 8.8 inches (223 mm)

Cut Sheet Forms (Cut Sheet Path)

Width – 2 ¾ to 10 5/8 inches (69.9 mm to 269.8 mm)

Individual Part Thickness - .005 inch maximum (.127 mm)

Total Form Thickness - .028 inch maximum (.711 mm)

Number of copies – 1 original plus 8 copies

Maximum Printable Width – 8.8 inches (223 mm)

Minimum Form Length – 4.25 inches (110 mm)

Minimum Form Weight – 20 lb. Bond (75 g/m^2)

3.2 Paper Paths

For best results, use the main paper path for thicker, stiffer forms.

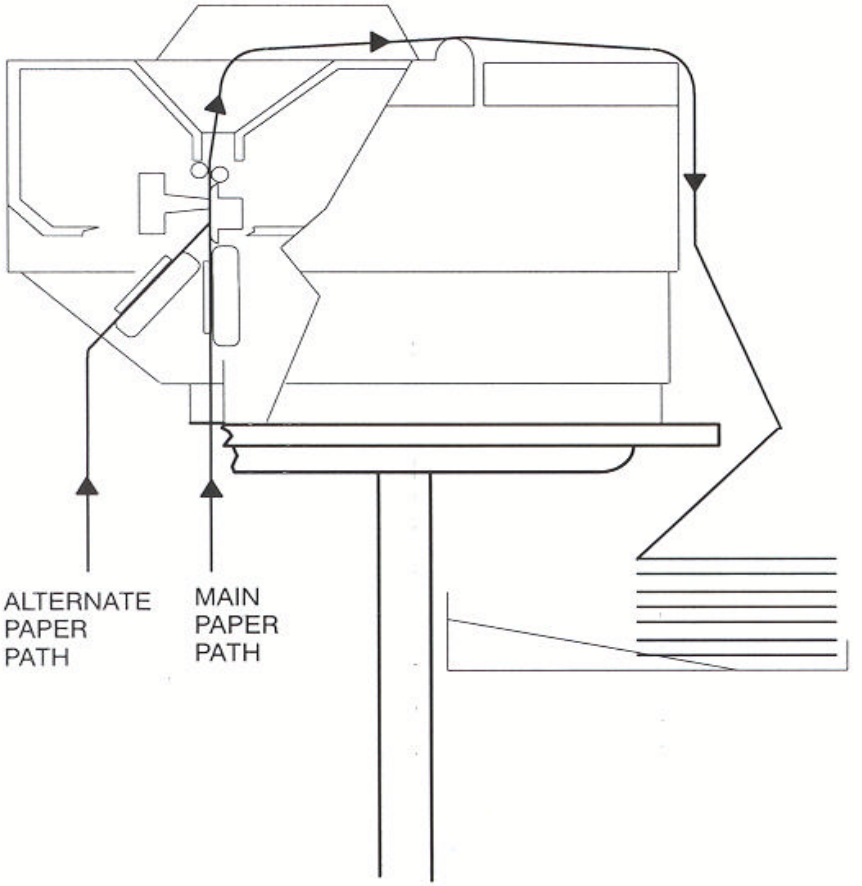


Figure 3-1: Paper Feed Paths

3.3 Load Forms

NOTE

To load the main tractor path on Dual Path printer, place alternate path tractors in center position. Main tractor doors cannot be opened with alternate tractors aligned in front. (Hint: Use least frequently changed paper in main tractors and frequently changed paper or narrow stock in the alternate path.) If both paths are used, main tractor path must be loaded first.

NOTE

If paper is to be loaded into alternate path, align the left tractors with alignment mark on printer for both feed paths before loading front most forms.

NOTE

Form Thickness Adjustment Knob automatically retracts printhead to allow for forms loading and repositions to print position after loading.

To access the tractors and load a continuous form into either tractor, proceed as follows: (For cut sheet forms, go directly to Step 8.)

1. Unlock both tractors by rotating the locking levers.
2. Align the left tractor with the alignment mark located on the body of the printer. Lock left tractor in place. Place the right tractor at the approximate forms width.

CAUTION

IMPROPER TRACTOR LOCATION RESULTING IN PRINTING PAST THE EDGE OF THE FORM CAN CAUSE DAMAGE TO THE PRINTHEAD.

3. Position the front paper guides and rear paper supports equally across width of form. (Hint: For easy movement, grab the front paper guides and push up while sliding.)

NOTE

Proper position of paper supports will help prevent jams.

4. Open the left tractor door and place the left side of the form in the left tractor. Close tractor door. (Hint: Place form on lower 3 pins of tractor drive. Hold form in place by pressing against tractor housing before closing tractor door with other hand.)

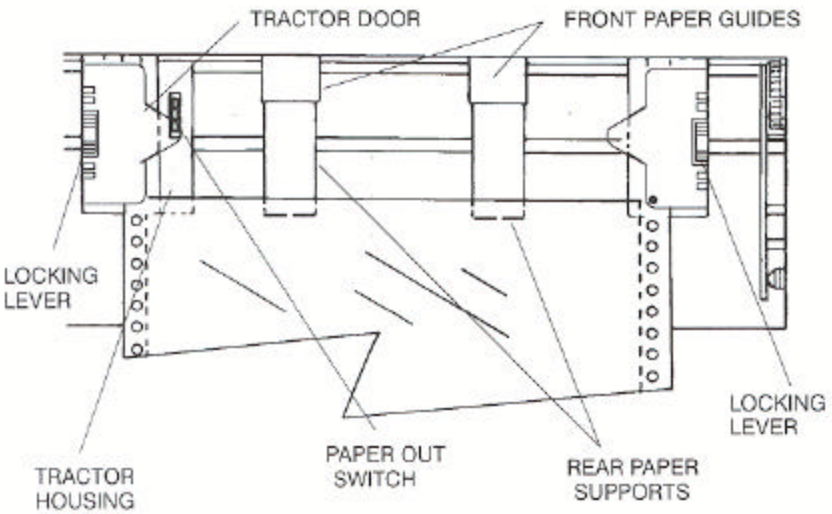


Figure 3-2: Load Paper In Tractors (Typical)

5. Open the right tractor door and load the paper into the right tractor. Compare position of paper in left and right tractors and adjust as necessary to keep paper even. Improper alignment of paper feed holes (Figure 3-3) will result in paper jam. Close tractor door.
6. If necessary, move the right tractor to the right to slightly tension the paper. Lock the tractor in this position.

CAUTION

IMPROPER PAPER TENSION MAY CAUSE PAPER JAMS. PAPER SHOULD BE TENSIONED SUFFICIENTLY TO BE RELATIVELY FLAT BETWEEN THE TRACTORS, WHILE AVOIDING DISTORTION OF THE PAPER FEED HOLES.

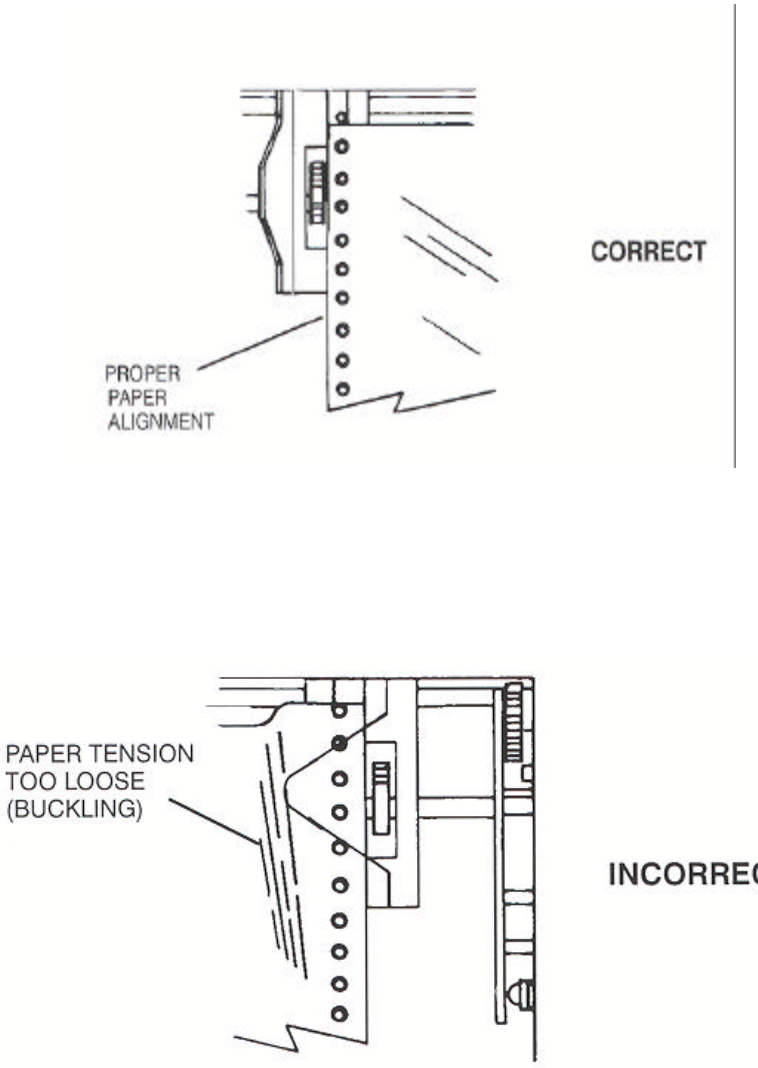


Figure 3-3: Forms Loading (Sheet 1 of 2)

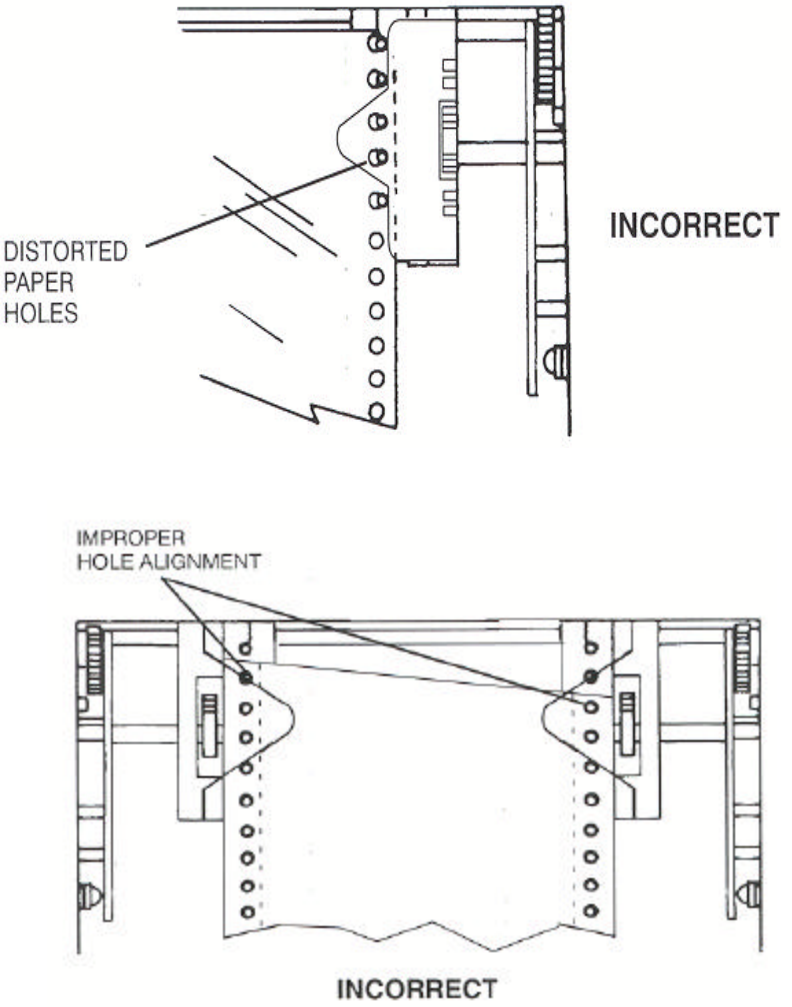


Figure 3-3: Forms Loading (Sheet 2 of 2)

7. Make sure the continuous forms are located directly under the tractors. The paper must hang straight. Incorrect positioning of the forms may cause a paper jam.

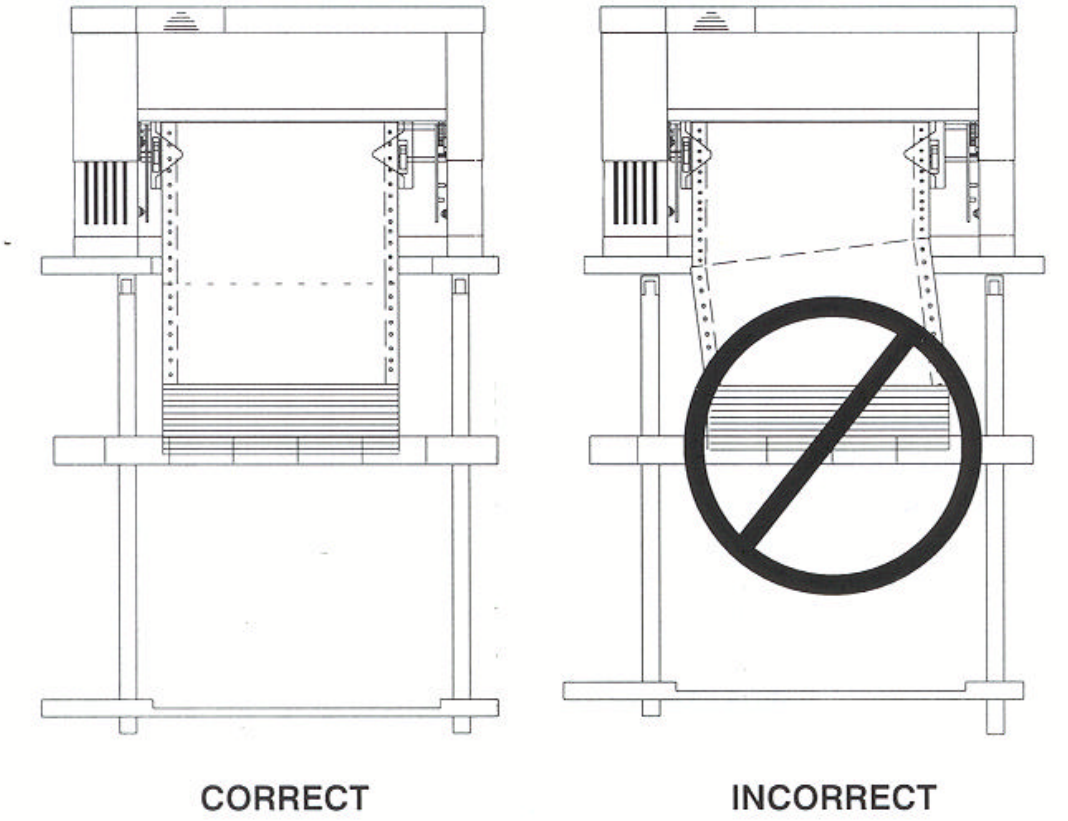


Figure 3-4: Placement of Continuous Forms

8. Set the power switch to On. (For cut sheet forms, go directly to Step 10).

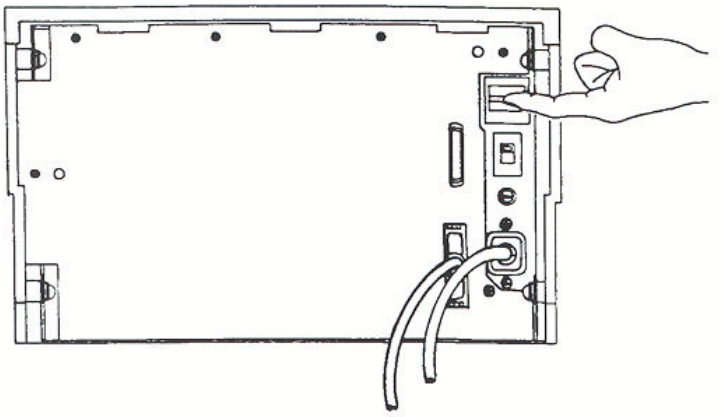


Figure 3-5: Turn On Power

9. After the printer initializes, press the Load key to load paper. When the load key is pressed, the Form Thickness Adjustment knob will automatically move to the correct location. Go to Step 11.

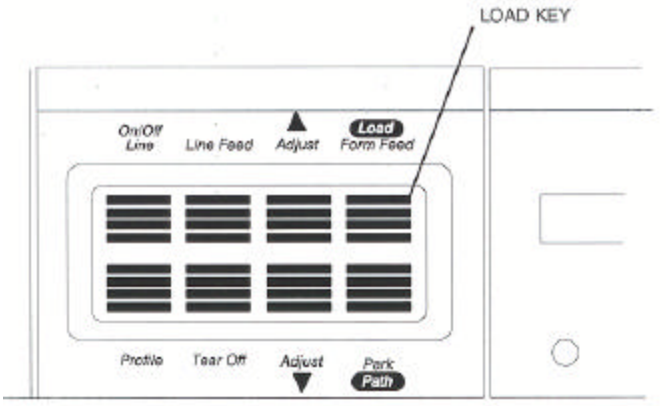


Figure 3-6: Press Load Key

10. Set left paper guide window at the "0" mark. Grab form in center with one hand and align left edge of form against left paper guide. (Do not fully insert form.)

    Use other hand to snug right paper guide against right edge of form. (Do not buckle forms between paper guides.)

    Push in form until leading edge is squarely against rollers. (Care should be taken to keep form straight.) Printer will automatically load form and go on line.

NOTE

To eject a cut sheet form for any reason, press the Form Feed Key.

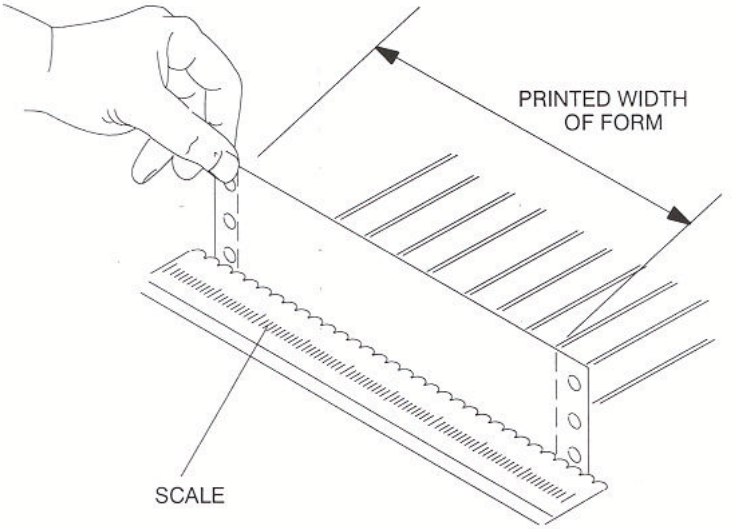


Figure 3-7: Tear Off Bar Scale

NOTE

If forms length is between 4.5" and 6.0", verify that the Vertical Gap Position Feature is set to 0.0" (located under M8 Form Thickness in the setup mode). See Section 4.6 for further instructions on how to change this setting. Failure to set Vertical Gap for these forms may cause trailing edge of form to catch under guide during loading.

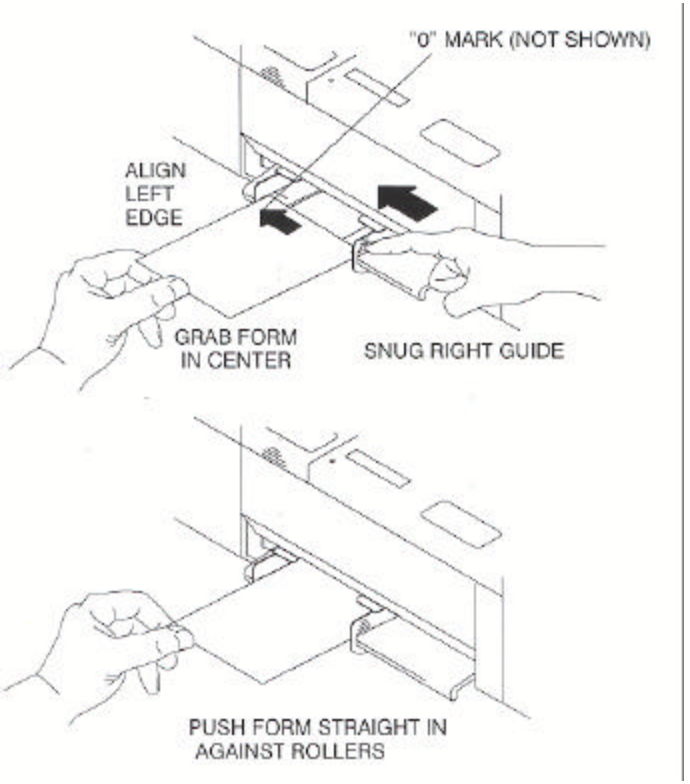


Figure 3-8: Loading Cut Form

11. Set form length, right and left margins. To set form length, first measure the length of the form (in inches) and multiply this value by the vertical lines per inch. For example: if the form length is 11 inches and the vertical pitch is 6 lines per inch, then the form length would be:

    11 inches x 6 lines per inch = form length 66 lines

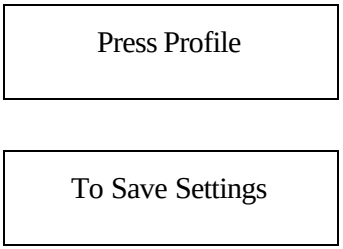
    To set the form length, open the keypad door and press the Quick Access key until "Form Length" appears in the display. Press the Value keys to change the setting and press the Enter key to save the setting.

    To set left and right margins, measure the printed width of the form (in inches excluding pinfeed holes) and multiply this value by the font pitch. The scale on the tear off bar may be used to estimate margin location for 10 cpi.

    For example: if the printed form width is 8.5 inches and the font pitch is 10 characters per inch, then the form width would be:

    8.5 inches by 10 cpi = right margin 85

    To set the right margin, press the Quick Access key until "Right Margin" appears in the display. Press the Value keys to change the margin setting and press the Enter keys to save the setting. If you shift the left margin, you may want to shift the right margin by the same amount. Close the keypad door to exit Setup Mode. The LCD will read:

12. Press Profile key to save settings.
13. Place the On/Off Line key to place the printer back on line.

3.4 Top of Form Adjustment (Adjusting First Printline Location)

NOTE

Perform this adjustment immediately after loading paper to determine where the first line will print. Making this adjustment while printing on the page allows fine alignment without resetting line count.

When paper is loaded into the printer, the printer automatically positions the paper to print on the first line of the form. If you need to change the location of the first print line, use the Adjust Form key and proceed as follows:

1. To place the printer in Top-of-Form Adjust Mode, open the Keypad Door and press the Adjust Form key. The form will advance until the bottom of the first print line is positioned just above the tear off bar for viewing (Figure 3-9). (For units equipped with cut sheet option, open the Top Access Cover and use the metal tear edge just above the top rollers.)
2. Use the Value ▲ and Value ▼ keys to move the paper up or down to the position desired for first line of type. The line directly above the tear bar will be the first print line (Figure 3-9).
3. Press the Adjust Form key or close Keypad Door. The printer will reverse feed the form back to print position.
4. This adjustment affects the Load feature and is automatically saved in memory for the current profile and will apply the next time forms are loaded.

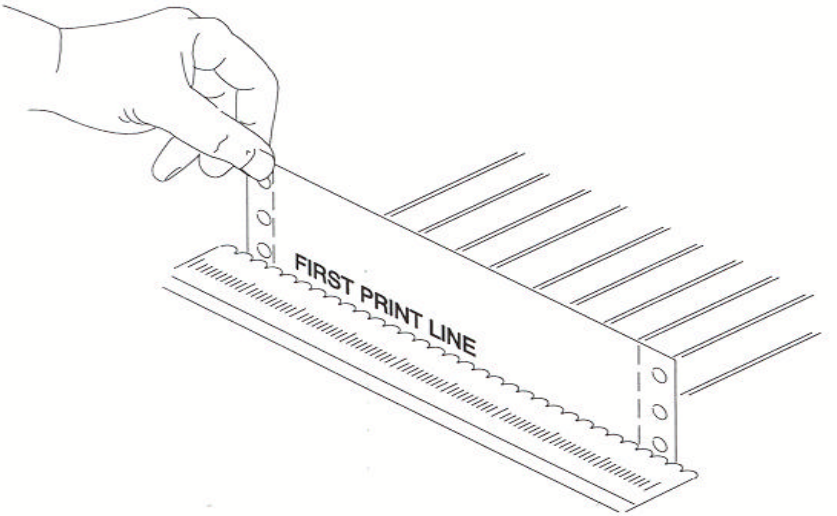


Figure 3-9: Set First Print Line

3.5 Tear Off Adjustment

In a demand document application, the form will be advanced to a tear off position when the Tear Off key is pressed. When the forms are in this position, the last printed form may be removed by pulling the perforation against the tear edge of the cover.

If the perforation does not come to rest at the tear edge, the tear off distance may be adjusted as follows:

1. Press the Tear Off key. The form should move up to the current tear location.

NOTE

By adjusting the tear distance to a large value, the form can be fed through a countertop, for example, if the printer is located under a counter.

2. Using the Adjust ▲ key or the Adjust ▼ key, move the paper until the perforation is located at the desired tear off position.
3. Press the Tear Off key. The form will return to the current print position.
4. This adjustment affects the Tear Distance feature and is automatically saved in memory for the current profile and will be applied when forms are reloaded.

NOTE

For cut sheet units, to avoid excessive opening and closing of the Top Exit Cover when alternating between short cut sheet forms and continuous tractor forms, adjust the tear bar (metal edge located immediately above top rollers) by using this procedure. (The value will be about 1-40/144 inches.)

NOTE

The function of the Tear Off key is affected by the Manual Tear feature located in the Forms Control Menu. Refer to Chapter 4 for a description of this feature.

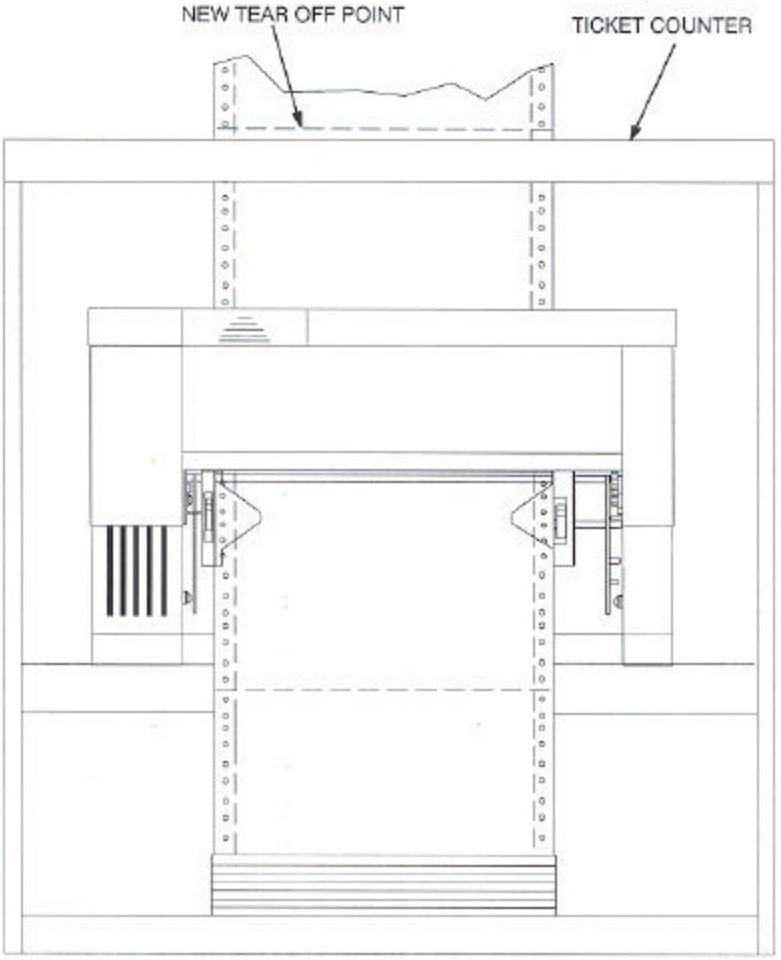


Figure 3-10: Printer Located Under Countertop

3.6 Form Thickness Adjustment

The distance from the printhead to the paper is automatically changed to accommodate the thickness of the forms whenever the unit is powered up or paper is loaded. The adjustment can be manually changed using the knob on the right-hand side of the printer, or adjusted automatically by changing the feature setting as outlined below:

CAUTION

IMPROPER FORM THICKNESS ADJUSTMENT CAN DAMAGE THE PRINTHEAD.

1. Load the form requiring this adjustment and run a print sample.
2. Inspect the print sample. The characters should be easily read with no missing dots. Be sure to check the last copy of multi-part forms for properly formed characters.

NOTE

To adjust form thickness automatically and store in memory, proceed with Step 3. If a temporary adjustment is needed, adjust manually beginning with Step 7.

3. If the print quality is unacceptable (too tight, missing dots, or smearing), or paper handling is affected, adjust form thickness gap as follows:

   a. Open the Keypad Door to access Setup menu.

b. Press the Next Menu key to access Menu 8, Form Thickness.

M8 FORM THICKNESS

c. Press Feature ▼ key to obtain this display.

Adj Form Gap XX

4. Use the Value keys to adjust the form thickness gap. Form thickness setting will be stored in memory.

   a. Press the Value ▲ key once or twice to reduce the form gap (moves the printhead closer to the form) if there is light print.

   b. Press the Value ▼ key once or twice to increase the form gap (moves the printhead away from the form) if there is smudging, smearing or paper handling issues.

NOTE

There is no direct correlation between form thickness position and number of parts in a multi-part form (e.g. adjustment control is not set to the fourth mark for a four-part form). Multi-part carbonless forms must be given time to cure before being separated to prevent light print quality. (Contact paper supplier for cure times.)

5. Once the adjustment has been made using the keypad, the printer will store the setting in memory only in the selected profile. The printer will continue to use this gap setting the next time forms are loaded.

6. Run another print sample. Return to Step 2 and repeat until print quality is acceptable.
7. Manually adjust the form thickness setting as follows (temporary adjustment, not stored in memory):
   a. Turn knob clockwise one click until print quality is acceptable.
   b. If smudging occurs, thickness gap is too small. Turn knob one click counterclockwise until print quality is acceptable.

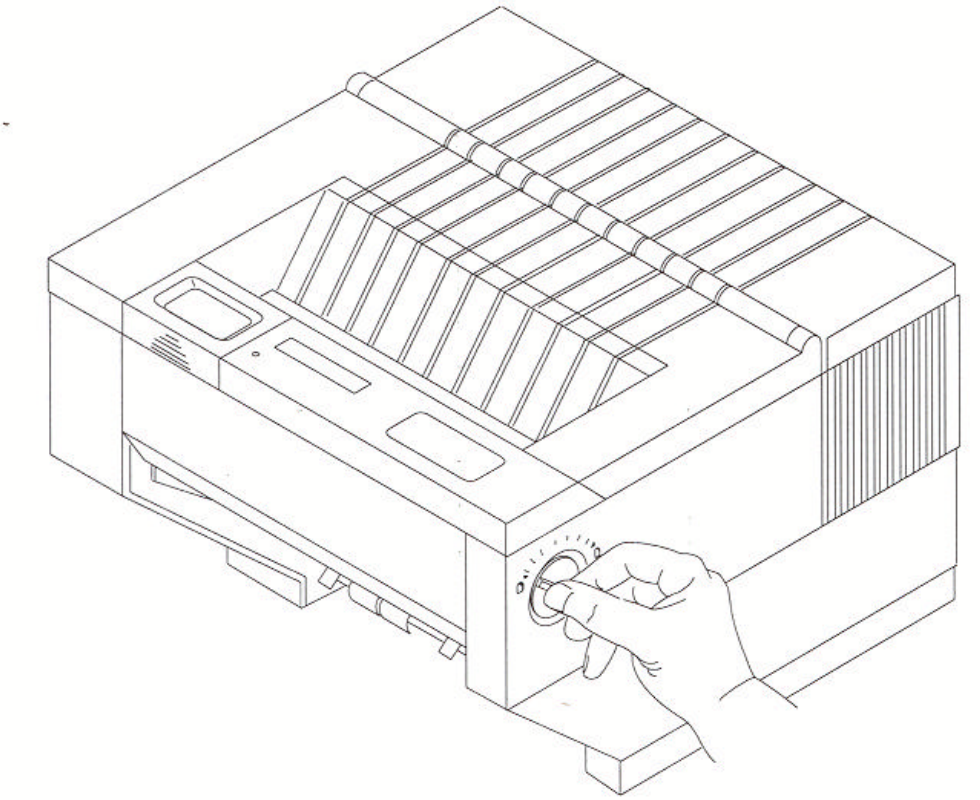


Figure 3-11: Manually Move Form Thickness Adjustment Knob

3.7 Heavy Forms Adjustment

The Heavy Forms feature allows the printhead to be positioned horizontally on the form to avoid labels, paper perforations or other variations in form thickness that can cause paper handling issues.

This feature becomes active when the paper moves more than 0.5 inches.

The default location of the printhead is 2 inches from the left side of the printer.

To change the location of the printhead from the default value, follow these steps:

1. Load form in printer and open Keypad Door.
2. Press Menu key to access M2 Forms Control.
3. Press Feature ▼ key to access the Heavy Forms feature.
4. The value in the display represents the location of the printhead for form feeds and paper advances over 0.5".
5. Press the Value keys to change this setting.

   For example: A label is located on the form from 3 to 5 inches from the left edge of the form. Set the Heavy Form feature at 1.5 inches or 6.5 inches to insure that the printhead and ribbon guide is away from the label during high speed paper moves. The feature may also be set to avoid paper staples on the pin drive margins of the forms.

   If the entire form is jamming, set this value to 9.8 inches to keep the printhead from the perforation folds (paper tents) during form feeding.

3.8 Changing From Main Paper Path to Alternate Path

If continuous forms are presently loaded in the printer, you may change to the alternate paper path by proceeding as follows:

(For cut sheet models, just insert the form. The following steps will be automatically executed by the printer.)

1. Press the On/Off Line key to take printer off line.
2. Press the Tear Off key to advance the form to the tear off point.
3. Remove the last printed form.
4. Press the Park key. The continuous forms will be backed down out of the paper path and held in the forms tractors. The display will appear as shown:

< Paper Out Main >

5. Press the Path key. The printer will shift to the alternate path then attempt to load paper.
6. If paper is not loaded in the alternate path, the display will indicate so.

< Paper Out Alt >

7. If paper is loaded, press On/Off Line key.

NOTE

To use the Path key, the 'Path' feature setting must be set to 'Either' in the current selected Profile. If the 'Path' feature is set to 'Main' or 'Alt', the Path key is disabled. See Sections 3.12 – 3.13 for a description of paper path changing using Profiles.

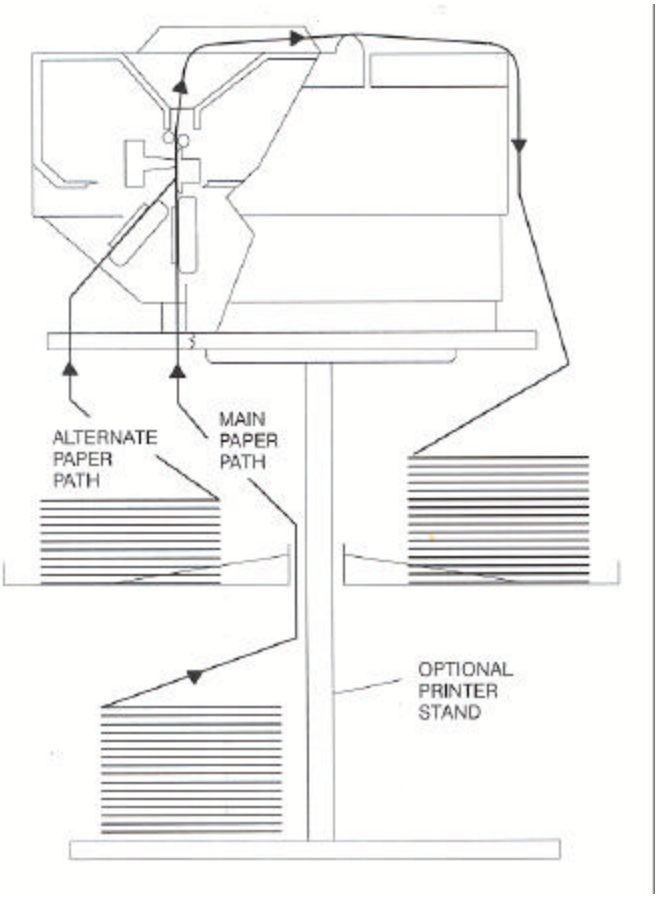


Figure 3-12: Main and Alternate Paper Paths
(Cut Sheet not Shown)

3.9 Changing From Alternate Paper Path to Main Paper Path

If paper is loaded in the alternate printer path, you may change to the Main Paper Path by proceeding as follows:

1. Press the On/Off Line key to take printer off line.
2. Press the Tear Off key to advance form to tear off point. Remove last printed form.
3. Press the Park key. The continuous forms will be backed down out of the paper path and held in the tractors. The display will appear as shown:

<Paper Out: Alt>

4. Press the Path key. The printer will shift to the Main Paper Path and automatically load paper. If paper is not loaded in the main path, the display will indicate so.

<Paper Out: Main>

5. If paper is loaded, press On/Off Line key.

NOTE

To use the Path key, the 'Path' feature setting must be set to 'Either' in the current selected Profile. If the 'Path' feature is set to 'Main' or 'Alt', the Path key is disabled. See Sections 3.12 – 3.13 for a description of paper path changing using Profiles.

3.10 Paper Out Condition

When the printer runs out of paper, the following messages will appear in the display depending on paper path selected:

<Paper Out: Main>

<LOAD CHECKS>

or

<Paper Out: Alt>

<LOAD PROFILE 2>

1. Remove last printed form from paper path by using Form Feed key.
2. Load continuous forms. Refer to Page 3-3.
3. Press the On/Off Line key to go back on line.

The alternating display indicates which path (Main, Alt) is empty and which form to reload.

NOTE

If the Profile has not been renamed to match the form being used, the display will indicate 'Load Profile x' as shown in the example above. In this case, the form associated with Profile 2 should be loaded. For more information on naming Profiles, see the 'Rename' feature located in the Profile Control menu described in Chapter 4.

3.11 Automatically Changing Paper Paths On Paper Out

The printer may be configured to automatically change paper paths during a paper out condition.

NOTE

This may be useful in applications where the printer is unattended or installed at a remote location. If this feature is enabled, the same forms must be loaded in both paper paths.

After changing paths, the printer will attempt a load. If paper is found, printing will continue. If no paper is installed, the unit will stop and indicate a paper out condition.

To enable this feature:

1. Open Keypad Door.
2. Press the Next Menu key until Menu 4 is displayed.

M4 PRINTER CNTRL

3. Press Feature ▲ until feature is displayed.

Auto Path SW Off

4. Press Value ▲ ▼ to turn the feature on, and then press the Enter key to save selection.
5. Close Keypad Door and press the Profile key to save profile.

3.12 Selecting Paper Paths Using the Profile Key

Each Profile contains a 'Path' feature which specifies the (Main, Alt, Either) paper path. When a profile is selected, the paper path may be automatically changed or the operator may be asked to load a new form in the currently selected paper path. The action taken depends on the value of the 'Path' feature setting (located in Menu 2 Forms Control).

After using the Profile key to select a new profile, the operator should either press the On/Off Line key or the Load key if paper is not loaded. The printer will then park the current form. If the current form cannot be parked, the printer will advance the form to the tear bar and display:

< Tear Off Form >

< Press On/Off Line >

After tearing off the current form and pressing On/Off Line, the printer will then park that form.

Example of profile names and paths:

Original Profile Name	New Profile Name	Path
Profile 1	Checks	Main
Profile 2	Invoice	Alternate
Profile 3	Memos	Alternate
Profile 4	Reports	Alternate

Example using same path:

The current profile is named "Invoices" and the paper path selected by that profile is alternate. The new profile named "Memos" specifies the same path (Alt). After selecting profile "Memos" and the printer has successfully parked the invoices, the following message will be displayed:

< Load Memos in >

< Alt Paper Path >

After loading memos into the alternate path, press the Load key. The printer will load the memos and resume normal operation.

Example using different path:

The current profile is named "Invoices" and the paper path selected by that profile is alternate. The new profile named "Checks" specifies the main paper path. After selecting profile "Checks" and the printer has successfully parked the invoices, the printer will load the main paper path and resume operation. If there is no form loaded in the selected path (main), the following message will be displayed:

< Paper Out: Main >

< Load Checks >

After loading checks into the main paper path, press the Load key. The printer will load the checks and resume normal operation.

3.13 Selecting Paper Paths From the Host Computer Using DPCL Command

In demand document applications, the paper path may be selected by using Downline Printer Control Language (DPCL) sequences to select the active Profile 1-4. This command is available in all emulation modes. Indicating a profile using DPCL commands will allow paper path selection from the host computer. For more information on configuring features and profiles, see Chapter 4.

NOTE

In dual tractor units, the most frequently used form should be loaded in the main path and other forms in the alternate path. Now, changing profiles will prompt the operator to load the correct form in the alternate path. To ensure the correct form is loaded, the alternate path should be left empty when not in use. This will cause the printer to stop and indicate which form to load when the path is selected.

After the profile is configured, it may be selected for the host computer using DPCL sequences. The paper path will be selected according to the profile selection. Refer to previous Section 3.12 for further information on paper path selection using profiles.

The DPCL sequence to change profiles is active in all emulations.

Select Profile (form) <n> **ESC$$E1.I18;<n>.X.**

CODE	FORMAT												
ASCII:	ESC	$	$	E	1	.	I	1	8	;	<n>	.	X	.
DECIMAL:	27	36	36	69	49	46	73	49	56	59	n	46	88	46
HEXADECIMAL:	1B	24	24	45	31	2E	49	31	38	3B	n	2E	58	2E

Description: This command is used to select Profile n where values of n range from 1 to 4. The Paper Path may be selected by the Host Computer by configuring the 'Path' feature to Main, Alt, or Either, and by selecting the Profile using this sequence.

Example:
```
10 rem select Profile 2
20 print chr$(27);"$$E1.I18;2.X."
```

Comment: See Chapter 4 for a description of Profile features including the 'Path' feature.

* Only the Main selection is available on single path units.

4. Features and Profiles

4.1 Features

This chapter describes and explains the various user programmable features of the printer. Using the keypad, the printer can be easily configured to operate in a variety of host environments and provide print for common applications such as reports, checks, invoices, and labels.

The printer's features are grouped into the following 10 categories:

Menu Name	Feature Examples
M1 PAGE FORMAT	Line/Inch, Form Length, Margins, etc.
M2 FORMS CONTROL	Load Dst, Horz Adj., etc.
M3 PERSONALITY	Emulations, Fonts, Character Sets, etc.
M4 PRINTER CONTROL	Auto LF, Auto CR, etc.
M5 SERIAL CONTROL	Baud Rate, Parity, Handshaking, etc.
M6 PARALLEL CONTROL	Handshaking, Ack After Busy, etc.
M7 PROFILE CONTROL	Naming, Saving Profiles, etc.
M8 FORM THICKNESS	Auto Form Gap, Retract Printhead, adjust Form Gap, etc.
M9 DIAGNOSTICS	Print Profile, Print Test, Firmware Rev., etc.

NOTE
System Control Group must be activated for access. See Appendix D.

M10 SYSTEM CONTROL	Off Line, Reset Key Lock, Quick Access, etc.

See Pages 4-11 through 4-26 for a detailed listing and description of all features and values.

4.2 Profiles

A unique benefit of this printer is its ability to store the feature settings for commonly used applications in what is called a Profile. Up to four profiles may be named, stored in the printer's non-volatile memory, and recalled with a few key strokes. This avoids time consuming setup and reprogramming each time the application changes.

Following is an example of some common forms used and specific features that may be programmed into a profile when using these forms:

Profile Name/Feature Value

Feature Name "Example"	P1 "Report"	P2 "Invoice"	P3 "Checks"	P4 "Statements"
Form Length	88	66	24	30
Lines/Inch	8	6	6	6
Right Margin	136	80	70	70
Horz Adj	135/144	135/144	100/144	200/144
Manual Tear	FF	TOF	TOF	TOF
Emulate	IBM PRO	IBM PRO	LA 120	LA 120
Font	DP 17.1	Draft 10	OCR A	Draft 10
Parallel	Enable	Disable	Disable	Enable
Path	Main	Either	Alternate	Alternate

In this sample, change from printing "Reports" to "Checks" as follows:

1. Take printer off line by pressing the On/Off Line key.
2. Park current form.
3. Change to desired profile, in this case "checks".
4. Load the appropriate forms ("checks").
5. Place unit on line.

For an application that is not stored in a profile, call up the profile whose features most closely match the application and reprogram only the features requiring change. These changes will not alter the profile's permanent settings unless you save them when you exit Setup Mode.

4.3 Setup Mode Key Functions

To change features, open the Keypad Door to enter Setup Mode. Figure 4-1 shows the Setup Mode keys and their respective functions.

A brief description of each key function follows:

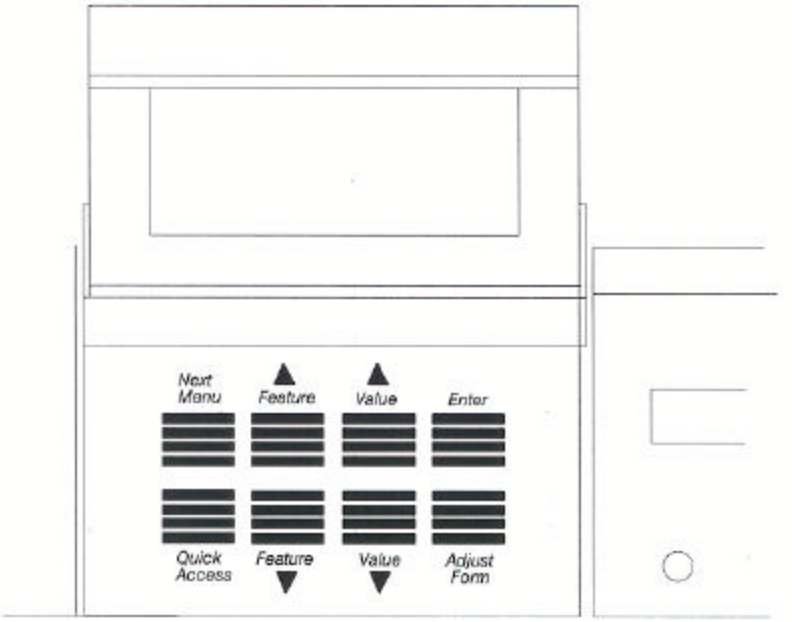


Figure 4-1: Setup Mode Keys

The Next Menu key provides access to a specific group of features. Pressing this key steps through the printer features by menu. This prevents having to "cycle through" the entire list using the Feature key in order to get to the desired feature.

This key provides immediate access to typical features required for quick setup. These include font, margins, form length, and lines/inch. The features accessed by this key can be changed to correspond to the user's needs.

The Feature keys are used to select a specific feature. Press the Feature ▲ key will move the display up the features list. Pressing the Feature ▼ key will move the display down the features list. When a menu boundary is crossed in either direction, it will be displayed.

The Value keys are used to change the value of a feature. Pressing the Value ▲ key increases feature values. Pressing the Value ▼ key decreases feature values.

The Enter key is used to accept new values for printer features. After the value of a feature has been changed, the Enter key is pressed to save the new settings into memory.

This key enables the user to adjust the top-of-form setting (first printline location) using the Value ▲ ▼ keys.

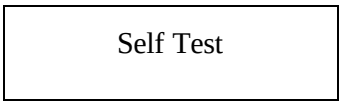
4.4 LCD Display

In Setup Mode, the LCD display provides the following information:

Feature Name and Value:

Menu Names:

Diagnostic Tests:



4.5 Profile Feature Listing

To print a listing of the feature settings of a particular profile, follow the steps below:

1. Make certain 20 column or wider paper is loaded in the printer.
2. Press the On/Off Line key to take the printer off line.
3. Before entering Setup Mode, press the Profile key until it displays the profile you wish to print.
4. Open the Keypad Door and use the Next Menu key to go to Menu 9. The display will read:

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5. Press the Feature ▼ key until display reads:

Print Profile

6. Press the Enter key. The printer will print a listing of the profile feature settings.
7. Close the Keypad Door to exit Setup Mode after printout is complete.
8. Press the On/Off Line key to return to normal operation.

4.6 Changing Features in a Profile

Feature settings in a profile may be changed through the keypad by following the steps below:

1. Press the On/Off Line key to take the printer off line.
2. Press Park key to park paper.
3. Press the Profile key to select profile being changed.
4. Open the Keypad Door.
5. Press the Next Menu key, as necessary, to scroll through the feature menus until you reach the menu containing the feature you wish to change.
6. Press the Feature ▲ or the Feature ▼ key to scroll the display up or down until you reach the feature to be changed.
7. Press the Value ▲ key or the Value ▼ key to scroll the display backward or forward until you reach the value you wish to set.

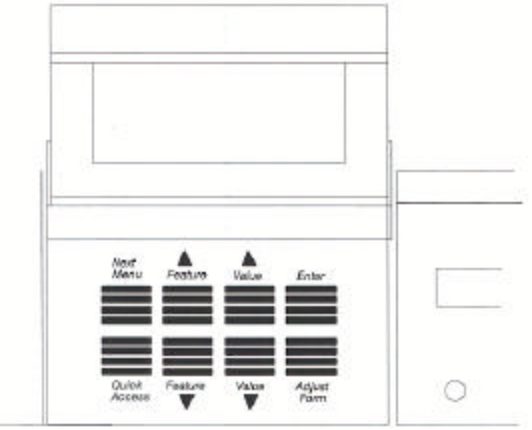


Figure 4-2: Changing Features in a Profile

8. Press the Enter key to record the new value.

9. Repeat Steps 5 through 8 as necessary until all features are correctly set for your application.
10. Close the Keypad Door to exit Setup Mode. The alternating display will read:

Press 'Profile'

To Save Settings

To answer "Yes", press the Profile key. This will permanently record the change in non-volatile memory for that profile.

To answer "No", press any other key. This will make the change temporary, thus not changing the original profile setting. These settings will be valid until profiles are changed again or the printer is powered off.

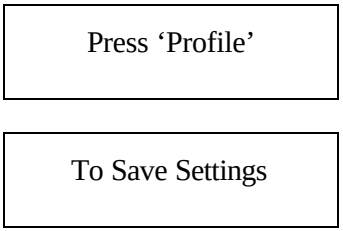
11. Press Load key to load paper (resets top-of-form).
12. Press the On/Off Line key to return to operation.

NOTE

To maintain correct top-of-form alignment when a profile change is made, the paper should be parked (if not already parked) and reloaded so that the printer can reset the top-of-form for the new profile.

As an example, assume the profile you are presently using defines the lines per inch as 6. To **permanently** change the lines per inch to 8, proceed as follows:

1. Press the On/Off Line key to take the printer off line.
2. Press Park key to park paper.
3. Open the Keypad Door to enter Setup Mode.
4. Press the Feature ▲ key to select Lines/Inch.
5. Press the Value ▼ key to change the Lines/Inch to 8 lines.
6. Press the Enter key to save the new Lines/Inch value.
7. Close the Keypad Door to exit Setup Mode. The LCD will read:



   Press Profile key to save entry.

8. Press the Load key to load paper (resets top-of-form).
9. Press the On/Off Line key to place the printer back on line.

After pressing the On/Off Line key, the printer will operate with the vertical motion defined as 8 lines per inch. The next time this profile is selected, or if the printer power is switched off and back on, the lines per inch margin will remain at 8 lines per inch.

4.7 User Programmable Features

Menu 1: Page Format

Printer Displays	Values	Description
Lines/Inch ###	1 2 3 4 6 8 12	Vertical pitch for printing text in lines per inch.
Form Length ###	1 . . 200	Lines per page resets top and bottom margins. Value cannot exceed bottom margin.
Top Margin ###	1 . . . 200	Number of lines from the top-of-form and the first print line. Value cannot exceed form length.
Bottom Margin ###	1 . . . 200	Bottom margin The last print line allowed on the form Value cannot exceed form length.
Left Margin ###	1 . . MLL	The left margin can be set from 1 to the right margin. Maximum Line Length (See Appendix A)
Right Margin ###	LM . . MLL	Clear Horizontal Tabs Pressing the Enter key will clear all horizontal tabs. Maximum Line Length (See Appendix A)

Menu 1: Page Format (Cont'd)

Printer Displays	Values	Description
Clear Horz Tabs		Clear Horizontal Tabs Pressing the Enter key will clear all horizontal tabs.
Horz Tab ### xxx	Set/Clr	Horizontal Tabs Pressing the Value key selects the column (#) where a horizontal tab may be set or cleared. Pressing the Enter key will Set or Clr (clear) a tab in that column
Clear Vert Tabs		Clear Vertical Tabs Pressing the Enter key will clear all horizontal tabs.
Vert Tab ### xxx	Set/Clr	Vertical Tabs Pressing the Value key selects the line (##) where a vertical tab may be set or cleared. Pressing the Enter key will Set or Clr (clear) a tab in that line.

Menu 2: Forms Control

Printer Displays	Values	Description
Load ###/144"	0 0/144 . . . . . Current Form Length In Inches	This feature is used to align the first printline of a form and the printhead. This feature is normally set using the Adjust Form key. This feature is active only during paper loading. Increments are in inches or 1/144th of an inch.
Load Crg Mov ###		This feature determines if the print head moves during a Load function. This feature is only used during paper loading.
	On	The print head will move while the paper is being loaded. This normally will prevent fanning of a multi-part form.
	Off	The print head will stay to the far right of the carriage. No motion will occur until the printer seeks the thickness of the form.
Horz Adj xxx/144"	0/144 . . . 144/144	This feature allows the user to logically offset the form horizontally to the left, up to 1 inch. This feature is active immediately when set.
Tear x xxx/144"	0 0/144 . . . 11 0/144	This feature determines the distance the paper is moved when the Tear Off key is pressed.

Menu 2: Forms Control (Cont'd)

Printer Displays	Values	Description
Manual Tear xxx	FF	The printer will perform a form feed before moving to the tear position after pressing the Tear Off key.
	TOF	The printer will move to the tear position after printing crosses the next forms boundary after pressing the Tear Off key.
	No FF	This value will move the paper the tear distance only. No form feeds are performed.
Manual Time ###s	OFF	The Tear Off key must be pressed to return the forms to the print position.
	1 . . 30	The time in seconds that the form will be in the tear position before automatically returning to the print position. This feature works only with the Manual Tear key.
Auto Tear xxx	OFF	Values set for "Off", the printer will not move the form into the tear position if the form is at top and no data is being transmitted.
	IDLE	Value set for "Idle", the printer will move the form into the tear position if the form is at top and no data is being transmitted.
	PAGE	Moves the form to the tear bar position on every page break while on line. The form will retract after the time specified by the "Auto Time X" feature has expired.

Menu 2: Forms Control (Cont'd)

Printer Displays	Values	Description
Auto Time ###s	1 30	The time in seconds that the form will be in the tear position after more data is sent to the printer. This feature works only when the Auto Tear feature is ON.
HF: Pos crg x.x"	0.0" 0.1" 0.2" . . . 9.8"	Specifies the position of the carriage, when the Heavy Forms feature is enabled. The maximum value is dependent on the current value of the Horz Adj xxx/144" feature.
HF: xxxxxxxxxxxx		Specifies when the Heavy Forms sequence is initiated.
	On Feed > x.x"	On a paper feed greater than x.x inches the carriage is positioned to the location specified by the HF:Pos crg x.x" feature. The default = .5" which is 3 lines @6 LPI.
	0.0" 0.1" 0.2" . 5.0"	
	On page break	On a form feed (FF) or paper move that crosses a forms boundary or bottom margin (page break), the carriage will be positioned to the location specified by the HF: Pos crg x.x" feature.
	Disabled	Heavy forms sequence is disabled.

Menu 2: Forms Control (Cont'd)

Printer Displays	Values	Description
Path xxxxx	Either Main Alt.	Allows the current profile to be paper path specific.
Paper Speed ###	3 15	This feature controls the paper feed speed in inches per second. Slower speeds may improve paper handling of certain forms.

Menu 3: Personality

Printer Displays	Values	Description
Emulate xxxxxxxx	IBM Pro IBM Grph. LA 120 Epson FX DS-180 Display	This feature selects the desired emulation. Escape sequences for each emulation are listed in the "Programmer's Manual." Hex display feature, see "Troubleshooting and Maintenance" for further information.
Font xxxxxxxxxx	DP 10 DP 12 DP 13.2 DP 15 DP 16 DP 16.5 DP 17.16 DP 18 DP 20	Data processing fonts. Italic print quality will vary when using DP fonts.
	Draft 10 Draft 12 Draft 13.2 Draft 15 Draft 16 Draft 16.5 Draft 17.16 Draft 18 Draft 20	Draft fonts (9 x 12 matrix)
	Courier 10 Prestige 12 OCR_A 10 OCR_B 10	NLQ font (18 x 24 10 cpi) NLQ font (18 x 20 12 cpi) NLQ font (18 x 36 10 cpi) NLQ font (18 x 36 10 cpi)

Menu 3: Personality (Cont'd)

Printer Displays	Values	Description
Set xxxxxxxxx	7 Bit ASCII DEC Supplmt1 IBM Code 437 IBM Code 850 Epson Italic Epson Graph Epson Ital/Gr	Refer to "Programmer's Manual" for character tables.
Nat. xxxxxxxx	USA UK France Germany Italy Switzerland Canadian Fr Japan Latin Am Spain Denmark Norway Finland Sweden Spain II Denmark II Sp/Lat Am Nor/Den Swed/Fin	All nationalities are available in all symbol sets, fonts, and emulations (except OCR A and B) using Setup Mode. The actual nationality selected using emulation escape sequences vary depending on emulation. Refer to the Programmer's Manual for each emulation.
IBM CHAR Set	1 or 2	
Print Zero as #	0 Ø	Prints Zero without a slash Prints Zero with a slash

Menu 4: Printer Control

Printer Displays	Values	Description
Auto LF xxx	Disable	No line feed with carriage return.
	Enable	Performs a line feed with carriage return.
Auto CR xxx	Disable	No carriage return with line feed.
	Enable	Performs a carriage return with line feed.
Wrap xxx	Disable	Printable data past the right margin is ignored.
	Enable	Performs a carriage return line feed if data exceeds the right margin.
Print xxxxxxxx	Bidirect	Bi-Directional printing
	Unidirect	Unidirectional printing prints left-to-right only.
Auto Path SW xx	ON	When this feature is set to 'ON' and a paper out occurs while printing, the printer will automatically change to the other paper path and continue printing if the forms are loaded successfully.
	OFF	This feature is valid only on dual tractor units.
Vert Graphic xxx	ON	Specifies status of the TI-885 raster graphics mode
	OFF	When ON Anadex graphics is enabled when DS-180 Emulation is selected.
Horz Graphic xxx	ON	Specifies status of the TI-885 horizontal graphic mode
	OFF	
Power Up xxxxxxxx	On Line	Specifies whether printer powers up into on line or off line status
	Off Line	

Menu 4: Printer Control (Cont'd)

Printer Displays	Values	Description
Buffer Size xxxx	512 . . . . . Max	Specifies the size of the data buffer. Lower limit of this range may be limited by "Window Size" feature. Depends on buffer option installed
Window Size xxxx	256 . . . . . . Max Size Less 1024	Window (FIFO size) Specifies how many bytes of data must be emptied out of a full data buffer before the communication interface will go into the "Ready" mode Upper limit of this range is limited by the "Buffer Size" feature.
Ribbon	##% Used	This feature displays the estimated ribbon used. The value is based upon the percentage of Max Ribbon feature.
Dble Strike xxx	ON OFF	Prints in unidirectional emphasized mode. Used for higher contrast on multi-part forms Normal print.

Menu 4: Printer Control (Cont'd)

Printer Displays	Values	Description
DGCL xxxxxxx	Disable	Disables recognition of Barcode Transparency commands
	Enable	Enable recognition of Barcode Transparency Commands
Exit Mode xxxxxx	Adjust	Adjust the form to the next logical line feed boundary upon exiting the Barcode Task mode.
	Return	Return the form to the last active vertical position upon exiting the Barcode Task mode. See the ^J000 command
	No Adj	Position the form directly below the last printable pass of the Task mode upon exiting the Task mode
	BC-300	Emulates the Barcode 300 exit mode.
Command Char xxx	33	Defines the default command character
	255	Example: 94 represents the [^] character
Overlap xxxxxxx	Disable	Disables one dot overlap when printing barcodes
	Enable	Enables one dot overlap when printing barcodes
DW Term	Disable	Double wide print is not affected by line terminations
	Enable	Double wide print is cancelled by CR, LF, FF, and VT
		Valid only when DS-180 Emulation is selected.

See Chapter 6 in Programmer's Manual for barcode programming.

Menu 5: Serial Control

Printer Displays	Values	Description
Baud Rate xxxx	110 300 600 1200 1800 2400 4800 9600 19.2k	Refer to the documentation of your host computer to determine the baud rate.
Serial xxxxx	RS-232	Selects serial configuration
	RS-422	Cable must be configured to match. See Appendix B
	OFF	Selecting OFF disables both serial configurations.
Parity xxxxx	None Even Odd	Refer to the documentation for your host computer to determine parity.
	Space Mark	Space 8th Bit only Mark 8th Bit only
Data Bits xxxxxxx	7 8	Refer to the documentation for your host computer to determine data bits.

Menu 5: Serial Control (Cont'd)

Printer Displays	Values	Description
DTR xxxxxxx	Enable	Hardware Handshaking DTR (Data Terminal Ready) Busy on when: Buffer filled to high water mark Printer off line Paper out condition Error conditions Busy off when: Buffer below low water mark
	Disable	Will remain high at all times.
Handshk xxxxxxx	ENQ_ACK EXT_ACK X-ON/ X-OFF XON+ETX XON+ENQ NONE	Specifies whether to use software handshaking
X-ON Ctrl xxx	Single Robust	Specifies which type of X-ON Handshaking control is active
X-OFF Ctrl xxx	Single Robust	Specifies which type of X-OFF handshaking control is active
Modem Ctrl xxx	On	Activates the following signals: RTS (Request to Send) CTS (Clear to Send)
	Off	Disables the above signals (RTS is held high)

Menu 6: Parallel Control

Printer Displays	Values	Description
Handshk on xxxx	Busy < or > Ack	Parallel interface handshaking Active when: Buffer filled to high water mark Printer off line Paper out condition Error conditions Inactive when: Buffer below low water mark
Ack xxxxxx Busy	After Before	Ack will occur after busy. Ack will occur before busy.
8^{th} Bit xxxxxxx	Enable Disable	Printer will honor the 8^{th} bit. Printer will ignore the 8^{th} bit
Parallel xxxxxxx	Enable Disable	Parallel port is enabled. Parallel port is disabled. The printer will ignore any data sent to the parallel port. Handshaking will indicate busy.

Menu 7: Profile Control

Printer Displays	Values	Description
Rename: xxxxxxxx	0 ….. 9 A ….. Z a ….. z Space	Profile Name This feature allows you to give the current profile a customized name. To change the current name: 1. Press the Value key until the desired "flashing" character is displayed. 2. Press the Enter key to store that character and skip to the next character. This new name will be displayed next to On Line/Off Line when Setup Mode is exited.
Save Profile		Pressing the Enter key will save into non-volatile RAM all the current feature values including those affected by the application.
Reset Profile		Pressing the Enter key will reset the **current profile** features to the factory default.
SER Prt	Off 1 . Max #	This feature links the data received by serial port to be associated with a specific profile. The printer automatically switches to the associated profile number.
PAR Prt	Off 1 . Max #	This feature links the data received by the parallel port to be associated with a specific profile. The printer automatically switches to the associated profile number.
Port Time ###s	1 . 1200	This feature is used to determine how long the printer waits before accepting data from a different interface.

Menu 7: Profile Control (cont'd)

Printer Displays	Values	Description
Max Profile xx	1 2 3 4	This feature is used to limit the number of active profiles, thus eliminating the need to cycle through unused profiles. This feature is universal and can be changed in any profile.

Menu 8: Form Thickness Control

Printer Displays	Values	Description
Auto Form Gap		Allows the user to perform an immediate automatic form thickness adjustment. Thickest part of form should be used when making this adjustment.
Quiet or Whisper	High Medium Low	This feature determines method and impact of a print line. Quiet – the printer prints at full character per second values. Whisper – the printer prints half of the character in the first pass and the other half in the second pass. The high, medium and low values are available in specific optional configurations.
Adj. Form Gap xxx	0-198 Units	Allows the user to specify/change the form thickness distance. Pressing Value ▲ key causes form thickness gap to decrease by 1 unit. Pressing Value ▼ key causes form thickness gap to increase by 1 unit.
Hor Gap Pos xx.x	0.0" . . 8.8"	Allows the user to have the printer perform auto form gapping at any horizontal position on the print line in tenths of an inch.
VR Gap Pos xx.x	0.0" . . Form Length in inches	Allows the user to have the printer perform auto form gapping at any vertical position on the paper. This is in tenths of an inch and is limited by the current form length.

Menu 9: Diagnostics

Printer Displays	Values	Description
Print Profile		Pressing the Enter key will print the current profile features. Paper must be loaded in the printer before pressing the Enter key. to stop test, close the Keypad Door or press the Enter key.
P/N: ###### xx		Firmware revision number
Test Printhead		Pressing the Enter key will result in testing each printwire in the printhead. Paper must be loaded in the printer before pressing the Enter key. To stop test, close the Keypad Door or press the Enter key.
Run Mode test		Pressing the Enter key will result in printing font renditions (Double-high, Emphasize, etc.) in the current symbol set. Paper must be loaded in the printer before pressing the Enter key. To stop the test, close the Keypad Door or press the Enter key.
Run Self Test		Pressing the Enter key will result in printing an ASCII ripple pattern. Paper must be loaded in the printer before pressing the Enter key. To stop the test, close the Keypad Door or press the Enter key.

Menu 10: System Control

NOTE

Refer to Appendix D for instructions on accessing Menu 10.

5. Troubleshooting and Maintenance

5.1 Scheduled Maintenance

This chapter provides scheduled maintenance and troubleshooting procedures that can be performed by the operator. A qualified technician should perform any troubleshooting or maintenance beyond the level presented in this chapter.

WARNING

MAKE CERTAIN THE PRINTER IS DISCONNECTED FROM THE AC POWER SUPPLY BEFORE REACHING INTO THE UNIT TO PERFORM ANY CLEANING OR MAINTENANCE TASK.

CAUTION

DO NOT USE CLEANERS, SOLVENTS OR LUBRICANTS ON ANY OF THE WORKING PARTS OF THE PRINTER.

The scheduled maintenance that should be performed is periodic cleaning (approximately every 3 months). Clean the cover with a soft, non-abrasive cloth.

Use a small vacuum cleaner to remove dust from the carriage, platen, paper tractors, paper out sensors, and printer throat. A dry, lint-free cloth may be used to clean accumulated dirt from the carriage shafts and the platen.

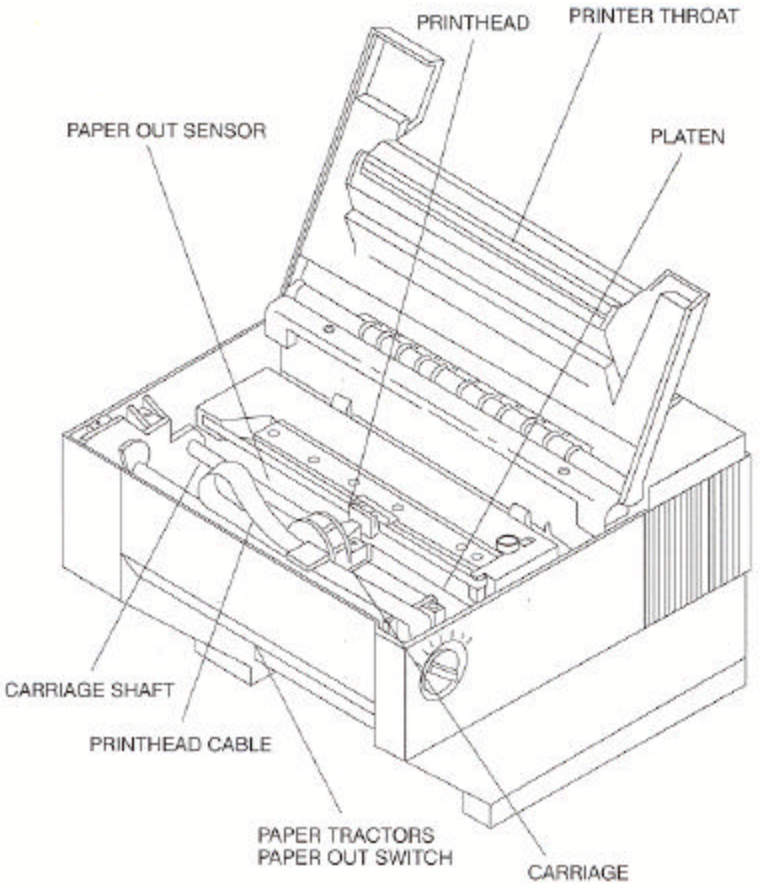


Figure 5-1: Cleaning the Printer

5.2 Error Message

Paper Out Condition (Main Tractors)

When the printer runs out of paper, the following message will appear in the display:

< Paper Out: Main>

The printer will automatically go off line when the paper supply is depleted. To recover from a paper out condition:

1. Load paper into the main tractors.
2. Press the Load key to load forms.
3. Press the On/Off Line key to go back on line.

   The error message will be cleared from the display after paper is loaded.

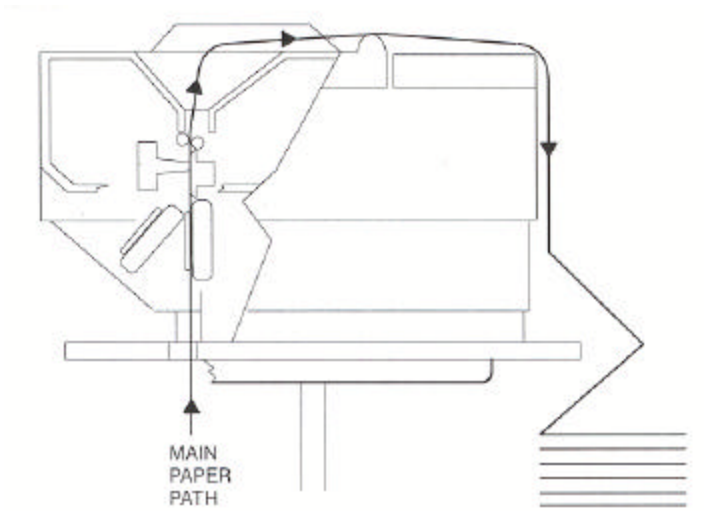


Figure 5-2: Main Tractor Path

Paper Out Conditions (Alternate Tractors)

< Paper Out: ALT >

When the alternate tractors run out of paper, the following message will appear in the display:

1. Load paper into Alternate tractors.
2. Press Load key to load forms.
3. Press On/Off Line key to continue.

   The error message will be cleared from the display after paper is loaded.

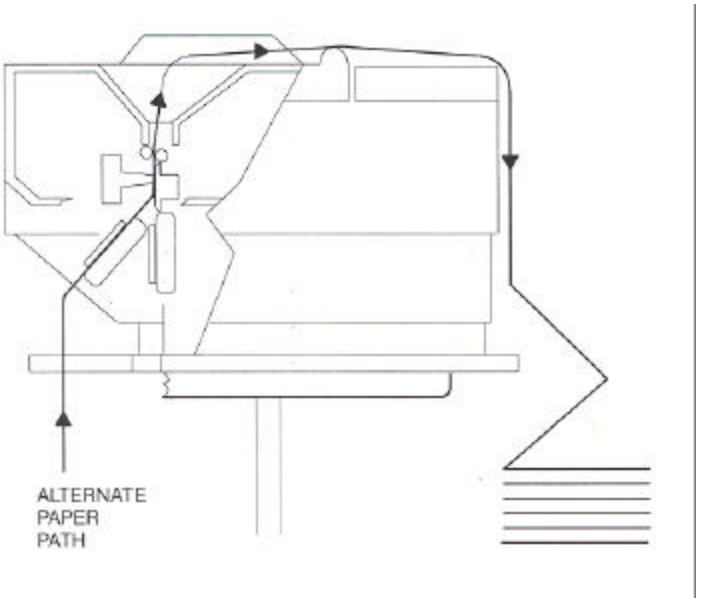


Figure 5-3: Alternate Tractor Path

Paper Jam

Paper jams may occur for several different reasons including: incorrect forms loading, form thickness adjustment set too close, or form out of specification. Check the value of the features that may affect form thickness adjustment: horizontal gap, vertical gap, heavy forms, and adjust form gap.

To clear a paper jam:

1. Turn the printer off.
2. Manually rotate the Form Thickness Adjustment Knob counterclockwise so that the printhead is the maximum distance away from the platen.
3. Open the Access Cover.
4. For tractors: Paper that has not reach the platen may be removed by opening the tractors and pulling the paper straight down.
5. For cut sheet: Paper that has not reached the platen can be dislodged by pressing Park and/or Line Feed and by the paper straight out.
6. Carefully, remove all paper fragments. Make certain no paper fragments are left on the platen, ribbon guide, or paper sensor. Make certain ribbon and guide are factory approved and are in the correct position and not twisted.
7. Close the Access Cover.
8. Turn the printer power on. When the power is switched on, the printer resets the carriage and checks the paper path. The printer will indicate a paper out condition if paper needs to be reloaded.
9. Reload paper as necessary.
10. The form thickness adjustment will automatically reposition for normal operation.

Carriage Jam

If the carriage is unable to move because of foreign objects in the printer or because of mechanical failure, the following messages will alternate in the display:

< Carriage Jam >

Press On/Off Line Key

To recover from this error condition:

1. Press the On/Off Line key to take the printer off line.
2. Open the Access Cover.
3. Clear the obstruction and make certain the carriage can move freely.

WARNING

PRINTHEAD MAY BE HOT.

4. Close the access cover.
5. Press the On/Off Line key to place the printer on line. When the printer goes on line, the printer will reset the carriage, check the paper path, and clear the error message from the display. The printer will indicate a paper out condition if the paper needs to be reloaded.
6. The form thickness adjustment will automatically reposition for normal operation.

Keypad Lockout

The following message is displayed momentarily after pressing a key which has been locked out or delayed:

```
>> Key Locked <<
```

This feature can be changed by using the instructions located in Appendix D.

5.3 Printer Diagnostics

Printer Diagnostics

The following printer diagnostics are available to aid in troubleshooting printer malfunctions. They are accessed while in the Setup Mode under Menu 9: Diagnostics. To initiate these diagnostics, perform Steps 1-5

.

NOTE

Paper must be loaded prior to performing printer diagnostics.

1. Open the Keypad Door to access Setup Menu.
2. Press Next Menu key until the display appears as shown.

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3. Press Feature ▼ key until display indicates name of diagnostic to be performed. For example:

Run Self Test

4. Press Enter key to start the selected test. LCD display alternate as follows:

Diagnostics

'Enter' To Stop

5. Press Enter key to stop, or close the Keypad Door.

Print Profile

This test will print a complete listing of feature settings for the current profile. This is normally used to obtain a quick list of the printer feature settings that can be compared with the computer system.

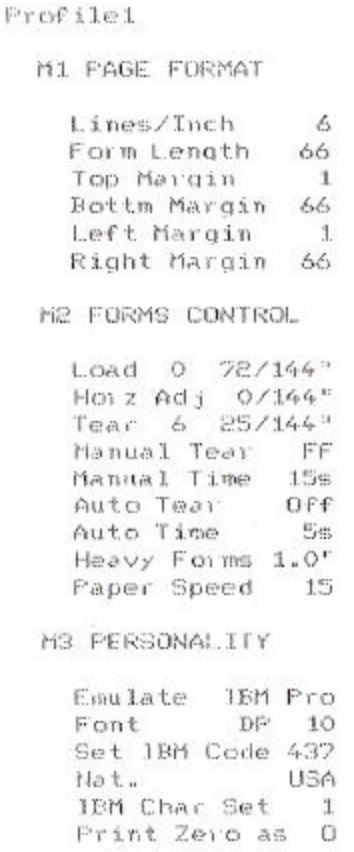


Figure 5-4: Print Profile

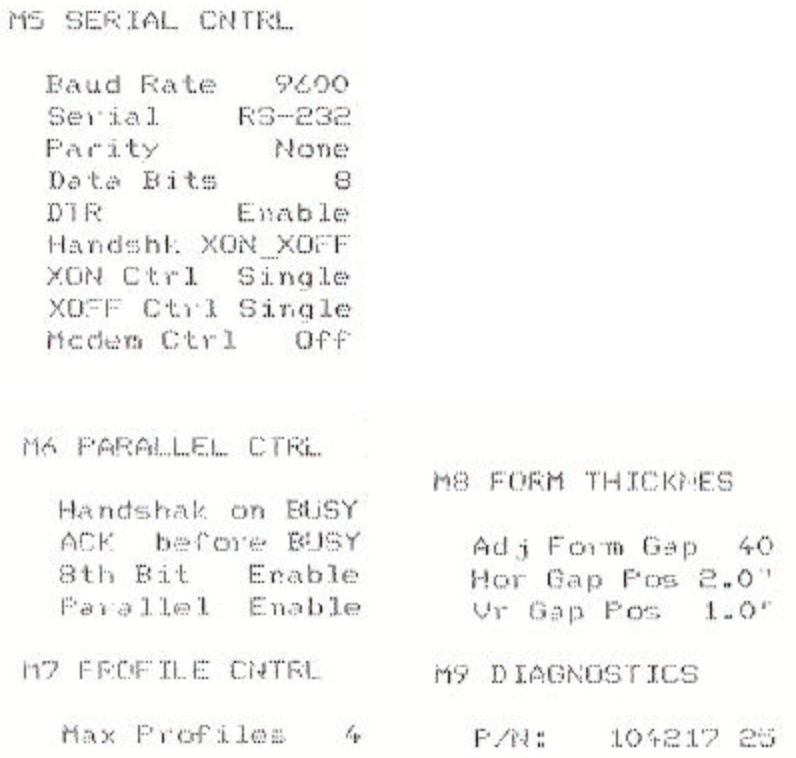


Figure 5-4 (cont'd): Print Profile

P/N: 104217 – xx (Firmware Part Number)

This test is normally used by service personnel to determine what level and type of firmware is installed in the printer. The test is included in the "Print Profile" feature, Figure 5-4, M9 Diagnostics.

Test Printhead

This test verifies that the individual printhead impact wires and the controlling electronics are operating properly. It may be used to identify the cause if dots are missing on the print out. In this test, one complete line is printed using each wire in the printhead. The wire is noted in the test print out.

NOTE

To prevent print off the page, 80 column paper should be used for this test.

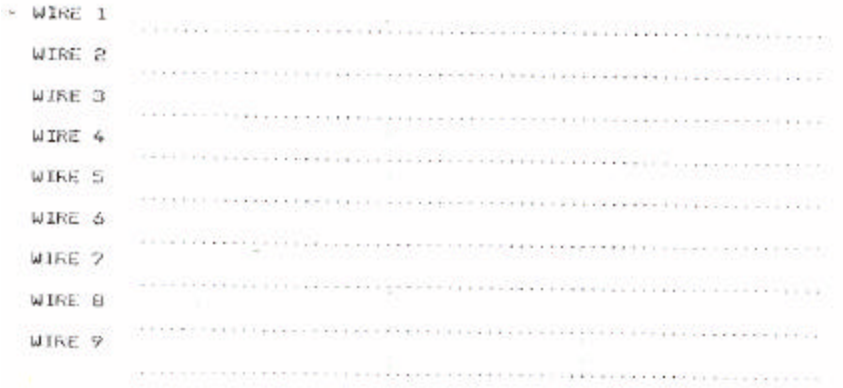


Figure 5-5: Printhead Test

Run Mode Test

This test (requiring 80 column paper) will print the current Symbol set in all fonts available in the printer.

Figure 5–6. Run Mode Test

Run Self Test

This test (requiring 80 column paper) will print an ASCII ripple pattern and will test the internal logic of the printer. If this test runs, the printer has passed all internal diagnostics.

Figure 5–7. Run Self Test

Display Mode

This test (requiring 80 column paper) is accessed while in Setup Mode under M3 Emulate. It is used to aid in program debugging or problem isolation. When Enabled, all data being sent to the printer from the computer is passed through the normal printer logic and printed in a hex dump format. Escape sequences and control codes are not executed. The output from the display mode can be compared to the control codes and escape sequences listed in the "Programmer's Manual". With this information you can determine if escape sequences are correct for the emulation selected.

Example: Assume that the printer is set up for Proprinter Emulation. The illustration below shows two lines of text that were printed by the printer. The display dump of this data is shown on the right.

Starting at the top left corner of the display print out is the ASCII code (in hexadecimal) '0F'. Referring to the Proprinter Emulation in the "Programmer's Manual", under "Select Condensed Printing", you will find the hexadecimal code '0F' with a description of what the command does for that emulation. This tells you that this ASCII code is valid for this emulation. It also tells you that the data following this code should print in 17.1 cpi and is canceled by receiving a DC2 (cancel condensed printing) control code. The data following the '0F' are the ASCII "HEX" codes for the text shown below. Under the ASCII Data column, control codes are printed as a period <.

Figure 5–8. Display Mode Test

5.4 Troubleshooting

NOTE

Please read this section before continuing to symptom analysis.

The following diagnostic tests are used to aid in isolating possible printer malfunctions. These tests will assist the operator in determining printer/host problems. Additional information for printer error recovery is described under Error Messages. For host to printer communication problems, it is suggested that the operator read the Interface Functional Description of this manual prior to symptom analysis. The operator should also be familiar with displaying and setting of printer features. Refer to the chapters on "Features" for this information.

The following section lists symptoms and corrective actions to be performed for each symptom. Prior to starting the symptom analysis, it is suggested that the printer be powered off for approximately 30 seconds and then powered back on. This will clear any possible bad data in memory and reload Profile settings. Verify settings by running the Print Profile diagnostic as described on Pages 5-9, and compare the output to your desired configuration. If no changes are needed, rerun the print job. If the problem persists, go to the Troubleshooting Table and locate the symptom that best describes the problem you are experiencing. Perform the corrective actions listed for the symptom. If the problem still exists after performing the corrective actions, or if there is not a symptom that corresponds to the problem you are experiencing, call a qualified technician for further assistance.

In the table, some corrective actions indicate to the operator to check a 'Feature Value' to make sure it is set correctly. An incorrect feature value can vary between host systems, applications, configurations, etc., and may cause the particular symptom. For example:

The operator may need to check the setting of the Parallel Enable/Disable feature found under Menu 6 (Parallel Control) and verify that the Parallel port is Enabled.

5.5 Troubleshooting Table

Symptom	Corrective Action
No Host Communication Serial	Verify properly selected profile.
	Check interface cable (pin outs), cable connections, or try a new cable.
	Verify emulation selected.
	Verify baud rate, serial type (RS-232, RS-422), parity, data bits, DTR, handshaking
	Is serial port disabled?
	Reset profile and re-setup the printer.
No Host Communication Parallel	Verify properly selected profile.
	Check interface cable (pin outs), cable connections, or try a new cable.
	Verify emulation selected.
	Handshaking (Ack and/or Busy), 8^{th} bit control
	Is parallel port disabled?
	Reset profile and re-setup the printer.
No Power/Blank Display	Verify power plug connection to the printer.
	Verify power plug connection to power outlet.
	Try another power outlet.
	Check main fuse located on the rear of the printer. Ensure that voltage switch is set properly.

Symptom	Corrective Action
Paper Feeding Problems Tractors	Verify power plug connection to the printer.
	Verify paper tension. Adjust tractors if paper is too tight or too loose causing buckling (See Section 3.3)
	Make sure the paper holes are aligned properly in tractors.
	Equally space rear paper supports and front paper guides between tractors.
	Verify forms are hanging straight down from the tractors and the front of the printer is aligned with the edge of the table top or stand.
	Verify that the ribbon guide is fully seated on the printhead.
	Verify that there are no twists in the ribbon.
	Do not print off the edge of the form or on the paper staples. Verify that the left tractor is positioned to the alignment mark and that the left and right margins are set properly.
	Verify form thickness is within the specification.
	Verify Heavy Forms feature setting is on (See Sections 3.6 – 3.7).
	Reduce print speed (under M2 Forms Control in Setup Mode) and/or move paper to Main paper path on dual path units only.

Symptom	Corrective Action
Paper Feeding Problems	Remove any paper jams by pressing Line Feed and Adjust ▲ or ▼.
Cut Sheet *	Turn power off, open Access Cover and remove any foreign objects. Adjust the right edge guide to the correct width and reload paper. (See Section 3.3)
	If form is 4.5 inches to 6.0 inches long, verify that the Vertical Gap position is set to 0.0 inches (located under M8: Form Thickness. See Sections 4.6 – 4.7)
	Reduce Paper Speed (located under M2: Forms Control. See Sections 4.6 – 4.7)
	If vertical spacing is not exactly 6 or 8 lines/inch (exceptionally thick, stiff, and long forms), adjust Cut Sheet Comp. feature value.
Skewed Print On Cut Sheet Forms	Make sure to grab the form in the center and align left edge of the form against the left edge guide.
	Verify the right edge guide is positioned properly against the form.
	Reduce the Paper Speed (located under M2: Forms Control. See Sections 4.6 – 4.7)
Improper Print Alignment between first and last sheet of form	Keep Top Exit Cover closed while printing. Do not allow form to spill over front of printer. Do not touch the form as it is printing.
(Delamination)	Reduce Paper Speed (located under M2: Forms Control See Sections 4.6 – 4.7)
	Verify that the form thickness setting is correct for the application and increase forms thickness setting, if necessary.

* To avoid vertical inaccuracy, do not print using Double High, Double Strike, Superscript, or Twelve dot high characters over the last 2 inches of a cut sheet form.

Symptom	Corrective Action
Carriage Jam	Turn off power, open front Access Cover, and check for foreign objects.
	Verify label is not stuck to the ribbon guide.
	Verify form thickness setting.
No Print	Verify installation of ribbon and ribbon guide.
	Run a self-test. See "Diagnostic Tests"
	Verify form thickness setting as described under the "Form Thickness Adjustment" of this manual.
Short Ribbon Life	Inspect failed ribbon. Ribbon should have two distinct wear bands. If only one band is visible, ribbon is defective.
	If ribbon fabric shows vertical runs, printhead gap is too small or printhead is damaged. Check print gap and printhead.
	Ribbon life can be affected by application. Heavy graphics, barcode and NLQ printing can shorten ribbon life.
Prints Garbage	Verify properly selected profile.
Parallel	Check interface cable (pin outs), cable connections, or try a new cable.
	Verify emulation selected.
	Handshaking (Ack and/or Busy), 8^{th} bit control
	Reset profile and re-setup the printer.

Symptom	Corrective Action
Prints Garbage	Verify properly selected profile.
Serial	Check interface cable (pin outs), cable connections, or try a new cable.
	Verify emulation selected.
	Verify baud rate, serial type (RS-232, RS-422), parity, data bits, DTR, handshaking.
	Reset profile and re-setup the printer.
Loss of Data Buffer Overflow	Check interface cable (pin outs), cable connections, or try a new cable
Parallel	Verify emulation selected.
	Handshaking (Ack and/or Busy), 8th bit control
	Reset profile and re-setup the printer.
Loss of Data Buffer Overflow	Check interface cable (pin outs), cable connections, or try a new cable
Serial	Verify emulation selected.
	Verify baud rate, serial type (RS-232, RS-422), parity, data bits, DTR, handshaking.
	Reset profile and re-setup the printer.
Printhead Moves but No Printing Occurs	Check Form Length feature. Form length must be equal to the length of the form being used.
Printhead Pauses at End of Print Lines	Printhead thermal protection is activated. Make sure printer has proper air flow and is not located in an excessively hot area. Printer will exit this mode automatically after cooling.

Symptom	Corrective Action
Printer Will Not Switch Paths	Change the Path Value to "Either" under M2: Forms Control. (See Section 3.8 – 3.13). Verify the Config feature in M10 matches the configuration of the printer.
First Print Line Location is Wrong	Readjust the first print line using the instructions in Section 3.4.
Print Contrast on Last Sheet is Too Light	Verify the forms thickness setting is correct for the form being used.
	Enable the High Impact feature under M4: Printer Control (See Section 4.6 – 4.7)
	Select an NLQ font listed in Section 3.4.
Printer is Too Noisy	Enable Quiet Mode feature under the M8: Form Thickness Control. (See Section 4.6 – 4.7).

A. Printer Specifications

A.1 Printer Characteristics

- **Printhead:**

  9 wire with a rated life of 200,000,000 draft characters.

- **Maximum Line Length:**

  Main Tractor Path 8.8 inches (223mm)
  (88 columns @ 10 cpi)

  Alternate Tractor Path 8.8 inches (223mm)
  (88 columns @ 10 cpi)

- **Vertical Pitch:**

  1, 2, 3, 4, 6, 8 and 12 lines per inch and variable spacing, depending on the emulation.

A.2 Emulations

- Epson FX-80
- DEC LA-120
- IBM Graphic Printer
- IBM Proprinter XL
- DS-180

A.3 Font Specifications

- **Available Fonts/Typefaces:**

	Pitches	Matrix (H x W)	Print Speed (CPS)
DP	10, 12*, 13.2, 15, 16.5, 17.16, 18, 20	9 x 10	300
Draft	10, 12, 13.2, 15, 16, 16.5, 17.16, 18, 20	9 x 12	250
Courier	10	18 x 24	62
Prestige	12	18 x 20	75
Helvetica	12	18 x 24	75
OCR A	10	18 x 36	42
OCR B	10	18 x 36	42

* 9 x 9 at 333 cps

- **Graphic Densities:**

Horizontal Dots/Inch	Vertical Dots/Inch
60	72 dots/inch and variable spacing, depending on emulation
72	
80	
90	
120	
240	

- **International Character Sets :**

Epson Nationalities	DEC Nationalities
USA	USA
France	U. K.
Germany	Finland
U. K.	Sweden
Denmark I	Norway/Denmark
Sweden	Germany
Italy	France
Spain I	
Japan	
Norway	
Denmark II	
Spain II	
Latin America	

A.4 Paper Feed Specifications

- **Paper Types:**

  Main Tractor: 3 ½ inches to 10 5/8 inches (88.9 mm to 269.8 mm), 1 to 9 part, .028 inches (.127 mm) max. thickness. Individual parts not to exceed .005 inches (.711 mm) thickness without factory approval.

  Alternate Tractor: 3 inches to 10 ½ inches (76.2 mm to 266 mm), 1 to 9 part, .28 inches (.127 mm) max. thickness. Individual parts not to exceed .005 inches thickness (.711 mm) without factory approval.

  Cut Sheet: 2 ¾ inches to 10 5/8 inches (69.8 mm to 269.8 mm), 1 to 9 part, .028 inches (.127 mm) max. thickness. Individual parts not to exceed .005 inches thickness (.711 mm) without factory approval.

- **Paper Access:**

  Bottom – Main Tractor Path

  Front – Alternate Tractor Path or Cut Sheet Path

- **Feed Direction:**

  Forward – Continuous

  Reverse – Continuous

- **Forms Tear/Off:**

  Zero forms tear off

- **Paper Slew (Paper Advance):**

  Slew speed is 15 IPS (inches per second) and is programmable. Cut sheet slew is 10 IPS maximum.

A.5 Forms Mode Change

- **Parking Forms :**

  The forms are reverse fed into the tractors, so that the alternate paper path may be selected. The new forms are then reloaded to the previously set top-of-form and top margin.

- **Tear Off:**

  A key may be used to advance the forms a predefined distance, so the last printed form can be removed without wasting the next form. The distance advanced is programmable by the user. The forms are returned to print position when the key is pressed again, or after a user specified timeout period.

A.6 Communications Interface

- **Communications Buffer Size :**

  3K to 128K depending on RAM option installed. Size and handshaking limits are programmable.

- **RS-232/RS-422 Serial Interface Characteristics:**

  Baud Rates: 110, 300, 600, 1200, 1800, 24,00, 4800, 9600, 19.2Kb

  Protocol Types: X-ON/X-OFF, ETX/ACK, ENQ/ACK, DTR

- **Centronics – Compatible Parallel Interface Characteristics :**

  36 pin Amphenol Configuration

  Protocol Types: BUSY, ACK

A.7 Operator Panel Functional Description

- **Display Description:**

  1 line by 16 character LCD. In addition, an LED is used to indicate READY (On Line) status.

- **Keyswitch Layout:**

  8 keys

A.8 Ribbon Cartridge/Drive

Stationary cartridge with an average life of 7-10 million characters (depending upon printing application).

A.9 Physical

17.0 inches (431mm) wide x 15.7 inches (398mm) deep x 12.3 inches (312mm) high (Dual Tractor Top Roller version)

17.0 inches (431mm) wide x 15.7 inches (398mm) deep x 11.3 inches (287mm) high (Standard Model)

17.0 inches (431mm) wide x 16.7 (424mm) inches deep x 12.3 inches (312mm) high (Cut Sheet Model)

Weight: 45 lbs (20.4 Kg) (Standard and Dual Tractor Model); 46 lbs (20.9 Kg) (Cut Sheet Model)

A.10 Electrical

- **Power Requirements:**
  97 V to 132 V, 57 to 63 Hz
  195 V to 264 V, 47 to 53 Hz

A.11 Shock and Vibration

The printer meets NSTA pre-shipment requirements.

A.12 Environmental

- **Temperature:**
  Non-operating: -30° to 180° F (-34° to 82° C)
  Operating: 40° to 104° F (5° to 40° C) up to 7,000 ft.
  Derate linearly from 78° to 104° F (25° to 40° C) between 7,000 and 10,000 ft.
- **Humidity:**
  Non-operating: 10 to 90% RH non-condensing
  Operating: 20 to 80% RH non-condensing
- **Noise Level:**
  Less than 65 dBA
  Less than 57 dBA with optional covers
- **Electrostatic Discharge:**
  Will withstand 15kV discharge with shielded cables.

A.13 Compliances

This unit will comply with the following at the time of production.

- **Safety:**

  UL 1950
  CSA C22.2 No 950M-1989
  EN 60950
  IEEE587
  EN 50082-1

- **EMI:**

  FCC Class A
  EN 55022 Class A
  VDE Class B

B. Interface Specifications

B.1 Parallel Interface

- **Data Transmissions:**

  7 or 8 bit

- **Synchronization:**

  Externally supplied Data Strobe

- **Handshaking:**

  Acknowledge (Busy before Acknowledge or Busy after Acknowledge)
  Busy (Acknowledge before Busy or Acknowledge after Busy)

- **Logic Level:**

  Input data and all interface signals are TTL compatible.

  Two output signals control the handshaking on the parallel interface, the BUSY signal and the ACKNOWLEDGE signal. An incoming DATA STROBE will cause BUSY to go high.

  PAPER END: The PAPER END signal is an active high signal that will go high when paper out is detected.

  ERROR: The ERROR signal will go low with the detection of an error condition. A fatal printer error condition exists when ERROR is low, PAPER END is low and SELECT is high.

  SELECT: When the printer is ready to receive data, the SELECT signal is set high. This signal will go low when:

  The On/Off Line key is pressed.
  There is a carriage jam.
  Paper out is detected.
  Fatal errors.

	SIGNAL			
CONDITION	**+BUSY**	**+PAPER-END**	**+SELECT**	**-ERROR**
READY	LOW	LOW	HIGH	HIGH
FIFO FULL	HIGH	LOW	HIGH	HIGH
PAPER OUT	HIGH	HIGH	LOW	LOW
CRG JAM	HIGH	LOW	LOW	LOW
OFF LINE	HIGH	LOW	LOW	HIGH
FATAL ERROR	HIGH	LOW	HIGH	LOW

+ Active high
- Active low

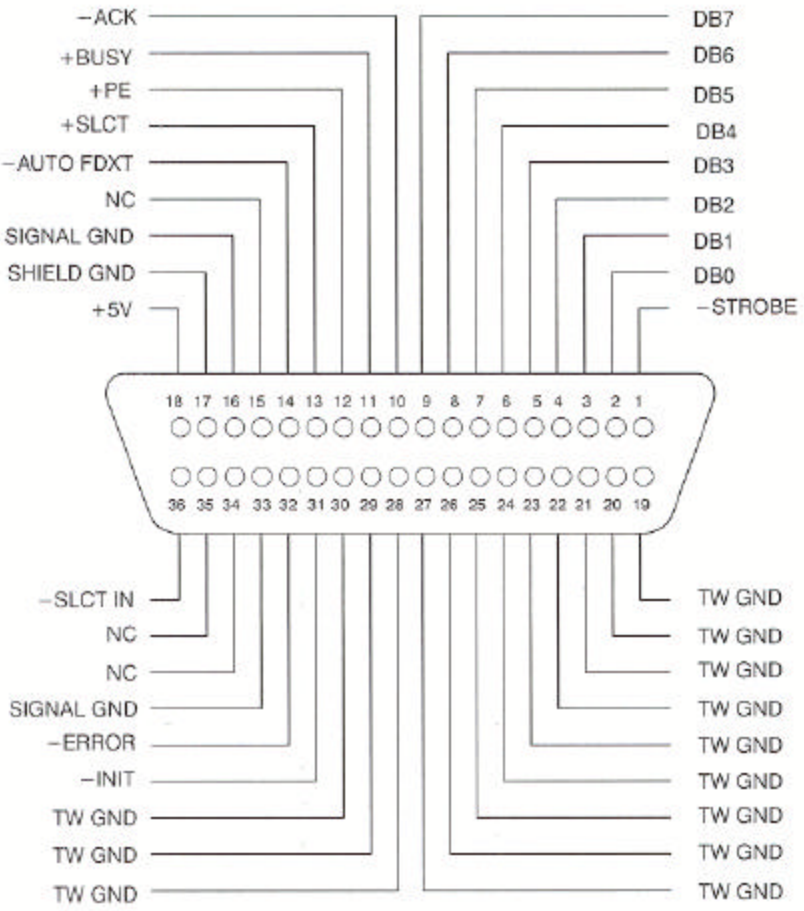


Figure B–1. 36 Pin Parallel Interface Connector

The following diagram illustrates the signal timing of the parallel interface when Acknowledge is issued after busy.

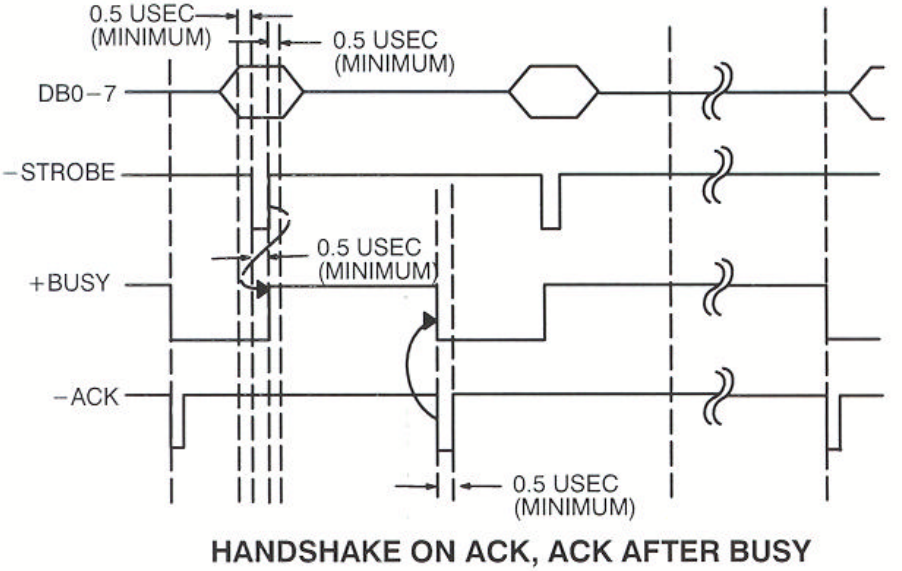


Figure B-2: Signal Timing Pattern (Sheet 1)

The following diagram illustrates the signal timing of the parallel interface when Acknowledge is issued before busy.

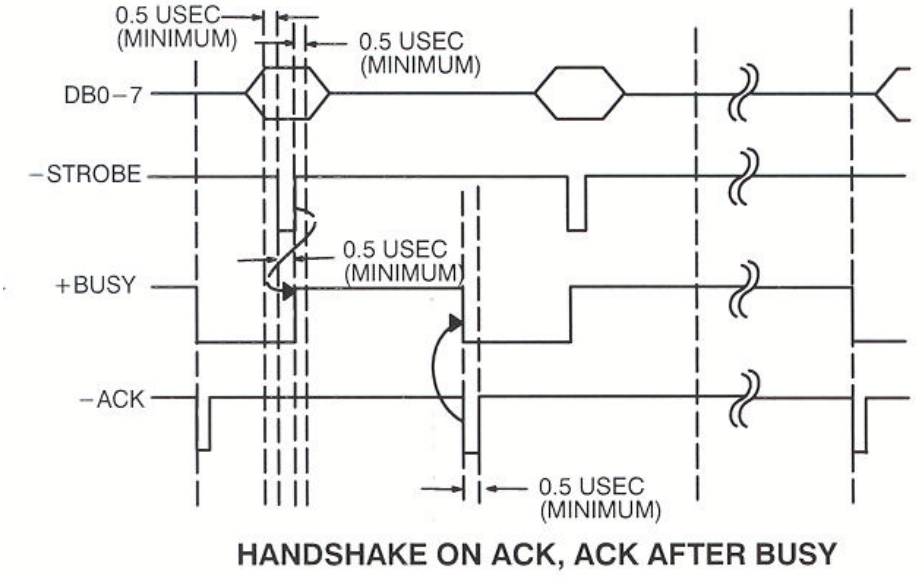


Figure B-2: Signal Timing Pattern (Sheet 2)

B.2 Parallel Interface Enable/Disable

1. Set the power switch to On.
2. Press the On/Off Line key.
3. Open the Keypad Door. The first menu will appear on the display.
4. Press the Next Menu key until you have accessed Menu 6. The display will appear as shown:

M6 PARALLEL CONTROL

5. Press the Feature ▲ key to select the Parallel feature.
6. Press the Value ▼ key to select enable/disable.
7. Press the Enter key to accept your selection.

   There are three additional features which allow you to configure the parallel interface to suit your needs: Handshake, [BUSY, ACK], [ACK, BUSY, BEFORE, AFTER]. and [8th Bit ENABLE, DISABLE]. All three features are contained in Menu 6: Parallel Control. Each feature is explained in detail in Chapter 4. After you finish your parallel interface configuration, continue with Step 8.

8. Close the Keypad Door to exit Setup Mode. The alternating message will be displayed.

Press 'Profile'

To Save Settings

9. Press the Profile key to save the setting in non-volatile memory.
10. Press the On/Off Line key to place the printer back on line.

B.3 RS-232 Serial Interface

- **Data Transfer Rates (Baud Rate):**

110	2400
300	4800
600	9600
1200	19200
1800	

- **Synchronization:**

  Start-Stop Bits

- **Data Format:**

Start Bit:	1
Data Bits:	7 or 8
Parity:	Odd, even or no parity
Stop Bit:	1 for reception
	1 for transmission

  If the host serial interface is configured for 7 Bit data with no parity, data from host computer must contain two stop bits.

- **Handshaking Protocols:**

  X-ON/X-OFF: (DC1/DC3) In this protocol, the printer will respond with the DC3 (X-OFF) character when:

  Print buffer is nearly full.
  Paper out condition exists.
  Carriage jam condition detected.
  Printer is off line.

When the printer is ready for more data, it will transmit the DC1 (X-ON) character.

ETX/ACK: The host will include the ETX character at the end of a string of data. When the printer detects the ETX character, it transmits an ACK character to the host, indicating it is ready for more data.

ENQ/ACK: The host will include the ENQ character at the end of string of data. When the printer detects the ENQ character, it transmits an ACK character to the host, indicating it is ready for more data.

XON + ETX: Enables XON/XOFF and ETX/ACK

XON + ENQ: Enables XON/XOFF and ENQ/ACK

Serial port configuration can only be selected through the front panel. Only one handshaking protocol can be selected at a time. The DTR protocol can be selected with any handshaking protocol. If the user selects modem control, the printer will only receive and transmit data if RTS, CTS and DSR are honored and provided by the host.

X-ON CTRL: Only when 'Robust' X-ON CTRL is selected, DC1 will be transmitted every 4 seconds while the printer is idle and ready to accept data. Also, if no data is being transmitted and the printer is printing, a DC1 will be transmitted every 256 bytes as the FIFO goes empty.

X-OFF CTRL: Only when 'Robust' X-OFF CTRL is selected, DC3 will be transmitted every time a character is received while the serial interface is not ready to accept data.

SIGNAL	P/N	NO MODEM CONTROL	MODEM CONTROL
DTR	20 11	When the printer is ready to accept data, this line will be high (+EIA LEVEL). This line will go low (-EIA LEVEL) when: a. Print buffer is nearly full (within 512 bytes) b. Paper out condition exists. c. Carriage jam condition detected. d. Printer is off line.	When the printer is ready to accept data, this line will be high (+EIA LEVEL). This line will go low (-EIA LEVEL) when: a. Print buffer is nearly full (within 512 bytes) b. Paper out condition exists. c. Carriage jam condition detected. d. Printer is off line.
RTS	4	This signal will always be held high	RTS will be held high when the interface is ready to transmit data.
CTS	5	CTS is always assumed high	The interface will monitor the CTS signal generated by the host in response to RTS. When this signal goes on (high), the host is ready to receive data.
DSR	6	DSR is always assumed high	If DSR is low, the interface will ignore all data received on the serial port. This signal must hold high for the interface to receive and transmit data.
DCD	8	Same as DSR	Same as DSR

B.4 Serial Interface Selection

1. Set the power switch to On.
2. Press the On/Off Line key.
3. Open the Keypad Door. The first menu will appear on the display.
4. Press the Next Menu key until you have accessed Menu 5. The display will appear as shown:

M5 SERIAL CNTRL

5. Press the Feature ▼ ▲ keys to select the Serial feature.
6. Press the Value ▼ key to select RS-232, RS-422, or disable.
7. Press the Enter key to accept your selection.

   There are five additional features which allow you to configure the serial interface to suit your needs: Parity, Data Bits, DTR, Handshake and Modem Control. All five features are contained in Menu 5: Serial Control. Each feature is explained in detail in Chapter 4. After you finish your serial interface configuration, continue with Step 8.

8. Close the Keypad Door to exit Setup Mode. The message will alternate on the display as shown:

Press 'Profile'

To Save Settings

9. Press the Profile key to save profile.
10. Press the On/Off Line key to place the printer back on line.

RS-232 Serial Interface Connector Pin Assignment

PIN	SIGNAL NAME	SIGNAL DIRECTION
1	Frame Ground	
2	Transmitted Data	Out
3	Received Data	In
*4	Request to send	Out
*5	Clear to Send	In
*6	Data Set Ready	In
7	Signal Ground	
*8	Data Carrier Detects	In
9	No Connect	
10	No Connect	
11	Data Terminal Ready	Out
12	No Connect	
13	No Connect	
14	Reserved	
15	Reserved	
16	Reserved	
17	Reserved	
18	Reserved	
19	Reserved	
20	Data Terminal Ready	Out
21	No Connect	
22	No Connect	
23	No Connect	
24	No Connect	
25	No Connect	

* These signals are available only when the Modem Control feature is enabled.

RS-422 Serial Interface Connector Pin Assignment

PIN	SIGNAL NAME	SIGNAL DIRECTION
1	Frame Ground	
2	Reserved	
3	Reserved	
4	Reserved	
5	Reserved	
6	Reserved	
7	Signal Ground	
8	Reserved	
9	No Connect	
10	No Connect	
11	No Connect	
12	No Connect	
13	No Connect	
14	Transmitted Data (+)	Out
15	Transmitted Data (-)	Out
16	Received Data (+)	In
17	Received Data (-)	In
18	Data Terminal Ready (+)	Out
19	Data Terminal Ready (-)	Out
20	Reserved	
21	No Connect	
22	No Connect	
23	No Connect	
24	No Connect	
25	No Connect	

C. Default Tables

Profiles are user definable sets of default parameters that can be used to setup the printer for predetermined function(s). All profiles reside in the non-volatile printer memory and are retained when the printer is powered off. Upon power up, the last selected profile configuration is loaded into the printer control system.

All profiles are defaulted to the same factory settings.

C.1 Menu 1: Page Format

Feature Defaults		Profile 1	Profile 2	Profile 3	Profile 4
Lines/Inch	6				
Form Length	66				
Top Margin	1				
Bottm Margin	66				
Left Margin	1				
Right Margin	80				
Clear Horz Tabs		**********	**********	**********	**********
Horz Tab ###	xxx				
Clear Vert Tabs		**********	**********	**********	**********
Vert Tab ###	xxx				

*** These features cannot be user defined.

C.2 Menu 2: Forms Control

Feature Defaults		Profile 1	Profile 2	Profile 3	Profile 4
Load 0	72/144"				
Load Crg Mov	On				
Horz Adj	0/144"				
*Tear x	x/144"				
Manual Tear	FF				
Manual Time	15s	sec	sec	sec	sec
Auto Tear	OFF				
Auto Time	5s	sec	sec	sec	sec
HF: Pos Crg	2.0"				
HF: On Feed>	0.5"				
Path	Either				
Paper Speed	15				

* Varies depending on Top Access cover configuration.

C.3 Menu 3: Personality

Feature Defaults		Profile 1	Profile 2	Profile 3	Profile 4
Emulate	IBM PRO				
Font	DP 10				
Set	IBM Code 437				
Nat.	USA				
IBM Char	1				
Print Zero as	0				

C.4 Menu 4: Printer Control

Feature Defaults		Profile 1	Profile 2	Profile 3	Profile 4
Auto LF	Disable				
Auto CR	Disable				
Wrap	Enable				
Print	Bidirect				
Auto Path SW	OFF				
Vert Graphic	OFF				
Horz Graphic	OFF				
Power Up	On Line				
Buffer Size	3K				
Window Size	512				
Dble Strike	OFF				
DGCL	Enable				
Exit Mode	Adjust				
Command Char	94				
Overlap	Disable				

C.5 Menu 5: Serial Interface

Feature Defaults		Profile 1	Profile 2	Profile 3	Profile 4
Baud Rate	9600				
Serial	RS-232				
Parity	None				
Data Bits	8				
DTR	Enable				
Handshk	X-On/X-Off				
X-On Ctrl	Single				
X-Off Ctrl	Single				
Modem Ctrl	OFF				

C.6 Menu 6: Parallel Interface

Feature Defaults		Profile 1	Profile 2	Profile 3	Profile 4
Handshak On	Busy				
Ack	Before Busy				
8th Bit	Enable				
Parallel	Enable				

C.7 Menu 7: Profile Control

Feature Defaults		Profile 1	Profile 2	Profile 3	Profile 4
Rename:	Profile 1				
Save Profile		**********	**********	**********	**********
Reset Profile		**********	**********	**********	**********
SER Prt	OFF				
PAR Prt	OFF				
Port Time	8s				
Max Profiles	4				

*** These features cannot be user defined.

C.8 Menu 8: Form Thickness Control

Feature Defaults		Profile 1	Profile 2	Profile 3	Profile 4
Auto Form Gap		xxxx	xxxx	xxxx	xxxx
Quiet	High				
Adj. Form Gap	4.0"				
Hor Gap Pos	2.0"				
VR Gap Pos	1.0"				

C.9 Menu 9: Diagnostics

Feature Defaults	Profile 1	Profile 2	Profile 3	Profile 4
Print Profile	**********	**********	**********	**********
P/N: ##### xx	**********	**********	**********	**********
Test Printhead	**********	**********	**********	**********
Run Mode Test	**********	**********	**********	**********
Run Self Test	**********	**********	**********	**********

*** These features cannot be user defined.

To change these settings, follow the direction in Chapter 4 "Features". It is suggested that the user execute the "Print Profile" feature for each used profile and enter each altered value into the applicable default table or attach it to this manual.

C.10 Menu 10 System Control

Feature Defaults	Profile 1	Profile 2	Profile 3	Profile 4
Reset NVRAM				
Key, Lockout All Unlocked				
Reset Quick List • Font DP 10 • Lines/Inch 6 • Form Length 66 • Left Margin 1 • Right Margin 80	xxxx	xxxx	xxxx	xxxx
Add Quick Ftr				
Delete Quick Ftr				
Ribbon Life 10M				
Replace Rib 95%				
Check Rib 85%				
*Config				

* Depends on mechanical configuration. Resets to 'Tractor' only when new firmware is installed.

D. System Administration Features

D.1 Features Available In System Control Menu

This appendix describes how to access features that are not normally available while the printer is in Setup Mode. These features are found in Menu 10: System Control.

By accessing this menu you can:

- Reset all profiles and system information to factory defaults.
- Reset the Key Lock Out feature to factory defaults.
- Selectively lock out individual keypad functions such as Setup Mode using the Key Lock Out feature.
- Reset the Quick Access List to factory defaults.
- Add features to the Quick Access List.
- Delete features from the Quick Access List.
- Change the mechanical configuration of the printer.

NOTE

Use of these features may be restricted by removing this appendix from the manual.

To access this menu do the following:

1. Load the paper in the printer.
2. Place the printer on line (READY LED On).
3. Press the following keys in the order indicated below:
   a. Profile
   b. Park/Path
4. Open the Keypad Door and Menu 10 can be found using the Next Menu key.

D.2 Menu 10: System Control

Displayed Function	Values	Description of Features
Reset Printer NVM		Pressing the Enter key will reset all profiles to their factory defaults. This will also set top-of-form to the current position and the printhead to platen default position. To complete the printer's reset: 1. Unload any installed paper. 2. Cycle the printer power. The LCD will momentarily display "Resetting NVRAM" and after reset is complete "NVRAM Reset" when the Enter key is pressed.
Reset Key Lock		Pressing the Enter key will reset all Key Lock features to factory defaults. The LCD will momentarily display Key Lock Reset when the Enter key is pressed.

Menu 10: System Control

Displayed Function	Values	Description of Features
Key Lock Functions Off Line Load/FF Setup Adj Up Adj Down Tear Off Line Feed Profile Park/Path		Use the Value up/down keys to scroll through the available key list. If the Enter key is pressed, the Values "lock" or "unlock" will toggle, respectively. The selected values are automatically saved. This feature can be set or reset from any profile. Any Key Functions necessary to clear an error, such as Paper Out, Carriage Jam, etc., are functional immediately, regardless if that key has been turned off.
	Unlock	The Key Function displayed will be active when pressed.
	Lock	The Key Function displayed will be inactive. The user will not be able to activate the function. Pressing an inactive key causes the LCD to display "KEY LOCKED". In order to enter Setup Mode if setup is locked, the printer must be on line and the following keystrokes must be entered consecutively: a. Press Profile b. Press Park/Path c. Open the Keypad Door

Menu 10: System Control

Displayed Function	Values	Description of Features
Reset Quick List		Resets the list of features accessed by the Quick Access key to the default features.
Add Quick FTR		Use Value ▲ ▼ keys to select feature to add to Quick Access key. Press Enter key. This feature can now be accessed using Quick Access key. Up to seven features can be available with the Quick Access key.
Delete Quick FTR		Use Value ▲ ▼ keys to select feature to delete to Quick Access key. Press Enter key. This feature will no longer be accessible from the Quick Access key.
Ribbon Life	1- 50M	The value in this feature indicated the total number of characters (in millions) that the RIBBON USED feature uses to calculate the percent ribbon used.
Replace Rib	1 to 100	This value indicates when the printer displays the REPLACE RIBBON message. This feature monitors the Ribbon Used feature and must be set to a value greater that the CHECK RIB feature.
Check Rib	1 to 100	This value indicated when the printer displays the CHECK RIBBON message. This feature must be set to a value less that the REPLACE RIB feature. This feature monitors the Ribbon Used feature.
Config	Tractor Trac-Fric Dual Trac Trac Roll	Sets the mechanical configuration of the printer. This is set to the correct value at the factory. This feature is useful if the firmware or main electronics controller board is replaced. The value is automatically saved.

D.3 Key Functions That Can Be Locked

Displayed Function	Description of Function
Off Line	Disables the ability to place the printer Off Line. This function is disabled only when paper is properly installed in the printer. Profile Select and Park keys are also disabled because they are only active when the printer is off line.
Park/Path	Disables the ability to Park the form.
Adj Up	Disables the ability to make minor adjustments in the print position.
Form Feed	Disables the ability to perform a form feed from the keypad.
Adj Down	Disables the ability to make minor adjustments in the print position.
Tear Off	Disables the ability to move the paper to the tear off position from the keypad. The Automatic Tear Off feature, if set, is still active.
Line Feed	Disables the ability to perform a line feed from the keypad.
Profile	Disables the ability to change profiles.
Setup	Disables the ability to enter Setup Mode.

E. ASCII Conversion Chart

ASCII CHR	DECIMAL VALUE	HEX VALUE	ASCII CHR	DECIMAL VALUE	HEX VALUE
NUL	0	0	EM	25	19
SOH	1	1	SUB	26	1A
STX	2	2	ESC	27	1B
ETX	3	3	FS	28	1C
EOT	4	4	GS	29	1D
ENQ	5	5	RS	30	1E
ACK	6	6	US	31	1F
BEL	7	7	Space	32	20
BS	8	8	!	33	21
HT	9	9	"	34	22
LF	10	A	#	35	23
VT	11	B	$	36	24
FF	12	C	%	37	25
CR	13	D	&	38	26
SO	14	E	'	39	27
SI	15	F	(	40	28
DLE	16	10	)	41	29
DC1	17	11	*	42	2A
DC2	18	12	+	43	2B
DC3	19	13	,	44	2C
DC4	20	14	-	45	2D
NAK	21	15	.	46	2E
SYN	22	16	/	47	2F
ETB	23	17	0	48	30
CAN	24	18	1	49	31

ASCII Conversion Chart (Cont'd)

ASCII CHR	DECIMAL VALUE	HEX VALUE	ASCII CHR	DECIMAL VALUE	HEX VALUE
2	50	32	K	75	4B
3	51	33	L	76	4C
4	52	34	M	77	4D
5	53	35	N	78	4E
6	54	36	O	79	4F
7	55	37	P	80	50
8	56	38	Q	81	51
9	57	39	R	82	52
:	58	3A	S	83	53
;	59	3B	T	84	54
<	60	3C	U	85	55
=	61	3D	V	86	56
>	62	3E	W	87	57
?	63	3F	X	88	58
@	64	40	Y	89	59
A	65	41	Z	90	5A
B	66	42	[	91	5B
C	67	43	\	92	5C
D	68	44	]	93	5D
E	69	45	^	94	5E
F	70	46	-	95	5F
G	71	47	`	96	60
H	72	48	a	97	61
I	73	49	b	98	62
J	74	4A	c	99	63

ASCII Conversion Chart (Cont'd)

ASCII CHR	DECIMAL VALUE	HEX VALUE	ASCII CHR	DECIMAL VALUE	HEX VALUE
d	100	64	r	114	72
e	101	65	s	115	73
f	102	66	t	116	74
g	103	67	u	117	75
h	104	68	v	118	76
i	105	69	w	119	77
j	106	6A	x	120	78
k	107	6B	y	121	79
l	108	6C	z	122	7A
m	109	6D	{	123	7B
n	110	6E	|	124	7C
o	111	6F	}	125	7D
p	112	70	~	126	7E
q	113	71	DEL	127	7F

F. ASCII Character Sets

F.1 ASCII Character Sets

A Character Set is a collection of characters (i.e. letters, numbers, and symbols) organized into a "Set" where each character is assigned a unique code. Documax supports the following Character Sets that are selected automatically when the emulation is selected.

To select a Character Set different from the default select the emulation then character set.

Each character set table contains characters that may be printed or executed as Control Codes. This is determined by the currently selected emulation. Refer to the chapter for the emulation selected to determine how to print or execute these codes. When IBM Proprinter emulation is selected the Setup Mode feature "IBM Char Set x" is used as follows. Refer to the User's Manual for instructions on changing this feature.

F.2 7 Bit ASCII Character Set

HEX	0	1	2	3	4	5	6	7
0	SP 0	SP 16	SP 32	0 48	@ 64	P 80	' 96	p 112
1	SP 1	SP 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	SP 2	SP 18	" 34	2 50	B 66	R 82	b 98	r 114
3	SP 3	SP 19	# 35	3 51	C 67	S 83	c 99	s 115
4	SP 4	SP 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	SP 5	SP 21	% 37	5 53	E 69	U 85	e 101	u 117
6	SP 6	SP 22	& 38	6 54	F 70	V 86	f 102	v 118
7	SP 7	SP 23	' 39	7 55	G 71	W 87	g 103	w 119
8	SP 8	SP 24	(40	8 56	H 72	X 88	h 104	x 120
9	SP 9	SP 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	SP 10	SP 26	* 42	: 58	J 74	Z 90	j 106	z 122
B	SP 11	SP 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	SP 12	SP 28	, 44	< 60	L 76	\ 92	l 108	| 124
D	SP 13	SP 29	- 45	= 61	M 77	] 93	m 109	} 125
E	SP 14	SP 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	SP 15	SP 31	/ 47	? 63	O 79	_ 95	o 111	SP 127

7 Bit ASCII Character Set (Cont'd)

HEX	8	9	A	B	C	D	E	F
0	SP 128	SP 144	SP 160	0 176	@ 192	P 208	' 224	p 240
1	SP 129	SP 145	! 161	1 177	A 193	Q 209	a 225	q 241
2	SP 130	SP 146	" 162	2 178	B 194	R 210	b 226	r 242
3	SP 131	SP 147	# 163	3 179	C 195	S 211	c 227	s 243
4	SP 132	SP 148	$ 164	4 180	D 196	T 212	d 228	t 244
5	SP 133	SP 149	% 165	5 181	E 197	U 213	e 229	u 245
6	SP 134	SP 150	& 166	6 182	F 198	V 214	f 230	v 246
7	SP 135	SP 151	' 167	7 183	G 199	W 215	g 231	w 247
8	SP 136	SP 152	(168	8 184	H 200	X 216	h 232	x 248
9	SP 137	SP 153	) 169	9 185	I 201	Y 217	i 233	y 249
A	SP 138	SP 154	* 170	: 186	J 202	Z 218	j 234	z 250
B	SP 139	SP 155	+ 171	; 187	K 203	[219	k 235	{ 251
C	SP 140	SP 156	, 172	< 188	L 204	\ 220	l 236	| 252
D	SP 141	SP 157	- 173	= 189	M 205	] 221	m 237	} 253
E	SP 142	SP 158	. 174	> 190	N 206	^ 222	n 238	~ 254
F	SP 143	SP 159	/ 175	? 191	O 207	_ 223	o 239	SP 255

F.3 IBM Code Page 437 Symbol Set

HEX	0	1	2	3	4	5	6	7
0	∅ 0	► 16	SP 32	0 48	@ 64	P 80	' 96	p 112
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	■ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	¦ 124
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127

IBM Code Page 437 Symbol Set (Cont'd)

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▓ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	· 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	‾ 250
B	ï 139	¢ 155	½ 171	╗ 187	╦ 203	▒ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▪ 220	∞ 236	n 252
D	ì 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	∅ 237	2 253
E	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	SP 255

F.4 IBM Code Page 850 Symbol Set

HEX	0	1	2	3	4	5	6	7
0	Ø 0	► 16	SP 32	0 48	@ 64	P 80	' 96	p 112
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	■ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127

IBM Code Page 850 Symbol Set (Cont'd)

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▒ 176	└ 192	ð 208	Ó 224	240
1	ü 129	æ 145	í 161	▓ 177	┴ 193	Ð 209	ß 225	± 241
2	é 130	Æ 146	ó 162	▮ 178	┬ 194	Ê 210	Ô 226	‗ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	ı 213	Õ 229	§ 245
6	å 134	û 150	ª 166	╢ 182	ã 198	Í 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	Ã 199	Î 215	þ 231	¸ 247
8	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	Ï 216	Þ 232	° 248
9	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	ï 139	ø 155	½ 171	╗ 187	╦ 203	▮ 219	Ù 235	¹ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▮ 220	ý 236	³ 252
D	ì 141	Ø 157	¡ 173	¢ 189	═ 205	▮ 221	Ý 237	² 253
E	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	▮ 254
F	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▮ 223	´ 239	SP 255

F.5 Epson Italic Symbol Set

HEX	0	1	2	3	4	5	6	7
0	à 0	Ş 16	SP 32	0 48	@ 64	P 80	‘ 96	p 112
1	è 1	ß 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	ù 2	Æ 18	" 34	2 50	B 66	R 82	b 98	r 114
3	ò 3	æ 19	# 35	3 51	C 67	S 83	c 99	s 115
4	ì 4	Ø 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	• 5	ø 21	% 37	5 53	E 69	U 85	e 101	u 117
6	£ 6	22	& 38	6 54	F 70	V 86	f 102	v 118
7	‡ 7	Å 23	’ 39	7 55	G 71	W 87	g 103	w 119
8	¿ 8	○ 24	(40	8 56	H 72	X 88	h 104	x 120
9	Ñ 9	Ü 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	ñ 10	ä 26	* 42	: 58	J 74	Z 90	j 106	z 122
B	¤ 11	ö 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	₧ 12	ü 28	, 44	< 60	L 76	\ 92	l 108	| 124
D	Ä 13	É 29	- 45	= 61	M 77	] 93	m 109	} 125
E	ä 14	é 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	ç 15	¥ 31	/ 47	? 63	O 79	_ 95	o 111	ø 127

Epson Italic Symbol Set (Cont'd)

HEX	8	9	A	B	C	D	E	F
0	à 128	S 144	SP 160	0 176	@ 192	P 208	' 224	p 240
1	è 129	£ 145	! 161	1 177	A 193	Q 209	a 225	q 241
2	ù 130	ƒ 146	" 162	2 178	B 194	R 210	b 226	r 242
3	ò 131	¢ 147	# 163	3 179	C 195	S 211	c 227	s 243
4	ì 132	Ø 148	$ 164	4 180	D 196	T 212	d 228	t 244
5	' 133	ø 149	% 165	5 181	E 197	U 213	e 229	u 245
6	£ 134	¯ 150	& 166	6 182	F 198	V 214	f 230	v 246
7	¡ 135	ª 151	' 167	7 183	G 199	W 215	g 231	w 247
8	¿ 136	º 152	(168	8 184	H 200	X 216	h 232	x 248
9	¤ 137	¤ 153	) 169	9 185	I 201	Y 217	i 233	y 249
A	ñ 138	ª 154	* 170	: 186	J 202	Z 218	j 234	z 250
B	¤ 139	º 155	+ 171	; 187	K 203	[219	k 235	{ 251
C	¤ 140	¤ 156	, 172	< 188	L 204	\ 220	l 236	| 252
D	¤ 141	¤ 157	- 173	= 189	M 205	] 221	m 237	} 253
E	¤ 142	¤ 158	. 174	> 190	N 206	^ 222	n 238	~ 254
F	¤ 143	¥ 159	/ 175	? 191	O 207	_ 223	o 239	Ø 255

F.6 Epson Graphics Symbol Set

HEX	0	1	2	3	4	5	6	7
0	à 0	Ş 16	SP 32	0 48	@ 64	P 80	' 96	p 112
1	è 1	ğ 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	ù 2	Æ 18	" 34	2 50	B 66	R 82	b 98	r 114
3	ò 3	æ 19	# 35	3 51	C 67	S 83	c 99	s 115
4	ì 4	Ø 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	° 5	ø 21	% 37	5 53	E 69	U 85	e 101	u 117
6	£ 6	22	& 38	6 54	F 70	V 86	f 102	v 118
7	¡ 7	Å 23	' 39	7 55	G 71	W 87	g 103	w 119
8	¿ 8	å 24	(40	8 56	H 72	X 88	h 104	x 120
9	Ñ 9	Ü 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	ñ 10	ä 26	* 42	: 58	J 74	Z 90	j 106	z 122
B	¤ 11	ö 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	Pt 12	ü 28	, 44	< 60	L 76	\ 92	l 108	| 124
D	Ä 13	É 29	- 45	= 61	M 77	] 93	m 109	} 125
E	ä 14	é 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	ç 15	¥ 31	/ 47	? 63	O 79	_ 95	o 111	ø 127

Epson Graphics Symbol Set (Cont'd)

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▓ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Æ 146	ó 162	▉ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	▏ 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	‾ 250
B	ï 139	¢ 155	½ 171	╗ 187	╦ 203	▇ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	■ 220	∞ 236	n 252
D	ì 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	∅ 237	² 253
E	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

F.7 Epson Italic Graphics Symbol Set

HEX	0	1	2	3	4	5	6	7
0	à 0	Š 16	SP 32	0 48	@ 64	P 80	‘ 96	p 112
1	è 1	š 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	ù 2	Ä 18	" 34	2 50	B 66	R 82	b 98	r 114
3	ò 3	ä 19	# 35	3 51	C 67	S 83	c 99	s 115
4	ì 4	Ø 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	° 5	ø 21	% 37	5 53	E 69	U 85	e 101	u 117
6	£ 6	22	& 38	6 54	F 70	V 86	f 102	v 118
7	¡ 7	Å 23	’ 39	7 55	G 71	W 87	g 103	w 119
8	¿ 8	Ö 24	(40	8 56	H 72	X 88	h 104	x 120
9	Ñ 9	Ü 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	ñ 10	ä 26	* 42	: 58	J 74	Z 90	j 106	z 122
B	¤ 11	ö 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	₧ 12	ü 28	, 44	< 60	L 76	\ 92	l 108	/ 124
D	Ä 13	É 29	- 45	= 61	M 77	] 93	m 109	} 125
E	ä 14	é 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	ç 15	ÿ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127

Epson Italic Graphic Symbol Set (Cont'd)

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ò 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	ï 139	¢ 155	½ 171	╗ 187	╦ 203	▉ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▐ 220	∞ 236	n 252
D	ì 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	∅ 237	² 253
E	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▀ 222	ε 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▄ 223	∩ 239	255

F.8 DEC Supplemental Symbol Set

HEX	0	1	2	3	4	5	6	7
0	SP 0	SP 16	SP 32	0 48	@ 64	P 80	' 96	p 112
1	SP 1	SP 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	SP 2	SP 18	" 34	2 50	B 66	R 82	b 98	r 114
3	SP 3	SP 19	# 35	3 51	C 67	S 83	c 99	s 115
4	SP 4	SP 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	SP 5	SP 21	% 37	5 53	E 69	U 85	e 101	u 117
6	SP 6	SP 22	& 38	6 54	F 70	V 86	f 102	v 118
7	SP 7	SP 23	' 39	7 55	G 71	W 87	g 103	w 119
8	SP 8	SP 24	(40	8 56	H 72	X 88	h 104	x 120
9	SP 9	SP 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	SP 10	SP 26	* 42	: 58	J 74	Z 90	j 106	z 122
B	SP 11	SP 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	SP 12	SP 28	, 44	< 60	L 76	\ 92	l 108	| 124
D	SP 13	SP 29	- 45	= 61	M 77	] 93	m 109	} 125
E	SP 14	SP 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	SP 15	SP 31	/ 47	? 63	O 79	_ 95	o 111	SP 127

DEC Supplemental Symbol Set (Cont'd)

HEX	8	9	A	B	C	D	E	F
0	SP 128	SP 144	SP 160	° 176	À 192	? 208	à 224	? 240
1	SP 129	SP 145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	SP 130	SP 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	SP 131	SP 147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	SP 132	SP 148	? 164	? 180	Ä 196	Ô 212	ä 228	ô 244
5	SP 133	SP 149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	SP 134	SP 150	? 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	SP 135	SP 151	§ 167	· 183	Ç 199	Œ 215	ç 231	œ 247
8	SP 136	SP 152	¤ 168	? 184	È 200	Ø 216	è 232	ø 248
9	SP 137	SP 153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	SP 138	SP 154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	SP 139	SP 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	SP 140	SP 156	? 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	SP 141	SP 157	? 173	½ 189	Í 205	Ÿ 221	í 237	ÿ 253
E	SP 142	SP 158	? 174	? 190	Î 206	? 222	î 238	? 254
F	SP 143	SP 159	? 175	¿ 191	Ï 207	ß 223	ï 239	SP 255

F.9 Nationality Overlay Character Set

| Nationality | Native Emulation | | | ASCII Code | | |

G. Escape Sequence Quick Reference

G.1 Epson FX

The following is a listing of the commands and their functions. For complete sequence, see the Programmer's Manual.

ASCII Command	Epson FX Command Description
NUL	Terminates horizontal and vertical tab escape sequences.
BEL	Sounds the printer buzzer.
BS	Backspace.
HT	Horizontal tab.
LF	Line feed.
VT	Vertical tab.
FF	Form feed.
CR	Carriage return.
SO	Shift out. Selects enlarged mode for the current line.
SI	Shift in. Selects condensed printing.
DC1	Device control 1. Enable printer
DC2	Device control 2. Cancels condensed printing.
DC3	Device control 3. Disable printer.
DC4	Device control 4. Cancels enlarged mode.
CAN	Cancel. Cancel text in the print buffer.
ESC	Initiates an escape sequence.
ESC SO	Selects enlarged.
ESC SI	Selects condensed printing.

Epson FX (Cont'd)

ASCII Command	Epson FX Command Description
ESC !	Master Print mode selection
ESC #	Cancel Most Significant Bit (MSB) function.
ESC %	Select character set from ROM or from RAM.
ESC &	Define User-defined characters in RAM
ESC *	Select Graphic mode.
ESC –	Select/Cancel underlining.
ESC /	Select Vertical Tab Channel.
ESC 0	Set line spacing to 1/8 inch.
ESC 1	Set line spacing to 7/72 inch.
ESC 2	Set line spacing to 1/6 inch.
ESC 3	Set line spacing to n/216 inch.
ESC 4	Select italic character set.
ESC 5	Cancel italic character set.
ESC 6	Enable upper character set (80 hex to 9F hex and FF hex).
ESC 7	Enable extended control codes (Turns off ESC 6).
ESC 8	Disable paper out detector.
ESC 9	Enable paper out detector.
ESC :	Copies resident characters (ROM) to RAM.
ESC <	Enable one line unidirectional printing.
ESC =	Set MSB to 0 (Sets 8^{th} bit low).
ESC >	Set MSB to 1 (Sets 8^{th} bit high).
ESC ?	Reassign graphic codes.

Epson FX (Cont'd)

ASCII Command	Epson FX Command Description
ESC @	Resets printer.
ESC A	Set line spacing to n/72 inch.
ESC B	Set vertical tabs.
ESC C	Set forms length in lines.
ESC C	Set forms length in inches when first variable is a null.
ESC D	Set horizontal tab.
ESC E	Select emphasized printing.
ESC F	Cancel emphasized printing.
ESC G	Select double-strike printing.
ESC H	Cancel double-strike printing.
ESC I	Enable/disable printing of characters stored in the lower control code area (00hex to 31 hex).
ESC J	Perform an immediate line feed of n/216 inch.
ESC K	Select single-density graphics.
ESC L	Select double-density graphics.
ESC M	Select Elite (12 cpi) mode.
ESC N	Set perforation skip to n lines.
ESC O	Disable perforation skip mode.
ESC P	Select Pica (10 cpi) mode.
ESC Q	Set right margin.
ESC R	Select international character set.
ESC S	Select Superscript or Subscript characters.

Epson FX (Cont'd)

ASCII Command	Epson FX Command Description
ESC T	Cancel Superscript or Subscript characters.
ESC U	Select/Cancel Unidirectional print mode.
ESC W	Select/Cancel Enlarged print mode.
ESC Y	Select high speed double-density graphics.
ESC Z	Select quadruple-density graphics.
ESC ^	Select 9-pin graphics.
ESC b	Set up vertical tabs for Vertical tab channel c.
ESC l	Set left margin.
ESC j	Perform an immediate reverse line feed of n/216 inch.
ESC k	Select NLQ Typestyle.
ESC p	Select/Cancel Proportional printing.
ESC s	Select/Cancel half-speed printing.
ESC x	Select NLQ or Draft Print.
DEL	Deletes the last text character in the print buffer.

G.2 IBM Proprinter

ASCII Command	IBM Proprinter Command Description
NUL	Terminates horizontal and vertical tab escape sequences.
BEL	Sounds the printer buzzer.
BS	Backspace.
HT	Horizontal tab.
LF	Line feed.
VT	Vertical tab.
FF	Form feed.
CR	Carriage return.
SO	Shift out. Selects Double wide mode for the current line.
SI	Shift in. Selects condensed printing.
DC1	Device control 1. Enable printer
DC2	Device control 2. Selects 10 character per inch (10 cpi).
DC3	Device control 3. Disable printer.
DC4	Device control 4. Cancels double wide mode.
CAN	Cancel. Cancel text in the print buffer.
ESC –	Select/Cancel underlining.
ESC 0	Set line spacing to 1/8 inch.
ESC 1	Set line spacing to 7/72 inch.
ESC 2	Activate line spacing set by ESC A.
ESC 3	Set line spacing to n/216 inch.
ESC 4	Set top of form at current position.

IBM Proprinter (Cont'd)

ASCII Command	IBM Proprinter Command Description
ESC 5	Select/Cancel automatic line feed.
ESC 6	Select character set 2.
ESC 7	Select character set 1.
ESC 8	Disable paper out detector.
ESC 9	Enable paper out detector.
ESC :	Select 12 characters per inch.
ESC <	Enable one line unidirectional printing.
ESC =	Start downloading characters.
ESC A	Set line spacing to n/72 inch.
ESC B	Set vertical tabs.
ESC C	Set forms length in lines.
ESC C	Set forms length in inches when first variable is a null.
ESC D	Set horizontal tab.
ESC E	Select emphasized printing.
ESC F	Cancel emphasized printing.
ESC G	Select double-strike printing.
ESC H	Cancel double-strike printing.
ESC I	Enable/disable printing of characters stored in the lower control code area (00hex to 31 hex).
ESC J	Perform an immediate line feed of n/216 inch.
ESC K	Select normal-density graphics.
ESC L	Select double-density graphics (half speed).

IBM Proprinter (Cont'd)

ASCII Command	IBM Proprinter Command Description
ESC N	Set perforation skip to n lines.
ESC O	Disable perforation skip mode.
ESC P	Select/Cancel proportional printing.
ESC Q	Disable the printer.
ESC R	Reset tabs to default settings.
ESC S	Select Superscript or Subscript characters.
ESC T	Cancel Superscript or Subscript characters.
ESC U	Select/Cancel Unidirectional print mode.
ESC W	Select/Cancel Double-wide print.
ESC X	Set left and right margins.
ESC Y	Select normal speed double-density graphics.
ESC Z	Select high density graphics.
ESC [@	Select double-high printing.
ESC \	Select characters from All Characters table.
ESC ^	Select a character from the All Characters table.
ESC _	Select/Cancel overlining.
SP	Moves print position one character space to the right.

G.3 DEC LA-120

ASCII Command	DEC LA-120 Command Description
NUL	Null character.
BEL	Sounds the printer buzzer.
BS	Backspace.
HT	Horizontal tab.
LF	Line feed.
VT	Vertical tab.
FF	Form feed.
CR	Carriage return.
CAN	Cancel. Cancel text in the print buffer.
ESC	Introduces an escape sequence.
ESC (A	Select UK character set language.
ESC (B	Select USA character set language.
ESC (C	Select Finland character set language.
ESC (E	Select Norway character set language.
ESC (H	Select Sweden character set language.
ESC (K	Select Germany character set language.
ESC (R	Select France character set language.
ESC [20h	Enable auto carriage return.
ESC [20l	Disable auto carriage return.
ESC 3	Set vertical tab at current line.
ESC D	Execute a line feed.
ESC E	Execute a carriage return line feed.

DEC LA-120 (Cont'd)

ASCII Command	DEC LA-120 Command Description
ESC H	Set horizontal tab at current column.
ESC J	Set vertical tab at current line.
ESC 2	Clear all horizontal tabs.
ESC [4	Clear all vertical tabs.
ESC [n a	Advance by n columns.
ESC [c	Request for product ID.
ESC [0c	Request for product ID.
ESC [n d	Go to line number n.
ESC [n e	Advance by n lines.
ESC [g	Clear horizontal tab at current column.
ESC [0g	Clear horizontal tab at current column.
ESC [2g	Clear all horizontal tabs.
ESC [3g	Clear all horizontal tabs.
ESC [1g	Clear vertical tab at current line.
ESC [4g	Clear all vertical tabs.
ESC [n r	Set top margin to n.
ESC [n;0;r	Set top margin to n.
ESC [;n r	Set bottom margin to n.
ESC [0;n r	Set bottom margin to n.
ESC [n1;n r	Set top and bottom margins to n1 and n2.
ESC [n s	Set left margin to n.
ESC [n;0 s	Set left margin to n.

DEC LA-120 (Cont'd)

ASCII Command	DEC LA-120 Command Description
ESC [;n s	Set right margin to n.
ESC [0;n s	Set right margin to n.
ESC [n u	Set horizontal tab at column n.
ESC [n1;n2..;n16u	Set horizontal tabs at column n1….n16.
ESC [n v	Set vertical tab at line n.
ESC [n1;n2..;n16v	Set vertical tabs at line n1….n16.
ESC [w	Select 10 characters per inch.
ESC [0w	Select 10 characters per inch.
ESC [1w	Select 10 characters per inch.
ESC [2w	Select 12 characters per inch.
ESC [3w	Select 13.2 characters per inch.
ESC [4w	Select 16.5 characters per inch.
ESC [5w	Select 5 characters per inch.
ESC [6w	Select 6 characters per inch.
ESC [7w	Select 6.6 characters per inch.
ESC [8w	Select 8.25 characters per inch.
ESC [z	Select 6 lines per inch.
ESC [0z	Select 6 lines per inch.
ESC 1z	Select 6 lines per inch
ESC {2z	Select 8 lines per inch.
ESC [3z	Select 12 lines per inch.
ESC [4z	Select 2 lines per inch.

DEC LA-120 (Cont'd)

ASCII Command	DEC LA-120 Command Description
ESC [5z	Select 3 lines per inch.
ESC [6z	Select 4 lines per inch.
ESC [n‘	Go to column n.
ESC L	Set horizontal tab at current column.
ESC [nt	Set form length to n.
DEL	Cause no printer operation.

G.4 TI-885 (optional)

ASCII Command	TI-885 Command Description
NUL	Null Character
BEL	Sound The Printer Bell
BS	Backspace
HT	Horizontal Tab
LF	Line Feed
VT	Vertical Tab
FF	Form Feed
CR	Carriage Return
SO	Select Enlarged Mode (By Line)
ESC	Escape
ESC PC ESC \	Select 10-Pitch Characters
ESC 6	Select 10-Pitch Characters
ESC P D ESC \	Select 16 2/3-Pitch Characters
ESC 7	Select 16 2/3-Pitch Characters
ESC P I ESC \	Select 5-Pitch Characters
ESC P J ESC \	Select 8 1/3-Pitch Characters
ESC P K ESC \	Select 12-Pitch Characters
ESC P M ESC \	Select Double-Wide Pitch
ESC P N ESC \	Cancel Double-Wide Pitch
ESC P O ESC \	Select Enhanced Characters
ESC P P ESC \	Cancel Enhanced Characters

TI-885 (Cont'd)

ASCII Command	TI-885 Command Description
ESC b	Select Bidirectional Print
ESC u	Cancel Bidirectional Print
ESC [Ns	Set Left Margin
ESC [; Ns	Set Right Margin
ESC [N_1;N_2;s	Set Left and Right Margin
ESC [Nr	Set Top Margin
ESC [;Nr	Set Bottom Margin
ESC [N_1;N_2;r	Set Top and Bottom Margin
ESC [Nt	Set Form Length
ESC C n or ESC 2 n	Set Form Length
ESC P L O ESC \ or ESC @	Load Default Form
ESC H	Set Horizontal Tab At Current Print Column
ESC [g or ESC [0g	Clear Horizontal Tab At Current Print Column
ESC [Nu	Set A Horizontal Tab
ESC [N_1;N_2;N_{16}u	Set Horizontal Tabs
ESC [2g	Clear All Horizontal Tabs
ESC [N‘	Tab Right To Column N
ESC [Na	Tab Right N Columns
ESC J	Set Vertical Tab At Current Print Line
ESC [1g	Clear Vertical Tab At Current Print Line

TI-885 (Cont'd)

ASCII Command	TI-885 Command Description
ESC [Nv	Set A Vertical Tab
ESC [N_1;N_2;N_kv	Set Vertical Tabs
ESC [4g	Clear All Vertical Tabs
ESC [Nd	Tab To Line N
ESC [Ne	Advance Paper N Lines
ESC 2	Set Line Spacing To 1/6 Inch
ESC 0	Set Line Spacing To 1/8 Inch
ESC A	Set Line Spacing To n/72 Inch
ESC 3	Set Line Spacing To n/216 Inch
ESC K	Select Single-Density Graphics (60 dpi)
ESC L	Select Double-Density Graphics (120 dpi)
ESC @	Reset Printer
ESC [c	Product Identification

G.5 DS-180

ASCII Command	DS-180 Command Description
NUL	Null Character
BEL	Sound The Printer Bell
BS	Backspace
HT	Horizontal Tab
LF	Line Feed
VT	Vertical Tab
FF	Form Feed
CR	Carriage Return
SO	Select Double Wide Print
SI	Cancel Double Wide Print
ESC	Escape
DEL	Delete
ENQ or FS	Enter Anadex Graphics
ACK or GS	Exit Anadex Graphics With No Forms Correction
ESC [5w	Select 5-Pitch Characters
ESC [6w	Select 6-Pitch Characters
ESC [7w	Select 6.6-Pitch Characters
ESC [8w	Select 8.25-Pitch Characters
ESC [w or [0w	Select 10-Pitch Characters
ESC [1w	Select 10-Pitch Characters
ESC [2w	Select 12-Pitch Characters

DS-180 (Cont'd)

ASCII Command	DS-180 Command Description
ESC [3w	Select 13.2-Pitch Characters
ESC [4w	Select 16.5-Pitch Characters
ESC $ 1	Enable Continuous Underline
ESC $ 2	Disable Continuous Underline
ESC (A	Select Character Set – United Kingdom
ESC (B	Select Character Set – US ASCII
ESC (C	Select Character Set – Finland
ESC (H	Select Character Set – Sweden
ESC (E	Select Character Set – Norway/Denmark
ESC (R	Select Character Set – France
ESC (K	Select Character Set – Germany
ESC $ 5	Select Alternate Character Set
ESC $ 6	Cancel Alternate Character Set
ESC [ns or ESC [n;0s	Set Left Margin
ESC [;ns or ESC [0;ns	Set Right Margin
ESC [n1;n2s	Set Left And Right Margin
ESC [nr or ESC [n;0r	Set Top Margin
ESC [;nr or ESC [0;nr	Set Bottom Margin
ESC [n1;n2r	Set Top And Bottom Margin

DS-180 (Cont'd)

ASCII Command	DS-180 Command Description
ESC [nt	Set Form Length
ESC 1	Set Horizontal Tab At Current Print Column
ESC [g or ESC [0g	Clear Horizontal Tab At Current Print Column
ESC [nu	Set A Horizontal Tab
ESC [n1;n2;n16u	Set Horizontal Tabs
ESC [2g	Clear All Horizontal Tabs
ESC [3g	Clear All Horizontal Tabs
ESC 2	Clear All Horizontal Tabs
ESC3	Set Vertical Tab At Current Print Line
ESC [1g	Clear Vertical Tab At Current Print Line
ESC [nv	Set A Vertical Tab
ESC [n1;n2;nxv	Set Vertical Tabs
ESC [4g	Clear All Vertical Tabs
ESC 4	Clear All Vertical Tabs
ESC [20h	Enable Auto Carriage Return
ESC [20l	Disable Auto Carriage Return
ESC [4z	Set Line Spacing To 2 Lines Per Inch
ESC [5z	Set Line Spacing To 3 Lines Per Inch
ESC [6z	Set Line Spacing To 4 Lines Per Inch
ESC [z or ESC [0z	Set Line Spacing To 6 Lines Per Inch
ESC [1z	Set Line Spacing To 6 Lines Per Inch
ESC [2z	Set Line Spacing To 8 Lines Per Inch

DS-180 (Cont'd)

ASCII Command	DS-180 Command Description
ESC [3z	Set Line Spacing To 12 Lines Per Inch
ESC [n‘	Set Print Column
ESC [na	Advance Print Column By “n” Columns
ESC [nd	Set Print Line To Line “n”
ESC [ne	Advance Print Line By “n” Lines
ESC E	Execute Carriage Return And Line Feed
ESC D	Perform Line Feed
ESC $ 8 or ESC $ N	Perform Reverse Half Line Feed
ESC $ 7 or ESC $ P	Perform Half Line Feed
ESC $ S n or ESC $ s n	Set DS-180 Discrete (boolean) Feature
ESC $ C n or ESC $ c n	Clear DS-180 Discrete (boolean) Feature
ESC $ F n 1 ; n2	Change DS – 180 Value (Integer) Feature

G.6 DPCL Command Sequence Summary

ASCII Command	DPCL Emulation Command Description
ESC$$EE_1.	DPCL entry mode
X.	DPCL exit mode
I1;P_1.	Forms Length
I2;P_1.	Vertical Pitch
I3;P_1.	Top Margin
I4;P_1.	Bottom Margin
I5;P_1.	Left Margin
I6;P_1.	Right Margin
I7;P_1.	Manual Tear Time
I8;P_1.	Automatic Tear Time
I10;P_1.	Paper Slew Speed
I11;P_1.	Buffer Size Control
I13;P_1.	DGCL or Bar Code Command Character
I15;P_1.	Coax Maximum Print Position
I16;P_1.	Number of Data Bits (ASCII)
I17;P_1.	Maximum Profile Number
I18;P_1.	Change Profile
I19;P_1.	Automatic Form Gap Distance
I24;P_1.	Window Size Control
I25;P_1.	Heavy Forms Carriage Position
I26;P_1.	Heavy Forms Activation

DPCL Command Sequence Summary (Cont'd)

ASCII Command	DPCL Emulation Command Description
I27;P_1.	Cut Sheet Timeout
I28;P_1.	Cut Sheet Calibration
I29;P_1.	Horizontal Gap Position
I30;P_1.	Vertical Gap Position
A1;P_1;P_2;P_{32}.	Set Horizontal Tabs
A2;P_1;P_2;P_{32}.	Clear Horizontal Tabs
A3;P_1;P_2;P_{32}.	Set Vertical Tabs
A4;P_1;P_2;P_{32}.	Clear Vertical Tabs
F2;P_1.	Tractor Horizontal Adjust Distance
F5;P_1.	Tear Off Distance
R1;P_1.	Clear All Horizontal Tabs
R2;P_1.	Clear All Vertical Tabs
R3;P_1.	Save Profile
R4;P_1.	Reset Profile
R5;P_1.	Print Profile
R6;P_1.	Print Wire Test
R8;P_1.	Form Thickness Adjustment
R10;P_1.	Reset Quick List
R12;P_1.	Execute Mode Test
R13;P_1 P_2.	Execute Self Test
R14;P_1 P_2.	Reset NVRAM
R15;P_1.	Reset Keypad Lockout

DPCL Command Sequence Summary (Cont'd)

ASCII Command	DPCL Emulation Command Description
B2;P_1.	Automatic Line Feed
B3;P_1.	Automatic Carriage Return
B4;P_1.	Automatic Line Wrap
B5;P_1.	Unidirectional Print
B7;P_1.	Power Up On Line
B8;P_1.	Quiet Mode (Not available on Quiet Option)
B9;P_1.	DGCL/Barcode Recognition
B10;P_1.	One Dot Overlap
B11;P_1.	Twinax/Coax Command Pass Through
B12;P_1.	Twinax Font Lock
B13;P_1.	Twinax Margin Lock
B14;P_1.	Twinax Vertical Pitch Lock
B15;P_1.	Twinax Forms Length Lock
B16;P_1.	Twinax/Coax Paper Move On Line
B17;P_1.	Twinax/Coax Clear Printer Buffer
B18;P_1.	Coax Form Feed After Local Print
B19;P_1.	Coax Form Feed Before Local Print
B20;P_1.	Coax Prints Null as Spaces
B21;P_1.	DTR Handshaking Enable (ASCII Only)
B22;P_1.	Modem Control Enable (ASCII Only)
B24;P_1.	Eight Bit Enable (ASCII Only)
B25;P_1.	Parallel Enable

DPCL Command Sequence Summary (Cont'd)

ASCII Command	DPCL Emulation Command Description
B26;P_1.	Print Suppression
B27;P_1.	Paper Out Detection Defeat
B28;P_1.	Auto Path Switch (Documax Dual Tractor)
B29;P_1.	Vertical Graphics
B30;P_1.	Horizontal Graphics
B31;P_1.	High Impact
B32;P_1.	DIGL Auto Form Feed
B34;P_1.	Double Wide
B37;P_1.	Ignore FF at TOF (COAX only)
E1;P_1.	Manual Tear
E2;P_1.	Emulation Mode
E3;P_1.	Font/Pitch
E4;P_1.	Symbol Set
E5;P_1.	Nationality
E6;P_1.	Slashed Zeroes
E7;P_1.	DGCL/Bar Code Exit Mode
E8;P_1.	Twinax Device Address
E9;P_1.	Twinax Device ID
E10;P_1.	Twinax International Character Set
E11;P_1.	Coax Lines Per Inch
E12;P_1.	Coax Physical Buffer Size
E13;P_1.	Coax Logical Buffer Size

DPCL Command Sequence Summary (Cont'd)

ASCII Command	DPCL Emulation Command Description
E14;P_1.	Coax Mono/Dual Case Printing
E15;P_1.	Coax Single/Double Spacing
E16;P_1.	Coax International Character Set
E17;P_1.	Coax Paper Out Timer
E18;P_1.	Baud Rate (ASCII Only)
E19;P_1.	Serial Configuration (ASCII Only)
E20;P_1.	Parity (ASCII Only)
E21;P_1.	Serial Handshake Mode (ASCII Only)
E22;P_1.	Parallel Handshake Mode (ASC II Only)
E23;P_1.	Parallel Acknowledge Mode
E24;P_1.	Paper Path
E25;P_1.	Key Control
E27;P_1.	Mechanical Configuration
E28;P_1.	Auto Tear Off Mode
E29;P_1.	IBM Character Set
E30;P_1.	X-on Control
E31;P_1.	X-off Control
S1;P_1.	Profile Name
C.	Comment

H. DGCL

H.1 Datasouth Graphics Command Language

The Datasouth Graphics Command Language contains a powerful set of graphics and text commands which can be accessible by the user from all emulation modes. The DGCL structure consists of two distinct levels: a Transparency level (or mode) and a Task level. The Transparency level can be accessed from any emulation mode by simply entering the up caret PY command sequence (^PY). The Task level can be accessed from (and only from) the Transparency mode by entering one of the Task initiation commands ^E, ^M, ^U or ^V.

The Datasouth Graphics Command Language will allow the user to:

- Draw variable length and variable width lines up to 13.2 inches horizontally by 13.2 inches vertically, with the line types solid, dashed, dotted, and dash-dotted, being user selectable.
- Draw variable length and variable width boxes up to 13.2 inches horizontally by 13.2 inches vertically, with the box types solid, dashed, dotted, and dash-dotted, being user selectable. The thickness of the horizontal and vertical line segments will also be independently selectable.
- Print expanded characters in tenth inch increments up to 9.9 inches horizontally by 9.6 inches vertically. Horizontal and vertical dimensions can be controlled independently.

NOTE

The vertical tenth inch increment is only an approximation and it is actually 7/72 inch. Specifying a vertical dimension value of 99 yields an actual dimension of 9.6 inches.

- Print variable height and variable ratio horizontal barcodes (up to 9.9 inches in height). Human readable text will be user selectable. The most commonly used barcode symbols will be supported.
- Customize DGCL entry and exit parameters via menu feature selection.

The DGCL Recognition feature gives the user the ability to enable and disable recognition of the Datasouth Graphics Command Language. When the feature is 'enabled', the DGCL entrance command '^PY' will be recognized and executed thus giving the user access to all the DGCL commands. When the feature is 'disabled', the DGCL entrance command '^PY' will be ignored thus locking out user access to the DGCL mode. Under this condition all DGCL data will be passed on to the active emulation mode command processor and handled in a manner consistent with that active emulation mode.

The 'Default Command Character' feature gives the user the ability to select the default command character for the DGCL mode. The command character is the leading character in any valid DGCL command sequence. Valid selectable command characters would be any printable ASCII code between 33 and 255.

The 'One Dot Barcode Overlap' feature will give the user the ability to overlap the different passes of a barcode symbol by one dot.

The 'DGCL Exit Mode' feature gives the user the ability to select 1 of 4 exit modes.

NOTE

The up caret character (^) is the command character used to introduce a DGCL command sequence and does not represent the control key. This character cannot be printed in DGCL mode unless you change the command character with the ^N command. The default value of the command character is determined by the 'Default Command Character' feature. It will be assumed throughout the remainder of this specification, that the default command character is the '^' character.

H.2 Transparency Mode

Whenever the printer senses a ^PY command (and the 'DGCL Recognition' feature is enabled), the printer will enter DGCL Transparency mode. In this mode, the printer will screen incoming data for valid DGCL commands. When a valid DGCL command is encountered, it will be processed by the Transparency Mode Command Processor (see Table H-1). All other data will be passed through and processed by the active emulation mode.

Transparency mode processing will continue until the user either initiates a Task with one of the commands ^E, ^M, ^U or ^V, or exits DGCL mode with a ^PN command. If a Task is initiated, control is handed over to the Task Mode Command Processor. If a ^PN command is sensed, control is returned to the active emulation mode. It should be emphasized that the only DGCL command recognized from the base emulation mode is the DGCL entrance command '^PY'.

Upon entering the DGCL Transparency mode, certain features will he initialized to a default value while others will be allowed to retain a value obtained from a previous DGCL session. Likewise when exiting the DGCL Transparency mode and handing control back over to the active emulation mode, certain features may be initialized to their default value.

The following is a summary of some DGCL Transparency mode features and their values upon entering and exiting the Transparency mode:

Upon Entering DGCL	**Feature Value**
Data Suppression	Disabled
Control Code Suppression	Disabled
Double Vertical Dot Density	Disabled
Horizontal Repeat	Disabled
Unidirectional Print	Retains active value
One Dot Barcode Overlap	Retains active value

Upon Exiting DGCL	**Feature Value**
Command Character	Reverts back to default

Table H-1 Transparency Mode Command Sequences

Command	DGCL Command Description
^SP	NUL
^!	SOH
^~	STX
^#	ETX
^$	EOT
^%	ENQ
^&	ACK
^`	BEL
^(	BS
^)	HT
^*	LF
^+	VT
^,	FF
^-	CR
^.	SO
^/	SI
^0	DLE
^1	DC1
^2	DC2
^3	DC3
^4	DC4
^5	NAK

Table H-1 Transparency Mode Command Sequences (Cont'd)

Command	DGCL Command Description
^6	SYN
^7	ETB
^8	CAB
^9	EM
^:	SUB
^;	ESC
^<	FS
^=	GS
^>	RS
^?	US
^A	Disable data suppression.
^E	***CCW Landscape mode.
^F	Enable control code suppression.
^G	General purpose terminator
^J	Nested Vert. Repeat terminator.
^M	Portrait mode.
^N	Change command character.
^O	Disable control code suppression.
^PN	Exit DGCL mode.
^R	Vertical Repeat
^S	Horizontal Repeat.
^U	***Upside down Portrait mode.

Table H-1 Transparency Mode Command Sequences (Cont'd)

Command	DGCL Command Description
^V	***CW Landscape mode.
^X	Enable data suppression.
^Y	Numeric Variables.
^Z	Vertical Repeat terminator.
^a	Disable double dot density.
^b	Enable double dot density.
^g	Disable unidirectional printing.
^h	Enable unidirectional printing.
^j	Enable one dot overlap barcode printing.
^k	Disable one dot overlap barcode printing.

*** To remain compatible with existing industry standard software, these commands are only recognized to the extent that they initiate Task mode. Once in Task mode, all data pertinent to these unsupported commands will be ignored. The ^M command should be used to initiate Task mode.

H.3 Task Mode

Whenever one of the commands ^E, ^M, ^U or ^V is sensed in the Transparency mode, control is handed over to the Task Mode Command Processor. Active emulation commands are not recognized in the Task mode and will be interpreted according to this mode. In Task mode you enter commands to create barcodes, draw lines and expand characters. All data received during a particular task session is decoded and processed as a unit (or task). No actual printing takes place until the task is terminated via a valid task terminator. At this point, the data is broken up into passes, processed and printed. Valid task terminators are the ^*, ^+, ^- and ^, commands. Other valid task terminators are the linefeed, carriage return, vertical tab and form feed control codes. These task terminators are valid only if the control code suppression mode is disabled. All control codes other than the four mentioned above are ignored in the task mode.

If you are entering a large task and need to enter data on a new line, you can enter a ^F command to suppress the ASCII control codes and avoid terminating the task prematurely. To end the task and print your data, enter one of the task terminator commands described in the paragraph above. Data entered in Task mode is printed at either 120 x 72 dots per inch or 120x 144 dots per inch, depending on the status of the ^KF command.

If a task becomes too large or too complex to be contained within the limits of the task buffer, task data will be truncated. Task information placed beyond the 13.2 inch wide task window will be ignored. Control codes such as CR, LF, HT, VT, etc., have no effect on the placement or positioning of information when in the Task mode. To change the active print position in the Task mode, use the ^T and ^J commands. Table H-2 provides a list of valid command sequences for the Task mode.

Upon entering the DGCL Task mode, certain features will be initialized to a default value while others will be allowed to retain the value passed from the Transparency mode.

The following is a summary of some DGCL Task mode features and their values upon entering the Task mode.

Upon Entering DGCL Task	Feature Value
Data Suppression	Retains passed value
Control Code Suppression	Retains passed value
Double Vertical Dot density	Retains passed value
Horizontal Repeat	Retains passed value
Unidirectional Print	Retains passed value
One Dot Barcode Overlap	Retains passed value
Command Character	Retains passed value
Horizontal Position	0 (zero)
Vertical Position	0 (zero)
Reverse Video	Disabled
Descender Mode	Disabled
Height	Specified in ^E, ^M, ^U, or ^V command
Width	Specified in ^E, ^M, ^U, or ^V command

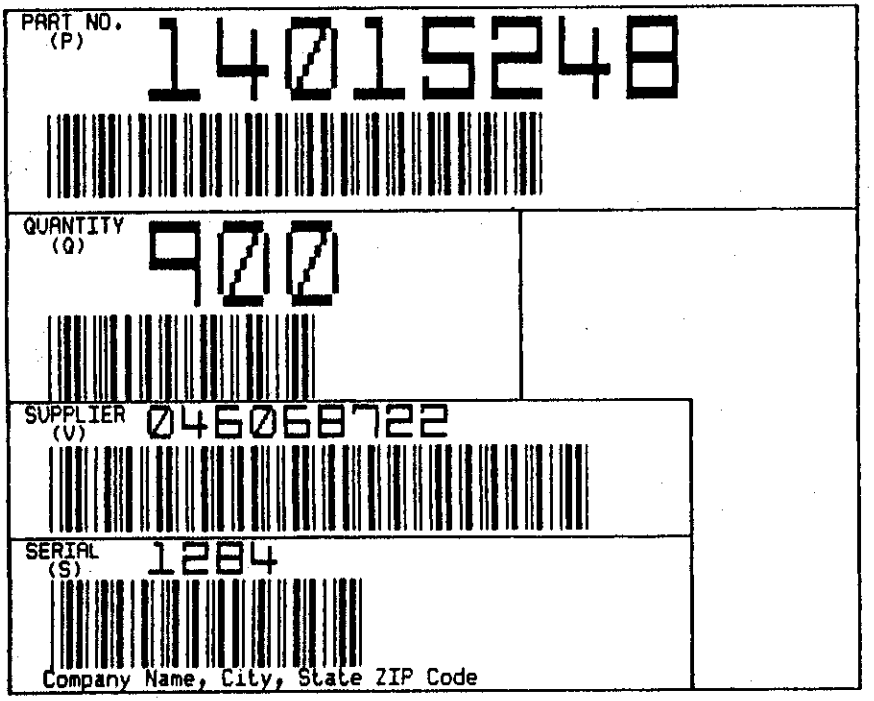
Table H-2 Task Mode Command Sequences

Command	DGCL Command Description
^*^+^,^-	Task terminators- Exit task mode and print data. Return control to transparency mode.
^A	Disable data suppression
^B	Select a horizontal barcode.
^D	Turn descender mode On/Off.
^F	Enable Control Code Suppression.
^G	General purpose terminator.
^H	Set character height.
^J	Set vertical positioning.
^KF	Turn vertical double-density On/Off.
^Lb	Draw a box. (four types available)
^Ll	Draw a line. (four types available)
^LF	Draw a form.
^M	Portrait mode.
^N	Change command character.
^O	Disable control code suppression.
^R	Turn reverse video On/Off
^S	Select Print Density.
^T	Set horizontal positioning.
^W	Set character width.
^X	Enable data suppression.
^Y	Numeric Variables.

H.4 Sample Program for AIAG Label

This sample program generates the following AIAG label using the Datasouth Graphics Command Language.

^PY^X	Enter transparency mode	^A
^F^X	Enable ctrl code sup.	^A
^M0000000^X	Enter task mode	^A
^D^X	Enable descender mode	^A
^LB0500040012^X	Draw Box	^A
^J120^T0000^LS05000001^X	Bottom of PN field	^A
^J120^T0300^LS00020110^X	Right end of Q field	^A
^J230^T0000^LS04000001^X	Bottom of Q field	^A
^J230^T0400^LS00020170^X	Right end of V & S field	^A
^J310^T0000^LS04000001^X	Bottom of V	^A
^S3^X	Select 15 pitch font	^A
^J002^T0010PART NO.^X	Part number title	^A
^J122^T0010QUANTITY^X	Quantity title	^A
^J133^T0026(Q)^X	Quantity code	^A
^J232^0010SUPPLIER^X	Supplier title	^A
^J243^T0026(V)^X	Supplier code	^A
^J312^T0010SERIAL^X	Serial title	^A
^J232^T0022(S)^X	Serial code	^A
^M0202000^X	Set size to 0.2 x 0.2	^A
^J232^T0081046068722^X	Human readable supplier	^A
^J312^T00811284^X	H.R. serial number	^A
^M0504000^X	Set size to 0.5 x 0.4	^A
^J004^T008114015248^X	H.R. part number	^A
^J124^T0081900^X	H.R. quantity	^A
^J061^T0026^KF^BNAP14015248^G^KF^X	Part number barcode	^A
^J176^T0026^KF^BNAQ900^G^KF^X	Quantity barcode	^A
^J254^T0026^KF^BNAV046068722^G^KF^X	Supplier barcode	^A
^J334^T0026^KF^BNAS1284^G^KF^X	Serial number barcode	^A
^S3^X	Select 15 pitch font	^A
^J385^T0020Company Name, City, State ZIP Code ^X	Company Name	^A
^-^PN		


PART NO.
(P)
14015248
QUANTITY
(Q)
900
SUPPLIER
(V)
046068722
SERIAL
(S)
1284
Company Name, City, State ZIP Code

AIAG Label

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AMT Datasouth Corp.

Corporate Headquarters
4765 Calle Quetzal
Camarillo, CA 93012
(805) 388-5799 PH
(805) 484-5282 FX

Charlotte Operation
4216 Stuart Andrew Blvd.
Charlotte, NC 28217
(704) 523-8500 PH
(704) 525 6104 FX

AMT Datasouth International
Unit B, Pinnacle 15
Gowerton Rd, Brackmills
Northampton, NN4 7BW
England
+44 1604 763394 PH
+44 1604 760661 FX

www.amtdatasouth.com