Compliance Statement Insert

Device Name: AC, DC Portable, Van, Wall Mount Printer   **Model Number: 6820**

The responsible party for the compliance of this device is: **Intermec Technologies Corporation**
6001 36th Avenue West
Everett, WA 98203
USA

CAUTION: See users guide instructions for handling, charging, and replacing batteries. Failure to follow those instructions can result in personal injury, fire, or battery explosion.

This product conforms to the following approvals.   The user(s) of this product are cautioned to use accessories and peripherals approved by Intermec Technologies Corporation. The use of accessories other than those recommended, or changes to this product that are not approved by Intermec Technologies Corporation, may void the compliance of this product and may result in the loss of the users authority to operate the equipment.

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.

FCC Digital Emissions Compliance
    This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the radio of television receiving antenna.
- Increase the separation between the computer equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the radio or television receiver is connected.
- Consult the dealer or an experienced radio television technician for help.

Canadian Digital Apparatus Compliance
    This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

    Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Radio Wave Exposure Information for Model 6820 Configurations with Bluetooth Radio
    The Model 6820 Printer has been designed to comply with applicable safety requirements for exposure to radio waves. These requirements are based on scientific guidelines that include safety margins designed to assure the safety of all persons, regardless of age and health.

    The Model 6820 Printer with the Bluetooth option has been evaluated using the FCC Maximum Permissible Exposure (MPE) exposure guidelines when used with the Intermec accessories supplied or designated for this product. Use of other accessories may not ensure compliance with FCC RF exposure guidelines. Users should maintain 20 cm (approximately 8 inches) of clearance between themselves and the 6820 Printer when using the Bluetooth radio interface.

578-100-026E

DECLARATION OF CONFORMITY

(According to ISO/IEC Guide 22 and EN 45014)

THE PRODUCT HEREWITH COMPLIES WITH THE REQUIREMENTS OF :

THE LOW-VOLTAGE DIRECTIVE 73/23/EEC.
THE EMC DIRECTIVE 89/336/EEC.
THE R&TTE DIRECTIVE 1999/05/EC.

Manufacturer's Name:	**European Representative:**
Intermec Technologies Corporation	**Intermec International Incorporated**
6001 36th Avenue West	**Sovereign House, Vastern Road**
Everett, WA 98203	**Reading, Berkshire**
USA	**RG1 8BT England**

Declares that the product listed below:
Product Type: ITE/Residential, Commercial, and Light Industrial
Product Name: 6820 DC Portable, Van, Wall Mount Printers
Model Number: 6820   **Product Options: ALL**
Beginning Serial Number: All   **Date Issued: August 10, 2005**

Conforms to the following product specifications:

Safety: IEC 60950-1 / EN 60950-1

EMC: EN 55022 : 1998 / CISPR Publication 22 : 1997, Class B Limits and Methods
       EN 55024 : 1998 (CISPR 24) Information Technology Equipment – Immunity Characteristics –
               Limits and Methods of Measurement
               EN 61000-4-2 : 1995 – Electrostatic Discharge
               EN 61000-4-3 : 1995 – Radiated RF Field
               EN 61000-4-4 : 1995 – Electrical Fast Transients
               EN 61000-4-5 : 1995 – Voltage Surge
               EN 61000-4-6 : 1996 – Conducted RF Field
               EN 61000-4-11 : 1994 – Voltage Dips, Short Interruptions, and Variations
      EN61000-3-2 : 1995 + A1 : 1998 + A2 : 1998 + A14 : 2000 – Harmonic Current Emissions
      EN61000-3-3 : 1995 – Voltage Fluctuation and Flicker

Radio: ETSI EN 300 328

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

Company Official: Michael Abel   **Position: Vice President**

Signature: **Signed Copy on File**   **Date: August 10, 2005**

European Contact: Luc Van Geel, Intermec International Incorporated, Sovereign House, Vastern Road, Reading, Berkshire, RG1 8BT England; Phone INT+44 118 987 9400; Fax INT+44 118 987 9401

Czech Republic Contact: Global AmeriTech Corporation, Rytirska 10, 110 00, Prague 1, Czech Republic; Phone INT+420-224 210 493; Fax INT+420-224 211 729

578-100-026E

PROHLÁŠENÍ O DODRŽOVÁNÍ TECHNICKÝCH NAŘÍZENÍ

(V souladu se směrnicí 22 ISO/IEC a EN 45014)

STRÁNKA JEDNA Z JEDNÉ STRÁNKY

**ZDE UVEDENÝ VÝROBEK SPLŇUJE POŽADAVKY:
SMĚRNICE 73/23/EEC PRO NÍZKONAPĚŤOVÁ ZAŘÍZENÍ
SMĚRNICE EMC 89/336/EEC
SMĚRNICE R&TTE 1999/05/EC**

Jméno výrobce:
Intermec Technologies Corporation
6001 36th Avenue West
Everett, WA 98203, USA

Evropský zástupce:
Intermec International Incorporated
Sovereign House, Vastern Road
Reading, Berkshire
RG1 8BT England

prohlašuje, že níže uvedený výrobek:
Typ výrobku: Vybavení informační technologie/rezidenční, komerční a lehké průmyslové
Název výrobku: Model 6820 Kopírka
Číslo výrobku: Model 6820   **Varianty:** Všechny
Počáteční sériové číslo: Všechna   **Datum vydání:** 10. Důstojný 2005

Splňuje následující parametry výrobku:

Bezpečnostní: IEC 60950-1 / EN 60950-1

EMC: EN 55022 : 1998 / CISPR vyhláška 22: 1997, Limity a metody třídy B
EN 55024: 1998 (CISPR 24) Vybavení informační technologie – charakteristiky odolnosti –
        Limity a metody měření
        EN 61000-4-2 : 1995 – Elektrostatický výboj
        EN 61000-4-3 : 1995 – Vyzařované vysokofrekvenční pole
        EN 61000-4-4: 1995 – Rychlé přechodové elektrické jevy
        EN 61000-4-5: 1995 – Napěťový ráz
        EN 61000-4-6: 1996 – Vedené vysokofrekvenční pole
        EN 61000-4-8: 1995 – Magnetické pole
        EN 61000-4-11: 1994 – Krátkodobé poklesy napětí, krátká přerušení a pomalé změny napětí
    EN61000-3-2: 1995 + A1: 1998 + A1: 1998 + A1: 2000 – Vyzařované harmonické proudy
    EN61000-3-3: 1994 – Kolísání napětí a blikání

Radio: ETSI EN 300 328

Já, níže podepsaný, tímto potvrzuji, že výše uvedené vybavení splňuje požadavky výše uvedených nařízení a standardů.

Zástupce společnosti: Michael Abel   **Pozice: viceprezident**

Podpis: _____**Podepsaná kopie v evidenci**_____   **Datum:** <u>**10. Důstojný 2005**</u>

Evropský kontakt: Intermec International Incorporated, Sovereign House, Vastern Road, Reading, Berkshire, RG1 8BT England;
Telefon: MEZIN. +44 118 987 9400; Fax MEZIN.+44 118 987 9401

Kontakt v České republice: Global AmeriTech Corporation, Rytířská 10, 110 00, Praha 1, Česká republika;
Telefon: MEZIN. +420-224 210 493; Fax MEZIN. +420-224 211 729

578-100-026E

Intermec

User's Manual

6820 Series
80-Column Printer

Intermec Technologies Corporation

Corporate Headquarters   Technical Communications Department
6001 36th Ave. W.   550 Second Street SE
Everett, WA 98203   Cedar Rapids, IA 52401
U.S.A.   U.S.A.

www.intermec.com

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There are U.S. and foreign patents pending.

Bluetooth is a trademark of Bluetooth SIG, Inc., U.S.A.

This product includes cryptographic software written by Eric Young (EAY@cryptsoft.com).

Document Change Record

This page records changes to this document. The document was originally released as Revision A.

Revision	Date	Description of Change
E	04/2004	Updated printer paper specifications in Chapter 1, "*Introduction.*"
F	08/2004	Merged technical reference information into user guide to create a user manual. Added information about Bluetooth configuration, 600 Series Computers, 700 Series Computers, and the 6820 Configuration Utility application for Windows 2000 and Windows XP operating systems.
G	12/2004	Updated information for the Bluetooth shutdown timer. Added Appendix C, "Printer Fonts Test Print Jobs" to provide sample test font print jobs.
H	05/2005	Includes Bluetooth information for the wall mount printer.
J	10/2005	Included CK60 Handheld Computer infomration.

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7 **Troubleshooting and Diagnostics**

A   Bluetooth Configuration Commands

B   Cross-Reference Tables

Contents

Before You Begin

This section provides you with safety information, technical support information, and sources for additional product information.

Safety Summary

Your safety is extremely important. Read and follow all warnings and cautions in this document before handling and operating Intermec equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the safety warnings and cautions.

Do not repair or adjust alone

Do not repair or adjust energized equipment alone under any circumstances. Someone capable of providing first aid must always be present for your safety.

First aid

Always obtain first aid or medical attention immediately after an injury. Never neglect an injury, no matter how slight it seems.

Resuscitation

Begin resuscitation immediately if someone is injured and stops breathing. Any delay could result in death. To work on or near high voltage, you should be familiar with approved industrial first aid methods.

Energized equipment

Never work on energized equipment unless authorized by a responsible authority. Energized electrical equipment is dangerous. Electrical shock from energized equipment can cause death. If you must perform authorized emergency work on energized equipment, be sure that you comply strictly with approved safety regulations.

Safety Icons

This section explains how to identify and understand dangers, warnings, cautions, and notes that are in this manual. You may also see icons that tell you when to follow ESD procedures and when to take special precautions for handling optical parts.

A warning alerts you of an operating procedure, practice, condition, or statement that must be strictly observed to avoid death or serious injury to the persons working on the equipment.

Avertissement: Un avertissement vous avertit d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour éviter l'occurrence de mort ou de blessures graves aux personnes manupulant l'équipement.

A caution alerts you to an operating procedure, practice, condition, or statement that must be strictly observed to prevent equipment damage or destruction, or corruption or loss of data.

Attention: Une précaution vous avertit d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour empêcher l'endommagement ou la destruction de l'équipement, ou l'altération ou la perte de données.

Note: Notes either provide extra information about a topic or contain special instructions for handling a particular condition or set of circumstances.

Global Services and Support

Warranty Information

To understand the warranty for your Intermec product, visit the Intermec web site at www.intermec.com and click **Service & Support**. The Intermec Global Sales & Service page appears. From the **Service & Support** menu, move your pointer over **Support**, and then click **Warranty**.

Disclaimer of warranties: The sample code included in this document is presented for reference only. The code does not necessarily represent complete, tested programs. The code is provided "as is with all faults." All warranties are expressly disclaimed, including the implied warranties of merchantability and fitness for a particular purpose.

Web Support

Visit the Intermec web site at www.intermec.com to download our current manuals in PDF format. To order printed versions of the Intermec manuals, contact your local Intermec representative or distributor.

Visit the Intermec technical knowledge base (Knowledge Central) at intermec.custhelp.com to review technical information or to request technical support for your Intermec product.

Telephone Support

These services are available from Intermec Technologies Corporation.

Service	Description	In the U.S.A. and Canada call 1-800-755-5505 and choose this option
Factory Repair and On-site Repair	Request a return authorization number for authorized service center repair, or request an on-site repair technician.	1
Technical Support	Get technical support on your Intermec product.	2
Service Contract Status	Inquire about an existing contract, renew a contract, or ask invoicing questions.	3
Schedule Site Surveys or Installations	Schedule a site survey, or request a product or system installation.	4
Ordering Products	Talk to sales administration, place an order, or check the status of your order.	5

Outside the U.S.A. and Canada, contact your local Intermec representative. To search for your local representative, from the Intermec web site, click **Contact**.

Who Should Read this Manual?

This manual provides you with information about the features of the 6820 Series 80-Column Printer, how to install, configure, operate, maintain, access the programming capability, and troubleshoot the printer.

Related Documents

This table contains a list of related Intermec documents and their part numbers.

Document Title	Part Number
6820 Printer Terminal Holder Upgrade Instructions	962-018-011
6820 Printer Installation Instructions	962-018-016

The Intermec web site at www.intermec.com contains our documents that you can download in PDF format.

To order printed versions of the Intermec manuals, contact your local Intermec representative or distributor.

1 **Introduction**

The 6820 Printer is used in the route accounting industry to produce high-quality customer invoices, receipts, load reports, transfers, and other documents. A unique "sleep" feature saves energy when the printer is not printing, eliminating the ON/OFF switch. Data input is normally provided by hand-held or mobile computers.

About the Printers

- **Fixed Mount Printer**
  The fixed mount printer is mounted in motor vehicles or used in a settlement room. The terminal holder may be mounted on the printer or a remote dock can connect to the side of the printer. A deep paper tray, which holds up to 200 3-ply forms (about 2" or 5 cm thick) is under the printer mechanism.

- **Portable Printer**
  The portable printer has a handle so that you can carry it. An optional internal battery permits operation without the use of an external power source. The terminal holder is an integral part of this printer. A shallow paper tray, which holds up to 50 3-ply forms (about an inch or 2.5 centimeters thick) is under the printer mechanism.

- **Wall Mount Printer**
  The wall mount printer hangs on a mounting plate secured to a wall. Computers communicate with this printer through the remote terminal holder, remote dock, or vehicle dock. With no internal paper tray, paper is loaded from a separate paper tray (holds up to 2.5" or 6 cm of paper) or a box. The printer mechanism is permanently attached.

Fixed Mount Printer
(with 4000 Series/62XX Terminal Holder)

Portable Printer
(with 61XX Terminal Holder)

Wall Mount Printer
(with mounting plate and flat paper tray)
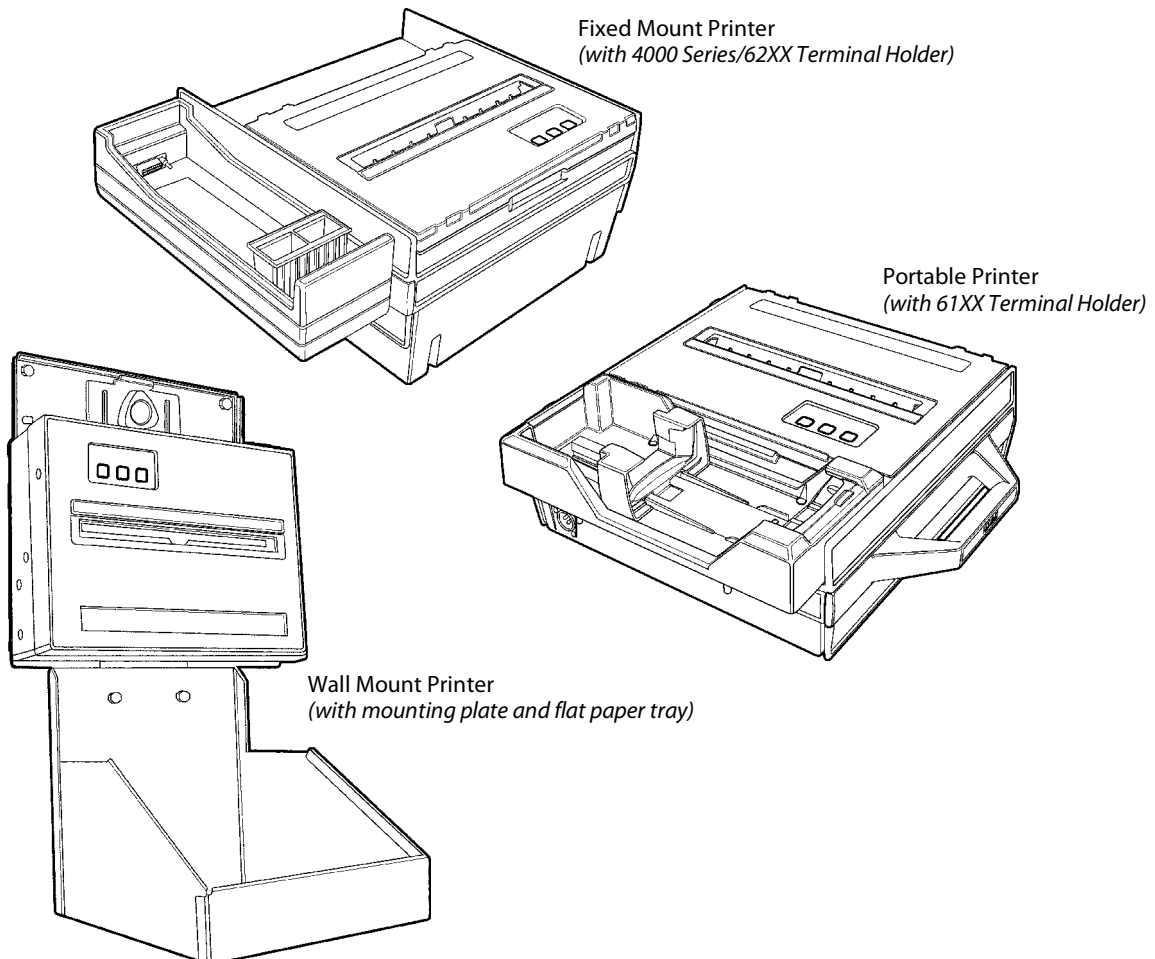
Battery Options

The following battery options are available for the 6820 Printers. See "*Inside Sales*" for ordering information and part numbers

Internal Battery

This battery (P/N: 317-075-001) allows the portable printer and some fixed mount printers to operate independently of other power sources.

Vehicle Battery

A power cable provides power to the printer through a cable permanently installed in the vehicle.

Connectors

Each printer has a dc power jack that connects the printer to a power source, such as the vehicle battery or an external power supply.

Each printer communicates with a mobile computer through the 25-pin data communications connector (wall mount printer) or mobile computer socket (in terminal holder, remote terminal holder, or vehicle dock).

Fixed Mount Printer

The dc power connector is on the bottom rear of the printer behind the printer terminal holder. The data communications socket is in either the printer terminal holder or a separate vehicle dock.

Portable Printer

The dc power connector is on the side of the printer beneath the printer terminal holder. The data communications socket is either in the printer terminal holder or a separate vehicle dock.

Wall Mount Printer

The dc power connector is on the bottom left of the printer. The data communications connector (25-pin socket) is on the bottom right.
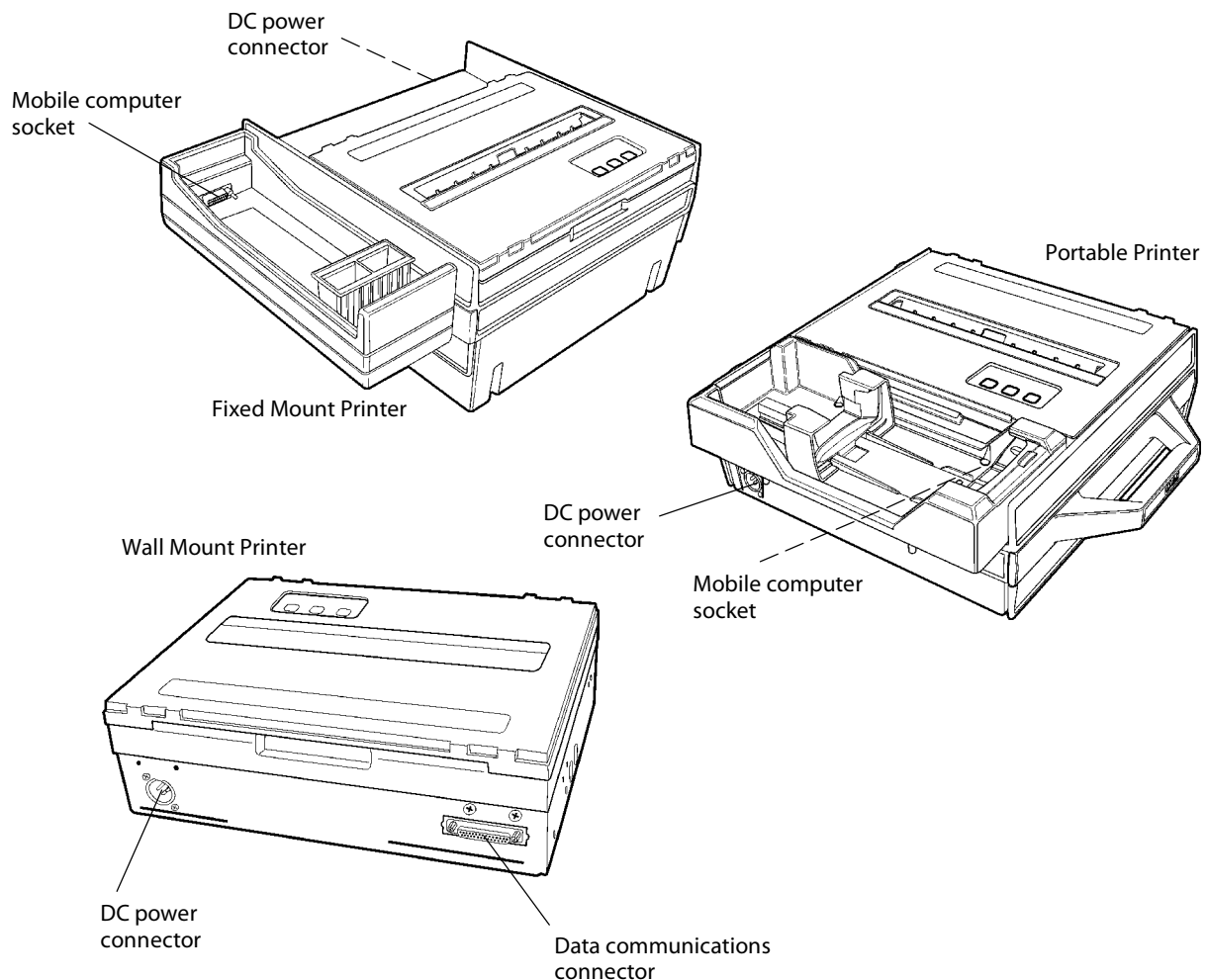
Control Panel

The printer control panel has four indicators in the top row and three buttons in the bottom row. Three indicators blink when there is a problem. The three buttons adjust and align the paper.

Indicators

PAPER OUT	The printer is out of paper.
HEAD JAM	The print head is jammed and cannot move.
LOW BATT	The internal battery voltage, the vehicle battery voltage, or the power module voltage is too low.
Power	This stays lit while the printer is in active mode, or awake. When the printer is in sleep mode, or without power, this is dark.

Buttons

FORM FEED	Press this button to feed the paper into the printer mechanism or when the printer should advance to the next form. If the printer ran out of paper, press this button to initiate automatic paper loading.
SET PAGE	Press this button to signal the beginning of the page to the printer after you have made the appropriate paper adjustments; or to set the linefeed counter to zero and move the print head to its home position. *In "Paper Out" conditions, press this button to clear the Paper Out error before printing can resume.*
LINE FEED	Press this button to adjust the top of the paper to the next line.
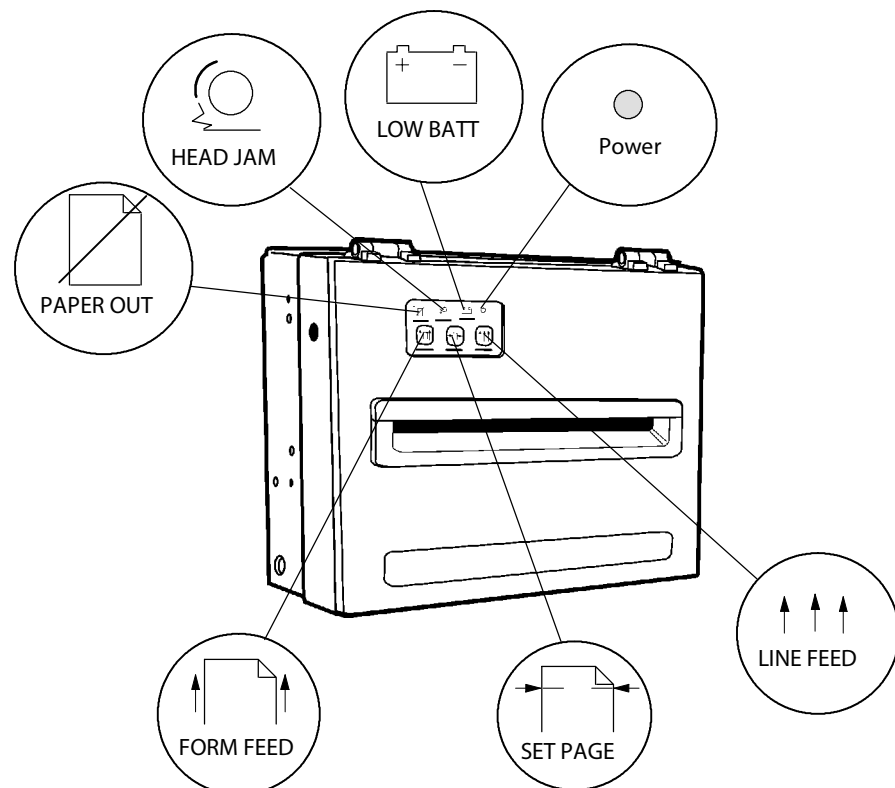
Hinges on Printer Cover

All printer covers are hinged to the printer. These hinges have a tension screw (turn clockwise to tighten, turn counterclockwise to loosen), should you need to adjust them.
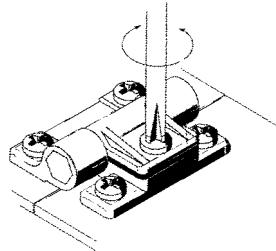
Internal Power Module

The alternating current (ac) power module, or the ac foot, is available for fixed mount and portable printers — *not for wall mount printers* — and allows for ac operation. The ac foot is installed at the factory and *is not an add-on option.*

Insert the power cord connector into the ac foot connector in the printer; then plug the cord into an ac outlet. This power cord can wrap around the ac foot when not in use.

AC foot

Plug on power cord
(goes to ac outlet)

Paper

⚠️ **Caution**
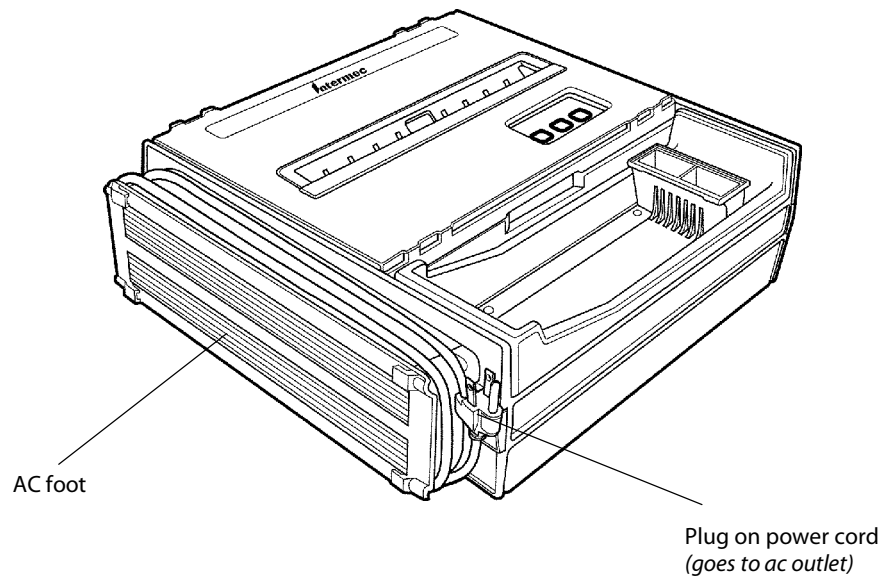
Use of paper that matches the following specifications ensures optimum 6820 performance. Variation from these specifications, use of aged paper, or use of paper exposed to elements such as dirt or humidity may cause printing problems.

The printer works with 1–3 ply carbonless paper that is single-edge glued and designed for sprocket feed. Standard paper size is 8.5 x 11" or 8.5 x 12" (241 x 305 mm international). Use 3-ply forms up to a maximum of 0.009 inch (0.23 mm) thick.

A soft, flexible, rubber type cement applied to one perforation strip only is preferred. The resultant lamination should wrap around a 1-1/4 inch diameter roll without curl or wrinkle.

Material Breakdown

The following tables show the material broken down per ply:

14# CBF (Carbonless Back and Front)

	Target	Under	Over
Basis Weight	14#	13.3	14.7
Caliper	2.9	2.6	3.2
Moisture	5.0	4.0	6.0
Smoothness (RS)	165	110	230
Smoothness (CB)	270	220	320
Brightness (Wht)	88	86	90
Colors available: White, Canary, Pink, Goldenrod, Blue, Green			

15# CF (Carbonless Front)

	Target	Under	Over
Basis Weight	15#	14.43	15.8
Caliper	3.0	2.5	3.2
Moisture	5.0	4.0	6.0
Smoothness (RS)	140	100	180
Smoothness (CF)	140	100	180
Brightness (Wht)	85	84	86
Colors available: White, Canary, Pink, Goldenrod, Blue, Green			

16# CB (Carbonless Back)

	Target	Under	Over
Basis Weight	16#	15.2	16.8
Caliper	3.3	2.8	3.8
Moisture	5.7	4.2	6.7
Smoothness (RS)	180	120	270
Smoothness (CB)	270	220	320
Brightness (Wht)	86	84	88
Opacity (Wht)	81	78.5	82

20# OCR Laser Bond

	Target	Under	Over
Basis Weight	20#	15.2	16.8
Caliper	4.0	3.8	4.2
Moisture	3.8	4.7	5.0
Smoothness	140	100	170
Brightness (Wht)	94	82	N/A*
Opacity (Wht)	85	84	N/A
* Not Applicable			

Caliber Breakdown

The following information show the caliber of forms broken down per ply:

1-Ply (20#)
Targeted: 4.0
Maximum: 4.2

2-Ply (15# and 16#)
Targeted: 6.3
Maximum: 7.0

3-Ply (14#, 15#, and 16#)
Targeted: 9.2
Maximum: 10.2

Printer Dimensions

Below are the three most common printer configurations:

Wall Mount Printers

See the *6820 Printer Installation Instructions* P/N: 962-018-016 for Wall Mount assembly dimensions. Below are the width, height, and depth dimensions for the Wall Mount Printer.

Width	Length	Depth
13.25"	10.5"	4.5"
(33.7 cm)	(26.7 cm)	(11.4 cm)

Fixed Mount Printers

The base of the Fixed Mount Printer is 12.75" (32.5 cm) wide by 14" (35.5 cm) front to back. The upper portion varies according to the configurations shown in the following table.

Fixed Mount Printer Dimensions

Configuration (with deep paper tray)	Width	Length	Depth
with 61XX Holder Side Mount	20.25" (51.4 cm)	14.5" (36.8 cm)	7.5" (19.1 cm)
with 4000 Sesries, 62XX, 600 Series, 700 Series, or CK60 Holder Side Mount	▮ 18.5" (47.0 cm)	14.5" (36.8 cm)	8.0" (20.3 cm)
with 61XX Holder Top Mount	16.75" (42.5 cm)	16.75" (42.6 cm)	7.5" (19.1 cm)
with 4000 Series, 62XX, 600 Series, 700 Series, or CK60 Holder Top Mount	▮ 15.0" (38.1 cm)	16.75" (42.6 cm)	8.0" (20.3 cm)

Portable Printers

The Portable Printer may come with a handle, an ac foot, or with a terminal holder top mount. *Note the ac foot adds 2.5" (6.35 cm) to the width.*

Portable Printer Dimensions

Configuration	Width	Length	Depth
with handle, 61XX Holder Top Mount, and Deep Paper Tray	16.5" (41.9 cm)	16.75" (42.6 cm)	8.0" (20.3 cm)
with handle, 61XX Holder Top Mount, and Shallow Paper Tray	16.75" (42.5 cm)	16.75" (42.6 cm)	7.5" (19.1 cm)
with handle, 4000 Series, 62XX, 600 Series, 700 Series, or CK60 Holder Top Mount, and Deep Paper Tray	▮ 15.0" (38.1 cm)	16.75" (42.6 cm)	8.0" (20.3 cm)
with handle, 4000 Series, 62XX, 600 Series, or 700 Series, or CK60 Holder Top Mount or Fill Plate, and Shallow Paper Tray	▮ 16.5" (41.9 cm)	15.0" (38.1 cm)	5.13" (13.0 cm)

Remote Connections

A printer and a computer, using the supplied serial cable, can operate while up to 30 feet (9 meters) apart.

Reset Button

Each printer has a reset button that cold-boots the printer.

Fixed Mount or Portable Printer

Both the fixed mount printer and the portable printer have the reset button on the left-hand side of the raised printer mechanism. See the following illustration for the location of the reset button.

Printer
mechanism
(raised)
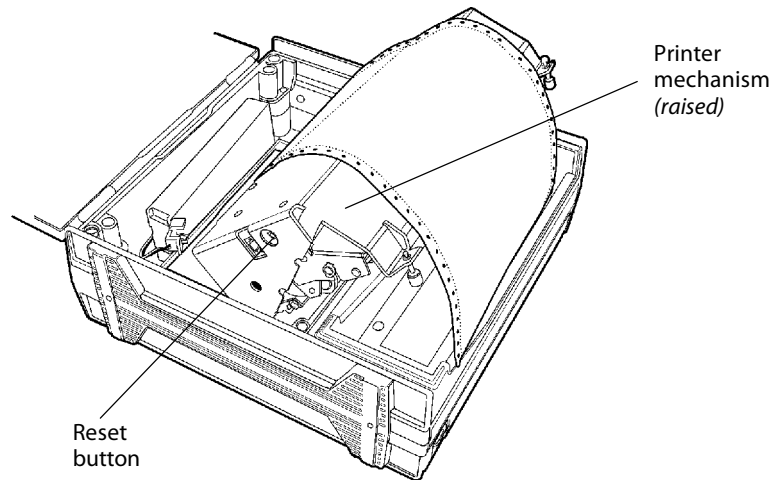
Reset
button

Wall Mount Printer

The wall mount printer has the reset button on the right hand side of the printer case.

Front of
printer

Reset
button
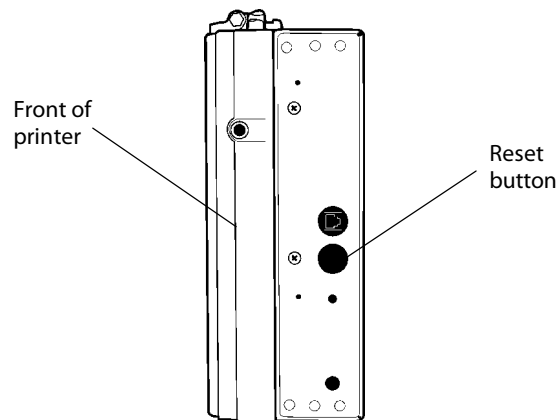
Specifications

Note: Various print fonts do affect the print speed.

Print Speed:	230 cps
Weight:	
Fixed Mount Printer:	14.41 lbs (6.55 kg)
Portable Printer:	
with 4000 or 61XX Terminal Holder:	12.75 lbs (5.80 kg)
with 62XX. 600 Series, 700 Series, or CK60 Terminal Holder:	12.25 lbs (5.67 kg)
Wall Mount Printer:	10.00 lbs (4.54 kg)
Mounting plate:	4.25 lbs (1.93 kg)
Flat paper tray:	5.40 lbs (2.45 kg)
Compact paper tray:	4.50 lbs (2.05 kg)
Temperature:	
DC Operating:	–4° to 140° F (–20° to 60° C)
AC Operating:	–4° to 113° F (–20° to 45° C)
Storage:	–22° to 158° F (–30° to 70° C)
Humidity:	
Operating:	10 to 85% noncondensing
Storage:	5 to 95% noncondensing
Altitude:	
Operating:	–100 to 5000 meters
Storage:	15,000 meters
Electrical:	
Voltage:	13.8 volts dc (nominal)
Current:	1 mA (sleep mode — no charge); 3.5 amps (average while charging internal battery)
Vibration:	1.5 Gs RMS for six hours
ESD:	15 kV noncontact and 8 kV contact
Battery:	
Shelf life:	1 year @ 77° F (25° C) 2.3 amperes-hour 12 volt lead acid *(order batteries through Inside Sales)*

Note: Battery goes dead within two weeks if connected to the printer and with no external charge source.

Inside Sales

Contact Inside Sales at 1-800-255-6292 for these supplies:

Cables:	
4' power cable	P/N: 226-215-001
8' Battery cable	P/N: 206-875-002
16' Battery cable	P/N: 206-875-006
22' Battery cable	P/N: 206-875-009
"Y" power cable	P/N: 226-325-001
Internal battery:	P/N: 317-075-001
Cleaning solutions:	
MICRO-CLEAN II	P/N: 901-438-001
Guide Shaft Cleaner	P/N: 901-439-001
Paper:	
1-ply:	P/N: 816-027-111
2-ply:	P/N: 816-027-012
3-ply:	P/N: 816-027-013
Ribbon cartridges with:	
Black ribbon:	P/N: 805-060-001
Purple ribbon:	P/N: 805-060-002

2 Operation

This chapter provides instructions how to set up the 6820 Printer for the first time.

Check List

Make sure the following tasks are done:

- Printer is unpacked.

- Foam blocks are removed from around the printer. Save the box and packaging materials for future use, such as servicing, relocations, etc.

- Twist tie is removed from the print head.

- Power cable is hooked up to the vehicle battery or power source.

- Printer is mounted in the vehicle.

The following tasks must be done. *Specific instructions for these tasks are described on the pages given*:

1 Connect the battery (page 15).

2 Install the ribbon cartridge (page 16).

3 Load the paper into the paper tray (page 18) and into the printer (several steps starting on page 20).

4 Insert the mobile computer (page 23).

Note: Complete these tasks **before** starting any printer operations.

Installing Internal Battery

The optional internal battery *(sold separately — see "Inside Sales" in Chapter 1 for ordering information and part number)* is primarily for portable printers; *not wall mount printers.* The battery can go in some fixed mount printers via a cable and a factory-installed adapter.

The printer battery recharges automatically when the printer is connected to an external power source via power cable. For most installations, the external power source is passed through the printer to the mobile computer. The printer battery *does not* provide charge to the computer.

Note: Remove the printer battery when storing a printer for over 30 days. After storage, reinstall the battery and connect the printer to an external power source for at least two hours, to recharge the battery.

1 Unlatch and open the printer mechanism.

2 Lower the battery into the rear of the printer case, as shown.

3 Attach the battery cable to the battery.

4 Push the battery down and back under the back edge of the case. The battery should snap into place.

5 Close and latch the mechanism.

Battery

Battery cable

Printer mechanism *(raised)*

Latches or rubber bumpers
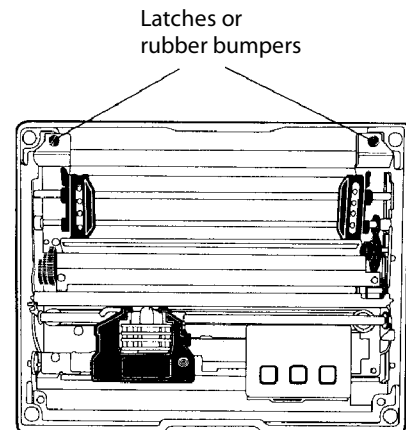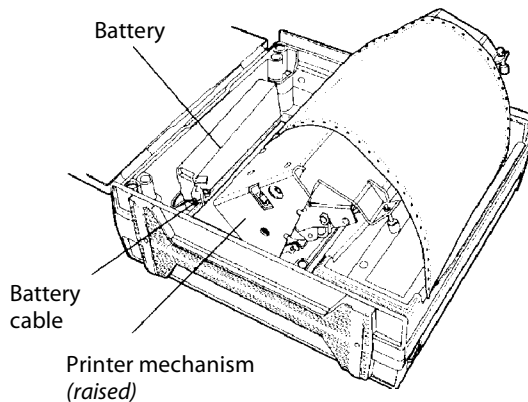
Installing the Ribbon Cartridge

Ensure there is a ribbon cartridge *(sold separately — see "Inside Sales" in Chapter 1 for ordering information and part number)* in the printer before you print and that the ribbon is fully seated (cartridge makes a distinct "snap" or "click") with the visible portion of the ribbon straight and even.

1 Turn the ribbon advance knob (in the direction of the raised arrows) to remove any slack in the ribbon.

2 Squeeze the ribbon cartridge locking tab into the cartridge, then lower the cartridge over the print head.

3 Lower the tab side of the cartridge until it clicks.

4 Release the tab and press *down* on the arrow to fully seat the ribbon cartridge (tab clicks *outward*).

5 Turn the ribbon advance knob *(follow raised arrows)* to align the ribbon in the front of the print head.
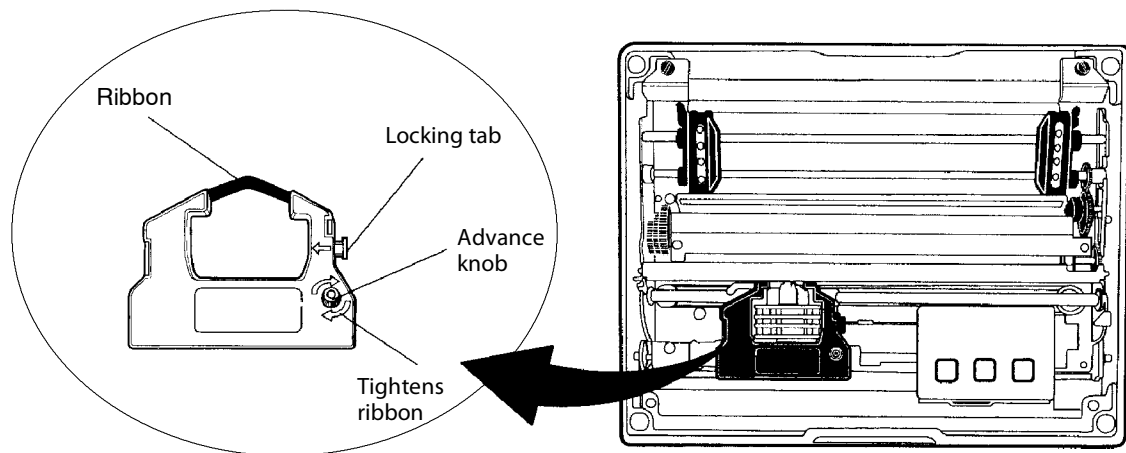
Adjusting the Print Head Gap

The head gap adjuster is near the printer mechanism on the side *opposite the green thumb wheel.* The print head adjuster has five notches between the print head and the platen for different paper thicknesses.

Verify the thickness of the paper loaded into the printer.

- If you are using single-sheet forms, set the head gap adjuster to the third notch *away from the paper.*

- If you are using multiple-sheet forms (2-ply or 3-ply), set the head gap adjuster to the fourth notch *away from the paper.*

- If you experience frequent head jams, set the head gap adjuster to the fifth notch *away from the paper.* This may stop the head jams.

- If the 2-ply and 3-ply paper have light printing, setting the gap adjuster to a closer setting will darken the print.
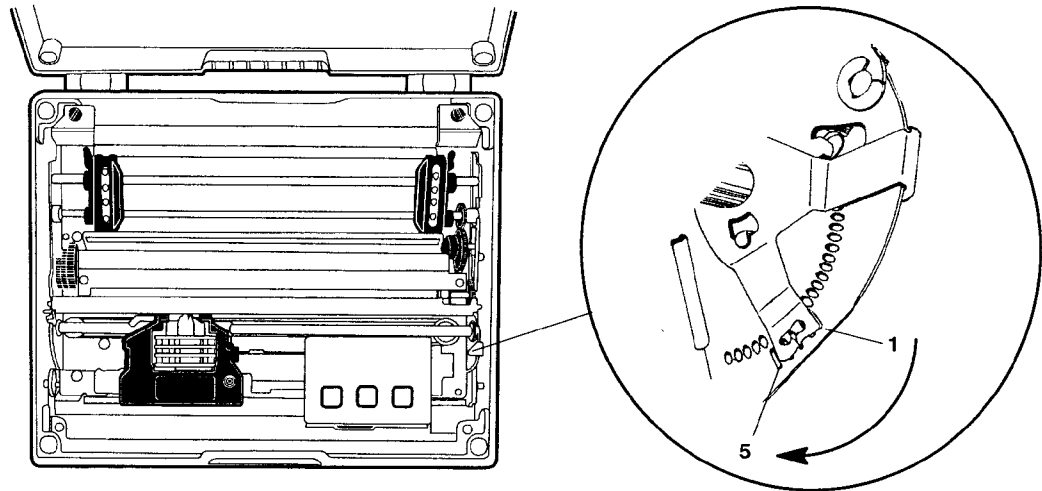
Note the print head adjuster is set on the third notch.

Loading Paper Tray

> **Note**: Do not exceed the recommended amounts of paper quantity or thickness. When loading multiple-sheet paper, be sure to have the original faced up, with the leading edge towards the rear of the printer.

Fixed Mount and Portable Printers

1 Unlatch and raise the printer mechanism.

2 Lower a stack of paper, *with the original faced up*, into the paper tray under the printer mechanism.

- The fixed mount printer holds up to 200 3-ply forms (about 2" or 5 cm thick).

- The portable printer holds up to 50 3-ply forms (about an inch or 2.5 cm thick).

3 Pull the top form out and over the rear of the printer mechanism. Lower and latch the printer mechanism.

Paper tray
*(beneath printer
mechanism)*

Printer mechanism
(raised)
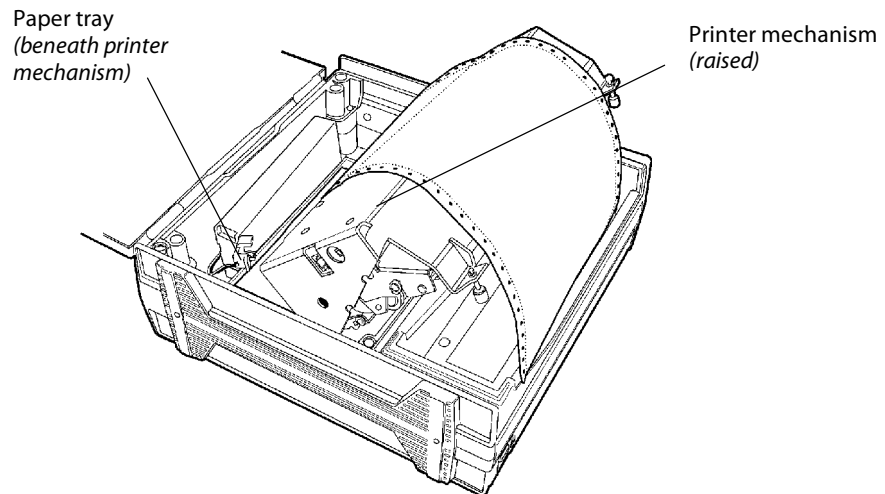
Wall Mount Printer

The wall mount printer can load paper from either an optional flat paper tray or an optional compact paper tray.

Loading the Flat Paper Tray

If you have a flat paper tray attached to the wall mount printer, hold a stack of paper, *up to 2.5 inches (6 cm) thick,* with the original facing you, and lay the stack flat into the tray. Pull the top form out to load into the printer.

Loading the Compact Paper Tray

If you have a compact paper tray attached to the wall mount printer, do the following to load paper into that tray:

1 *With the original facing you,* hold a stack of paper, *up to 2.5 inches (6 cm) thick,* vertically over the compact paper tray.

2 Simultaneously lower the paper into the compact paper tray and pull up the bottom end of the paper until the entire stack fits, **like a "U,"** inside the compact paper tray.

3 Pull the top form out to load into the printer.
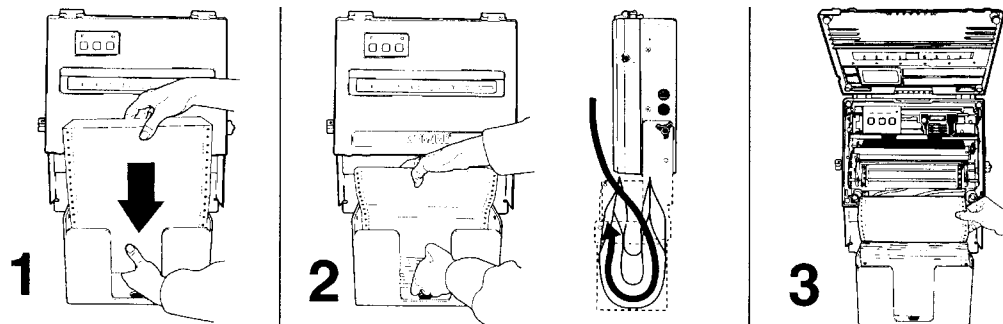
The compact paper tray is filled in this illustration

Loading Paper into Printer

⚠️ **Caution**

CAUTION: Follow these steps to load the paper into the printer, or paper jams may occur.

Paper for the 6820 Printer has perforated strips that fit onto the pinfeed holder pins, guiding the paper into the printer. This paper is sold separately in 1-, 2-, or 3-ply forms. See "*Inside Sales*" in Chapter 1 for ordering information and part numbers.

Positioning the Paper

1 Open the pinfeed holders outward.

2 Take the top edge of the sheet of paper and position it, *original side facing down*, over the pinfeed holder pins.

3 Align the first few holes of the paper, on each side of the paper, onto the pinfeed holder pins.

4 Close the pinfeed holders.

5 Raise the paper bail.
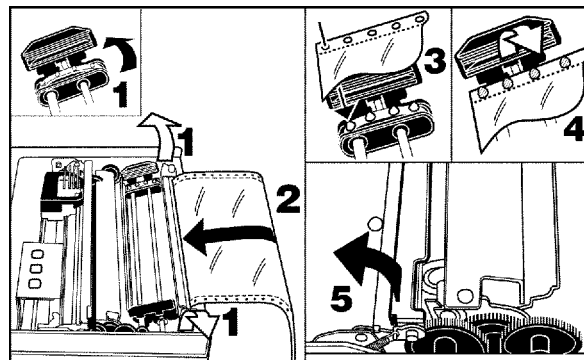
Note: Go to the next page to adjust the pinfeed holders.

Adjusting the Pinfeed Holders

Note: There are two pinfeed holders, one next to the green thumb wheel and one opposite the same wheel. Always loosen the pinfeed holder opposite the green thumb wheel.

Note: Adjusting the pinfeed holder next to the green thumb wheel may cause information to print in the wrong place. If this pinfeed holder is moved, correct its location by releasing the pinfeed holder tab, moving the pinfeed holder as close to the green thumb wheel as possible, then locking the pinfeed holder tab, before adjusting the opposite pinfeed holder.

If the paper does not fit on the two pinfeed holders properly, follow these steps to adjust the area between the two pinfeed holders to fit the width of the paper. See the following illustration.

1 With the pinfeed holders open, release the locking tab on the pinfeed holder *opposite* the green thumb wheel.

2 Adjust the pinfeed holder position so that the pins align with the paper.

3 Close the pinfeed holder.

4 Ensure that the paper is smooth (no folds, bulges, bows, etc.) between the pinfeed holders. If so, push the locking tab down on the pinfeed holder that you adjusted.
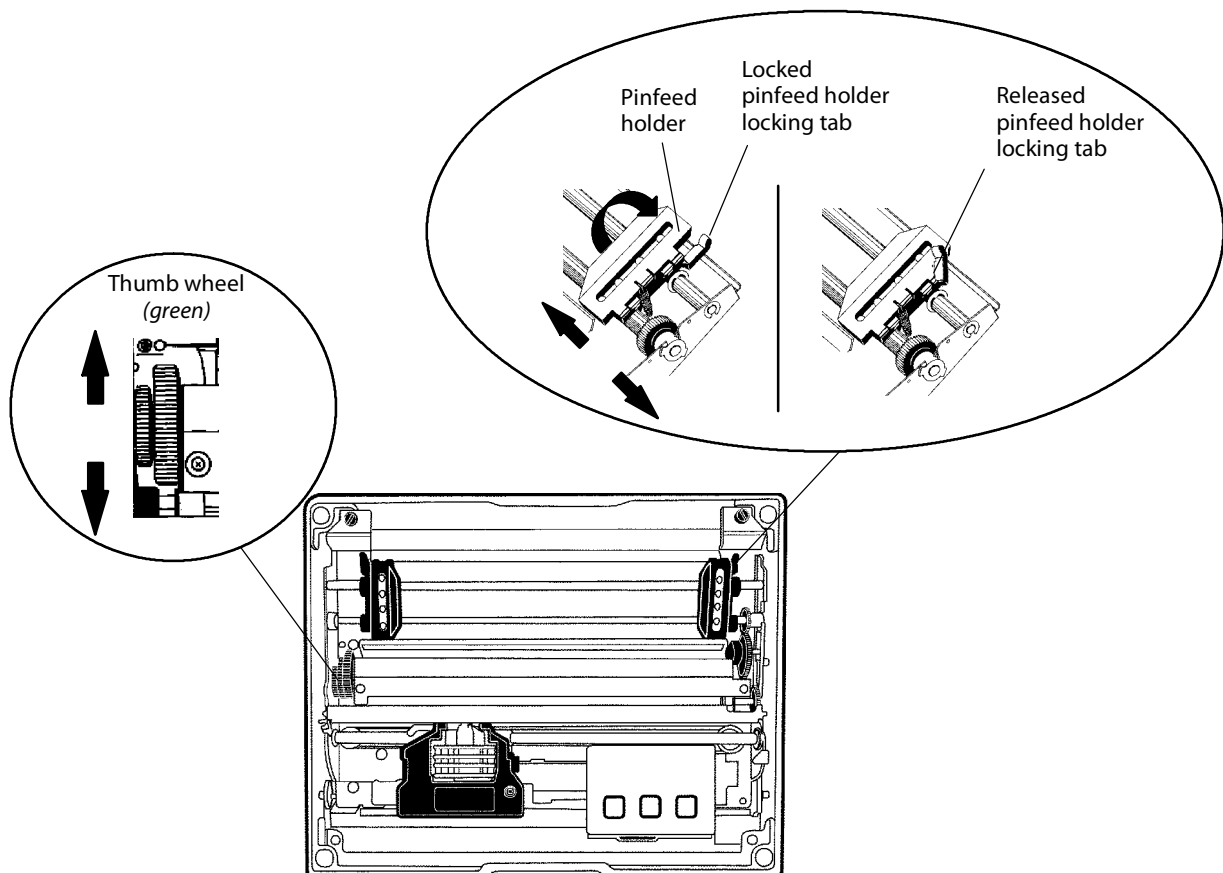
Setting the Paper

Do the following to feed the paper into the printer:

1 Press the **FORM FEED** button on the control panel to feed the paper into the printer.

2 Lower the paper bail. An empty printer autofeeds new paper approximately 0.1" (0.25 cm) beyond the top of the paper bail.

Note: The ideal distance to feed paper beyond the paper bail may vary due to environmental conditions (such as humidity) and specific aspects of certain paper. Use the green thumb wheel to position the paper to a desired distance per your conditions.

Note: If your paper has a preprinted logo on every page, make sure the print head is below the preprinted logo. If not, you can adjust the position of the paper, either by pressing the **LINE FEED** button, or by using the green thumb wheel.

3 Once the paper is properly positioned, press the **SET PAGE** button, thus clearing the **PAPER OUT** light, and to indicate where the top of the page is.

4 Close the printer lid. Ensure that the paper passes through the paper slot when the printer begins to print.
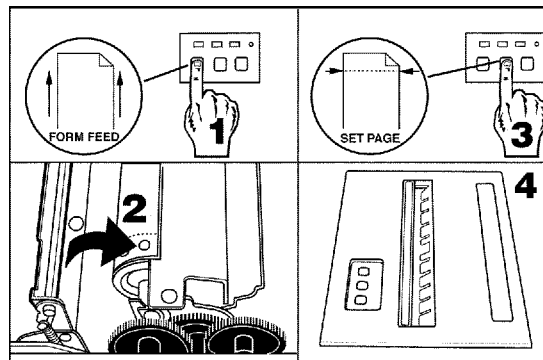
Inserting Computer in Terminal Holder

Note: When removing the computer, do not press the computer keys against the terminal slide retainer. Always store the computer in the terminal holder.

The fixed mount or portable printers have terminal holder options for the 4000 Series, 61XX, 62XX, 600 Series, 700 Series, or CK60 Computer.

Inserting a 4000 Series or a 62XX Computer

Do the following to insert either a 4000 Series or a 62XX Computer into the terminal holder:

1 Insert the *bottom* of the computer into the terminal slide retainer.

2 Use the computer to push the terminal slide retainer all the way in the direction shown. See part **A** in the following illustration.

3 Lower the connector end of the computer into the terminal holder.

4 Slide the computer to fully seat it in the printer docking connector. See part **B** in the following illustration.

(A) Bottom (or battery) end of computer. (B)

Computer connector end in printer

Terminal slide retainer
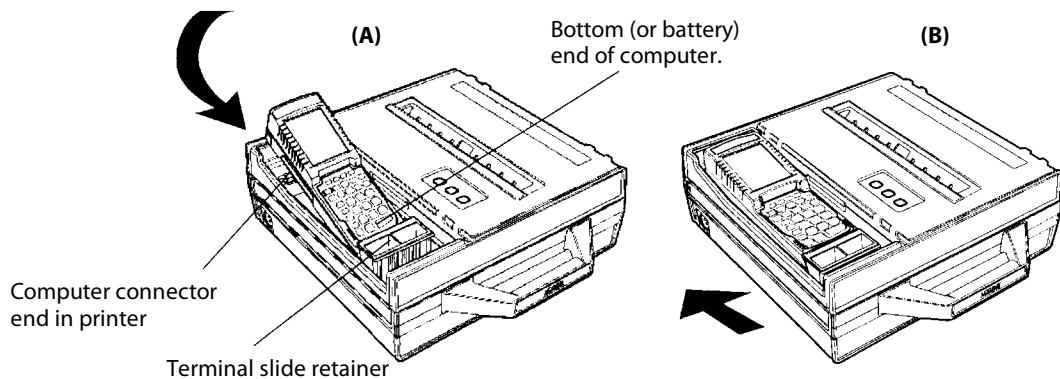
Inserting a 61XX, a 600 Series, a 700 Series, or a CK60 Computer

Do the following to insert a 61XX, 600 Series, 700 Series, or CK60 Computer into the terminal holder:

1 Insert the *top* of the computer into the terminal slide retainer.

2 Use the computer to push the terminal slide all the way in the direction shown. See part **A** in the following illustration.

3 Lower the connector end of the computer into the terminal holder.

4 Slide the computer to fully seat it in the docking connector. See part **B** in the following illustration.
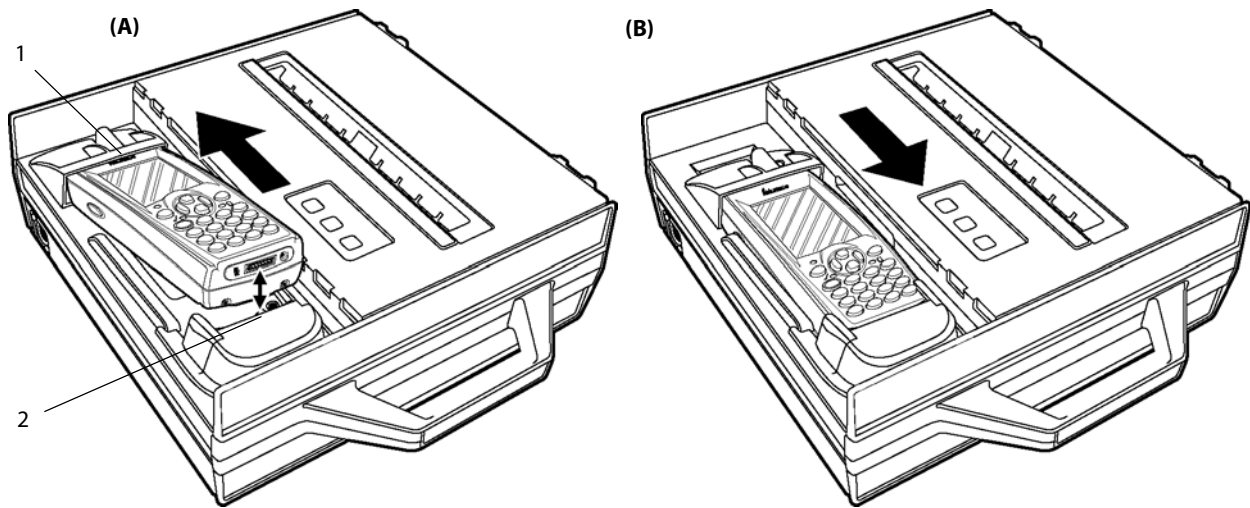
1. Top (display) of computer inserted in terminal slide retainer
2. Docking connectors

This illustration shows a 700 Series computer.

3 Maintenance

The printer lasts longer and performs better when it is operated correctly and kept clean.

Operating Guidelines

Do
Ensure that the computer remains connected to the printer throughout printing or operation.
Make sure the printer cover is closed *(except during maintenance or when loading paper)*.
Ensure there is paper properly installed in the paper tray or dashboard mount.
Disconnect the printer power cable when jump-starting the vehicle.
Clean the external surface of the printer using a soft cloth moistened with mild soap and water, a good quality cleaner, such as MICRO-CLEAN II, and if necessary, rubbing alcohol.
Make sure your printer is loaded with paper before communicating with your mobile computer.

Do Not
Spill liquids or food crumbs into the printer.
Sit or stand on the printer.
Use solvents or abrasive cleaners on the printer.
Rest objects on, under, or against the printer.
Allow the printer to be knocked over or physically damaged.
Start or stop the vehicle engine while printing.
Overload paper tray *(paper jams will occur)*.
Use objects to remove paper from between the print head and platen *(damage to mask spring/print head will occur)*.

General Cleaning

CAUTION: Do not use glass cleaners with ammonia. Permanent damage to the printer cover will occur if such glass cleaners are used.

CAUTION: Do not use abrasives or solvents (or any product containing these substances) to clean any part of the unit. Permanent damage to the printer will occur if such substances are used.

CAUTION: Never use ketonic solvents (acetone or ketone) or aromatic solvents (toluene or xylene) to clean any part of the printer. Doing this can damage the printer.

Note: MICRO-CLEAN II is the only cleaner recommended for this purpose. Other cleaners can damage the case.

Note: GUIDE SHAFT CLEANER is recommended for cleaning your 80-column printer guide shafts. Cleaning the printer guide shaft can reduce the number of head jams caused by dirt and buildup.

Note: Both cleaners are sold separately. See "*Inside Sales*" in Chapter 1 for ordering information and part numbers.

Periodic cleaning helps maintain the appearance and reliability of the printer. When cleaning the printer, inspect both the outside and the inside for obvious signs of damage, wear, or impending failure.

Cleaning the Outside

Do not pour liquid cleaners directly on the printer case. Instead, dampen a soft, lint-free cloth with a quality cleaner and clean the exterior surfaces with this cloth. *Do not use solvent solutions.* Inspect the dc power jack, all cables, and the remote terminal holder or vehicle dock for damage.

Cleaning the Inside

CAUTION: Let the printer cool before you clean the inside of the printer, or you may burn your fingers.

Open the printer cover and inspect the ribbon cartridge and all visible moving parts on the printer mechanism for signs of wear or damage.

Pinfeed holder

Thumb wheel (green)

Paper bail

Head gap adjuster

Ribbon cartridge
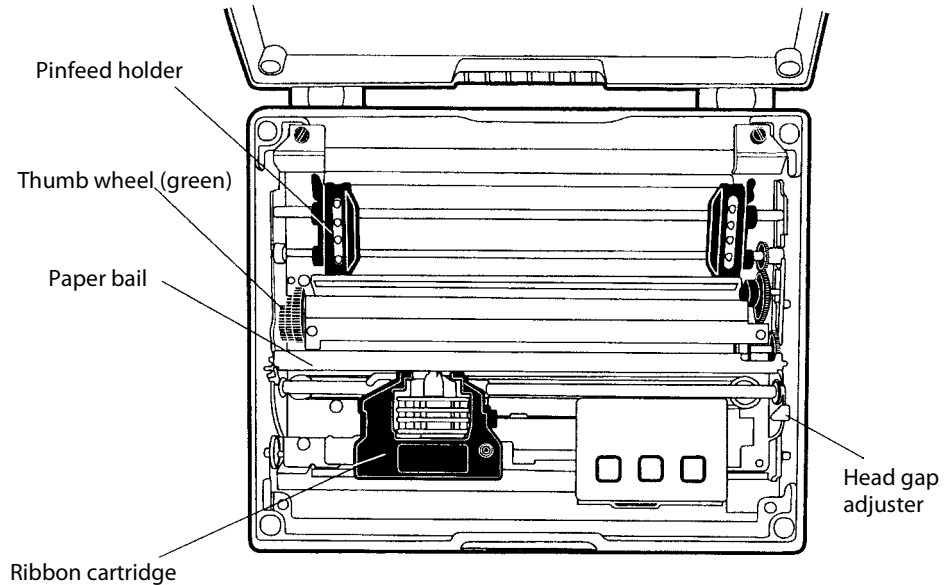
This illustration shows the visible moving parts of the printer mechanism.

Use a low-pressure, dry air source, such as "canned air" available at electronic supply houses and typewriter repair facilities, or a vacuum, to remove accumulated paper dust from the printer mechanism.

The printer ribbon contains a special lubricant to ensure that the fine dot wires inside the print head receive adequate lubrication. Replace the ribbon frequently to prolong the life of the print head. The printer requires no additional user-applied lubrication. Ribbon cartridges, available in black or purple, are sold separately. See "*Inside Sales*" in Chapter 1 for ordering information and part numbers.

Removing Old Ribbon Cartridge

Physically move the print head mechanism to an open area, then do the following to remove the old ribbon cartridge:

1 Squeeze the ribbon cartridge locking tab (on the side of the cartridge) against the ribbon cartridge.

2 Lift the ribbon cartridge to remove the ribbon from the print head. Ensure the ribbon does not catch.

3 Lift the ribbon cartridge out of the printer.
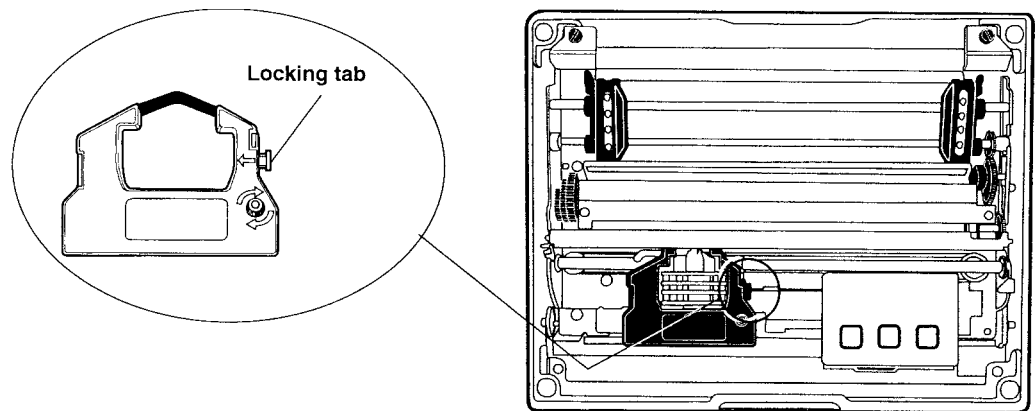
Cleaning the Mask Spring

Look at the mask spring behind the print head. If the mask spring needs to be cleaned, go on to the next page. If the mask spring appears to be in good condition, install a new ribbon cartridge as described on page 16.

Mask spring
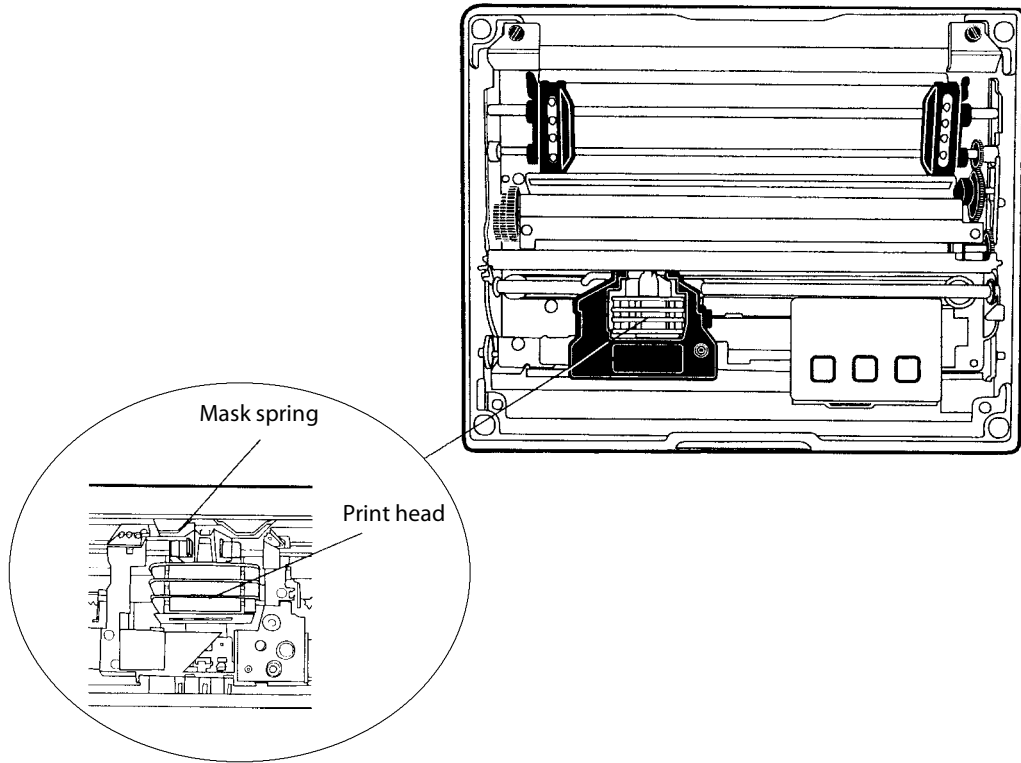
Print head

This shows the location of the mask spring.

Do the following to clean the mask spring:

1 Unlatch the print head locking tabs to release the print head, lift the print head aside, then lift up the paper bail. *Do not detach the print head unit.*

⚠ **Caution**

CAUTION: Never use a sharp object, such as pinchers, to clean between the print head and the platen (rubber roller). This can damage the mask spring and print head.

2 Remove the clear plastic paper guide that seats the mask spring, if necessary. Use your fingernails to loosen the base of the paper guide, then pull the paper guide straight up from the printer mechanism.

3 Remove the metal mask spring from the paper guide and clean with a quality cleaner. Replace if damaged.

4 Put the good, clean mask spring into the paper guide and install the paper guide into the printer.

5 Close the paper bail, reinsert the print head, latch the two print head locking tabs, and install the ribbon.

Print head
locking tabs

Print head
(lifted aside)

Mask spring

Paper bail *(raised)*
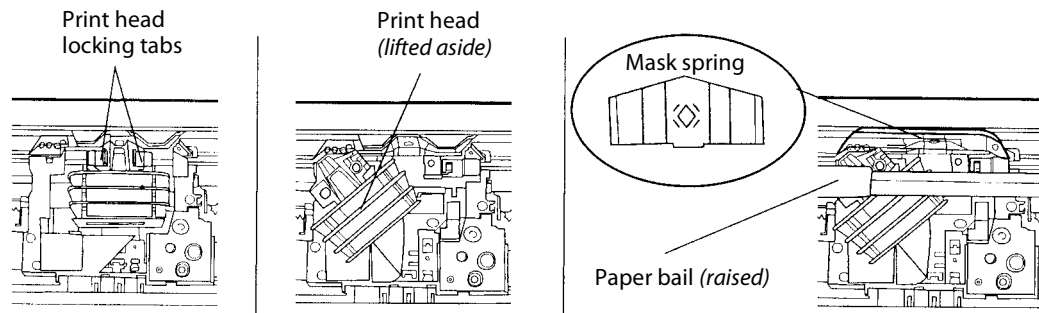
Changing the Printer Settings

Note: If your printer configuration matches either of the following conditions (manufacturing date or control program version #), then you may not be able to use your printer control panel to reconfigure the printer.

For units built after March 15, 1999 (line **4** on your self-test report for the manufacturing date under the "MFG Date" header) or with control program versions greater than 1.67 (line **10** on the self-test report), you do need to use the configuration utility to change settings. See Chapter 4, "*Using the 6820 Printer Configuration Utility*" for information on using the configuration utility to reflash your printer.

Note: Old printers can be updated with newer control program versions.

The following configuration information applies to units with control program versions 1.67 or older.

On rare occasions, you may need to reconfigure the printer. Use the control panel to enter the following modes and set the printer. *Factory defaults are in bold*:

- **Protocol Selection**
  Sets the protocol (**NPCP** or DTR)

- **Configuration**

  - Autofeed (**CR** versus CR+LF)

  - Bit Rate (9600 bps or **19.2K**)

  - Zero Print Option (**slashed** (∅) or unslashed (0))

Protocol Selection Mode

Press and hold *both* the **FORM FEED** and **LINE FEED** buttons until you hear a beep to activate the protocol selection mode. See the Protocol Binary Sequence table on page 33 for available protocols *in the order they are stored.* The **PAPER OUT, HEAD JAM,** and **LOW BATT** lights turn ON or OFF in combinations to indicate which protocol is selected for the printer. (Factory default is NPCP, all three indicators must be OFF.)

Configuration Mode

Press and hold *both* the **SET PAGE** and **LINE FEED** buttons, for about four seconds until you hear a beep, to activate the configuration mode.

Setting the Autofeed
- If the **LOW BATT** indicator stays dark, autofeed is set to CR only when the printer receives a CR in the input data.

- If the same indicator is lit, autofeed is set to LF+CR and a linefeed is performed when a CR is received in the input data stream from the host.

Press **LINE FEED** to toggle these two autofeed options.

Selecting the Bit Rate

- If the **PAPER OUT** indicator is lit, the printer is set for "19.2K."

- If the same indicator stays dark, the printer is set for "9600 bps."

Press the **FORM FEED** button to toggle these bit rates.

Adjusting the Zero Print Option

- If the **HEAD JAM** indicator is lit, the zero print option is set for the zero with a slash (Ø) to appear in printouts.

- If the **HEAD JAM** indicator stays dark, the zero print option is set for the zero without a slash (0) to appear in printouts.

Press the **SET PAGE** button to toggle between these zero print options.

After selecting configurations, press *both* **SET PAGE** and **LINE FEED** buttons and listen for a beep to take the printer out of the "Configuration Mode." Warm-start the printer to reset it with the new configurations.

Protocol Binary Sequence

Protocol	PAPER OUT Indicator	HEAD JAM Indicator	LOW BATT Indicator
NPCP *(factory default)*	OFF	OFF	OFF
Reserved	OFF	OFF	ON
Reserved	OFF	ON	OFF
Reserved	OFF	ON	ON
DTR no parity	ON	OFF	OFF
DTR odd parity	ON	OFF	ON
DTR even parity	ON	ON	OFF
IrDA	ON	ON	ON

Repeatedly press the **LINE FEED** button to *increment* the light sequence to the protocol of choice (NPCP to IrDA).

Example

If the printer is set for "NPCP" (OFF, OFF, OFF), press the LINE FEED button four times to increment the protocol selector to the "DTR no parity" protocol (ON, OFF, OFF).

Repeatedly press the **SET PAGE** button to *decrement* the light sequence to the protocol of choice (IrDA to NPCP).

Example

If set for "DTR no parity" protocol (ON, OFF, OFF), press the SET PAGE button four times to return to "NPCP" (OFF, OFF, OFF).

After you have selected the protocol, press *both* the **FORM FEED** and **LINE FEED** buttons and listen for a beep. This takes the printer out of the Protocol Selection Mode. Warm-start the printer to reset it with the new protocol.

4 Using the 6820 Printer Configuration Utility

The Intermec® 6820 Printer Configuration Utility is run on a host computer to manipulate the configuration of a 6820 Printer flash memory.

This chapter describes how to install and use the configuration utility. Before using the configuration utility, you must connect your host computer to your printer, go to page 37 for instructions.

Font Modules

Intermec Technologies provides the following font modules for your 6820 Printer:

- NFT00000.MOD — Default International, 4820 compatible
- NFT00437.MOD — IBM/Microsoft compatible Code Page 437
- NFT00932.MOD — JIS Japanese
- NFT00936.MOD — GB2312 Chinese Simplified
- NFT00949.MOD — KSC5601 Korean
- NFT00950.MOD — Big 5 Traditional Chinese

Note: See Appendix C, "*Printer Font Test Jobs,*" for sample print jobs.

Note that there are three versions of the default font module (NFT00000.MOD) — Arabic, Turkish, and International. Any one version of this module, but not all three versions, can appear in the 6820 Printer Configuration Utility "FONTS" directory and install on the 6820 Printer. The International version of this font module is automatically placed in the "FONTS" directory when the Configuration Utility is installed on the host computer.

All three versions are included on the toolkit CD as follows:

- The Arabic version is included in the "Default Fonts\Arabic" directory.
- The Turkish version is in the "Default Fonts\Turkish" directory.
- The International version is in the "Default Fonts\International" directory.

Once the Configuration Utility is installed on the host computer, any of these default font modules can replace the existing default font module (NFT00000.MOD). Copy the desired default font from the appropriate toolkit CD default fonts directory to the "FONTS" directory of the Configuration Utility. The Configuration Utility has access to any font modules in this "FONTS" directory.

For Windows 95 and Windows 98 users:
If the default installation process was followed, the configuration utility "FONTS" directory is located at "6820PRTR\TOOLKIT\FONTS" where "6820PRTR" is replaced by the actual directory in which you chose to extract the files.

For Windows 2000 and Windows XP users:
If you followed the default installation process, the Configuration Utility "FONTS" directory is located at "Program Files\Intermec\6820 Printer Configuration Utility\FONTS."

Note: Do not rename the font files in the "FONTS" directory. If you do so, the files names will not match the data in these files and the fonts will not work as expected.

Connecting to the Printer

Connect your printer to your desktop computer via a serial cable. The serial COM Port connector on either your Fixed Mount Printer or your Portable Printer is on your printer mechanism, the same side as the green thumb wheel.

Printer
mechanism
(raised)

COM Port connector

Reset button
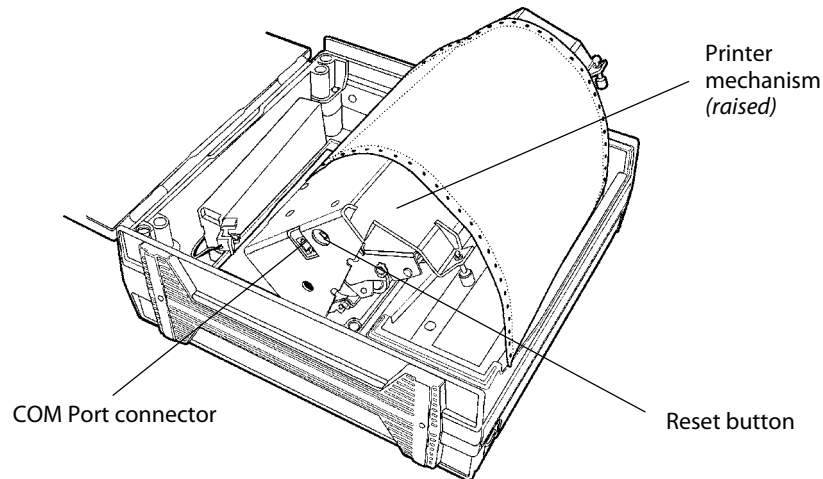
Be sure to locate and disconnect the gray terminal holder ribbon cable connector from the floor of the printer cavity. The cable is located behind the printer mechanism on the same side as the green thumb wheel and is the one that is *not* attached to the printer mechanism.

Disconnect this terminal holder
ribbon cable from the floor of
the printer cavity

Ignore this cable attached
to the printer mechanism.
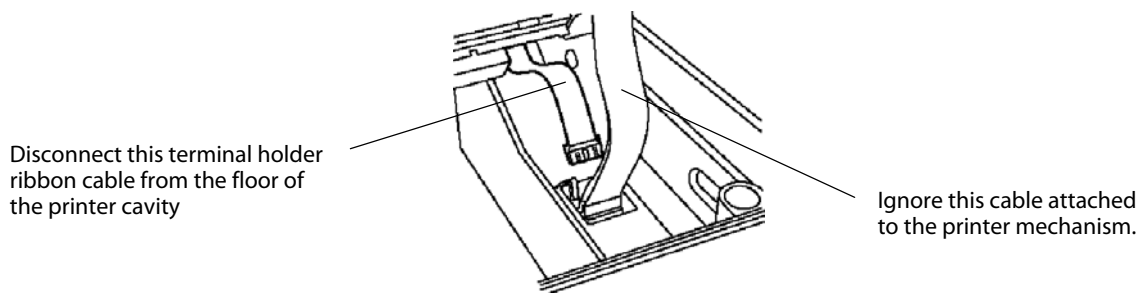
Intermec Technologies provides a printer configuration utility based on several operating systems that may be used on your host computer. Below are the operating systems for which the configuration utility is written. Select your operating system, then go to that page to begin instructions for your particular configuration utility.

- If your host computer has either Windows 95 or Windows 98, go to page 38 for instructions.

- If your host computer has Windows 2000 or Windows XP, go to page 53.

Instructions for Windows 95 or Windows 98

These instructions apply to desktop computers running either Windows 95 or Windows 98 operating systems.

Installation

All files necessary to configure the 6820 Printer are located in the toolkit, including the Configuration Utility application program, RPGPCONF.EXE, and the initialization file, RPGPCONF.INI. The initialization file is used by the Configuration Utility to specify the location and names of font and printer control program files.

To set up your host computer to use the Configuration Utility, extract the toolkit files from the self-extracting archive file, NPTK6820.EXE. First, create a directory, on your host computer, with an appropriate name for the Configuration Utility files. The name of this directory is your choice. You could choose to have the files extracted at the root directory of your host computer. However, the directory used in the example below is \6820PRTR. Execute the self-extracting file from the target directory while specifying the path to NPTK6820.EXE in the command line.

Upon executing NPTK6820.EXE, a "TOOLKIT" subdirectory is created, as well as other associated subdirectories, as shown in the diagram below. The Configuration Utility application program and the initialization file are extracted to the TOOLKIT subdirectory. Other files are extracted to the other subdirectories created by the archive file.
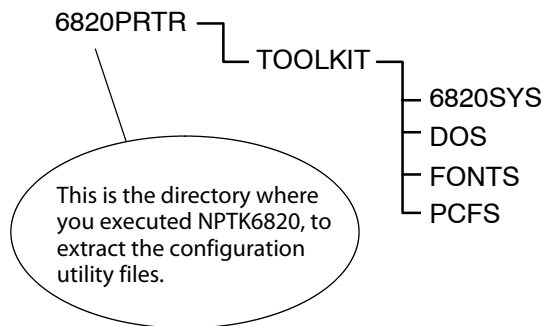
Configuration File Support

The configuration utility allows the user to generate custom configuration files. These files have the file name extension of ".PCF", and they reside in the directory specified in the initialization file. See DEFAULT.PCF, in the PCFS directory for an example.

Configuration Utility Operation

A configuration consists of a list of fonts, some parameter settings, and optionally, a printer control program.

When the utility is active, it holds a configuration in memory. This is called the "working configuration". Initially, this working configuration

has no fonts, the parameters are set to the default values, and there is no printer control program in memory. You should consider the working configuration as temporary and lost when you exit from the utility.

The Configuration Utility's main menu offers you various ways to manipulate the working configuration. You can overwrite this working configuration with a previously saved configuration, stored either in a disk file on the computer or in the 6820 Printer itself by using one of the **Load Printer Configuration** options. You can modify the working configuration by using one of the **Modify Printer Configuration** options. Once the working configuration is loaded and modified, you can save this to either a disk file or the printer by using one of the **Save Printer Configuration** options.

In addition to the various Load, Modify, and Save options, a **Defaults** option is provided, which allows you to restore the printer to a default configuration with a single option.

Starting the Program

When you run RPGPCONF.EXE, the first screen you see is like the following. Click **OK** to continue to the Main Menu.

Main Menu

The following options are available on the Main Menu.

- Use **Load Printer Configuration** to load an existing configuration. Load either from disk or from the printer.

- Use **Modify Printer Configuration** to review or modify the working configuration, or include the printer control program in the currently loaded configuration.

- Use **Save Printer Configurations** to save a configuration file to disk or download the working configuration to your 6820 Printer.

- Use **Defaults** to restore the printer to its default configuration.

Note that when the Main Menu is first displayed, the **Save Printer Configuration** options are grayed out, prohibiting selection of those options until a configuration is loaded or modified.
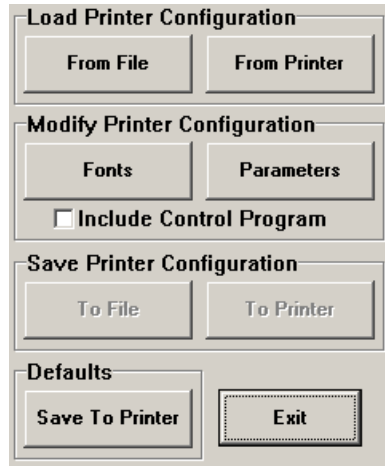
Exit from the Configuration Utility Program

If you click **Exit**, a message appears to prompt whether you want to exit. Click **No** to return to the Main Menu. Click **Yes** to exit the program.

Load Printer Configuration

This set of options allows you to load configuration information from disk (on the host computer) or from the printer (connected to the host computer).

Load Configuration from File option

This option, selected from the Main Menu, allows you to load a configuration file from one of the drives on your host computer.

Click **From File** from the Main Menu to access the File, Open window. Here, you can open a configuration parameters file from one of your host computer drives. It operates like the File, Open on a standard Windows program.
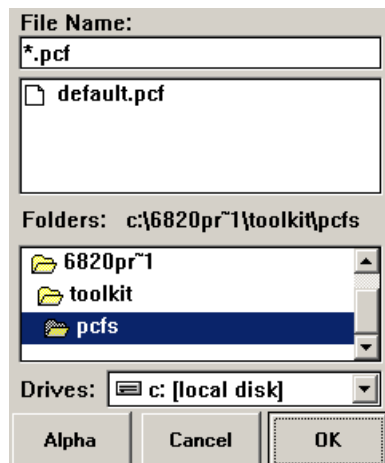
Canceling the Operation
Click **Cancel** to return to the Main Menu without selecting a file to open.

Selecting a File Name
You can select the drive, directory, and file name with your pointing device, using standard MS Windows file selection methods. If you want to enter text for a file name, you can do this with the alpha keyboard, or use your host computer keyboard. Click **Alpha** to access the alpha keyboard described on page 52.

Loading the Selected File
After selecting a configuration file to load, click **OK.** If the selected file does *not* exist, you see an error message similar to the following. Click **OK** to return to the Main Menu without loading a file.
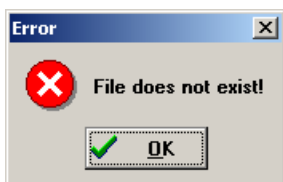
If the file does exist, you see a warning that loading the selected file will overwrite your working configuration, as shown in the message box below. Click **OK** if this is acceptable, otherwise click **Cancel** to return to the Main Menu without loading a file.
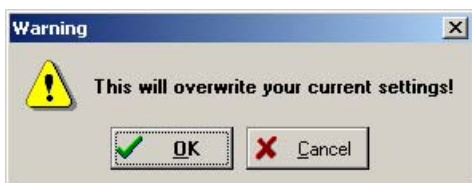
After clicking **OK**, the configuration from the selected file is loaded into memory and becomes the current working configuration. If this load is successful, a message similar to the one shown below is displayed. Click **OK** to return to the Main Menu.

However, if the working configuration is not replaced successfully with the configuration from the selected file, an error message is displayed informing you that it was not successful, as shown below. Click **OK** to return to the Main Menu without loading a file.

Information

i   Load aborted - Configuration unchanged.

✔   OK

Load Configuration from Printer

This option, selected from the Main Menu, loads a configuration from the 6820 Printer. Click **From Printer** from the Main Menu to display a warning message (as shown below) and indicate that the printer's configuration will overwrite the working configuration. Click **OK** to overwrite the configuration, otherwise click **Cancel** to return to the Main Menu without loading the printer's configuration.

Warning

⚠   This will overwrite your current settings!!!

✔   OK   ✘   Cancel

If you click **OK,** a message is then displayed prompting you to reset the printer. If the connection is not successful, after approximately 20 seconds, the following message is displayed.

Error

✖   Printer not responding. Retry connection?

✔   Yes   ⊘   No

If you click **Yes**, repeat the previous steps, starting with *Attempting a Connection to the Printer*.

If you click **No**, an error message appears (as shown below) is displayed informing you that the configuration was not loaded. Click **OK** to return to the Main Menu without loading the printer's configuration.
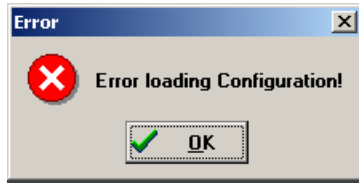
Connection Successful

If the connection to the printer is successful, then no user intervention is required throughout the remainder of this operation. The Get From Printer function is initiated, and the Configuration Utility copies the printer configuration into the working configuration.
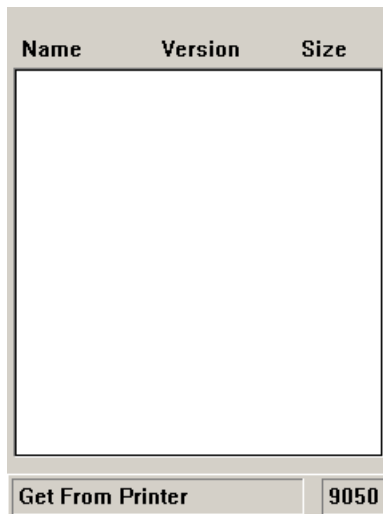
This utility communicates with the 6820 Printer to find out the current parameter settings and which font modules are loaded. The name, version, and size of these font modules are then displayed on the Get From Printer screen.

If the operation is successful, you are returned to the Main Menu and the printer configuration is loaded as the working configuration. You can view or modify the working configuration by selecting a **Modify Printer Configuration** option.

Modify Printer Configuration

This set of options allows you to view or change a working configuration, including adding fonts from disk (on the host computer), deleting printer fonts, and changing parameters settings.

Include Control Program is a switch that determines whether to include the printer control program when saving the working configuration to the printer. Click this box to change the setting. When checked, the control program is included the next time you save the printer configuration.

Generally, you only need to update the control program as new versions become available. The control program is named NPFL6820.MOD.

Font Selection

This option, selected from the Main Menu, selects fonts that are available on disk, or deletes existing fonts. A variety of different international fonts are also available in the toolkit for the 6820 Printer.

Clicking **Fonts** from the Main Menu takes you to Font Selection where you can perform operations related to font files,. The **Fonts Available** list shows font files that are available on disk. The **Fonts Selected** list show fonts that are in the current printer configuration.

Note that **Save** is grayed out, prohibiting that selection, until either new fonts are selected, or fonts are removed from the **Fonts Selected** list.
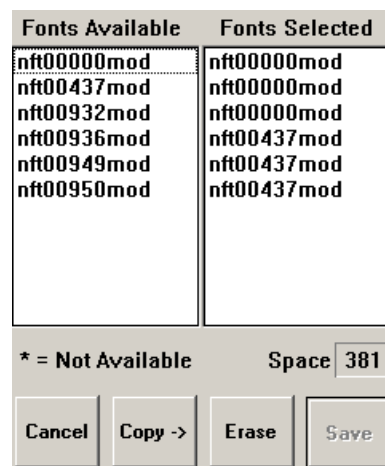
Copying Font Files

To select font files, highlight the font files in the **Fonts Available** list, with your pointing device. You can highlight several files at one time, using conventional Windows selection methods. Then click **Copy** to copy those font files to the **Fonts Selected** list.

However, if you attempt to copy fonts from the **Fonts Available** list when these fonts already exist in the **Fonts Selected** list, the following error message is displayed, once for each of the duplicate fonts (where the current font file name is listed in place of NFT00000.MOD).

Click **OK** to close the error message and not copy the font to the **Fonts Selected** list. If there are two or more duplicate fonts, the cycle repeats until an error message is displayed for each of the duplicate font files.

The font file names become unhighlighted, you remain in the Font Selection window, and the duplicate fonts are not copied to the **Fonts Selected** list.

Deleting Font Files

To avoid the problem of exceeding flash memory, you can delete fonts in the printer flash, from the **Fonts Selected** list. To do this, select the font names you want to delete in the **Fonts Selected** list, then click **Erase** to clear the names from the **Fonts Selected** list.

Space Remaining in Flash

The **Space Selection** box, below the **Fonts Selected** list, displays the space remaining in flash (in kilobytes), based on fonts currently selected. When this number is negative, it means the available space in flash is less that the size of the selected fonts. Delete some fonts before saving the rest.

Saving the Selected Fonts

Note that **Save** is initially grayed out, disabling its use. Once the **Fonts Selected** list is changed, **Save** is enabled (no longer grayed out).

Fonts marked with an asterisk (*), in the **Fonts Selected** list, are currently in printer flash, but not found on disk, and are lost when flash is updated from disk (Save to Printer option).

When **Save** is clicked, and there is enough space in printer flash memory for the fonts in the **Fonts Selected** list, the working configuration is updated with the selected fonts. The amount of printer flash memory to spare, after being loaded with the selected fonts, is shown (in kilobytes) in the **Space** box. As long as this number is not negative, there is enough space for the selected fonts.

However, if you attempt to save fonts and there is not enough space in printer flash memory, the following error message is displayed. Click **OK** to return to the Font Selection window and delete fonts in the **Fonts Selected** list.

Canceling the Operation

Click **Cancel** to return to the Main Menu without making any changes. If you have not made any changes to the **Fonts Selected** list, you return to the Main Menu.

However, if you have already made some changes to the **Fonts Selected** list, a confirmation message appears, similar to that shown below. Click **OK** to return to the Main Menu with changes made to the **Fonts Selected** list discarded. Click **Cancel** to remain in the Font Selection window.
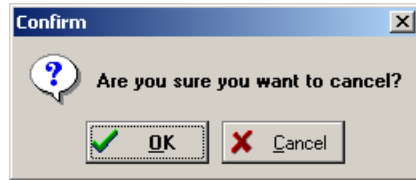
Parameters Selection

This option, selected from the Main Menu, allows you to review or modify the working configuration.

Click **Parameters** from the Main Menu to access the Parameters window where you can modify any of the parameters that are not grayed out. Default parameter values are marked with an asterisk (*).

Modifying Parameters

To modify the configuration, select parameters on this screen using your pointing device.

Required for Bluetooth — Convert the Printer to Epson DTR Mode

Those using Bluetooth must switch the 6820 Printer from the Norand Portable Communications Protocol (NPCP) mode to the Epson DTR mode with the baud rate set to "19.2K" and the parity set to "None." *Note: The 6820 Bluetooth adapter does not support any other settings.*

Note: If your version of the Configuration Utility has a 38.4K bit rate selection, ignore that selection. If selected, it defaults to 19.2K bps. On future releases, the 38.8K bit rate will not show on the display.

Note: If your version of the Configuration Utility has an XON/XOFF selection, ignore that selection. If selected, it defaults to DTR. On future releases, the XON/XOFF protocol will not show on the display.

Saving Parameters
Clicking **Save** updates the working configuration and returns you to the Main Menu.

Canceling the Operation
Click **Cancel** to return to the Main Menu without modifying any configuration parameters.

Save Printer Configuration
These options allow you to save the working configuration to disk or to printer.

Save is initially grayed out in the Main Menu, and cannot be used until a configuration is either loaded or modified.

Save to File
This option, selected from the Main Menu, allows you to select the drive, directory, and file name with your pointing device, using standard Windows file selection methods.

Click **To File** from the Main Menu to access the File Save As window (similar to the File Open window). This option allows you to save the working configuration to a disk file.

File Name:
default.pcf

■ default.pcf

Folders: c:\6820pr~1\toolkit\pcfs

📂 6820pr~1
📂 toolkit
📂 pcfs

Drives: 🖳 c: [local disk]

| Alpha | Cancel | OK |
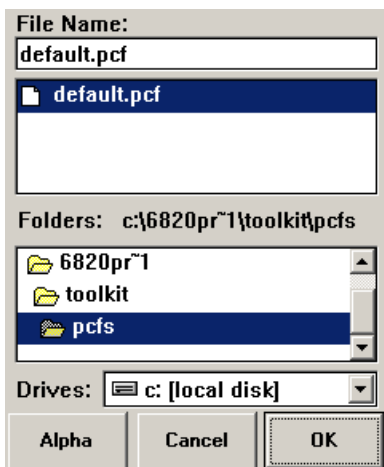
Choosing File Name and Location on Disk

You can select the drive, directory, and file name with your pointing device, using standard MS Windows file selection methods. If you want to enter text for a file name, you can do this with the alpha keyboard, or use your host computer keyboard. Click **Alpha** to access the alpha keyboard described on page 52.

Saving the Configuration to Disk

After you have selected the drive, directory, and file name, click **OK** to save the configuration file. If a file by the same name exists, the following confirmation message is displayed, informing you that if you continue it will overwrite the existing file.
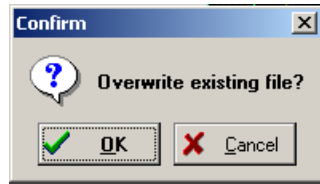
Click **Cancel** to return to the Main Menu without the working configuration saved to a file.

Click **OK** for the File Save As operation to continue. The following information is displayed assuring you that the working configuration was successfully saved to disk. Click **OK** to return to the Main Menu.
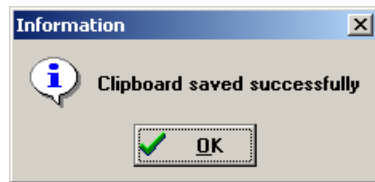
Canceling the "Save to File" Operation

From the File, Save As window, if you click **Cancel**, this aborts the Save to File operation, and returns you to the Main Menu without saving the working configuration.

Save to Printer

This option, selected from the Main Menu, allows you to send the working configuration to your 6820 Printer.

When **To Printer** from the Main Menu is clicked, a warning message (as shown below) is displayed.

This means that the working configuration is copied into flash memory, in your 6820 Printer, and overwrites the current configuration settings that are in your printer. Click **OK** to for the system to connect to the printer and transfer the configuration, or click **Cancel** to return to the Main Menu without updating the printer.

Attempting a Connection to the Printer
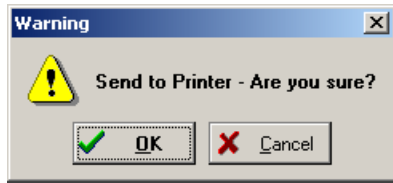
After clicking **OK**, a message is displayed, informing you that the system is attempting to establish connection with the printer. At this point you should connect a serial cable (P/N: 226-270-001) between your host computer and the printer (if not already connected), then reset the printer.

Connection Failed

If the connection is *not* successful after the predetermined period of time (approximately 20 seconds), the following message is displayed.

Click **Yes** to repeat the previous steps above (starting with *Attempting a Connection to the Printer*), else click **No**. An error message (as shown below) is displayed informing you that the configuration was not saved. Click **No** to return to the Main Menu without updating the printer.
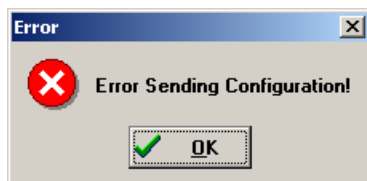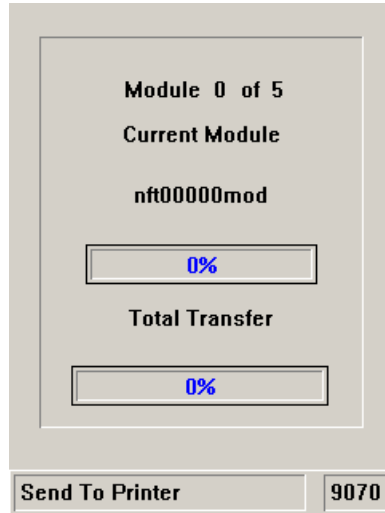
Connection Successful

If the connection is successful, the following screen is displayed, the Send to Printer function is initiated, and the printer's configuration is updated to match the working configuration.

```
Module  0  of  5

Current Module

nft00000mod

┌──────────────────────────┐
│           0%             │
└──────────────────────────┘

Total Transfer

┌──────────────────────────┐
│           0%             │
└──────────────────────────┘

Send To Printer              9070
```

This screen displays the progress made while updating the printer's configuration. Upon completion of this operation, the **Total Transfer** bar reaches 100%, and you return to the Main Menu.

Save Defaults to Printer

Click **Save to Printer** on the Main Menu to load the default configuration file, DEFAULT.PCF, and save it to the printer. This combines the operations of the [from file], the selection of the DEFAULT.PCF file, and the [to printer] into a single button. The following message appears stating that the working configuration is overwritten. Click **Cancel** to return to the Main Menu without loading the default configuration file.

```
┌─────────────────────────────────────────┐
│ Warning                             [x] │
├─────────────────────────────────────────┤
│  ⚠  This will change the current         │
│     configuration!                       │
│                                          │
│      ┌──────────┐   ┌──────────┐        │
│      │ ✔  OK    │   │ ✘  Cancel│        │
│      └──────────┘   └──────────┘        │
└─────────────────────────────────────────┘
```

If you click **OK**, and if the default configuration file is *not* successfully loaded into the working configuration (such as an illegal directory), then the following error message appears. Click **OK** to return to the Main Menu without loading a file.
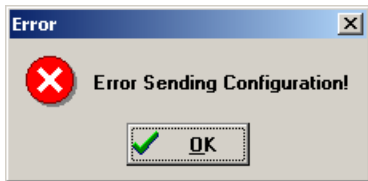
If the default configuration file is successfully loaded into the working configuration, a message, as shown below, is displayed. Click **OK** to continue with the **Restore Defaults to Printer** operation.

Attempting a Connection to the Printer

If the default configuration was successfully loaded into working configuration, then a message is displayed, prompting you to reset the printer.

Connection Failed

If the connection is not successful, after approximately 20 seconds, the following message is displayed.

Click **Yes** to repeat the previous steps, above, starting with *Attempting a Connection to the Printer*. If you click **No**, an error message (as shown below) is displayed. Click **OK** to return to the Main Menu without saving the default configuration to the printer.
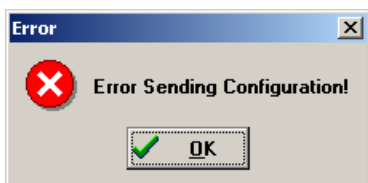
Connection Successful

If the operation was successful, your 6820 Printer is now set to the default configuration in flash memory, and you are returned to the Main Menu.

Default Printer Settings

These settings are used when **Restore Defaults to Printer** is selected:

|	
Zero Print Option	Slash all zeros (zeros are printed with a slash)
Autofeed Configuration	CR (carriage return at end of line without line feed)
Protocol	NPCP
Parity	N/A (for NPCP)
Bit Rate	19.2K

For other printer defaults, refer to the *Printer Defaults* paragraph in Appendix B, "*Cross-Reference Tables.*"

Alpha Keyboard

The **Alpha** button, on either the File Open window or the File Save As window, brings up the alpha keyboard onscreen for you to enter text.
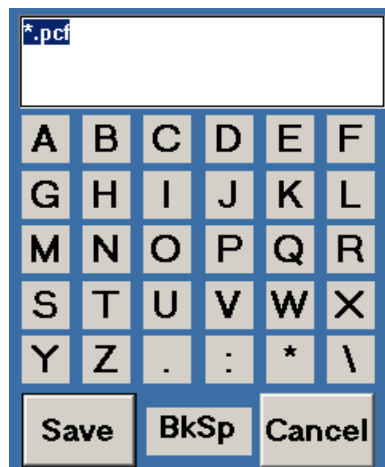
Returning the File Name to the Previous Dialog Window

After selecting all of the needed text, click **Save** to return the text to the window where needed. Click **Cancel** to exit without saving the text. The following confirmation message appears. Click **OK** to return to the previous window without the entered text, or click **Cancel** to stay with the alpha keyboard.
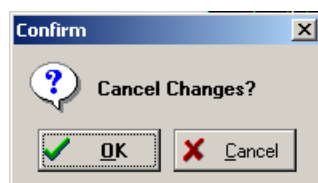
Instructions for Windows 2000 or Windows XP

These instructions apply to desktop computers running either Windows 2000 or Windows XP operating systems.

Installation

All files necessary to configure the 6820 Printer are located on the CD for the 6820TKCD toolkit, including the 6820 Printer Configuration Utility application program, PCONFIGAPP.EXE. To set up your host computer to use the Configuration Utility, do the following:

1 Insert the toolkit CD in your host computer.

2 From your desktop, use your Explorer application to view the contents of the tookit CD.

3 Double-click the SETUP.EXE executable file, then click **Next** from the Welcome screen to continue.
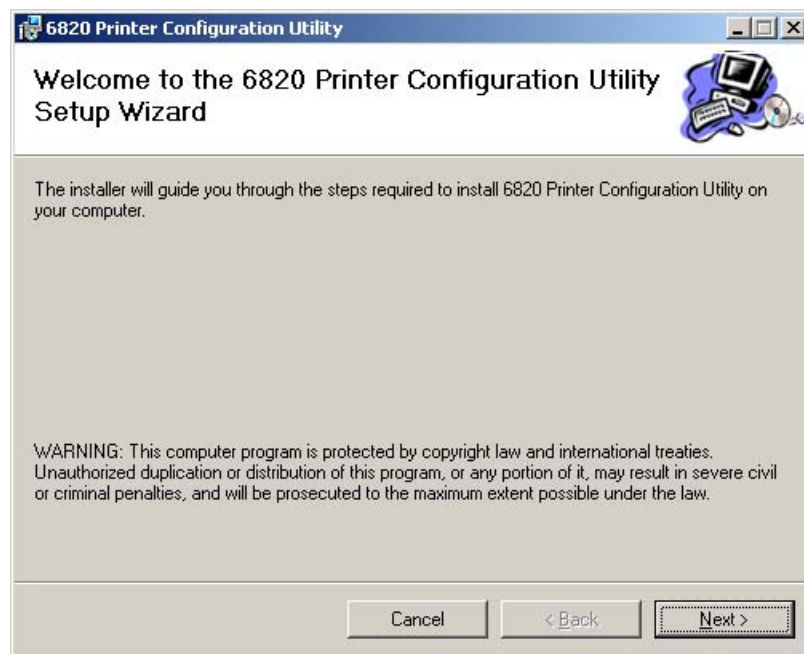
4 If you wish to change the default location of this installation, click **Browse** to change the destination. If this installation is for anyone who uses this desktop computer, select **Everyone** near the bottom of this screen. Click **Next** to continue.
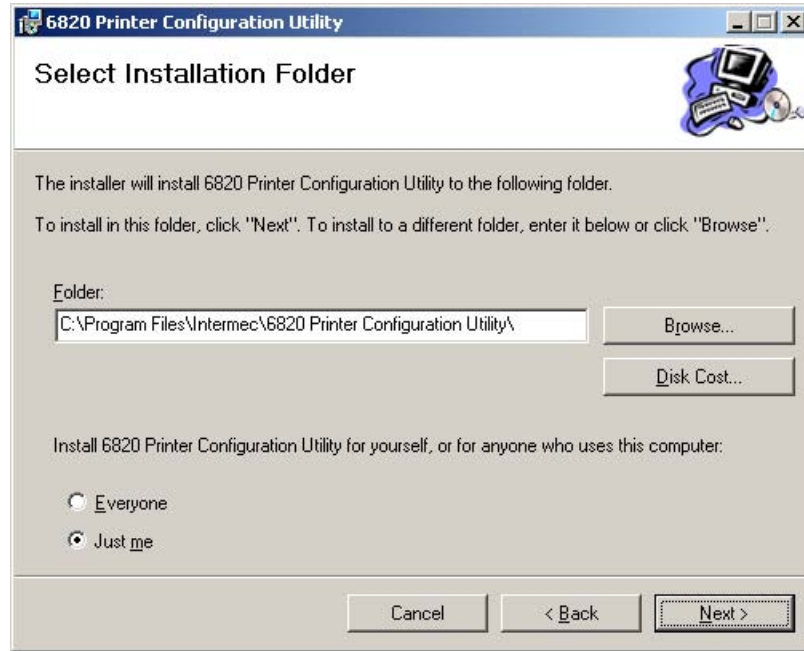
If you wish to know the amount of space required for the configuration utility, click **Disk Cost** for the following screen. Click **OK** to close and return to the installation screens.
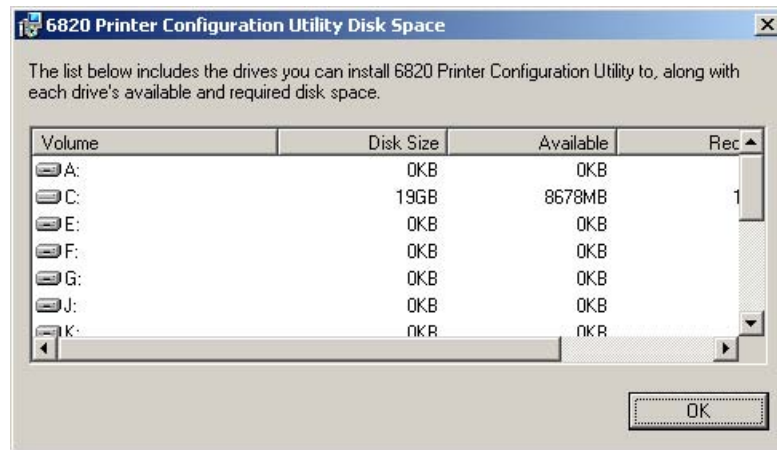
5 Click **Next** to verify this installation, click **Back** to adjust the information in the previous screen, or click **Cancel** to exit this installation.
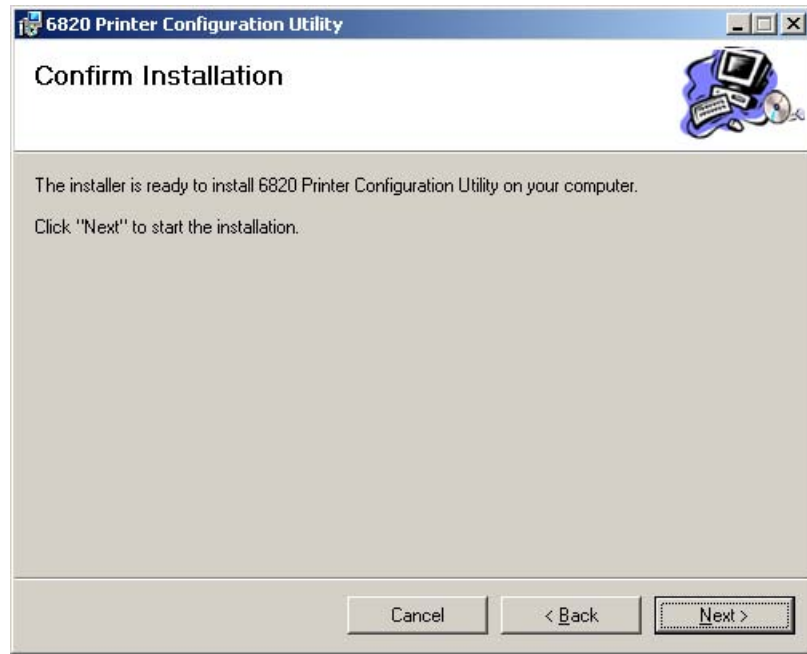
6 A progress screen, followed by an Installation Complete screen finishes this installation. Click **Close** to exit the installation.
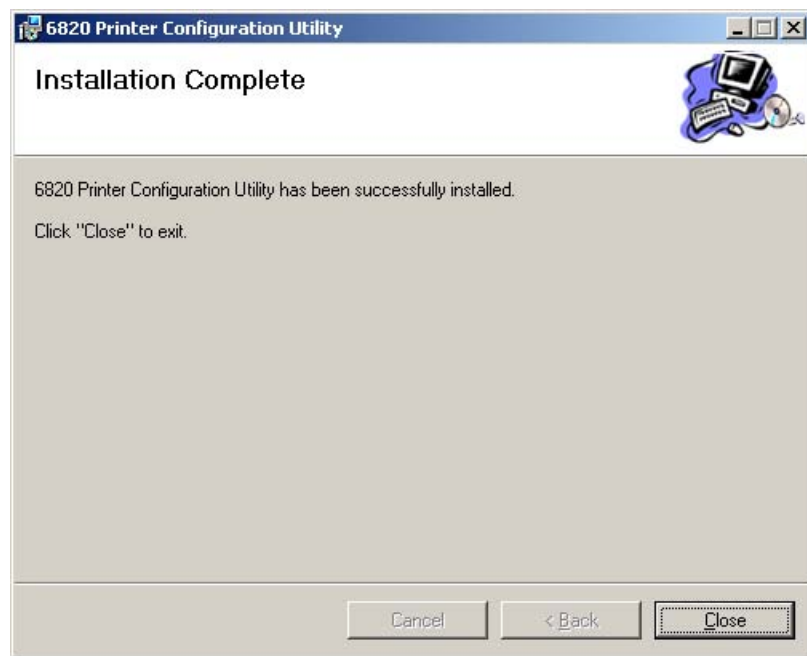
If the default location was not changed in step 4 on the previous page, the "Program Files\Intermec\6820 Printer Configuration Utility" subdirectory is created. The Configuration Utility application program and applicable DLL files are extracted to this subdirectory.

After installation, from your desktop, click **Start** > **Programs** > **Intermec** > **6820 Printer Configuration Utility** to access the 6820 Printer Configuration Utility executable and related documentation.

Configuration Utility Operation

Note: If your 6820 Printer has a Bluetooth adapter, its RS-232 line driver can be in contention with the configuration port's connected programming PC. Disconnect the Bluetooth adapter before continuing.

This configuration consists of a list of fonts, some parameter settings, and a printer control program.

When the utility is active, it holds a configuration in memory. This is called the "configuration clipboard." Initially, this configuration has parameters set to their default values. Consider the contents of the configuration clipboard as temporary and lost when you exit from the utility.

With the Configuration Utility, you can view the configuration stored in your 6820 Printer using the **Get 6820 Configuration** button. You can configure or modify the printer settings in your printer using the **Set 6820 Configuration** button.

In addition, you can use the **Reset to Defaults** button to reset the configuration clipboard to the recommended printer configuration. *Note that this button does not send the default configuration to the printer.*

Starting the Program

From your desktop, click **Start** > **Programs** > **Intermec** > **6820 Printer Configuration Utility** > **PConfigApp.exe** to access the 6820 Printer Configuration Utility.
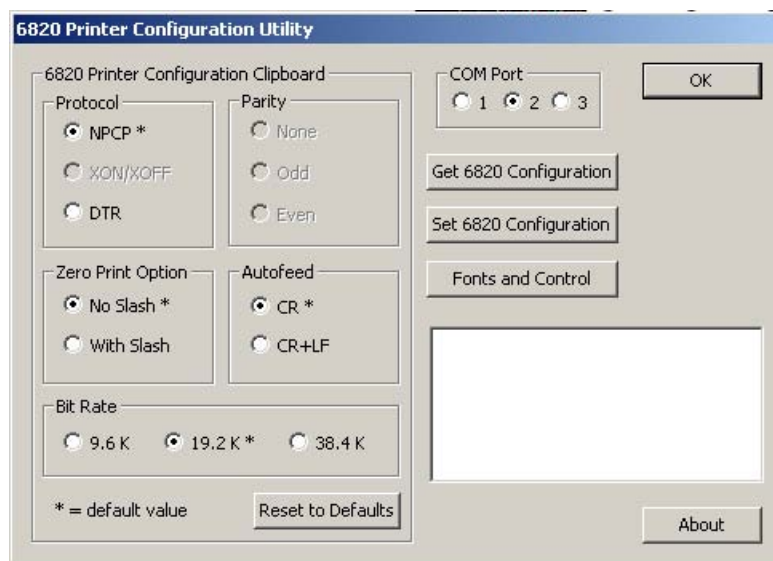
COM Port

This utility is flexible in which COM Port to use to communicate with your printer. If COM Port 1 is not available or is in use by another application, select another COM Port with which to connect to your printer.

Establishing a Communication with the Printer

Click either the **Get 6820 Configuration** or the **Set 6820 Configuration** button to open communications with the printer.

1 The "*Opening COM Port x to printer . . .*" message appears in the text box of your utility. The "x" in the message indicates to which COM Port your utility is set.

2 When the "*Press Reset on the printer*" message appears in the text box, press the reset button on your printer mechanism.

3 As soon as successful communication is established between your desktop computer and your printer, an "*Opening COM Port x to printer. . . Done.*" message appears in the text box.
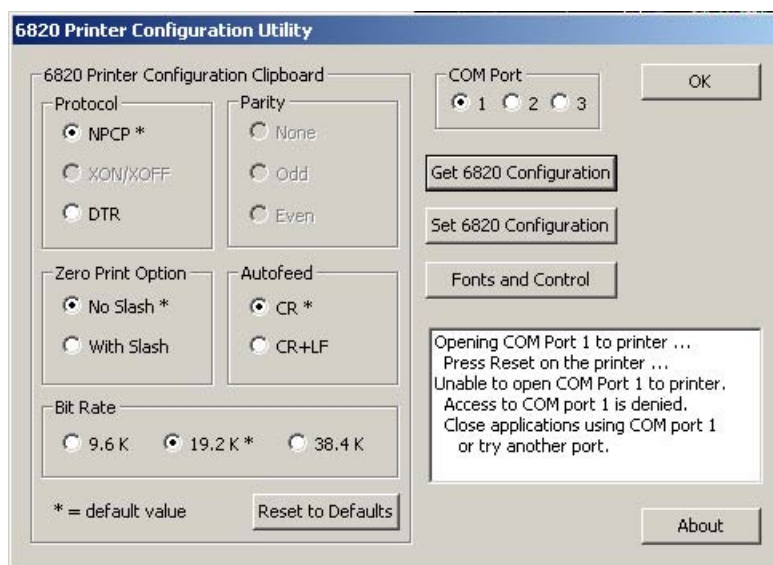
Note: If an "*Unable to open COM Port x to printer*" message appears in the text box, as shown in the previous sample, another software application may be using the selected COM Port. Either select another COM Port or disable the software application using the COM Port in question. See page 61 for more errors.

Get 6820 Configuration

To view the settings on your 6820 Printer, do the following:

1 Click **Get 6820 Configuration** to initiate communication.

2 The "*Getting printer parameters . . .* " message appears in the text box.

3 When finished retrieving information from the printer, the "*Getting printer parameters . . . Done*" message replaces the message described in step 2. This message indicates parameters were successfully obtained from the printer and the utility settings reflect your printer settings.

4 Either go to "*Set 6820 Configuration*" in the next paragraph; or click **OK** to close the utility, then detach the serial cable.

Set 6820 Configuration

The settings in the configuration clipboard are what is sent into your printer when you change its configuration.

1 In the configuration clipboard, if necessary, select what settings are required for your printer. *To undo your selections and return them to their defaults, click **Reset to Defaults**.*

2 Click **Set 6820 Configuration** to initiate communication. The "*Setting printer parameters . . .*"message appears in the text box of your utility.

3 Once settings in your printer are changed, the "*Setting printer parameters . . . Done*" message replaces the message described in step 2.

Note: If the parameters cannot be set, a "*Unable to set printer parameters*" message is shown. This indicates the connection broke down between your desktop computer and your printer.

4 Click **OK** to close the utility, then detach the serial cable.

Required for Bluetooth — Convert the Printer to Epson DTR Mode

Those using Bluetooth must switch the 6820 Printer from the Norand Portable Communications Protocol (NPCP) mode to the Epson DTR mode with the baud rate set to "19.2K" and the parity set to "None." *Note: The 6820 Bluetooth adapter does not support any other settings.*

Fonts and Control

Click **Fonts and Control** from the 6820 Configuration Utility to update the fonts stored in your printer or to update the printer control program.

The **Fonts Available for Update** list shows font files that are available. The **Fonts Selected for Update** list show fonts that are to go to the printer.
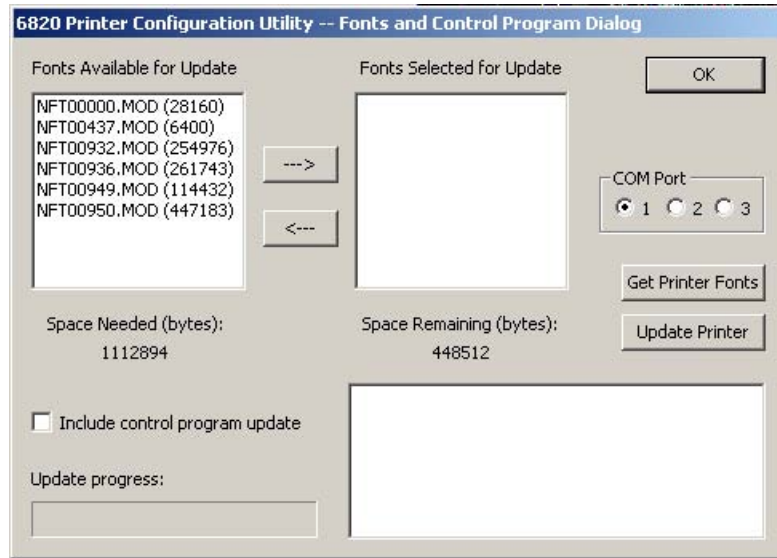
Get Printer Fonts

To learn what fonts are currently in your printer, click **Get Printer Fonts**, then wait for the information to appear in the text box in the bottom right corner of the dialog. Below is a sample screen.
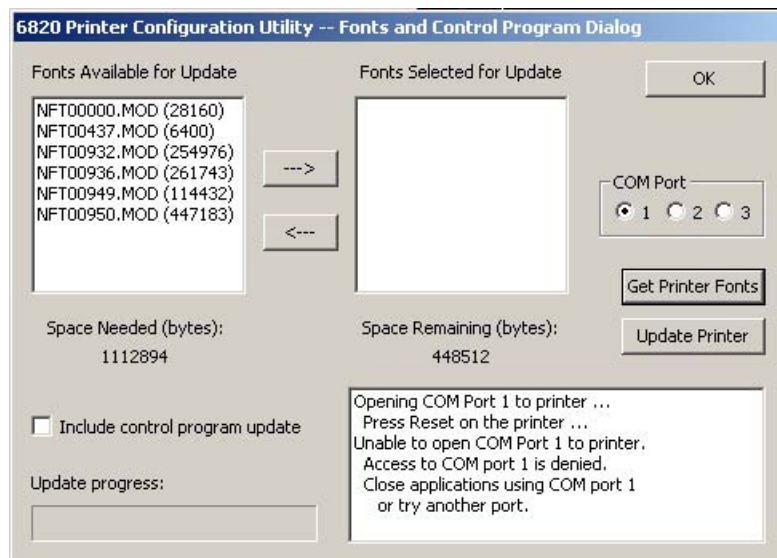
Copying Font Files
To select font files, highlight the font files in the **Fonts Available for Update** list. You can highlight several files at one time. Then click the right arrow pointing to the **Fonts Selected for Update** list to copy the selected font files to this list. Below is a sample screen.

If you select enough fonts that go over the space allowed, an error message will appear. Click **OK** to close the error message and not copy the font to the **Fonts Selected for Update** list. If there are two or more fonts that exceed the space allowed, this message repeats until an error message is displayed for each of the font files that went over the space allowed.

Space in Flash
The **Space Needed** information shown beneath the **Fonts Available for Update** list indicates the total space required (in bytes) for 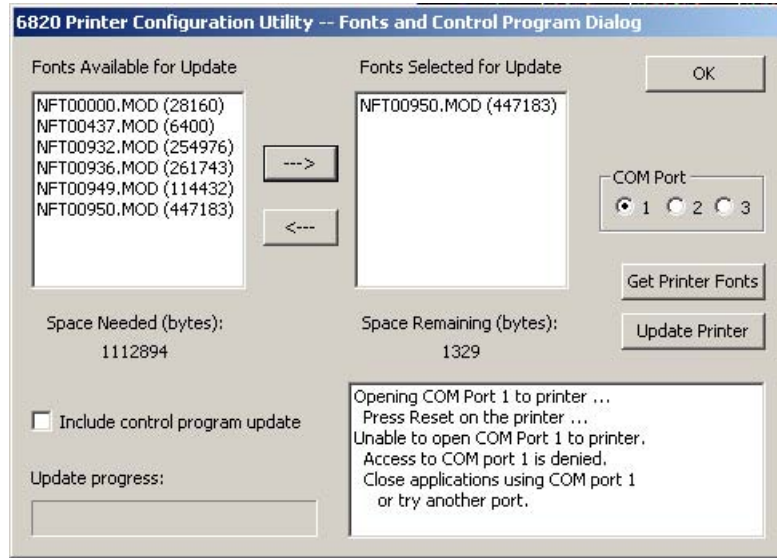all of the fonts in the list. The **Space Remaining** information listed below the **Fonts Selected for Update** list displays the space remaining in the printer, given the fonts in the **Selected** list.

Update Printer
This button updates the printer fonts and the control program depending on the options selected on the dialog. *Note that if the Selected list is empty and the Include control program update is not checked, a "Nothing selected for update" message appears in the text box.*

• Formats the printer flash for font updates and writes new font files to the printer for any fonts in the **Selected** list.

  Click the top, right arrow to copy selected font files from the **Fonts Available for Update** list to the **Fonts Selected for Update** list. Click the bottom, left arrow to remove any selected files from the **Fonts Selected for Update** list.

Click **Update Printer** to update the fonts in the printer with those in the **Fonts Selected for Update** list. The **Update progress:** bar indicates the progress as the control program or fonts are written to the printer.

- The **Include program control update** box determines whether to include the printer control program when updating the printer. Check this box to update the setting and include the control program the next time you update the printer configuration.

Generally, you only need to update the control program as new versions become available. The control program is named NPFL6820.MOD.
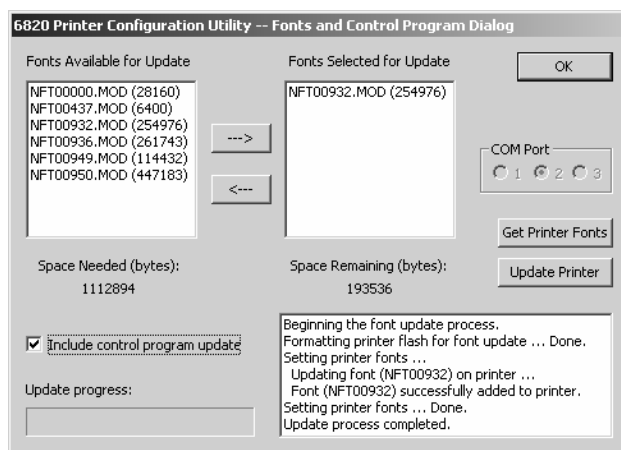
Default Printer Settings

The following settings are the defaults for your 6820 Printer:

Zero Print Option	Print zeros without a slash
Autofeed Configuration	CR (carriage return at end of line without line feed)
Protocol	NPCP
Parity	N/A (for NPCP)
Bit Rate	19.2K (19200)

For other printer defaults, refer to the *Printer Defaults* paragraph in Appendix B, "*Cross-Reference Tables.*"

Error Messages

There are three cases where the computer may not connect to the printer. Here are the three cases and error messages. *Note that "x" indicates the number assigned to the COM Port in question.*

Timeout Error

The timeout error may occur due to either of these situations:

- The printer was not reset in the time allowed.

- The COM port exists on the desktop computer but nothing is connected to the port.

Error Message:

```
Unable to open COM port x to printer. Printer not reset
within the time allowed or printer not connected to COM
port x.
```

Port Not Found Error

The COM port does not exist. The particular COM port is identified in the error message.

Error Message:

```
Unable to open COM port x to printer. COM port x cannot
be found.
```

Access Denied Error

The COM port exists but a connection with the printer is not established. The particular COM port is identified in the error message.

Error Message:

```
Unable to open COM port x to printer. Access to COM
port x is denied. Close applications using COM port x
or try another port.
```

About the Configuration Utility

Click **About** to learn about your version of the 6820 Configuration Utility. When done, click **OK** to return to the utility.
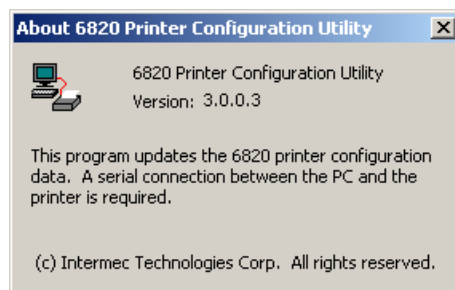
Bluetooth Adapter

Note: If your 6820 Printer is to use a Bluetooth adapter, be sure to connect this adapter after you exit the Configuration Utility, thus finish re-configuring the 6820 Printer fonts.

5   Control Code Definitions

This chapter contains a set of control code definitions and specifications for page layout for the 6820 Printer. These control code definitions are organized by categories of functions.

To locate control codes easily, several methods have been provided:

- Alphabetically organized (complete list)—
  refer to the *Control Codes & Escape Sequences Index* table in Appendix B, "*Cross-Reference Tables.*" Locate the index for the control code, and turn directly to that page.

- Numeric order (single character codes only)—
  refer to the *Single Character Control Code Definitions* table in Appendix B, "*Cross-Reference Tables.*" Locate the index for the control code, and turn directly to that page.

- Numeric order (complete list)—
  refer to the *Escape Sequences Quick Reference* table in Appendix B, "*Cross-Reference Tables*" and look up control codes by their actual code values. Locate the index for the escape sequence, and turn directly to that page.

Control Code Definitions

Buffers

I/O Buffer

All characters and control codes received by the printer are stored in this buffer. Characters and controls codes are read from this buffer and acted upon to form the print buffer. Characters are removed from the I/O buffer as they are processed.

Print (image) Buffer

All characters go through this buffer on their way to the printed page. This buffer contains the graphic image of the dots to print, from which characters are rendered. It is cleared when its contents are printed.

Special Notations

The following information defines notations included in the format definitions of the escape sequences, throughout this section.

Notation	Description
(0)	Used in the **ASCII** column of any of the *Format* definitions, indicates that its value can only be zero (and not the character "0"). For example: Select Top-Down Printing ESC US (0).
(1)	Used in the **ASCII** column of any of the *Format* definitions, indicates that its value can only be one (and not the character "1"). For example: Select Bottom-Up Printing ESC US (1).
*	When a number (at the end of an escape sequence) is marked with an asterisk, then either the value corresponding to that number or the value of the string character can be used for that number. For example, if 1* is shown, then either the value (1), or the value of the string character (decimal: 49, hex: 31) can be used.
NUL	The NUL character is represented in the **Dec** column as 0, in the **Hex** column as 00, and in the **ASCII** column as NUL.

General Printer Control Functions

Backspace

The print buffer is emptied. The print head is moved to the left one character space (using the current pitch). This can be performed to, but not beyond, the left margin setting. The backspace is ignored if justification of right, full, or centered is selected.

Format

Decimal	Hex	ASCII
8	08	BS

The backspace control code (BS) is not reliable when text contains different character pitches. For reliable backspacing, use the escape sequence (ESC "\"), *Set Relative Print Position*.

Beeper

The printer's sounding device produces a beep sound for approximately 1/10 of a second.

Format

Decimal	Hex	ASCII
7	07	BEL

Cancel Line

All of the characters currently in the print buffer are discarded. Current print position is set to left margin. Text already printed cannot be canceled.

Format

Decimal	Hex	ASCII
24	18	CAN

Carriage Return

The print head is repositioned at the start of the print line (usually at the left margin), and repositions the pointer to the start of the print buffer, after printing all data in the buffer. Also, all of the "one line" functions are reset, such as bold, double-strike, double-wide, or unidirectional printing.

Format

Decimal	Hex	ASCII
13	0D	CR

Note: You can add an automatic line feed with a configuration item (see *Configuration Parameters* in Chapter 7, "*Troubleshooting and Diagnostics*").

Delete

The last character in the print buffer is deleted. This functions only in left justification.

Format

Decimal	Hex	ASCII
127	7F	DEL

Form Feed

The contents of the print buffer is printed, the print buffer is cleared, and the paper is advanced to the top of the next page (Top of Form), according to the current page length setting. The carriage position is moved to the start of the line.

Format

Decimal	Hex	ASCII
12	0C	FF

Select Half-Speed Printing

Half-speed mode is turned on to provide quiet printing, and more accurate print positioning during text mode printing.

Format

Decimal	Hex	ASCII
27 115 1*	1B 73 01*	ESC "s" 1*

Cancel Half-Speed Printing

Half-speed mode is turned off (factory default), and continues with normal speed printing.

Format

Decimal	Hex	ASCII
27 115 0*	1B 73 00*	ESC "s" 0*

Set Inactivity Time for Sleep Mode

The time period, for which the printer waits during inactivity before it goes into low-power mode, is set (in *n* seconds). The factory default is 10 seconds.

Format

Decimal	Hex	ASCII
27 122 n	1B 7A n	ESC "z" n

Line Feed

Perform Line Feed

The contents of the print buffer is printed, then cleared, and the character count is reset to zero; then the print head advances to the next print line, using the current spacing. The position of the carriage is not affected and a carriage return is not executed.

Format

Decimal	Hex	ASCII
10	0A	LF

Perform n/216-inch Line Feed

The paper to immediately advanced n/216 of an inch. This does not affect subsequent line feeds. Range of *n* is 0–255.

Format

Decimal	Hex	ASCII
27 74 n	1B 4A n	ESC "J" n

Perform n/216-inch Reverse Line Feed

An immediate reverse line feed of n/216 of an inch is produced. This does not affect subsequent line feeds. Range of *n* is 0–255.

Format

Decimal	Hex	ASCII
27 106 n	1B 6A n	ESC "j" n

Perform Master Reset

The Master Reset code initializes the printer, by resetting all special modes to their default power-up states (see the *Factory Defaults* paragraph in Appendix B, "*Cross-Reference Tables*" for a complete list of settings that are initialized with this command).

Format

Decimal	Hex	ASCII
27 64	1B 40	ESC "@"

Set Print Position (absolute)

The print head is moved to an absolute horizontal position on the paper. The distance is specified, in dots from the left margin to the new print position (at which subsequent characters are printed). Each dot represents 1/60 of an inch. The values for *n1* and *n2* determine the distance, as follows:

number of dots = n1 + (n2 * 256)

Maximum position is 480. The previous contents of the current print buffer is printed.

If the position specified would have placed the print head outside the current margins, this function is ignored and the previous setting remains effective. This function is also ignored in right, center, and full justification modes.

Format

Decimal	Hex	ASCII
27 36 n1 n2	1B 24 n1 n2	ESC "$" n1 n2

Set Print Position (relative)

The print head is moved to a horizontal position on the paper, relative to the current print head position. The distance specified is in dots. To determine *n1* and *n2*, first calculate the displacement required in 1/120ths of an inch. If the displacement is to the left, subtract it from 65536. The values for *n1* and *n2* determine the distance, as follows:

number of dots = n1 + (n2 * 256)

Maximum displacement is ±960. If the position specified would place the print head outside the current margins, this function is ignored and the previous setting remains in effect. This function is also ignored in right, center, and full justification modes.

Format

Decimal	Hex	ASCII
27 92 n1 n2	1B 5C n1 n2	ESC "\" n1 n2

Select Top-Down Printing

Top-down printing (factory default) is enabled. The first page is printed first.

Format

Decimal	Hex	ASCII
27 31 0	1B 1F 00	ESC US (0)

Select Bottom-Up Printing

Bottom-up printing is enabled. The last page is printed first.

Format

Decimal	Hex	ASCII
27 31 1	1B 1F 01	ESC US (1)

Select Unidirectional Printing

Unidirectional mode is turned on, causing the print head to print from left-to-right only. This allows more accurate print positioning during text mode printing.

Format

Decimal	Hex	ASCII
27 85 1*	1B 55 01*	ESC "U" 1*

Cancel Unidirectional Printing

Unidirectional mode is turned off (factory default), allowing the print head to print in both directions.

Format

Decimal	Hex	ASCII
27 85 0*	1B 55 00)	ESC "U" 0*

Select Unidirectional (one line) Printing

Unidirectional printing is turned on, for the current line only. The contents of the print buffer is printed, and cleared, before setting this mode. This allows more accurate print positioning during text mode printing, for the current line.

Format

Decimal	Hex	ASCII
27 60	1B 3C	ESC "<"

Page Formatting Functions

This set of functions consists of control codes that change the formatting for the page, such as page length, margins, line spacing, etc. The page length (form length) and margin settings define the printable area on the page. These settings need to conform to the actual size of the paper used in the printer.

Page Length

Set Page Length (lines)

The length of the paper is set, in lines, where the range of *n* (number of lines) is 1-127 (default = 66). Keep in mind the line spacing and actual length of the paper when specifying this value, since this function is dependent on those parameters. Top-of-Form is reset to the current line and the *Skip Over Perforation* setting is canceled.

Format

Decimal	Hex	ASCII
27 67 n	1B 43 n	ESC "C" n

Set Page Length (inches)

The length of the paper is set, in inches, where the range of *n* (number of inches) is 1-22 (default = 11). Keep in mind the line spacing and actual length of the paper when specifying this value, since this function is dependent on those parameters. Also, Top-of-Form is reset to the current line and the *Skip Over Perforation* setting is canceled.

Format

Decimal	Hex	ASCII
27 67 0 n	1B 43 00 n	ESC "C" NUL n

Line Spacing

These functions set the amount of space from one line to the next, for line feeds. The factory default is 1/6 inch (6 lines per inch).

The Page Length, Vertical Tab, and Skip Over Perforation functions are also dependent upon this function.

Select 1/8-inch Line Spacing

Line spacing is set to 1/8 of an inch (8 lines per inch), for subsequent lines.

Format

Decimal	Hex	ASCII
27 48	1B 30	ESC "0"

Select 7/72-inch Line Spacing (7 dots)

Line spacing is set to 7/72 of an inch (approximately 9.7 lines per inch), for subsequent lines.

Format

Decimal	Hex	ASCII
27 49	1B 31	ESC "1"

Select 1/6-inch Line Spacing

Line spacing is set to 1/6 of an inch (6 lines per inch), for subsequent lines (factory default). 1/6 inch is equal to 12 dot spacing.

Format

Decimal	Hex	ASCII
27 50	1B 32	ESC "2"

Select n/216-inch Line Spacing

Line spacing is set to n/216 of an inch, for subsequent lines. A spacing of 1/216 inch is 1/3 the distance between pins of the print head (approximately 1/3 of a dot) and 27/216 is 8 lines per inch. Range of n is 0–255.

Format

Decimal	Hex	ASCII
27 51 n	1B 33 n	ESC "33" n

Select n/72-inch Line Spacing (n dots)

Line spacing is set to n/72 of an inch, for subsequent lines. A spacing of 1/72 inch (1 point in font size) is the distance between pins on the print head (approximately 1 dot) and 9/72 is 8 lines per inch. Range of n is 0–85.

Format

Decimal	Hex	ASCII
27 59 n	1B 41 n	ESC "A" n

Set Margins

Margin settings define the horizontal print area on the page. The minimum space between margins is the width of one double-wide pica character.

Set Right Margin

All text in the print buffer is cleared, then the right margin is set to *n* columns, using the current character pitch. This is the number of the characters from column 1 (at the left edge of the paper) to the last column before the right margin (factory default = 80).

The minimum space between margins is the width of one double-width pica character. The maximum value for this setting is the maximum number of characters (based on the current pitch) that would fit between the left margin and the right edge of the default printable area of the page. Ranges shown below could vary, depending on values of other parameters that affect character width. If the value specified is not within the allowed range, it is ignored.

Range of *n* is 2–80 in Pica mode, 2–96 in Elite mode, and 2–136 in Compressed mode.

Format

Decimal	Hex	ASCII
27 81 n	1B 51 n	ESC "Q" n

Set Left Margin

All text in the print buffer is cleared, then the left margin is set, relative to the number of columns to the left of the first column to be printed (factory default = 0).

The minimum space between margins is the width of one double-width pica character. The maximum value must be less than the right margin. Ranges shown below could vary, depending on values of other parameters that affect character width. If the value specified for this function is not within the allowed range, it is ignored.

Range of *n* is 0–78 in Pica mode; 0–93 in Elite mode, and 0–133 in Compressed mode.

Format

Decimal	Hex	ASCII
27 108 n	1B 6C n	ESC "l" n

Set Skip Over Perforation

This function is valid for continuous paper only. The number of lines to skip between the last printed line on the page and the first printed line on the next page is set. If the value specified for this function is greater than the page length, it is ignored. This function is canceled by the use of one of the *Set Page Length* functions (factory default = disabled).

The amount of space left blank at the bottom of the printed page is dependent upon the current Line Spacing.

Format

Decimal	Hex	ASCII
27 78 n	1B 4E n	ESC "N" n

Cancel Skip Over Perforation

The *Skip Over Perforation* is canceled, which allows the maximum number of lines to be printed on each page.

Format

Decimal	Hex	ASCII
27 79	1B 4F	ESC "O"

Character Style and Text Mode Functions

The following set of functions affect the appearance of text on the printed page. This could involve size, typeface, or other characteristics of the text.

Select Condensed Mode (compressed)

The condensed mode is selected, which prints characters at approximately 60% of the normal width. This results in character pitches, as shown below (for exact pitch values, see *Master Select*, on page 75):

Condensed Mode	Condensed + Expanded	Condensed + Elite
17 cpi (approximate)	9 cpi (approximate)	20 cpi (approximate)

This function empties the print buffer and turns compressed mode on, and stays on until canceled by *Cancel Compressed Mode*, ESC SI (0) or DC2 (factory default = disabled). *Note that this function is not supported in Double-byte Character Sets (DBCS).*

Format

Decimal	Hex	ASCII
27 15	1B 0F	ESC SI
15	0F	SI

Cancel Condensed Mode (compressed)

This function cancels the compressed mode, enabled by *Select Compressed Mode*, SI or ESC SI (1). *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 18	1B 12	ESC DC2
18	12	DC2

Select Double-Strike Mode

Double-strike printing is enabled, until *Cancel Double-Strike Mode* is encountered. Factory default disables double-strike. Text is made bolder by printing each dot twice, with the second dot slightly below the first dot. This mode is not available in NLQ, yet is not canceled by the selection of NLQ. *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 71	1B 47	ESC "G"

Cancel Double-Strike Mode

The effect of *Select Double-Strike Mode* is canceled. *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 72	1B 48	ESC "H"

Select Double-Wide (expanded) Mode (one-line-only)

Expanded print is enabled, for current line only. The mode set previously returns on subsequent lines. However, expanded print can be canceled with *Cancel Expanded Print*, DC4 or ESC "W" (0), before end of current line, or wrapping of the print buffer. This works with all three pitches (Pica, Elite, Compressed).

This mode is also terminated by the execution of a *Carriage Return*, *Line Feed*, *Form Feed*, *Vertical Tab* or wrapping of the print buffer. *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 14	1B 0E	ESC SO
14	0E	SO

Cancel Double-Wide (expanded) Print (one-line-only)

Double-Wide (expanded) print mode is canceled for the current line only. Modes set previously return on subsequent lines. However, it does not cancel expanded mode set by *Select Double-Wide (expanded) Mode*, ESC "W" (1) or *Master Select, ESC "!". Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 20	1B 14	ESC DC4
20	14	DC4

Select Double-Wide (expanded) Mode

Expanded print mode is enabled, until *Cancel Expanded Print* is encountered. Factory default disables double-wide mode. *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 87 1*	1B 57 01*	ESC "W" 1*

Cancel Double-Wide (expanded) Mode

Double-wide print mode (previously set by *Select Double-Wide Mode*) is canceled. *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 87 0*	1B 57 00*	ESC "W" 0

Select Elite Pitch

A character pitch of 12 cpi (characters per inch) is selected. This also cancels Pica Pitch (factory default = Pica). *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 77	1B 4D	ESC "M"

Select Emphasized Mode

Emphasized printing is enabled, until *Cancel Emphasized Mode* is encountered. The text is made bolder by printing each dot twice, with the second dot slightly to the right of the first dot. Factory default disables Emphasized mode. *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 69	1B 4B	ESC "E"

Cancel Emphasized Mode

The effect of the *Select Emphasized Mode* is canceled. *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 70	1B 46	ESC "F"

Define Intercharacter Space

This function defines the amount of space to the right of each character, in addition to the space allowed in the character design. The variable *n* represents the number of units of space, with each unit equal to 1/120 of an inch. Range of values for *n* is 0–63 with a factory default of 0.

Format

Decimal	Hex	ASCII
27 32 n	1B 20 n	ESC SP n

Select Italic Mode

The text (nongraphic) characters are italicized. Factory default disables Italic mode. *Note that this function does not work well with DBCS or alternate Single Byte Charater Sets (SBCS).*

Format

Decimal	Hex	ASCII
27 52	1B 34	ESC "4"

Cancel Italic Mode

The italic mode, set by the *Select Italic Mode* function, is canceled. *Note that this function does not work well with DBCS or alternate SBCS.*

Format

Decimal	Hex	ASCII
27 53	1B 35	ESC "5"

Master Select

Combinations of modes are allowed with this function. The variable *n* is determined by combining values for the desired modes, by adding them together. *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 33 n	1B 21 n	ESC "!" n

Valid combinations of the values in the following table include any combinations except that Pica cannot combine with Elite.

An example of combining values: Pica Compressed Italic Underlined, by adding values (00h + 04h + 40h + 80h), which results in C4h for the value of *n*.

Hex Value	Mode
00h	Pica
01h	Elite
04h	Condensed (compressed)
08h	Emphasized
10h	Double-Strike
20h	Double-Width (expanded)
40h	Italic
80h	Underlined

The following print conflicts occur between modes. A mode in any column takes precedence over all modes in the columns to its right.

1	2	3
Elite	Emphasized	Compressed

The following print modes can be combined producing different pitches:

Pitch	Mode
5 cpi	Expanded
6 cpi	Expanded Elite
8.58 cpi	Expanded Compressed
10 cpi	Pica
12 cpi	Elite
17.16 cpi	Compressed

Select Pica Pitch

A character pitch of 10 cpi (characters per inch) is selected (factory default). This also cancels Elite pitch. *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 60	1B 50	ESC "P"

Select Superscript Mode

All subsequent characters are printed approximately 2/3 the normal height in the upper part of the character space, until *Cancel Subscript/Superscript* is encountered. *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 83 0*	1B 53 00*	ESC "S" 0*

Select Subscript Mode

All subsequent characters are printed approximately 2/3 the normal height in the lower part of the character space, until *Cancel Subscript/Superscript* is encountered. *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 83 1*	1B 53 01*	ESC "S" 1*

Cancel Subscript/Superscript Mode

The effects produced by *Select Superscript Mode* and *Select Subscript Mode* are canceled. Factory default also disables both of these modes. *Note that this function is not supported in DBCS.*

Format

Decimal	Hex	ASCII
27 84	1B 54	ESC "T"

Select Underline Mode

The underlining of all subsequent characters (including spaces) is enabled, until the *Cancel Underline Mode* function is encountered.

Format

Decimal	Hex	ASCII
27 45 1*	1B 2D 01*	ESC "–" 1*

Cancel Underline Mode

The effect of the *Select Underline Mode* function is canceled. Factory default also disables the Underline mode.

Format

Decimal	Hex	ASCII
27 45 0*	1B 2D 00*	ESC "–" 0*

Tabs and Tab Setting Functions

Horizontal Tabs

This set of functions deals with horizontal tabs: set tabs, tab to next tab stop, clear tabs, and set tab increments.

- Tab settings are not affected by subsequent changes in pitch.
- Tabs may range up to maximum width for character and printer size.
- All previous tab stops are cleared when new tab stops are set. Also, if the left margin is changed after the horizontal tabs are set, then all tab stops are cleared.
- Tabs become absolute positions and are not affected by any subsequent change in character size.
- All tabs set outside of the printable area are ignored.

Perform Horizontal Tab

The print position is moved to the next horizontal tab stop. The tab positions, set by ESC "D", the *Set Horizontal Tabs* function, are not affected by any changes in character pitch.

The factory default tab settings are at intervals of eight characters, in the currently selected pitch. For the default tabs, the actual distance to each tab position is affected by changes in character pitch.

Format

Decimal	Hex	ASCII
9	09	HT

Set Horizontal Tabs

The current horizontal tabs are reset, and new horizontal tabs are set up, based on the current character width (pitch).

Format

Decimal	Hex	ASCII
27 68 n1 n2 ... nk 0	1B 44 n1 n2 ... nk 00	ESC "D" n1 n2 ... nk NUL

where, *n1* is the first tab (range of values for tab stops: 1–255), *n2* is the second tab (all tabs must be in ascending order)*, ...* are subsequent tabs (maximum number of tabs: 32), *nk* is the last tab to set (any value less than the previous tab value acts as a terminating character), *NUL* is the terminating character.

Clear Horizontal Tabs

All horizontal tab stops are cleared. It is merely a variant behavior of the *Set Horizontal Tabs* function, where the NUL acts as an early terminating character, since the function normally clears the existing tabs before setting any new tabs.

Format

Decimal	Hex	ASCII
27 68 0	1B 44 00	ESC "D" NUL

Vertical Tabs

This set of functions deals with vertical tabs: set tabs, tab to next tab stop, clear tabs, set tab increments, set tabs in channels, and select a tab channel.

- Tab positions are line numbers, counting from the Top of Form.

- All tabs set beyond the page length are stored, but are not used.

- Any tab set within the SOP range (Skip Over Perforation), during the time SOP is active, are stored but not used until SOP is canceled.

- If a vertical tab is encountered, and the next tab stop is outside the printable page area, a form feed is executed placing the print head at the next Top of Form.

- All previous tab stops are cleared when new tab stops are set.

- Tab settings are not affected by subsequent changes in line spacing.

Perform Vertical Tab

The contents of the current print buffer are printed first, then the print position is moved to the next vertical tab stop. If no channel is selected, then channel 0 is used. The carriage position is changed to the start of the next print line. If the vertical tab is performed beyond the last tab position set or beyond the last line of a form, then a form feed is performed. If no vertical tabs are defined, then the paper advances one line, using the currently selected line spacing, without changing the carriage position.

Format

Decimal	Hex	ASCII
11	0B	VT

Set Vertical Tabs

The current tabs are reset, and vertical tabs are set up, based on the current line spacing. Tab settings are not affected by subsequent changes in line spacing.

Format

Decimal	Hex	ASCII
27 66 n1 n2 ... nk 0	1B 42 n1 n2 ... nk 00	ESC "B" n1 n2 ... nk NUL

where *n1* is the first tab (range of values for tab stops: 1–255), *n2* is the second tab (all tabs must be in ascending order), ... are subsequent tabs (maximum number of tabs: 16), *nk* is the last tab to set (any value less than the previous tab value acts as a terminating character), *NUL* is the terminating character. All tab settings with this function are stored in channel 0.

Clear Vertical Tabs

All vertical tab stops are cleared. It is merely a variant behavior of the *Set Vertical Tabs* function, where the NUL acts as an early terminating character, since the function normally clears the existing tabs before setting any new tabs.

Format

Decimal	Hex	ASCII
27 66 0	1B 42 00	ESC "B" NUL

Set Vertical Tabs in Channel

This function works the same as the *Set Vertical Tabs* function, except that it stores the tabs into a specified channel, as specified by the variable *c*. This channel is selected for use by the *Select Vertical Tab Channel* function.

Format

Decimal	Hex	ASCII
27 98 c n1 n2 ... nk 0	1B 62 c n1 n2 ... nk 00	ESC "b" c n1 n2 ... nk NUL

where *c* is the channel number (range: 0–7), *n1* is the first tab (range of values for tab stops: 1–255), *n2* is the second tab (all tabs must be in ascending order)*, ...* are subsequent tabs (maximum number of tabs: 16), *nk* is the last tab to set (any value less than the previous tab value acts as a terminating character), and *NUL* is the terminating character.

Clear Vertical Tabs in Channel

All vertical tab stops in the specified channel are cleared. This is merely a variant behavior of the *Set Vertical Tabs in Channel* function, where the NUL acts as an early terminating character, since this function normally clears the existing tabs before setting any new tabs.

Format

Decimal	Hex	ASCII
27 98 c 0	1B 62 c 00	ESC "b" c NUL

Select Vertical Tab Channel

A specified tab channel is selected. It sets up the current tabs from that channel. Once this function is performed, all subsequent *Perform Vertical Tab* commands use the tab stops from the list retrieved from the specified channel. At power on, the printer uses the tabs stored in channel 0.

Format

Decimal	Hex	ASCII
27 47 c	1B 2F c	ESC "/" c

where *c* is the channel number (range: 0–7)

Character Sets and User-Defined Functions

Different character sets may be installed in the 6820 Printer. In some cases more than one character set may be present at one time, depending on the amount of available font memory. The 6820 Printer reserves 438K of memory for installable fonts in FLASH memory. You can install these character sets using NPCP or the flash configuration utility available in the 6820 Tool Kit. They can also install in flash at the time of manufacture or service. A printer tool kit is available for installing selected font modules.

Single Byte Character Sets

SBCSs are supported for MS-DOS, PL/N, and Intermec application compatibility. NFT00000.MOD is the default character set (font) for compatibility with the 4820 Printer. NFT00437.MOD is the IBM/Microsoft compatible character set for codepage 437.

Double-Byte Character Sets

DBCSs require two bytes to send to the printer to define the character to print. The first byte of the character code sent to the printer is known as a lead-in byte. The second byte of the character code is known as the trailing byte. Different character sets have different requirements for the values of both lead-in and trailing byte. When the lead-in byte does not fall in the range listed for the character set, a character from a SBCS may print. The following double-byte character sets are supported by the 6820 Printer.

DBCS

Font Module	Code Page	DBCS Language	Lead-in Byte	Trailing Byte
NFT00936.MOD	936	GB 2312 Chinese (simplified)	A1h–ABh B0h–F7h	A1h–FEh
NFT00950.MOD	950	big 5 Traditional Chinese	A1h–C6h C9h–F9h	40h–FEh (except 7Fh)
NFT00932.MOD	932	Shift JIS Japanese	81h–9Fh E0h–FCh	40h–FCh (except 7Fh)
NFT00949.MOD	949	KSC 5601 Korean	A1h–ACh B0h–C8h CAh–FDh	A1h–FEh

Note: See Appendix C, "*Printer Font Test Jobs,*" for sample print jobs.

Multi-Byte Character Sets

DBCS and SBCS can mix when printing a report. This mixture is referred to as a Multi-Byte Character Set (MBCS). When a DBCS is selected, the characters from the SBCS codepage currently selected are used for rendering character codes and control codes from 0 to 127. Codes above 127 (that fall within the range of lead-in bytes for the selected character set) treat the byte that follows as a trailing byte for that character set. Otherwise, for character codes above 128, the character code from the selected SBCS is printed. NFT00950.MOD (BIG 5 DBCS) does not allow the MBCS mode. For this character set, only control codes from 0–31 are treated as single byte characters when they are not proceeded by a lead-in byte. All escape sequence character strings are treated as SBCS.

Codepage Selection

Multiple codepages can be present in printer font memory at one time. One SBCS and one DBCS codepage can be selected as the active codepages at any time for MBCS mode. The active codepage can be changed at any time by substituting the appropriate value into *n1* and *n2* from the *International Character Sets* table on the next page.

Format

Decimal	Hex	ASCII
27 82 n0 n1 n2	1B 52 n0 n1 n2	ESC "R" n0 n1 n2

where *n0* is 255, *n1* is the high byte of codepage to select, and *n2* is the low byte of codepage to select.

Select National Character Set

By default, codepage 0 is selected by the printer at reset. The following escape sequence may be used to select international character support, and is only allowed for codepage 0. All other codepages use direct character code mapping to select the appropriate font for rendering.

Format

Decimal	Hex	ASCII
27 82 n	1B 52 n	ESC "R" n

where *n* is 0–14 and is the country code, as shown in the *International Character Sets* table on the next page. The default value for *n* is zero (USA).

A full 256 character set is not provided for these sets. There are 64 international characters stored in ROM: 32 in Roman and 32 in Italic. They are stored as codes 0–31 and 128–255. These codes are normally not accessible.

However, the ESC "R" command makes these codes available, but only 12 characters at a time. These 12 characters are available in these positions of the ASCII character table: 35, 36, 64, 91, 92, 93, 94, 96, 123, 124, 125, and 126, as shown in the *International Character Sets* table on the next page.

International Character Sets

Country	Country Number	35	36	64	91	92	93	94	96	123	124	125	126
USA	0	#	$	@	[	\	]	^	`	{	|	}	~
France	1	#	$	à	º	ç	§	^	`	é	ù	è	¨
Germany	2	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	β
England (UK)	3	£	$	@	[	\	]	^	`	{	|	}	~
Denmark 1	4	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Sweden	5	#	¤	É	Ä	Ö	Å	Ü	é	ä	Ö	å	ü
Italy	6	#	$	@	º	\	é	^	ù	à		è	ì
Spain 1	7	P	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
Japan	8	#	$	@	[	¥	]	^	`	{	|	}	~
Norway	9	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark 2	10	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Spain 2	11	#	$	á	¡	Ñ	¿	é	`	í	ñ	ó	ú
Latin America	12	#	$	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú
Hebrew	13	*Note: Hebrew fonts are available in the supplied font files. See "Hebrow Character Fonts" below.*											
Greek	14	*Note: Greek fonts are available in the supplied font files. See the "Greek Character Sets" table on the next page..*											

Hebrew Character Fonts

Hebrew characters represented by decimal values 38 and 65 through 90 are represented by the following 7x7 font descriptions.

```
*.*.*..  ....*.*  *.*.*.*  *.*.*.*  ....*.* *.*.*.* *.*.*.* *..*.*.
....*:.  ....:*.  .....*.  .....*.  ......* ..:*... .:*..*. *.:*.:*
....*:.  ...:*.*  .....*.  *....*.  ......* ..:*... ....*:. *....*
....*..  .......  .....*.  *....*.  ......* ..:*... *....*. *....*
....*:.  ...*:.*  .....*.  *....*.  ......* ..:*... *....*. *....*
*.*.*.*  ..*.*.*  .....*.  *....*.  ......* ..:*... *...*.* *....*.
.......  .......  .......  .......  ....... ....... ....... *.*.*..
.......  .......  .......  .......  ....... ....... ....... .......
65   66  67 68 69  70  71  72

.......  .......  .......  *......  ....... ....... ....... .......
.....*.* ..*.*.*  *.*.*.. *.*.*.*  *.*.*.* *..*... .....*.* .....*.*
......:.* ......:* .......* .....*  ....:..* .*.*.*. ......:* ......:*
......* ......*  .......* .....*.* *.....* ..*...* ......* ......*
......* ......*  .......* ......*. *.....* ..*...* ......* ......*
...... ......*  *.*.*.. .*.*... *.*.*.* *....* ......* ..*.*.*
....... ....... .......* ....... .....* *.*.*.* *...... .......
73   74  75 76 77  78  79  80

*.*.*.* *.....* *.*.*.* *.*.*.. *....*. *.....* *.*.*.* *.*.*.*
..*...* *.....* *.....* *.....* .*.*.. .*...*. .....* .......*
.*....* .*....* *.*...* *.*...* ..*.*.. .*...*. .....* .......*
*....*. ..*.*.. *......* .*....* ......* .....*. *.*.*.* ......*
*.*.*.. *.*.*.* .....* *.*.*.. .....* *.*.*.* *...... ......*
....... ....... .....* ....... .....* *....... ....... ......*
81   82  83 84 85  86  87  88

....*.  .......  .......
*..*.*.* ..*.*.* *.....*
*..*..* ..*...* .*....*
*..*..* ..*...* .*.*.*.
*.*..*. ..*...* *....*.
*....*. *.*.*.* *.....*
....... ....... .......
89   90 38
```

Greek Character Sets

Dec	Hex	Chr	Dec	Hex	Chr	Dec	Hex	Chr
97	61	A	105	69	I	113	71	P
98	62	B	106	6a	K	114	72	Σ
99	63	Γ	107	6b	Λ	115	73	T
100	64	Δ	108	6c	M	116	74	Y
101	65	E	109	6d	N	117	75	Φ
102	66	Z	110	6e	Ξ	118	76	X
103	67	H	111	6f	O	119	77	Ψ
104	68	θ	112	70	Π	120	78	Ω

Note: See Appendix C, "*Printer Font Test Jobs*," for sample print jobs.

The selected set stays in effect until the printer is reset and receives a Master Reset command, or a new international character set is selected. *Note that this function is only used with the default character set.*

User Defined Characters

The following code deals with user defined characters and their selection into memory.

Note: RAM-based definition or redefinition of standard characters is only useful when the default SBCS codepage is selected. There is no method to redefine characters in the other codepages, since unique codepages can be created and loaded into the printer font memory (flash) for use.

Copy ROM to RAM

The characters in ROM are copied into RAM, so a complete user-defined character set is created by editing selected characters. This ensures that all characters are defined when a user-defined character set is selected. This eliminates the need to unselect the user-defined character set when printing defined characters. *Note that this function is only useful with the default SBCS character set.*

Format

Decimal	Hex	ASCII
27 58 0 0	1B 3A 00 00 00	ESC ":" NUL NUL NUL

Define User-Defined Characters

Characters are redefined by the user in the currently selected mode. However, they can only be used in draft mode. *Note that this function is only useful with the default SBCS character set.*

Format

Decimal	Hex	ASCII

27 38 0 k1 k2 s1
        d1 ... d11
	1B 26 00 k1 k2 s1
	        d1 ... d11
		ESC "&" NUL k1 k2 s1
		        d1 ... d11

where *k1* is the character code of the first character to redefine, *k2* is the character code of the last character to redefine (any character between 0–255 can be redefined), and   (k1 could equal k2, if only one character is defined).

For each character defined, 12 bytes of data must be supplied, as follows:

where *s1* is the first byte that describes the character format. Bits 0–3 represent the end position in the grid, bits 4–6 represent the start position in the grid, and bit 7 determines whether the character uses the top eight pins or the bottom eight pins of the print head. If bit 7 = 0, the top eight pins are used. If bit 7 = 1, the bottom eight pins are used. The start and end positions are ignored during character imaging, but must be accurate to redefine the character code. *d1...d11* is the data that comprises the dot image pattern of the defined character.

When printable code expansion is enabled with ESC "I", the *Printable Code Area Expansion* function, and the user-defined character set is selected with ESC "%" (1), the *Select User-Defined Set* function, then the codes (less than 20h and greater than 7Fh) can be defined for use and are printable.

When printable code expansion is enabled with the *Enable Printing of Codes 128-255* function, and the user-defined character set is selected with the *Select User-Defined Set* function, then codes (between 80h and 9Fh) can be defined for use and are printable.

For a list of these characters, refer to the *Printable Code Expansion Characters* table on page 87.

Select User-Defined Character Set

A user-defined character set can be selected, after the *Define User-Defined Characters* function is used to define the character set. *Note hhis function is only useful with the default SBCS Character Set.*

Format

Decimal	Hex	ASCII
27 37 1	1B 25 01	ESC "%" (1)

Select Default Character Set

If the *Select User-Defined Set* function was previously set, this function switches back to the default character set. *Note this function is only useful with the default SBCS character set.*

Format

Decimal	Hex	ASCII
27 37 0	1B 25 00	ESC "%" (0)

Enable Printing of Codes 128-255

All codes (128–255) are treated as printable characters, rather than control codes, with this function. This allows the use of these characters for user-defined characters. A user-defined set must be selected, using the *Select User-Defined Set* function, before these characters can print. Factory default disables printing of these codes. *Note this function is only useful with the default SBCS character set.*

This function is only available when the default SBCS character set is selected.

Format

Decimal	Hex	ASCII
27 54	1B 36	ESC "6"

Disable Printing of Codes 128-255

This disables the printing of codes (128–255), set by *Enable Printing of Codes 128–255*. By default, these codes are disabled.

Format

Decimal	Hex	ASCII
27 55	1B 37	ESC "7"

Expand Printable Code Area

This function allows certain ASCII codes (00h to 1Fh) and codes (80h to 9Fh) to be printable when the variable *n* is set to the value of 1. This allows the use of these codes for user-defined characters. If *n* = 0, the function returns these two ranges of characters to non-printable control codes. A user-defined character set must be selected by ESC "%" (1), the *Enable Printing of Codes 128-255* function, before these codes can print. In both ranges, only the following codes can redefine as printable characters. Codes not listed, within the range (00h–1Fh), print as standard control codes. Codes not listed, within the range (80h-9Fh), are converted to a control code in the range of (00h-1Fh), by subtraction of 80h. *Note this function is only useful with the default SBCS character set.*

Format

Decimal	Hex	ASCII
27 73 n	1B 49 n	ESC "I" n

Printable Code Expansion Characters

Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII
00	NUL	11	DC1	80	none	91	none
01	SOH	15	NAK	81	none	95	none
02	STX	16	SYN	82	none	96	none
03	ETX	17	ETB	83	none	97	none
04	EOT	1C	FS	84	none	9C	none
05	ENQ	1D	GS	85	none	9D	none
06	ACK	1E	RS	86	none	9E	none
10	DLE	1F	US	90	none	9F	none

Enable Printing of Character Graphics

The printing of character graphics is enabled, until disabled with the *Disable Printing of Character Graphics* function. *Note this function is only useful with the default SBCS character set.*

Format

Decimal	Hex	ASCII
27 116 1	1B 74 01	ESC "t" (1)

For character values from 0 to 31 (00h–1Fh):

• When the default SBCS codepage is selected, the FX-86e IBM character graphics symbol set is printed.

• When other SBCS codepages are selected, the codes (00h-1Fh), listed above in the *Printable Code Expansion Characters* table are printed.

For character values from 32 to 126 (20h–7Eh):

- When the default SBCS codepage is selected, the selected international character set is printed.
- When other SBCS codepages are selected, the international character set selection is not in effect.

For the character value 127 (7Fh):

- When the default SBCS codepage is selected, a space is printed
- When other SBCS codepages are selected, the character associated with the codepage is printed.

For character values from 128 to 255 (80h–FFh), the FX-86e Epson Character Graphics set is printed.

Disable Printing of Character Graphics
The printing of character graphics is disabled. Factory default disables this function.

Format

Decimal	Hex	ASCII
27 116 0	1B 74 00	ESC "t" (0)

Print Character Graphics
This function allows printing of character graphics from the currently selected SBCS codepage, by sending a graphics string to the printer. The values of the graphics data bytes can range between 0–255.

Format

Decimal	Hex	ASCII
27 43 n d1 ... dn	1B 2B n d1 ... dn	ESC "+" n d1 ... dn

where *n* is the length of the character graphic string and *d1 ... dn* are the character graphics data stream.

The number of data bytes must be equal to the value of the variable *n*. The range of values (for the characters in each graphics data byte): 0–255

For character values from 0 to 31 (00h–1Fh):

- When the default SBCS codepage is selected, the FX-86e IBM character graphics symbol set is printed.
- When other SBCS codepages are selected, currently selected single byte codepage character graphics are printed.

For character values from 32 to 126 (20h–7Eh):

- When the default SBCS codepage is selected, the selected international character set is printed.
- When other SBCS codepages are selected, the character from the currently selected codepage are printed.

For the character value 127 (7Fh):

- When the default SBCS codepage is selected, a space is printed

- When other SBCS codepages are selected, the character graphics symbol is printed.

For character values from 128 to 255 (80h–FFh):

- When the default SBCS codepage is selected, the FX-86e Epson Character Graphics set is printed.

- When other SBCS codepages are selected, the corresponding character is printed.

Graphics Functions

Eight-Pin Graphics Modes

All 8-pin graphics functions require parameters, *n1* and *n2*, which represent the length of the graphics string that follows the *Select Graphics Mode* command, and are calculated as follows (assuming a temporary variable *n*):

n = total number of graphics dots needed for the graphic string
$n2$ = integer of (n divided by 256)
$n1$ = remainder of the $n2$ calculation

The simplest calculation, is to divide *n* (total number of dots needed for the graphics string) by 256. Then *n2* is the quotient (the whole number) and *n1* is the remainder. If you require less than 256 dots (columns), then *n1* indicates the number of dots and *n2* is set to zero.

Select Graphics Mode

The graphic mode, represented by the variable m (*Graphics Modes* table*)* is enabled. The total number of dot columns to print is represented by *n1* and *n2* (see parameter descriptions above). Any graphic string that exceeds the length of the print line is discarded.

Format

Decimal	Hex	ASCII
27 42 m n1 n2	1B 2A m n1 n2	ESC "*" m n1 n2

Reassign Graphics Mode

Graphic modes (shown in table below) can be changed with this function.

Format

Decimal	Hex	ASCII
27 63 s n	1B 3F s n	ESC "?" s n

where *s* is one of the "K," "I," "Y," or "Z" characters and *n* is one of the 0–7 modes as shown in the *Graphics Mode* table on the next page.

Graphics Modes

Mode	m	Dots per Inch / Dots per 8" Line
Single-density	0	60 dots per inch, 480 dots per 8 inch line
Low Speed Double-density	1	120 dots per inch, 960 dots per 8" line
High Speed Double-density *see note*	2	120 dots per inch, 920 dots per 8" line
Low-Speed Quadruple-density *see note*	3	240 dots per inch, 1920 dots per 8" line
CRT I	4	60 dots per inch, 480 dots per 8" line
Single-Density Plotter	5	72 dots per inch, 576 dots per 8" line
CRT II	6	90 dots per inch, 720 dots per 8" line
Double-Density Plotter *see note*	7	144 dots per inch, 1152 dots per 8" line

Note: Adjacent dots, in a given row, cannot be printed in these modes.

Select Single Density Graphics Mode

This is a simple method of printing graphics. The resolution is 60 dots per inch. Each 8-inch line can accommodate 480 columns of graphic dots. A graphic string that exceeds the length of the print line is discarded. Calculating the parameters, *n1* and *n2*, is described on page 89.

Format

Decimal	Hex	ASCII
27 75 n1 n2	1B 4B n1 n2	ESC "K" n1 n2

Select Low-Speed Double Density Graphics Mode

If Single Density graphics does not produce high enough density, try this mode. The number of dots per inch is doubled. However, the speed is reduced to half of what it would be with single density. Calculating the parameters, *n1* and *n2*, is described on page 89.

This is 8-pin single density graphics. The resolution is now 120 dots per inch. Each 8-inch line can accommodate 960 columns of graphic dots. A graphic string that exceeds the length of the print line is discarded.

Format

Decimal	Hex	ASCII
27 76 n1 n2	1B 4C n1 n2	ESC "L" n1 n2

Select High-Speed Double Density Graphics Mode

This 8-pin graphics mode produces the same density as the *Low-Speed Double Density* mode, however, the speed is doubled. Calculating the parameters, *n1* and *n2*, is described on page 89.

Format

Decimal	Hex	ASCII
27 89 n1 n2	1B 59 n1 n2	ESC "Y" n1 n2

The resolution is still 120 dots per inch. Each 8-inch line can accommodate 960 columns of graphic dots. A graphic string that exceeds the length of the print line is discarded. Take care that adjacent dots in a given dot row are not printed.

Select Low-Speed Quadruple Density Graphics Mode

With this 8-pin graphics mode, the number of dots per inch has gone up to 4x what it was in single density. Calculating the parameters, *n1* and *n2*, is described on page 89.

Format

Decimal	Hex	ASCII
27 90 n1 n2	1B 5A n1 n2	ESC "Z" n1 n2

The resolution is now 240 dots per inch. Each 8-inch line can accommodate 1920 columns of graphic dots. A graphic string that exceeds the length of the print line is discarded. Take care that adjacent dots in a given dot row are not printed.

Nine-Pin Graphics Modes

These 9-pin graphics functions also require two parameters, *n1* and *n2*. However, they are calculated slightly different than in the 8-pin graphics modes. Since each dot column to print must be represented by two data bytes, the total length of the graphic string (following the *Select … Graphics Mode* command) needs to first be divided by two. These parameters are calculated as follows (assuming a temporary variable *n*):

n = total number of dots needed, divided by 2
$n2$ = integer of (*n* divided by 256)
$n1$ = remainder of the n2 calculation

First, divide *n* (the total number of dots needed for the graphics string) by 2, then divide the result by 256. Then *n2* is the quotient (the whole number) and *n1* is the remainder. If you require less than 256 dots (columns), then *n1* indicates the number of dots and *n2* is set to zero.

Select 9-Pin Single Density Graphics Mode

Single density, 9-pin graphics mode is enabled. Calculating the parameters, *n1* and *n2*, is described previously under *Nine-Pin Graphics Modes*.

Format

Decimal	Hex	ASCII
27 94 0 n1 n2	1B 5E 00 n1 n2	ESC "^" (0) n1 n2

The resolution is 60 dots per inch. Each 8-inch line can accommodate 480 columns of graphic dots. A graphic string that exceeds the length of the print line is discarded.

Select 9-Pin Double Density Graphics Mode

Double density, 9-pin graphics mode is enabled. Calculating the parameters, *n1* and *n2*, is described previously under *Nine-Pin Graphics Modes*.

Format

Decimal	Hex	ASCII
27 94 1 n1 n2	1B 5E 01 n1 n2	ESC "^" (1) n1 n2

The resolution is now 120 dots per inch. Each 8-inch line can accommodate 960 columns of graphic dots. A graphic string that exceeds the length of the print line is discarded.

Page Layout for Fanfold Paper

Printable Area

The following illustration shows the printable area of the lower section of a page of fanfold paper and the upper section of the next page. The *Assured Print Area* is the best overall area in which to use for printing:

Paper width

Assured Print Area

8 inches Max.

(area 2)

0.75 inch
(or more)

(area 2)

0.75 inch
(or more)

Assured Print Area

55 lines max. (at 1/6" line spacing)

Paper End Detection Position

Abcdef...

...Xyz

1 inch

(area 1)

1.8333 inches (11 lines)
(area 3)

Perforation

1 inch

(area 1)

Abcdef...

...Xyz
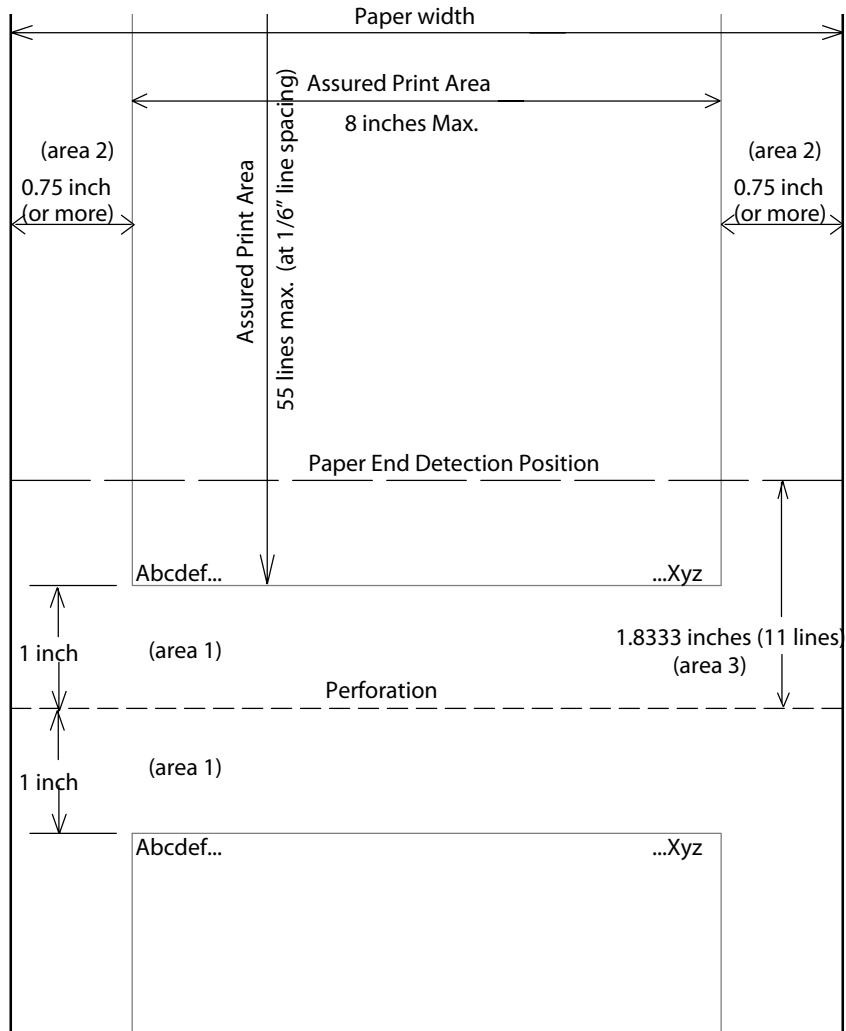
Generally, you should leave a 1-inch margin at both the top and the bottom of the page. This provides for a margin of six lines at 1/6 inch line spacing. Even though printing in area 1 (before or after the perforation) may be possible, you should keep in mind that paper feed precision is reliable only within the *Assured Print Area*.

However, consider the following:

- The top and bottom margins are represented by *Area 1*, as shown in the previous illustration. The top margin is defined as the distance between the top edge of the paper and the first row of printed characters. The bottom margin is defined as the distance between the last row of printed characters and the bottom edge of the paper.

- There is a possibility that printing can start within one line below the perforation and printing could continue beyond the *Assured Print Area*, however paper feed precision is only reliable with top and bottom margins of approximately one inch. Basically, you should consider there are only 55 lines available for reliable printing.

- The left and right margins are represented by *Area 2*. For reliable printing, use a margin of at least 0.75 inch at the left and right edges of the paper.

Paper End Detection

The *Paper End Detection* line shown in the previous illustration represents the point at which the *Paper Out* sensor detects the bottom edge of the paper.

Area 3 represents the the distance between the the Paper End Detection position and the bottom edge of the page.

Once the last page of the fanfold paper stack is in the printer, and the print head has advanced past this *Paper End Detection* line, printing is no longer reliable.

Also, once the bottom end of the last page has advanced through the printer, past the spring plate along the front of the platen, the paper should not reverse back through the printer, because the printer could jam and cause paper feed problems. Design applications to prevent any reverse paper feed from occurring after the *Paper Out* sensor has detected the bottom edge of the paper.

6 Bluetooth Adapter

This chapter provides general information and configuration information about the Bluetooth adapter that you may have upgraded to for your 6820 Printer.

About the Bluetooth Adapter

The Bluetooth adapter connects to an internal serial port of the 6820 Printer, providing serial print data over a transparent Bluetooth link, running a Serial Port Profile (SPP).

Once your 6820 Printer is upgraded to Bluetooth with this adapter, the 6820 Printer no longer supports NPCP (Norand® Portable Communications Protocol), and instead prints using the Epson DTR mode. Printing is primarily accomplished over a Bluetooth link using the SPP protocol with a 700 Series Computer. If the relevant printer configuration allows it, a 700 Series Computer in a terminal holder charges normally.

The Bluetooth adapter allows for four states or modes to be available. Each state is dependent upon either the pin states on the terminal holder connector or the programming connector on the adapter described later.

State	State/mode	HHC_A/B pin	HHC_DTR pin	Comments
1	Bluetooth Printing	0	0	Bluetooth printing/Bluetooth self-test
2	Pass-through printing	0	1	Printing from 700 Series or CK60 Handheld Computers allowed to pass-through the Bluetooth adapter transparently.
3	Bluetooth Reconfiguration	1	0	Reconfiguring Bluetooth module via 700 Series or CK60 Handheld Computer
4	Bluetooth programming cabled	X	X	Programming Bluetooth module via programming cable

- State 1 — In addition to allowing normal Bluetooth printing, this state also allows for a 700 Series or CK60 Handheld Computer in the terminal holder to perform a Bluetooth self-test.

- State 2 is a Transparent Pass Through mode available for all 700 Series and CK60 Handheld Computers. During this mode, the Bluetooth module is shut down and does not communicate.

- State 3 (Bluetooth reconfiguring using a 700 Series or CK60 Handheld Computer). This state is unavailable when a 700 Monochrome Computer is used, since the A/B pin is unavailable.

- State 4 allows for programming the Bluetooth module via its SPI pins. This state is also used for manufacturing tests. To be in this state, the 700 Series or CK60 Handheld Computer must not have an open terminal holder COM port and the specially designed programming adapter must be engaged.

Bluetooth Adapter Indicators

The interfaces on the Bluetooth adapter that allow for the different modes are detailed below:

700 Series or CK60 Handheld Computer to 6820 Pass Through

Note: Pass through printing requires shutting down the Bluetooth portion of the adapter. To reenable Bluetooth functionality after you finish pass through printing, press a button on the control panel to wake the printer.

When DTR on the 700 Series or CK60 Handheld Computer is set, the adapter board automatically opens a path between the 700 Series or CK60 Handheld Computer and the 6820 Transition/DC Board and powers down the Bluetooth module. Testing the DSR pin to reflect DTR allows the mobile computer to differentiate between a Bluetooth-equipped terminal holder and a non-Bluetooth equipped terminal holder.

700 Series or CK60 Handheld Computer to Bluetooth Module Communication Interface

The Bluetooth adapter allows a 700 Series or CK60 Handheld Computer to communicate directly with the Bluetooth module under two circumstances.

• When the configuration settings of the Bluetooth module are to print.

• When the Bluetooth module requires reconfiguration.

Bluetooth Adapter Power Management Flow
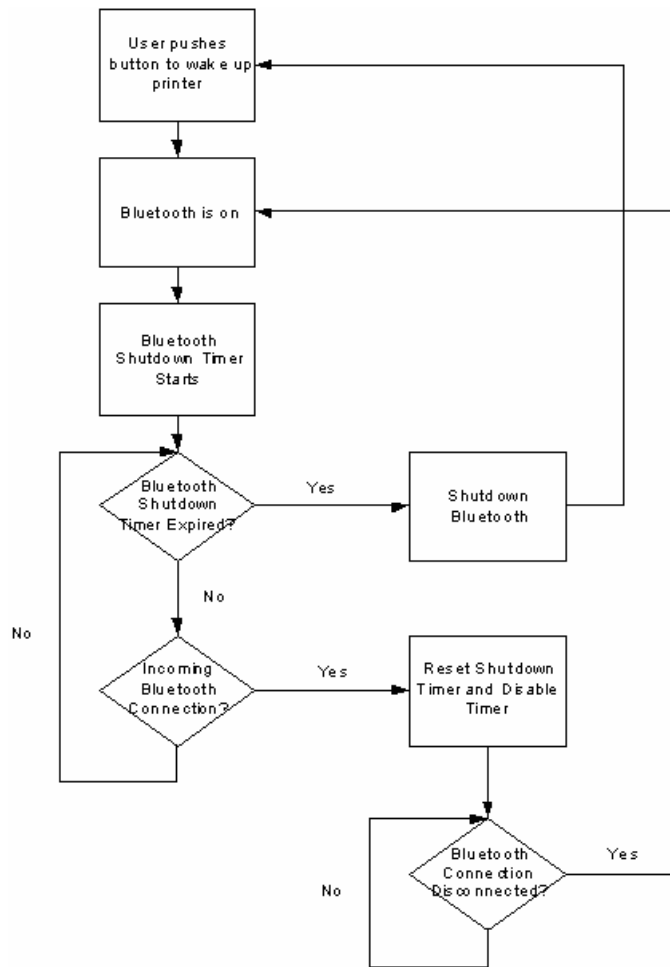
Bluetooth Power Management Flow Diagram

Radio Power On/Off Mechanism

Note: The shutdown timer configuration is addressed in Appendix A, "*Bluetooth Configuration Commands*."

As stated earlier, the Bluetooth adapter, including the Bluetooth radio shuts down after a configurable time (default is two hours). To wake the Bluetooth adapter, the 6820 Printer is powered on by any button push on the printer control panel. There are two ways to shutdown the Bluetooth module power:

• A 700 Series or CK60 Handheld Computer initiates a pass through mode, or

• The Bluetooth module sends a shutdown signal after a configurable amount of time. Default is two hours.

Security

The adapter complies with Bluetooth 1.1 specification, including bonding for authentication and enabling encryption.

Persistent Storage

These settings do not reset after a cold-boot is performed on the printer:

- Bluetooth Bonding Enablement/Disablement
- Bluetooth Encryption Enablement/Disablement
- Bluetooth Passkey
- Bluetooth Bonding List (Link Keys)
- Bluetooth Device Name
- Bluetooth Class of Device
- Discoverable setting
- Connectable setting
- Radio Shutdown Timer Timeout (default two hours)

System Behavior/Software Considerations

- Discoverability — The default mode is Discoverable. When configured to be Discoverable, the adapter is discoverable at all times, except when an active Bluetooth connection exists.
- Connectability — The default mode is Connectable. When configured to be Connectable, the printer is connectable at all times, except when an active Bluetooth connection exists.
- Link Loss — The 6820 Bluetooth adapter is able to recover from broken Bluetooth connections, including out of range, interference, power failure, or any other condition resulting in a broken connection. It returns to its previous Discoverable/Connectable state after a lost connection.
- Master/Slave — Printer shall participate in a Bluetooth connection as the Slave device.
- The Class of Device is 0x040680 which translates to a Service Class of Rendering, a Major Device Class of Imaging, and a Minor Device Class of Printer.
- The 6820 Bluetooth includes an SDP record that allows the printer to report an SPP instance with a Service Name of "Wireless Printer".
- The default Bluetooth Device Name is 6820-DDEEFF, where DDEEFF matches the respective portion of the Bluetooth Device Address (AA:BB:CC:DD:EE:FF). If the printer the adapter is connecting to is known, the Device Name is changed to 6820-SN, where SN is replaced with the serial number of the 6820.
- The 6820 Bluetooth adapter can save 16 link keys across cold boots. Link keys are saved in a circular list. The 17th link key replaces the first, the 18th replaces the 2nd, and so on.

Remote Configuration

You can query the following items:

- Discoverable State [Get/Set]

- Connectable State [Get/Set]

- Bondable State [Get/Set] *(Authentication)*

- Encryption State [Get/Set]

- Device Name [Get/Set]

- Device Address[Get]

- Class of Device[Get/Set]

- Service Name [Get/Set]

- Bluetooth Profile [Get]

- Bluetooth Passkey [Set] *(Get the fact that it is set)*

- Radio Shutdown Timeout

Bluetooth Performance

- Range — Operating range is expected to range from a minimum separation of 10cm to over 10m with a 700 Color or CK60 Handheld Computer.

- Link Loss can occur when going in or out of range while communicating with other Bluetooth devices. Degradation in range and data throughput is expected when in automobile cabins or when involved in intermittent loss of line-of-sight *(communications across a busy road)*.

Diagnostics Capabilities

Radio Self Test

The Bluetooth radio settings are available to a user. The 6820 Bluetooth adapter sends a print out of Bluetooth information to the printer upon receiving a message from a 700 Series or CK60 Handheld Computer in a terminal holder.

The self-test appears like the following.

```
6820 Bluetooth Adapter
Firmware:     Version YYYY MMDD HHMM

Bluetooth Configuration:
  Device Address: 0002371A0FD3
  Device Name:    6820-9843252
  Discoverable:   Yes
  Connectable:    Yes
  Authentication: No
  Encryption:   No
  Passkey:    Not Applicable (or Key present if Authentication is enabled)
Stored Link Keys: 2 of 16

Power Management:
  Shut Off Timer: 120 minutes
```

The Passkey entry either states "Not Applicable" or "Key Present" depending on the Authentication state. Tabs ensure items line up in columns as shown in this example.

Applications

A 6820 Bluetooth Information application that prints the Bluetooth self-test information on the 6820 Printer can be installed on your 700 Series or CK60 Handheld Computer. Do the following to use this application:

1 Insert the 700 Series or CK60 Handheld Computer in the terminal holder on the 6820 Printer.

6820 BT Information

2 From the 700 Series or CK60 Handheld Computer, tap **Start** > **Programs** > the **6820 BT Information** icon.

3 On the 6820 Printer, press the **SET PAGE** button on the printer control panel to "wake" the printer.

4 From the 6820BT Self-Test screen, tap **Trigger Self Test** to print the information.

Note: A GUI tool for Adapter configuration is not a deliverable of this product. The adapter is configurable via the Bluetooth Configuration Commands. See Appendix A, "*Bluetooth Configuration Commands*" for details.

System Qualification

Operation Resilience

Normal operation of the Bluetooth system is available in environments with radio backbones, including 802.11b, Spectrum 24, and OpenAir technologies.

Environmental Specifications

Temperature

The device must operate from -20°C to +60°C, and must be capable of non-operating storage from -30°C to +70°C.

Test	Range	Comments
Operating Cold to Hot Transition	–20° C to 50° C	External condensation allowed, internal prohibited
Operating Hot to Cold Transition	50° C to –20° C	Speed shall not degrade
Humidity		5% to 95% RH non-condensing
Operating		90% 25 – 60° C (no condensation)
Storage		90% 25 – 60° C (no condensation)

Altitude

–100 to 5000 meters

Vibration

Quasi-Random 3 axis		12g RMS, for four hours
Dynamic Induced Shock		20g on 3 axis
Operating		1G 5 Hz to 80 Hz
Storage		3G 5 Hz to 80 Hz
When packed	Frequency	5 to 55 Hz
	Acceleration	2 G
	Sweep	10 minutes (half cycle)
	Duration	1 hour
	Directions	x, y, and z

No external or internal damage should be found after the vibration test, and the unit should operate normally.

Unpackaged Drop

2 feet to concrete

Terminal Inspection

Minimum of 30,000 insertions for the terminal holder.

Safety/Regulatory/Agency Requirements

The Bluetooth adaptor within the 6820 Printer, including all options, must meet these electrical safety requirements for Information Technology Equipment. The test configuration must include a portable computer connected to the 6820 Printer, continuously printing the letter "H". At least 6dB of margin below the relevant limits must be demonstrated.

Product Safety	UL Listed per UL 1950 / UL 60950 (Printer and AC power supply) CSA C22.2, No. 950
	TUV/GS License per EN 60950 *(Printer, ac power supply)* CB Report for EN 60950 covering all country deviations *(Printer, ac power supply)*
	UL 2089 (for cigarette lighter-style adapters)
Vehicle Power Interfaces	SAE J1113 or ISO 7637
EMC	
Digital device radiated and conducted emissions	FCC Class B (US); Industry Canada ICES-003 Class B (Canada)
	CISPR 22 Class B, including telecom port conducted (Europe)
	AS/NZS 3548 (Australia/New Zealand); CNS 13438 (Taiwan)
EN 55024 Immunity	IEC 61000-4-2 Electrostatic Discharge
(Europe)	IEC 61000-4-3 Radiated RF Field
	IEC 61000-4-4 Electrical Fast Transients
	IEC 61000-4-5 Surge
	IEC 61000-4-6 Conducted RF
	IEC 61000-4-8 Magnetic Field
	IEC 61000-4-11 Voltage Dips and Interrupts (AC printers only).
AC power supply (Europe)	IEC 61000-3-2 (per Amendment 14) Class A if under 70 Watts loaded to 90% of rated value, Class D if over 70 Watts loaded to 90% of rated value
	IEC 61000-3-3 Voltage Fluctuation and Flicker.
Radio Type Approval	Bluetooth Radio - Modular radio approval is required. BT SIG approval is not mandatory but BT SIG GAP and SPP conformance is a prerequisite.
	FCC Part 15.247 (US)
	RSS-210 (Canada - indoor operation, unlicensed. Outdoor operation IF restricted to 2.450-2.4835GHz)
	RSS-139 (Canada - indoor/outdoor operation, licensed. 2.400-2.4835GHz)
	RSS-102 (Canada) - RF Exposure/SAR. Keep antennas more than 8 inches from operator to avoid SAR testing
	EN 300 328-1 & -2; EN 300 489-1 & 17 (Europe).
	SCT (Mexico)
Additional Approvals	IEC950 2nd Edition, 4th Amendment or IEC 60950 3rd Edition, resulting in a GS Mark and a CB Report addressing all country deviations
	S Mark for Argentina for any device connecting directly to the AC mains·
	CCIB Approval for China for any device connecting directly to the AC mains·
	Mexico NOM 19 as applicable

Default Configuration

Bluetooth Authentication	Off
Discoverable	True
Connectable	True
Class of Device	0x040680
Service Name	Wireless Printer
Device Name	6820-DDEEFF
Baud Rate	19,200
Data Bits	8
Stop Bits	1
Parity	None
Handshaking	Hardware
Radio Shutdown Timeout	120 Minutes

7 Troubleshooting and Diagnostics

This chapter helps you correct printing problems that may occur. If you experience a printing problem, you can perform several tests to find and possibly cure the problem.

This chapter also contains troubleshooting strategies for the 6820 Printer, and a detailed listing of the Diagnostics Information table.

Checking the Power Source

Press any key on the printer control panel. If there is power, the power indicator (green LED) turns on and the print head moves to its starting position. If the printer emits beeps and any of the other indicators light up or flash, observe the number of beeps and indicator flashes and refer to the *Printer Failure Indicators* table on page 119.

If there is no reaction from the printer after you press a key on the control panel, or only the green power light blinks, verify that the power cables are properly connected between the printer mechanism and its power source (internal battery, vehicle cable, or ac). If none of these steps "wake" up the printer with the problem, then you need to return the printer for service.

- **Internal battery**: Check the battery and its cable by installing into another known-good printer.

- **Vehicle cable**: Attach the printer in question to another vehicle power cable.

- **AC power**: Plug the printer into another outlet.

Self-Test Failure

If a partial report generates and a printer error occurs during printing, refer to the table on the next page for troubleshooting help.

If the printer does not generate a report:
- There may be a printer failure, refer to the troubleshooting table on the next page for possible solutions.

- There may be a power failure, check the power source (internal battery, charge cable, or ac adaptor).

Printer Mechanism Alignment

If head jams are occurring, the alignment of the printer mechanism may need correction.

Open the printer top cover, then install a ribbon cartridge (see page 16) and position the print head to the far left toward the green thumb wheel. Observe the area between the print head and the printer cavity (circled in the following illustration). If the ribbon cartridge touches the pivot frame or press nut, the printer mechanism needs realignment.
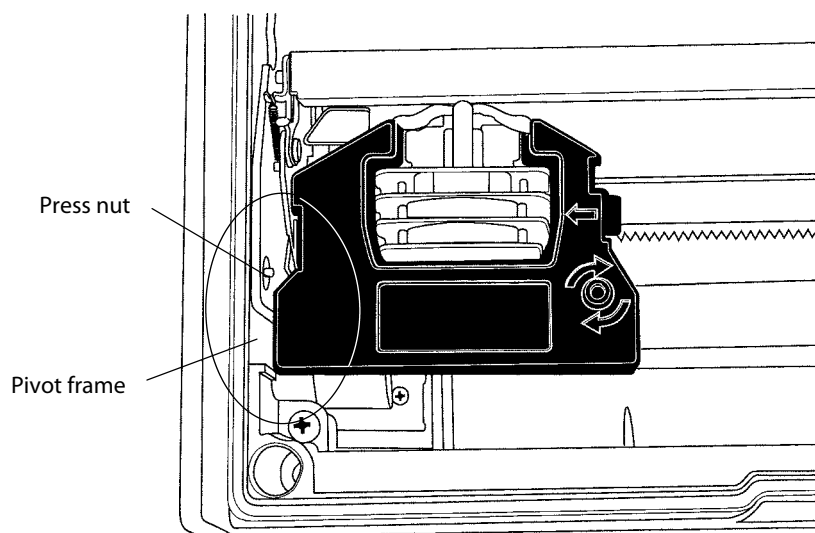
This illustration shows the print head to the far left in the printer.

1 Loosen the four screws that hold the mechanism in place using a Phillips screwdriver (see the following illustration).

2 Realign by pushing the printer mechanism to the right, *away from the green thumb wheel.*

3 Push on the right side of the printer mechanism to the back as far as it will go.

Note: In this position, the right back edge of the printer mechanism may touch the pivot frame. The left side must NOT touch the pivot frame.

4 Hold the printer mechanism in this position and *securely* tighten the screws in the sequence shown.

3 Top
Left

1 Top Right

Push mechanism
to the back

2 Bottom Left

4 Bottom Right

Push mechanism to the right.
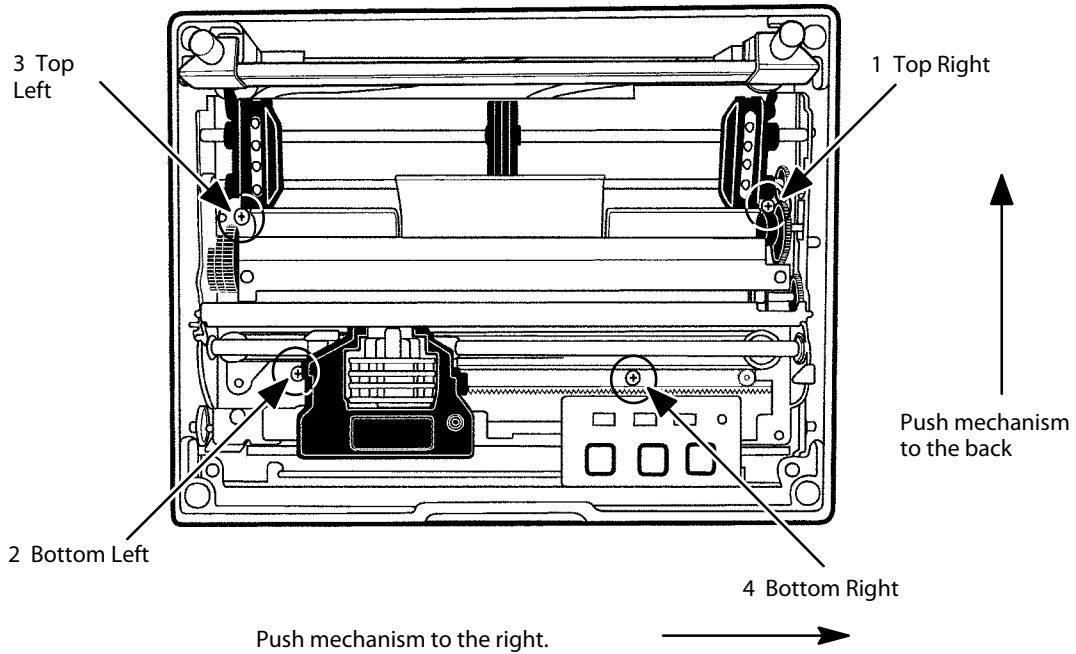
The four position screws that hold down the printer mechanism are shown in this illustration. Be sure to do the screws in the order given.

The position of the print head should NOT touch the pivot frame or press nut. If the print head does touch the pivot frame or press nut, return the printer for hardware repair.

Communications or Host Computer

The self-test report can verify that the communications protocol options selected for the printer match those expected by the host computer. If these options do not match, then reconfigure the printer using the control panel configuration modes.

If the protocol options do match, then the data communications cable may be defective. Verify that the cable is working by substituting a new cable or host computer. Also, check the computer vehicle dock.

Communications Pin-Out Configurations

Below are common cable configurations between a mobile computer or a dock and the printer:

	Mobile Computer			Wall Mount Printer or Remote Mount Terminal Holder
	Signal Name	Pin #	Pin #	Signal Name
		shield		
	Chassis Ground	shell ——	1	NC (No Connection)
	Charge Input	8 ——	9	HHC_CHARGE
	SG (Signal Ground)	9 ——	7	GND
	DSR (Data Set Ready)	7 ——	6	DTR
	DTR (Data Terminal Ready)	2 ——	20	NC
	CTS (Clear To Send)	6 ——	5	RTS
	RTS (Ready To Send)	3 ——	4	CTS
	RXD (Receive Data)	5 ——	3	TXD
	TXD (Transmit Data)	4 ——	2	RXD
	Dock_A/B_SW	NC ——	12	Term A/B

8   15
1   9

13   25
1   14
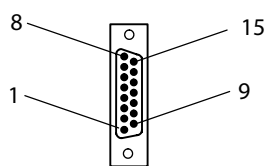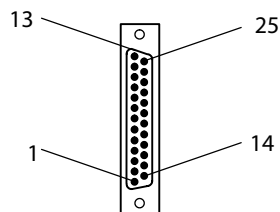
15-Pin DSUB Male   25-Pin DSUB Male

15-Pin to 25-Pin Cable P/N: 216-605-XXX

PC   Wall Mount Printer

Signal Name	Pin #	Pin #	Signal Name
DTR (Data Terminal Ready)*	20 —— 20		NC (No Connection)
RC (Receive Carrier)	17 —— 17		NC
TC (Transmit Carrier)	15 —— 15		NC
DCD (Data Carrier Detect)	8 —— 8		NC
SG (Signal Ground)	7 —— 7		GND
DSR (Data Set Ready)*	6 —— 6		DTR
CTS (Clear To Send)	5 —— 5		RTS
RTS (Ready To Send)	4 —— 4		CTS
RXD (Receive Data)	3 —— 3		TXD
TXD (Transmit Data)	2 —— 2		RXD

* Signals are not available on the 6100 Dock
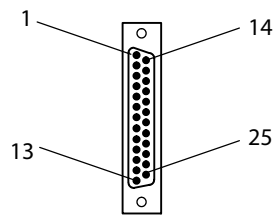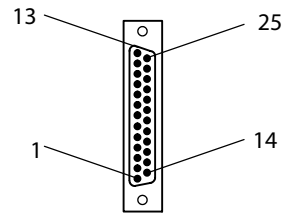
25-Pin DSUB Female   25-Pin DSUB Male

25-Pin to 25-Pin Cable P/N: 216-771-XXX

PC   Printer

Signal Name	Pin #	Pin #	Signal Name
TXD (Transmit Data)	3 —————— 4		RCT
RXD (Receive Data)	2 —————— 5		TXD
RTS (Ready To Send)	7 —————— 3		CTS
CTS (Clear To Send)	8 —————— 6		RTS
DSR (Data Set Ready)	6 —————— 7		DTR (Data Terminal Ready)
SG (Signal Ground)	5 —————— 9		GND
	shield		
Chassis Ground	shell ——— shell		Chassis Ground
. . . .	8		Terminal Charge out to computer
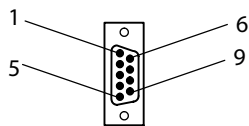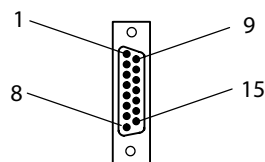
9-Pin DSUB Female   15-Pin DSUB Female

9-Pin to 15-Pin Cable P/N: 226-016-XXX

Dock   Printer w/ 6210 Terminal Holder

Signal Name   Pin #   Pin #   Signal Name

TXD (Transmit Data)   2 ———— 4   RXD
DTR (Data Terminal Ready)   20 ———— 2   NC (No Connection
RTS (Ready To Send)   4 ———— 3   CTS
RXD (Receive Data)   3 ———— 5   TXD
CTS (Clear To Send)   5 ———— 6   RTS
DSR (Data Set Ready)*   6 ———— 7   DTR
SG (Signal Ground)   7 ———— 9   GND
                                         shield
                                 open ———————— shell

* Signal is not available on the 6100 Dock
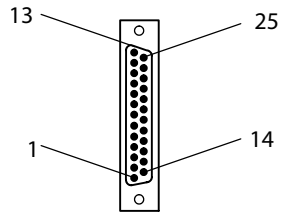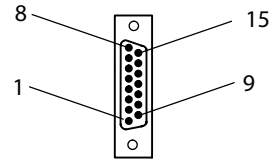
25-Pin DSUB Male   15-Pin DSUB Female

25-Pin to 15-Pin Cable P/N: 226-162-XXX

PC   Printer

Pin #   Pin #

7 ———— 6
5 ———— 5
3 ———— 3
2 ———— 2
8 ———— 1

5   9   1   6
1   6
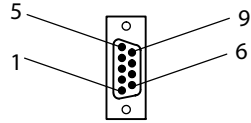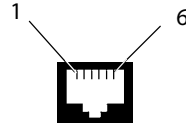
9-Pin DSUB Male   RJ-11 Jack

Data Communications Cable P/N: 226-270-XXX

The printer has a 25-pin connector with the following pinout designations and signal mnemonics:

Printer Communications Connector Pin-Outs

15-Pin D-Sub	25-Pin D-Sub	Signal Name	Type	I/O	Description
1	NC	NC	– – –	– – –	NC (No Connection)
2	20	NC	– – –	– – –	NC
3	4	CTS (Clear To Send)	RS-232	IN	Wake up
4	2	RXD (Receive Data)	RS-232	IN	Printer's RxD
5	3	TXD (Transmit Data)	RS-232	OUT	Printer's TxD
6	5	RTS (Ready To Send)	RS-232	OUT	IrDA baud rate select
7	6	DTR (Data Terminal Ready)	RS-232	OUT	IrDA baud rate select
8	9	HHC_CHARGE	POWER	OUT	7.5–15 V, up to 1 A per contact
9	7	GND	POWER		SG (Signal Ground)
10	NC	NC	– – –	– – –	
11	11	IO_SENSE	0–5 V ANALOG	IN	Analog input signal for I/O board type detection. Normally tied to +5 V.
NC	12	DOCK_A/B_SW	– – –	IN	Bluetooth Adapter configuration signal
12	18	IOB_RESET	TTL	OUT	Signal to hold I/O board in reset.
13	25	TTL_POWER	POWER	OUT	Power for I/O board logic (never shuts off)
14	NC	NC	– – –	– – –	
NC	NC	NC	– – –	IN	Switched 5 V from computer.
NC	NC	V_IN	– – –	– – –	Unswitched input power from printer.

Troubleshooting

The printing system is composed of four basic components: Printer, Computer, Power Source, and Communications. Any one of these components can prevent the printer from functioning properly.

Verifying the Printer Components

Power Source Verification

Start by verifying that power is available at the printer. Visually inspect the control panel to verify that the power indicator (Green LED) is lit. If it is not, press the **SET PAGE** button and note if the power indicator lights up. If it does, the power system is all right. If it does not, press the printer reset button. If the power indicator still does not light, check the power cable, by connecting it to a different printer. If the power indicator works on the new printer, then the cable is all right, and the printer that was originally connected is suspect. If it does not light, then the problem is most likely the cable or the power source. Depending on the results, either replace the cable or return the printer for service.

Printer Verification

If the power indicator works properly and the printer still does not print, then printer errors are noted. If any indicators light when the **SET PAGE** button is pressed, or the printer beeps, then refer to the *Printer Failure Indicators* table to determine the problem.

If none of the listed conditions are indicated by the beep codes and LEDs, yet the printer does not perform properly, then perform a printer self-test. Press and hold (for several seconds) the **FORM FEED** and **SET PAGE** buttons at the same time, until the printer beeps and all indicator lights come on. The lights change throughout the test, as it progresses.

At the end of the self-test, the printer generates a report. This report verifies the following: errors detected during self-test, the error history, and the communication configuration. If the printer self-test report does not print, then reset the printer. If the report does print after resetting, then the printer is all right and the reason the printer does not respond to host computer print requests is probably communications or host computer related. If the report is partially completed, and a printer error occurs during the printing of self-test, refer to the *Printer Failure Indicators* table for the cause of the printer failure.

Perform a Power On Self-Test (POST) to test for errors either by resetting the printer or powering it up. If any errors, audible error codes, along with indicator light status, are produced during POST (see the *POST Error Codes* table).

If the POST completes without error, try the printer self-test again. If self-test prints correctly this time, but the printer does not respond to the host computer, then the problem may be communications or host computer related. If errors are encountered during POST, contact Customer Support for assistance.

Communications / Host Computer Verification

Use the self-test report to verify that the communications protocol options, selected at the printer, match those expected by the host. If they do not match the expected results, reconfigure the printer using the control panel configuration modes described below in the Configuration part of this chapter.

If the protocol options match, then the communications cable may be defective. To determine if the cable is working, substitute a new cable. If the host computer is suspect, substitute a different host computer. A defective computer dock might be another possibility.

Error Handling

Printer Errors are divided into several classes: POST errors, Run-Time errors, and Fatal errors (consisting of flash write errors and EEPROM block errors).

Run-Time Errors

Run-time errors can occur during the course of printing. These errors are displayed on the LEDs, along with beep sequences. This causes the printer to stop printing and enter an error state. Then beep sequences are emitted, LED codes are displayed, the error status may be sent to the host (depending on the protocol), and the printer goes into suspend mode.

The printer exits from the suspend mode when the user presses one of the keyboard keys or communications is resumed from the host. The printer also places the print head in its home position and attempts to recover from the error condition. Until the error condition is corrected, the error procedure does not end, and the error state is not removed.

For **PAPER OUT** errors, the user must load paper and press the **SET PAGE** button before printing begins. The paper may be loaded to the top of form, either manually or automatically, by pressing the **FORM FEED** button to wake the printer from suspend mode.

For a listing of run-time errors, refer to the following table.

Printer Failure Indicators

Sets of Beeps	PAPER OUT	HEAD JAM	LOW BATT	Meaning
1 beep	OFF	OFF	ON	12V under voltage fault (Low Battery)
1 set of 2 beeps	OFF	OFF	2 blinks	12V over voltage fault (Input Voltage too high)
1 set of 3 beeps	OFF	OFF	3 blinks	24V under voltage fault (internal power supply failure)
1 set of 4 beeps	OFF	OFF	4 blinks	24V over voltage fault (internal power supply failure)
1 set of 13 beeps	OFF	OFF	OFF	Configuration error
2 sets of 2 beeps	OFF	2 blinks	2 blinks	Print head over temperature
2 sets of 3 beeps	ON	OFF	OFF	Paper Out
2 sets of 4 beeps	OFF	ON	OFF	Head Jam
2 sets of 5 beeps	5 blinks	5 blinks	5 blinks	Paper feed current fault *(Possible paper jam or feed motor failure)*
3 sets of 2 beeps	3 blinks	OFF	3 blinks	Print head over current (Print head failure)
3 sets of 4 beeps	OFF	3 blinks	OFF	Home switch failure
4 sets of 2 beeps	4 blinks	4 blinks	OFF	Print head short (Print head failure)
4 sets of 4 beeps	Erratic	Erratic	Erratic	Flash write error
12 sets of 12 beeps	OFF	OFF	OFF	Operating System software failure

The most common errors consist of Paper Out, Low Battery, and Head Jam. The other errors listed are of rare occurrences, but are provided for good printer diagnostics in the event failures should occur.

Power-On Self-Test (POST)

When the printer is reset, it performs a POST to verify other reasons the printer might be failing. Audible error codes, along with indicator light status, are produced during POST if an error is encountered, as listed in the *POST Error Codes* table.

A printer diagnostic cable, connected between the host computer and the printer, is used during POST to: configure the printer, access printer diagnostics, update software, and install new fonts.

To install the diagnostic cable: connect the phone plug into the phone jack on the printer, then connect the 9-pin DSub plug into the host computer.

After installing the diagnostic cable, reset the printer to initiate POST.

POST Errors

POST errors only occur after a push button reset, or an initial application of power to the printer. After the reset button is pressed, the LEDs (on the printer control panel) indicate the progress of POST. The first LED to light should be the power indicator (Green LED). A single beep should be heard immediately after this LED lights up to indicate the printer is active.

During the course of POST, the other LEDs light to indicate progress throughout the tests. If a POST failure is detected, the printer emits one of the following printer LED error codes and beep sequences.

POST Error Codes

Long Beep	Short Beep	PAPER OUT	HEAD JAM	LOW BATT	Power	Meaning
0	1	OFF	OFF	OFF	ON	*Operational*
0	0	OFF	OFF	OFF	OFF	No Power
0	0	OFF	OFF	OFF	ON	Control program Initial Program Load (IPL) successful
0	0	ON	OFF	OFF	ON	Diagnostic mode command check
0	0	ON	ON	ON	ON	Control program IPL
1	1	OFF	ON	OFF	ON	Invalid CRC on boot block
1	2	OFF	ON	ON	ON	Invalid CRC on control program or program not found
1	4	OFF	OFF	OFF	ON	Lower 64K RAM failure
1	4	OFF	OFF	ON	ON	Upper 64K RAM failure
1	5	ON	OFF	ON	ON	Diagnostic flash memory check failed or is not initialized
1	5	ON	ON	OFF	ON	Diagnostic memory write failure

After completion of the tests, all LEDs are turned off and there is an attempt to place the head in the home position. Until the next time the printer is reset and POST is performed, only run-time errors or fatal errors are reported.

Fatal Errors

Two types of fatal errors exist: Flash Write Errors and Printer Configuration Block Errors. These errors are extremely rare, but measures are built into the printer diagnostics to track possible occurrences.

Flash Errors

Errors related to writing or erasing flash are critical errors. These critical errors cause the printer to stop all processing and output an LED code and a sequence of beeps. The LED code represents the address of the segment that the error occurred on in octal notation. The octal digit changes every four beeps until four octal digits have been output. Only four octal digits are output since blocks are 256 bytes in size and flash can be addressed with a total of 0x7ff blocks. Note that the segment address output is the runtime address of the flash block and not the offset of the block within flash. To obtain the block offset within the flash, subtract 0x800 from the address output.

After the error code is processed, the printer enters suspend state. When the printer resumes, the error again is output and suspend reentered. A reset is required to eliminate the error condition. Flash write errors may be unrecoverable. If this is the case, the printer requires servicing by qualified technicians.

EEPROM Configuration Errors

Errors related to an invalid configuration block (diagnostic block) produce 13 beeps once, and then the printer suspends. It continues to produce this symptom, until the configuration block error is corrected. No LEDs light. This error may be caused by a flash write error or merely lack of proper printer configuration. If the error cannot be corrected by a reset of the printer, then the printer needs to be serviced by a qualified technician.

Self-Test Function Descriptions

Self-test consists of the following functions.

Boot Block Program Verification

A CRC (Cyclic Redundancy Check) is performed on the bootblock program. The calculated CRC is compared to the CRC embedded in the program module.

Control Program Verification

A CRC is performed on the control program, which is loaded into writable flash program memory. The calculated CRC is compared to the CRC embedded in the program module. The results of this test are printed on the self-test report.

Font Module Verification

A CRC is performed on the font modules, which are loaded into writable flash font memory. The calculated CRC is compared to the CRC embedded in the program module. The results of this test are printed on the self-test report.

A2D Check

Current reading of the A2D sources are performed, and the results are printed on the self-test report.

Nonvolatile Diagnostic Memory Verification

A CRC is performed on the area of the nonvolatile diagnostic memory that has a CRC over it. The results of this test are printed on the self-test report.

Nonvolatile Diagnostic Memory Update

The nonvolatile diagnostic memory is updated from the nonvolatile diagnostic memory data shadowed in memory.

Detailed Printer Self-Test

Self-test is user-selectable, verifies printer functions, and provides reporting of printer diagnostics. It performs a series of internal diagnostics and prints the results. When self-test begins, the beeper sounds for half a second and all LEDs turn *on* for half a second.

Initiating Self-Test

Self-test is initiated by simultaneously pressing both the **LINE FEED** and **SET PAGE** buttons on the control panel, while the printer is idle or asleep.

Terminating Self-Test

Self-test can be terminated manually, during the test, by simultaneously pressing both the **LINE FEED** and **SET PAGE** buttons.

Self-Test Report

Note: This method is recommended for determining printer functionality.

A self-test is equivalent to a warm start. Both are performed when you simultaneously press the **FORM FEED** and **SET PAGE** buttons on the control panel for a few seconds. Release these buttons when the printer beeps and all indicators are lit. If the buttons are held too long, the self-test will not happen and the printer will form-feed one page.

As the self-test progresses, the indicator lights change. Internal tests are performed and a 2-page report is printed. This report provides helpful information in diagnosing and troubleshooting printer problems. When the self-test is performed, the following actions occur:

Note: to abort the self-test can by pressing a button while the report is printing.

- All LEDs are turned on to verify the lights work
- A 600 ms beep is emitted to verify the beeper works
- LEDs flash individually to show progress during internal tests
- Current voltage and ambient temperature are obtained
- Validity of diagnostic block program is checked
- Validity of BootBlock program is checked
- Validity of control program is checked
- Validity of loaded fonts is checked
- LEDs turn off
- Self-test report is printed

Printer capability is diagnosed by printing the report. Device errors are displayed on the LEDs and emitted by the beeper. The printer then does a warm reset (soft reboot) upon error or completion of the self-test report.

First Page of Self-Test

The self-test report is divided into sections. Refer to pages 124 and 125 for a sample printout.

The printer model number is given on line 1 (first line). This identifies the printer type used, in this case the 6820.

The 8-digit serial number of the printer is listed on line 4 under the "Serial#" heading on line 3. The serial number is also on the inside of the printer. In portable printers, raise the printer mechanism to look for the number on the inside back wall.

"Battery Voltage," on line 13, gives the input voltage sampled at the beginning of the self-test. The input range must be between 7.5 and 15 volts. The input voltage must be greater than 10.5 volts to charge the internal battery. At 7.5 volts or less, the **LOW BATT** LED is turned on and the printer goes to sleep immediately. Apply external power to wake the printer to print. At 10.5 volts or less, the **LOW BATT** light comes on but the printer still prints.

The "Auto Feed" setting, on line 16, is a configurable item. "CR" Carriage Return means no auto linefeed. This is the most common setting for applications using NPCP. "CR+LF" means a linefeed will be added to each CR. This setting can produce double-spacing of reports. See page 32 for information on changing this configuration.

The "Interface Mode" setting, line 17, lists the interface protocol for the printer. The typical setting is NPCP. Others include DTR with no, odd, or even parity, and IrDA. See page 32 for additional information.

"Bit Rate" on line 18, lists the baud rate for the printer. Most application software autobauds so you do not have to select it. Bit rate is commonly set to 19200 (19.2K) or 9600 bps. See page 33 for additional information.

"A2D History," lines 21 through 25, is the history for voltage measurements and temperature measurements, as recorded by the printer.

"Head Jam History" on lines 26 through 29, gives information on head jams. If the printer is having frequent head jams, these lines can assist in determining the problem.

Under the "Home" header, if "Err" is listed, then the home position LED sensor has failed.

"Command" tells which printer command was executed when the head jammed.

"Direction" tells which way the head was moving, "left" toward home and "right" away from home. Home position is at the extreme left, toward the green thumb wheel.

"Speed" is the acceleration speed of the print head when the jam occurred.

"Step" is the acceleration step at the jam. "0" means no steps were taken, "15" means all steps were taken. "1–14" means printer jammed during acceleration or deceleration.

"Temp" is the ambient temperature at the last head jam. The temperature is listed in Celsius.

"Position" of carriage at the jam in 1/720 inches = 12 * step position. Divide the number by 12 to get the step position. There are 512 steps across the page. If it is jammed at position 0, check the printer mechanism alignment. If it is jamming in the middle, it is more likely a dirty ribbon or obstruction in the print head's path.

"Head Dot Pattern," line 37, is printed to verify the individual dot wires. There should be nine dots. If some are missing, it could be a print head failure or a circuit board failure.

(continued)

"Error Log" information appears on lines 38–43. This information is cleared after every self-test. This information is very helpful in determining problems.

"PE"	# of paper jams while feeding paper
"HJ"	# of head jams while print head is moving
"12Vu"	# 12-volt under voltage
"12Vo"	# 12-volt over voltage
"24Vu"	# 24-volt under voltage (Head/motor voltage)
"24Vo"	# 24-volt over voltage
"Home"	# Home detect errors (typically caused by paper scraps or circuit failures)
"Temp"	Unused
"OverC"	# Head over current errors (typically caused by a bad print head)
"HeadS"	# Head driver short errors (typically caused by circuit failures)
"Fault"	# Paper feed motor over current errors *(Excess current in paper feed motor could indicate circuit failure)*
"ADErr"	# A2D conversion failures
"EEErr"	# EEPROM write failures to diagnostic block
"Dlink"	# Software memory errors (Corruption in internal memory)
"Llink"	# Software memory errors

All other values are informational only. Remember that these values are cleared after the self-test.

Sample First Page of Self-Test

Note: Lines 15–18 are factory-default printer settings. Take note of these lines when reading the self-test report.

```
_____
 1 NP6820
 2 Copyright 1997, 1998, Intermec Technologies Corporation.  All Rights
Reserved.
 3 Serial#    MFG Date        Hardware            Check    Repairs   Svc Date
 4 12345678  yy/mm/dd  ddd-ddd-ddd/dddd (TOP)    GO/NG      00       yy/mm/dd
 5                     ddd-ddd-ddd/dddd (MLB)
 6                     ddd-ddd-ddd/dddd (PS)
 7                     ddd-ddd-ddd/dddd (IOB)
 8 Revisions:..........0000000000303100
 9 Bootblock:          NPBB6820.MOD  - Version  XX.XX  XXXX  XXXX  GO/NG
10 Control Program:    npfl6820.mod  - Version  XX.XX  XXXX  XXXX  GO/NG
11 Font Module:        nftxxxxx.mod  - Version  XX.XX  XXXX  XXXX  GO/NG
12 Font Module:        nftxxxxx.mod  - Version  XX.XX  XXXX  XXXX  GO/NG
13 Battery Voltage:    012.34        Low...../....High
14 Total Pages:        123456
15 Zero Font Style:    Ø
16 Auto Feed:          CR
17 Interface mode:     NPCP
18 Bit Rate:           19200
19 Cold Starts:        00024
20 Warm Starts:        00050
```

```
21 A2D History
22      Curr     Low       High      Min       Max       Error     Page      Count
23 24v: 024.00   023.21    023.91    023.21    024.51    027.21    00401     00021
24 12v: 012.55   010.91    013.51    010.90    014.50     8.71     00401     00021
25 Temp:  023    -020       055      -021       060       000      00401     00021
26 Head Jam History
27 Total Head Jams:   00186
28 Home  Command  Direction  Speed   Step  Temp  Position  Page
29       Print    Left       Const   010   -010  01440     12345
30 NPCP History
31 Disc    Addr    Parity   IFTS    Seq     CRC     Frame   Bind    IPLDU
32 12345   12345   12345    12345   12345   12345   12345   12345   12345
33 IRDA History
34      FramesOk     BroadCasts   CRC/TMO      DISCARD
35 rx   1234567890   1234567890   0123456789   0000000000
36 tx   1234567890   1234567890   0123456789   0000000000
37 HEAD DOT PATTERN
          ‾‾==-

38  Error Log
39 PE    HJ     12Vu   12Vo   24Vu   24Vo   Home   Temp   OverC  HeadS  Fault  ADErr
EEErr
40 Dlink   Llink
41 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345
12345
42 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345
12345
43 12345 12345 12345 12345 12345 12345 12345 12345 12345 12345
```

Second Page of Self-Test

Page 2 contains the print pattern used to diagnose printer mechanical behavior. The pattern continuously prints the ASCII characters between 33 and 126 decimal inclusive for the entire page, or until you cancel the print by pressing a button on the printer. An example of that rotating pattern is shown below.

```
!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmn
opqrstuvwxyz{|}~!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^
_'abcdefghijklmnopqrstuvwxyz{|}~!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
OPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuvwxyz{|}~!"#$%'()*+,-./0123456789:;<=>
?@ABCDEFGHIJKL
```

Self-Test Failure

If a partial report generates and a printer error occurs during printing,
refer to the table on the next page for troubleshooting help.

If the printer does not generate a report:
- There may be a printer failure, refer to the troubleshooting table on the next page for possible solutions.

- There may be a power failure, check the power source (internal battery, charge cable, or ac adaptor).

Miscellaneous Troubleshooting Tips

The following table lists actual printing problems, possible causes, and actions you should take to correct a problem.

Possible Printer Problems

Symptom	Test or Cause	Solution
Printer does not communicate with the mobile computer.	• Incorrect protocol selection. Check lines 17 and 18 on the self-test report for correct bit rate and protocol selection.	Change protocol settings through configuration process.
	• *Bluetooth* Unable to connect.	• Make sure you are in range (10cm to 10m) • Make sure your device is configured to be discoverable and/or connectable (see Appendix A, "*Bluetooth Configuration Commands*") • Make sure the Bluetooth shutdown timer has not expired
Double-spacing on application reports but single-spacing on self-test.	Check line 16 on the self-test report, if "CR+LF" then this is an incorrect configuration for NPCP.	See page 32 for instructions.
Zero prints incorrectly (with/without slash).	Check line 15 on the self-test report for "Zero Font Style" setting.	If incorrect, adjust the zero print option, see page 33 for instructions.
Does not print extended character set — missing font.	Check line 11 or 12 on the self-test report to see if the "NFT0000.MOD" file is listed after "Font Module."	Use the 6820 Printer Tool Kit to reload this file or send for hardware repair.
Printer emits 1 or 2 beeps or blinking green light is the only indicator.	Printer mechanism does not have adequate power for printing. The 12 V may be under or over voltage fault. *(Note: Error lights do not flash if voltage is too high)*	Check battery or power supply. • If battery, recharge or replace (see page 15 for instructions). • If power supply, adjust supply voltage to 7.5–15 volts. Check the printer's internal battery, if installed. Check the vehicle charge cable (see the *6820 Printer Installation Instructions* P/N: 962-018-016).
Printer emits 2 sets of 3 beeps	Printer out of paper	Reload paper into printer mechanism. See page 18 for instructions.
Printer works but some or all LEDs do not work.	Gray ribbon cable connecting control panel board to pivot frame assembly is loose.	Call Customer Support (800-755-5505) or send printer for hardware repair.
Printer does not print	• No voltage • Voltage too high or low. Check line 13 on the self-test report, under the "Battery Voltage" header. • No data input	Adjust supply voltage to 7.5–15 volts. Tighten computer connections.

Possible Printer Problems (continued)

Symptom	Test or Cause	Solution
No paper feed (paper jam or head jam)	**Test:** Pull paper toward roller. **Cause:** If paper is resistant: • Paper tray too full • Torn paper perforation • Paper wrinkled, creased, moist, or perforations missing • White ribbon cables obstructing paper • Head Jams due to carriage alignment. Check line 29 on self-test report, under "Position" header, for value.	 • Ensure fewer than 200 3-ply sheets in the deep paper tray and fewer than 50 3-ply sheets in the shallow paper tray. • Remove torn paper, load and center new paper, readjust pinfeed holders. • Replace the paper. • Straighten the white ribbon cables. • If "0," realign mechanism in pivot tray. See page 109 for printer mechanism alignment instructions.
No paper feed (paper jam or head jam) continued . . .	**Test:** Move print head manually from side to side. **Cause:** If print head resistant: 　**Test:** Remove ribbon cartridge, move print head. If smooth, ribbon is jammed. 　**Test:** Remove ribbon cartridge, move print head. If still resistant, mask spring is bent or damaged is bent or damaged. **Cause:** Print head gap adjuster too tight.	 Remove ribbon cartridge and turn knob. If ribbon resists, replace ribbon cartridge (see page 16 for instructions). Replace the mask spring (see page 31). Set the head gap adjuster to the fifth notch *away from the paper* (see page 17). If ribbon cartridge bumps against inside of printer, check white ribbon cable, home position sensor, and four screws.
	Cause: Paper scraps found in printer mechanism or around platen.	Remove any paper scraps, do a cleaning.
	Printer mechanism unlatched (unlocked). *(portable, fixed mount printers)*	Latch (lock) the printer mechanism into place.
	Printer has a glitch not defined above.	Do a self-test.

Note: In paper jams or head jams, press the **SET PAGE** button to clear the printer before printing can resume.

Compatibility Issues

Use the following information to determine some compatibility issues that come up relative to the 6820 Printer:

Compatibility Issues and Conclusions

Issue	Conclusion
Does 4820 Ribbon work with 6820 Printers?	Yes.
Do 4820 Applications work with 6820 Printers?	Yes. Applications that work on the 4820 Printer also work on the 6820 Printer.
Does the 6820 Printer work with an application that downloads some custom characters to the printer?	Yes. The "downloadable character set" feature is the same for both the 4820 and 6820 Printers.
Can 4820 Fixed Mount Printers be replaced with 6820 Printers?	Yes. 6820 Fixed Mount Printers can be installed on existing flat and angle mounts for the 4820 Printer.
Do NC4000 Power Supplies work with the 6820 Printer?	In some cases, printing while charging mobile computers may not be supported. If so, order a new charger (P/N: 851-027-003).
Do off-the-shelf 25-pin cables work between the dock and the 6820 Printer?	Most likely. If it does not, refer to comments in *Problems and Solutions*, above.

Diagnostic Information

Nonvolatile Flash Storage

Diagnostic information is stored in flash to support the hardware configuration, both at time of manufacture and in the field. This includes recording the initial configuration changes to hardware and software, and various environmental statistics helpful in determining why failures are occurring in the field. The flash is provided for storage of critical data that must remain in the unit after power to the unit is lost. The data in the flash is used for diagnostic information for a catastrophic failure, or over the phone with a customer.

Updating Diagnostic Information

The FLASH diagnostic information is updated and maintained by the printer. All diagnostic information is shadowed in RAM. At the end of every 50 forms, the FLASH information is updated from the RAM. The printer also updates the information upon the occurrence of any nonrecoverable error, printer reset, printer self-test and remote polling of Diagnostic information.

Fields are stored with ID first, then length, then data. The details of the data and the length of the entire field, including ID and Length bytes, are shown in the table on the next page.

Accessing Diagnostic Information

The amount of Flash memory reserved for nonvolatile diagnostic memory is 2K bytes. Printer self-test prints most of the information contained in the Diagnostic Memory for remote and end-user diagnostic access.

Diagnostic Information

Field ID	Length	Description	Stored as	Total Length
01	4	Serial #	7 digit BCD set at MFG	39 bytes
	3	Date of Manufacture. yy/mm/dd	6 digit BCD set at MFG	
	7 7 7 7	Hardware Configuration: ddd-ddd-ddd/dddd (top level part #) ddd-ddd-ddd/dddd (control board) ddd-ddd-ddd/dddd (power supply) ddd-ddd-ddd/dddd (i/o board)	52 digit BCD set at MFG	
	2	CRC of preceding fields.	2 byte binary set at MFG	
08	8	Hardware Revisions: ECNs applied. 64 ECNs can record separately by number 1-64.	8 byte bit field	11 bytes
	1	Service Repairs: a two-digit field indication of number of times unit is serviced.	2 BCD Digits	
	3	Date of last Repair. yy/mm/dd	6 BCD digits	
09	2	Cold Starts since MFG or last repair.	binary digits	8 bytes
	2	Warm Starts since last cold start.	binary digits	
	2	Pages printed over life.	binary digits	
10	2	Last high & low voltage extremes on 24-volt input over last 50 reports. Extremes stored as 8-bit A2D conversions.	2 bytes	11 bytes
	2	Voltage extreme history stores max. & min. 24-volt A2D conversions over printer life.	2 bytes	
	1	24-volt voltage error. Voltages greater than 10% considered errors. A2D value recorded.	1 byte	
	2	Form number at last voltage error.	2 bytes	
	2	24-volt error count.	2 bytes	
20	2	Last high and low voltage extremes on 12-volt input over last 50 reports. Extremes stored as 8-bit A2D conversions.	2 bytes	11 bytes
	2	Voltage extreme history stores min. & max. 12-volt A2D conversions over printer life.	2 bytes	
	1	12V voltage error. Voltages less than 10.5 volts and greater than 14.5 volts considered errors. A2D value is recorded.	1 byte	
	2	Page number at last 12-volt error.	2 bytes	
	2	12-volt error count.	2 bytes	

Diagnostic Information (continued)

Field ID	Length	Description	Stored as	Total Length
30	2	Temperature, minimum and maximum over last 50 reports. Set A2D value.	2 bytes	11 bytes
	2	Temperature, minimum and maximum over printer life. Set A2D value.	2 bytes	
	1	Temperature error. Last A2D conversion below -10 or above +60 Celsius recorded.	1 byte	
	2	Page number at last temperature error.	2 bytes	
	2	Total number of temperature errors.	2 bytes	
40	2	Total number of head-jams	2 bytes binary	11 bytes
	1	0 = No Home detect switch error 1 = Home switch engagement error	bit 0	
		0 = Seeking; 1 = Printing	bit 1	
		0 = Left; 1 = Right	bit 2	
		00 = Acceleration 01 = Constant speed 10 = Deceleration	bits 3-4	
		00 = 250 PPS (initialization) 01 = Low speed 10 = High speed	bits 5-6	
		0 reserved	bit 7	
	1	Acceleration or deceleration step motor value when jam occurred	1 byte binary	
	1	Ambient temperature when Head Jam occurred. Set A2D value.	1 byte	
	2	Form number where Head Jam occurred.	2 bytes binary	
	2	Carriage Position where Head Jam occurred.	2 bytes binary in 1/720"	

Diagnostic Information (continued)

Field ID	Length	Description	Stored as	Total Length
50	2	NPCP NDM (normal disconnect mode) error count. Increments when normal disconnect mode entered.	2 bytes	20 bytes
	2	NPCP address error count. Increments when invalid printer address received.	2 bytes	
	2	NPCP length parity error count. Increments when parity of length field in frame incorrect.	2 bytes	
	2	NPCP IFTS (invalid frame this state) error count. Increments when invalid session layer command received.	2 bytes	
	2	NPCP sequence error count. Increments when LLC sequence numbers incorrect.	2 bytes	
	2	NPCP CRC error count. Increments when MAC CRC error encountered.	2 bytes	
	2	NPCP Frame error count. Increments when IFRAMES received when session is not bound.	2 bytes	
	2	NPCP Bind error count.	2 bytes	
	2	NPCP IPLDUR (Invalid presentation layer data unit) error count. Increments when bad presentation layer command received.	2 bytes	
60	4	IrDA rxFramesOk — total frames received OK.	4 bytes	46 bytes
	4	IrDA rxFramesCrcErr — total frames received with CRC error.	4 bytes	
	4	IrDA rxTotalBytes — total Bytes received OK.	4 bytes	
	4	IrDA rxFramesDiscardBuf — total frames discarded due to no buffer space.	4 bytes	
	4	IrDA rxBroadcastFrames — total broadcast frames received OK.	4 bytes	
	4	IrDA rxFramesDiscardHwErr — total received frames discarded, due to hardware error.	4 bytes	
	4	IrDA txFramesOk — total frames transmitted OK.	4 bytes	
	4	IrDA txTotalBytes — total bytes transmitted OK.	4 bytes	
	4	IrDA txBroadcastFrames — total broadcast frames transmitted OK.	4 bytes	
	4	IrDA txFramesNotTxTimeout — total frames not transmitted due to time-out.	4 bytes	
	4	IrDA txFramesNotTxHwErr — total frames not transmitted due to hardware error.	4 bytes	

Diagnostic Information (continued)

Field ID	Length	Description	Stored as	Total Length
70	1	Zero font selection for codepage 437 0 = Ø; 1 = 0	1 byte	6 bytes
	1	Autofeed configuration 0 = CR; 1 = LF+CR	1 bit	
	1	Protocol Selection: 00h = NPCP 20h = DTR No Parity 21h = DTR ODD Parity 22h = DTR EVEN Parity (all other values reserved)		
	1	Bit Rate 0 = 9600; 1 = 19.2k		

A Bluetooth Configuration Commands

Configuration of the Bluetooth radio and software is accomplished using the Bluetooth Configuration Commands listed in this appendix.

Notation

Numbers are in decimal except:

- Numbers with an "h" suffix are in hexadecimal.
- Numbers with a "0x" prefix are in hexadecimal.
- Numbers with a "b" suffix are in binary.

Command

All printable characters can be entered directly via the keyboard. Any non-printable characters are entered in binary data format.

Binary data format is any non seven-bit ASCII data to transmit to the module is encoded in the Internet *percent* notation. Any hex byte to transmit is preceded by the "%" sign and encoded in hex ASCII. To send the value 0xF5, the "%F5" bytes are transmitted. The "%"character is always transmitted as "%25". Thus, a Bluetooth address *could* transmit as "%00%E0%03%45%F4%6D".

Generic format:

```
<command character><command type><command payload><CR>
<command character> is one character from the set: [A-Z]
<command type> is one character for the set: [0-9]
<command payload> is variable in length.
<CR> is the command terminator.
```

The *<command payload>* is formed from printable ASCII characters from the code range 0x20 to 0x7E.

Codes outside of this range are escaped using the percent (%) character followed by two hexadecimal digits.

The percent character is always represented by the three characters: %25

The command terminator is character code 0x13 (carriage return), or character code 0x10 (line feed), or character codes 0x13, 0x10 (carriage return, line feed).

An example command to set the friendly name to "Len's 100% serial module":

```
F0Len's 100%25 serial module<CR>
```

Character codes outside of the range of 0x20 to 0x7E are ignored.

When using percent (%) to form hexadecimal character codes there must be exactly two hex digits using characters: [0-9, A-F, a-f].

Characters outside of this range cause the command to fail.

Commands that fail return the four character sequence: NAK<CR>

Commands that are accepted return the four character sequence: ACK<CR>

Commands that return payload data use the format:

```
<command character><command type><command payload><CR>
<command character> is one character from the set: [a-z]
<command type> is one character for the set: [0-9]
<command payload> is variable in length.
<CR> is the command terminator.
```

The command character is the "lower case" version of the local host command.

Operating Modes

The module interface has two modes:

- **Bluetooth Link Active State**: In this case the Serial Interface looks like a raw serial port (TxD, RxD, CTS, etc. and GND). There is no intelligence in the Bluetooth module from the serial interface perspective. This mode does not support the command and control modes described below.

- **Bluetooth Link Inactive State**: This mode exists when a Bluetooth link is not existent: In this case, the serial interface looks like a serial port that supports a number of command and control modes.

Upon reset, the unit comes up in "Bluetooth Link Inactive State." After the first Bluetooth connection, the unit goes into "Bluetooth Link Active State." It stays in this state until the link is lost because the Master shuts it down or there is an out-of-range condition. At this point, it returns to the "Bluetooth Link Inactive State."

Command and Control Modes

Note that these commands are only available over the serial link, not over the air and are not available when the device is in the Bluetooth Link Active state.

Query Mode Commands

?<CR>	Read ACK
?F0<CR>	Read Friendly Name
?L<CR>	Read Security Mode
?C0<CR>	Read Connectable Mode
?C1<CR>	Read Page Scan Timing
?D0<CR>	Read Discoverable Mode
?D1<CR>	Read Inquiry Scan Timing
?S1<CR>	Read Class of Device
?S2<CR>	Read Service Name
?S4<CR>	Read PIN Code
?T0<CR>	Read Shutdown Timeout in minutes
?B0<CR>	Read Bluetooth Addresses of all the paired devices

Examples:

Command	Reply
"?<CR>"	"ACK<CR>"
"?F0<CR>"	"f0MyFriendlyName<CR>"
"?L<CR>"	"10<CR>" Turn off Encryption, Authentication, and Exclusion
	"11<CR>" Authentication
	"12<CR>" Encryption and Authentication
	"13<CR>" Encryption, Authentication, and Exclusive
"?C0<CR>"	"c0ON<CR>"
"?C1<CR>"	"c11024,512<CR>"
"?D0<CR>"	"d0ON<CR>"
"?D1<CR>"	"d11024,512<CR>"
"?S1<CR>"	"s1001F00<CR>"
"?S2<CR>"	"s2MyServiceName<CR>"
"?S4<CR>"	"s4MyPinCode<CR>"
"?T0<CR>"	"t0Shutdown Timer = 5 minutes<CR>"
"?B0<CR>"	"b0No Devices PairedCR>"

Set Local Bluetooth Device Name

Command	F0<Device Friendly Name><CR>
Definition	"Device Name" — String up to 254 bytes long
Default	"6820–DDEEFF" where *DDEEFF* is from the Bluetooth device address (AABBCCDDEEFF)
Example	"F01Len's 100%25 serial module<CR>" This sets the name to "Len's 100% serial module"

Set Class of Device/Service Field

Command	S1< Class of Device/Service field >
Description	The Class of Device/Service (CoD) field is a 24-bit field defined in the Bluetooth Assigned Numbers document. See *Assigned Numbers - Bluetooth Baseband* for up-to-date information on how to compose this value. This field is sent in a HEX ASCII format, most significant byte first.
Example	"S1001F00<CR>" is a common Class of Device value for a basic serial device.

Set Service Name

Command	S2<Service Name>
Description	Sets the service friendly name to send to the remote Bluetooth device in response to a service discovery request. The length of the service name is limited to 32 bytes.
Definition	Profile Name — Text name entered into the SDP record for the serial port profile
Default	"Wireless Printer"
Example	"S3Acme Printer<CR>"

Connectable On/Off: "ON" or "OFF"

Command	C0 <ON|OFF><CR>
Description	Sets the device into "connectable" mode
Example	"C0OFF<CR>" — Become non-connectable "C0ON<CR>" — Become connectable

Specify Page Scan Timing

Command	C1<Page_Scan_Interval>,<Page_Scan_Window><CR>
Description	Sets the Page Scan timing parameters
Default	4096,18
Example	"C11024,512<CR>"

Note: To enable scanning, the values for Interval and Window must be in the range of 18 to 4096. The Window value must be less than the Interval value. Both values must be zero to disable scanning.
Note: Page scan timing is described in the Bluetooth V1.1 Core Specifications; for up-to-date information, see: The Bluetooth Specification.
Note: Modification of the Page Scan Timing can improve connection times, but may adversely affect battery performance.

Enable Discoverable

Command	D0 <ON|OFF><CR>
Description	Sets the device into "discoverable" mode
Example	"D0OFF<CR>" — Become non-discoverable "D0ON<CR>" — Become discoverable

Specify Inquiry Scan Timing

Command	D1<Inquiry_Scan_Interval>,< Inquiry_Scan_Window><CR>
Description	Sets the Inquiry Scan timing parameters
Default	4096,18
Example	"D11024,512<CR>"

Note: To enable scanning, the values for Interval and Window must be in the range of 18 to 4096. The Window value must be less than the Interval value. Both values must be zero to disable scanning.
Note: Page scan timing is described in the Bluetooth V1.1 Core Specifications; for up-to-date information, see: The Bluetooth Specification.
Note: Modification of the Inquiry Scan Timing can improve device discovery response performance, but may adversely affect battery performance.

Set Encryption/Authentication: "PIN CODE"

Command	S4<PIN code>
Description	PIN Code — Pin code can be NULL and as long as 16 characters
Default	"S4%00" NULL PIN code
Example	"S4MyPinCode <CR>"

Manage Security Modes

This command controls the security access mode and device pairing.

The modes available are:

L0 Disable encryption, authentication and exclusion
L1 Enable authentication
L2 Enable encryption and authentication
L3 Enable encryption, authentication and exclusive

Mode L0 allows any remote device to connect.

Mode L1 require the remote device to be authenticated by a PIN request.

The PIN code for the module is set to a user-specified value with the S4 command. Currently the default PIN is the NULL string (see Note).

Mode L2 adds encryption to the Bluetooth link.

Mode L3 adds exclusive connection to one specific Bluetooth device.

In this mode only connection requests from the initial device are allowed. Connections from other devices are rejected even if they supply the correct PIN code.

Device pairing and bonding are associated with this command and works as follows:

After an L command is executed the current device pairing and bonding is deleted. The next device to connect becomes paired and bonded to the module.

In Modes L1 and L2, other devices are allowed to connect but only the first device to connect is paired and bonded. Other devices are always required to supply a PIN code to complete the connection.

In Mode L3, only one device is allowed to connect. This device is paired and bonded and needs to supply the PIN code only on the initial connection.

Example: "L3<CR>"

Note: Some of the Bluetooth user interfaces cannot supply a NULL string as a PIN code. Use the S4 command to specify a PIN code that is not NULL.

Read Module Version

Command	V0<CR>
Description	Displays the firmware build version currently running
Example	"V0<CR>" Returns: "v1yyyymmddHHMM<CR>"
Note: This command responds with the requested data only not the "ACK<CR>"	

Read Local Device Address

Command	V1<CR>
Description	Displays the local device address
Returns	"v1%xx%xx%xx%xx%xx<CR>"
Note: This command responds with the requested data only not the •ACK<CR>• *Example: Sent: "V1<CR>"* *Received: "v1%00%2C%C6%03%45%39"*	

Set Shutdown Timing

Command	T0<Time in Minutes><CR>
Description	"Time" – Integer value - 0 implies never expire the timer
Range	0–270 minutes
Default	120
Example	"T0120<CR>" This sets the shutdown timer to 120 minutes.

Clear Link Key Table

Command	B0<CLR><CR>
Description	Clear Pair or Bonding command cleans up all of the link key and Bluetooth address combination PSKEYs.
Default	None
Example	"B0CLR<CR>" This clears all saved link keys.

Web Links

The following is the list of web links used in this document and their addresses as of this publish date; they are subject to change without notice by their respective authors:

• "*Assigned Numbers — Bluetooth Baseband*":
https://www.bluetooth.org/foundry/assignnumb/document/baseband

• "*The Bluetooth Specification*":
www.bluetooth.com/dev/specifications.asp
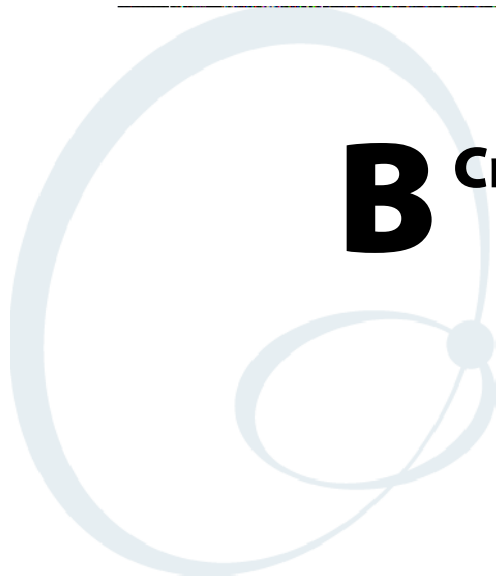
B Cross-Reference Tables

A set of cross-reference tables are provided to assist you in locating control codes and escape sequences. The default settings are also included.

Control Codes and Escape Sequences

The following table contains a complete alphabetized list of control codes, including single character control codes and escape sequences, as an aid to locating the control codes defined in Chapter 5, "*Control Code Definitions.*" For detailed definitions of these control codes, refer to the pages shown in the *Page* column of this table.

Control Codes and Escape Sequences Index

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Beeper	General Printer Control	65
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Set Vertical Tabs in Channel	Tabs and Tab Setting	80
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Define User-Defined Characters	Char. Sets, User Defined	85
Disable Printing of Character Graphics	Char. Sets, User Defined	88
Double Byte Character Sets	Char. Sets, User Defined	81
Enable Printing of Character Graphics	Char. Sets, User Defined	87
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Description	Category	Page
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Condensed (compressed):		
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D Default Character Set, Select	Char. Sets, User Defined	86
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Define User-Defined Characters	Char. Sets, User Defined	85
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Cancel Double Wide Mode (one line only)	Char. Style & Text Mode	74
Double Byte Character Sets	Char. Sets, User Defined	81
Select Double Strike Mode	Char. Style & Text Mode	73
Select Double Wide Mode	Char. Style & Text Mode	74
Select Double Wide Mode (one line only)	Char. Style & Text Mode	73
E Elite Pitch, Select	Char. Style & Text Mode	74
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Emphasized Mode, Select	Char. Style & Text Mode	74
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Cancel Double Wide Mode (one line only)	Char. Style & Text Mode	74
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Nine-Pin Graphics Modes	Graphics Functions	91
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L Left Margin, Set	Page Formatting	71
Length:		
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M Margin:		
Set Left Margin	Page Formatting	71
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Master Select	Char. Style & Text Mode	75
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Mode:		
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Cancel Double Strike Mode	Char. Style & Text Mode	73
Cancel Double Wide (expanded) Mode	Char. Style & Text Mode	74
Cancel Double Wide Mode (one line only)	Char. Style & Text Mode	74
Emphasized Mode, Cancel	Char. Style & Text Mode	75
Cancel Italic Mode	Char. Style & Text Mode	75
Cancel Subscript/Superscript Mode	Char. Style & Text Mode	77
Cancel Underline Mode	Char. Style & Text Mode	77
Select Condensed Mode (compressed)	Char. Style & Text Mode	72
Select Double Strike Mode	Char. Style & Text Mode	73
Select Double Wide (expanded) Mode	Char. Style & Text Mode	74
Select Double Wide Mode (one line only)	Char. Style & Text Mode	73
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Select Italic Mode	Char. Style & Text Mode	75
Select Pica Pitch	Char. Style & Text Mode	76
Select Subscript Mode	Char. Style & Text Mode	77
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N National Character Set, Select	Char. Sets, User Defined	82

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O One Line Only:		
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P Page:		
Set Page Length (inches)	Page Formatting	69
Set Page Length (lines)	Page Formatting	69
Perforation:		
Cancel Skip Over Perforation	Page Formatting	72
Set Skip Over Perforation	Page Formatting	72
Pitch:		
Select Elite Pitch	Char. Style & Text Mode	74
Select Pica Pitch	Char. Style & Text Mode	76
Position:		
Set Print Position (absolute)	General Printer Control	67
Set Print Position (relative)	General Printer Control	68
Print:		
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Cancel Printing of Codes 128-255	Char. Sets, User Defined	86
Cancel Unidirectional Printing	General Printer Control	68
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Disable Printing of Character Graphics	Char. Sets, User Defined	88
Print Character Graphics	Char. Sets, User Defined	88
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	Description	Category	Page
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	Space:		
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	Select 1/8 inch Line Spacing	Page Formatting	70
	Select 7/72 inch Line Spacing	Page Formatting	70
	Select n/72 inch Line Spacing	Page Formatting	70
	Select n/216 inch Line Spacing	Page Formatting	70
	Strike:		
	Cancel Double Strike Mode	Char. Style & Text Mode	73
	Select Double Strike Mode	Char. Style & Text Mode	73
	Subscript/Superscript:		
	Cancel Subscript/Superscript Mode	Char. Style & Text Mode	77
	Select Subscript Mode	Char. Style & Text Mode	77
	Select Superscript Mode	Char. Style & Text Mode	77
T	Tab:		
	Clear Horizontal Tabs	Tabs and Tab Setting	78
	Clear Vertical Tabs	Tabs and Tab Setting	80
	Clear Vertical Tabs in Channel	Tabs and Tab Setting	80
	Perform Horizontal Tab	Tabs and Tab Setting	78
	Perform Vertical Tab	Tabs and Tab Setting	79
	Select Vertical Tab Channel	Tabs and Tab Setting	80
	Set Horizontal Tabs	Tabs and Tab Setting	78
	Set Vertical Tabs	Tabs and Tab Setting	79
	Set Vertical Tabs in Channel	Tabs and Tab Setting	80
	Time for Sleep Mode, Set Inactivity	General Printer Control	66
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Description	Category	Page
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User Defined Characters:		84
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Copy ROM to RAM	Char. Sets, User Defined	84
Define User-Defined Characters	Char. Sets, User Defined	85
Disable Printing of Character Graphics	Char. Sets, User Defined	88
Enable Printing of Character Graphics	Char. Sets, User Defined	87
Enable Printing of Codes 128-255	Char. Sets, User Defined	86
Expand Printable Code Area	Char. Sets, User Defined	87
Select Default Character Set	Char. Sets, User Defined	86
Select User-Defined Character Set	Char. Sets, User Defined	85
Print Character Graphics	Char. Sets, User Defined	88
V Vertical:		
Clear Vertical Tabs	Tabs and Tab Setting	80
Clear Vertical Tabs in Channel	Tabs and Tab Setting	80
Perform Vertical Tab	Tabs and Tab Setting	79
Select Vertical Tab Channel	Tabs and Tab Setting	80
Set Vertical Tabs	Tabs and Tab Setting	79
Set Vertical Tabs in Channel	Tabs and Tab Setting	80
W Wide:		
Cancel Double Wide (expanded) Mode	Char. Style & Text Mode	74
Cancel Double Wide Mode (one line only)	Char. Style & Text Mode	74
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Select Double Wide Mode (one line only)	Char. Style & Text Mode	73

Single Character Control Code Definitions

This table contains control codes between 00h and 7Fh, and provides definitions for the ASCII symbols as used in the table on the next page and in format definitions in Chapter 2, *"Control Code Definitions."*

Dec	Hex	ASCII	Description	Page
0	00	NUL	Used as a terminator for several escape sequences.	
1	01	SOH		
2	02	STX		
3	03	ETX		
4	04	EOT		
5	05	ENQ		
6	06	ACK		
7	07	BEL	Beeper: sounds buzzer for 1/10 of a second.	65
8	08	BS	Backspace: moves print head one space to left.	64
9	09	HT	Horizontal Tab: moves print head to next tab stop.	78
10	0A	LF	Line Feed: moves paper to next line.	66
11	0B	VT	Vertical Tab: moves paper to next vertical tab stop	79
12	0C	FF	Form Feed: advances paper to top of next page.	65
13	0D	CR	Carriage Return: moves print head to left margin.	65
14	0E	SO	Shift Out: selects Double-wide Mode (one-line-only)	73
15	0F	SI	Shift In: selects Condensed (compressed) mode	72
16	10	DLE		
17	11	DC1	Device Control 1: sets printer online (not currently used)	
18	12	DC2	Device Control 2: cancels condensed mode (compressed)	73
19	13	DC3	Device Control 3: sets printer offline (not currently used)	
20	14	DC4	Device Control 4: cancels double-wide mode (online only)	74
21	15	NAK		
22	16	SYN		
23	17	ETB		
24	18	CAN	Cancel Line: clears all characters out of print buffer.	65
25	19	EM		
26	1A	SUB		
27	1B	ESC	Escape: defines start of escape sequence.	
28	1C	FS		
29	1D	GS		
30	1E	RS		
31	1F	US		
32	20	SP	Space Character	
127	7F	DEL	Delete: deletes last character in print buffer.	65

Escape Sequence Quick Reference

The following table is a quick reference between the escape sequences listed in ascending order, according to numeric values. For detailed definitions, see Chapter 2, "*Control Code Definitions.*"

Decimal	Description
ESC SO	Select Double-Wide (expanded) Mode *(one line only)*
ESC SI	Select Condensed Mode (compressed)
ESC DC2	Cancel Condensed Mode
ESC DC4	Cancel Double-Wide (expanded) Mode *(one line only)*
ESC US (0)	Select Top-Down Printing
ESC US (1)	Select Bottom-Up Printing
ESC SP n	Define Inter-Character Space
ESC "!" n	Master Select
ESC "$" n1 n2	Set Print Position (absolute)
ESC "%" (0)	Select Default Character Set
ESC "%" (1)	Select User-Defined Character Set
ESC "&" NUL k1 k2 s1 d1...d11	Define User-Defined Characters
ESC "*" m n1 n2	Select Graphics Mode
ESC "+" n d1...dn	Print Character Graphics
ESC "-" 0*	Cancel Underline Mode
ESC "-" 1*	Select Underline Mode
ESC "/" c	Select Vertical Tab Channel
ESC "0"	Select 1/8 inch Line Spacing
ESC "1"	Select 7/72 inch Line Spacing
ESC "2"	Select 1/6 inch Line Spacing
ESC "3" n	Select n/216 inch Line Spacing
ESC "4"	Select Italic Mode
ESC "5"	Cancel Italic Mode
ESC "6"	Enable Printing of Codes 128-255
ESC "7"	Disable Printing of Codes 128-255
ESC "<"	Select Unidirectional Printing *(one line only)*
ESC ":" NUL NUL NUL	Copy ROM to RAM
ESC "?" s n	Reassign Graphics Mode
ESC "@"	Perform Master Reset
ESC "A" n	Select n/72 inch Line Spacing
ESC "B" NUL	Clear Vertical Tabs
ESC "B" n1 n2 ... nk NUL	Set Vertical Tabs
ESC "C" n	Set Page Length (lines)
ESC "C" NUL n	Set Page Length (inches)

Decimal (continued)	Description
ESC "D" NUL	Clear Horizontal Tabs
ESC "D" n1 n2 ... nk NUL	Set Horizontal Tabs
ESC "E"	Select Emphasized Mode
ESC "F"	Cancel Emphasized Mode
ESC "G"	Select Double-Strike Mode
ESC "H"	Cancel Double-Strike Mode
ESC "I" n	Expand Printable Code Area
ESC "J" n	Perform n/216 inch Line Feed
ESC "K" n1 n2	Select Single-density Graphics Mode
ESC "L" n1 n2	Select Low-Speed Double-Density Graphics Mode
ESC "M"	Select Elite Pitch
ESC "N" n	Set Skip Over Perforation
ESC "O"	Cancel Skip Over Perforation
ESC "P"	Select Pica Pitch
ESC "Q" n	Set Right Margin
ESC "R" n0 n1 n2	Codepage Selection
ESC "R" n	Select National Character Set
ESC "S" 0*	Select Superscript Mode
ESC "S" 1*	Select Subscript Mode
ESC "T"	Cancel Superscript/Subscript Mode
ESC "U" 0*	Cancel Unidirectional Printing
ESC "U" 1*	Select Unidirectional Printing
ESC "W" 0*	Cancel Double-Wide (expanded) Mode
ESC "W" 1*	Select Double-Wide (expanded) Mode
ESC "Y" n1 n2	Select High-Speed Double-Density Graphics Mode
ESC "Z" n1 n2	Select Low-Speed Quadruple-Density Graphics Mode
ESC "^" (0) n1 n2	Select 9-pin Single Density Graphics Mode
ESC "^" (1) n1 n2	Select 9-pin Double Density Graphics Mode
ESC "b" c NUL	Clear Vertical Tab Channel
ESC "b" c n1 n2 ... nk NUL	Set Vertical Tabs in Channel
ESC "j" n	Perform n/216 inch Reverse Line Feed
ESC "l" n	Set Left Margin
ESC "s" 0*	Cancel Half-speed Printing
ESC "s" 1*	Select Half-speed Printing
ESC "t" (0)	Disable Printing of Character Graphics
ESC "t" (1)	Enable Printing of Character Graphics
ESC "z" n	Set Inactivity Time for Sleep mode
ESC "\" n1 n2	Set Print Position (relative)

Factory-Installed Printer Defaults

Function	Default Value
Carriage position	At left margin
Character set	Normal (not user defined)
Codepage	0
Codes 128-255	Disabled
Condensed (compressed)	Disabled
Double-Strike	Disabled
Double-Wide	Disabled
Emphasized	Disabled
Graphics mode	Not selected
Half-speed printing	Disabled
Intercharacter space	Zero (0)
International character sets	Disabled
Italic	Disabled
Justification	Left justification
Keyboard, printer	Enabled
Language	USA
Line Spacing	1/6 inch
Margin, left	0
Margin, right	80
MSB control	Disabled
NLQ	Disabled
Page length	11 inch (66 lines with Pica pitch)
Paper end sensor	Enabled
Pitch	Pica (10 characters per inch)
Power off sleep timer	10 seconds
Printer Code Area Expansion	Disabled
Printing direction	Top-down, bidirectional
Redefinition of graphic modes	Disabled
Skip over perforation	Disabled
Subscript/Superscript	Disabled
Tabs, horizontal	Set to default tabs (every 8 column)
Tabs, vertical	1 line feed each tab, channel = 0
Top of form	Set to current line
Underline	Disabled
Unidirectional printing	Disabled (bidirectional)
User defined character set	Removed

The settings in the previous table are installed in the printer at the factory. To restore the printer to these defaults, see page 10 for instructions.

The default settings listed below can be restored to the printer, as described in Chapter 4, "*Using the Configuration Utility.*"

Function	Default Value
Zero print option	Zeros are printed with a slash
Autofeed configuration	CR (carriage return added at end of line without line feed)
Protocol	NPCP (NORAND Portable Communications Protocol)
Parity	N/A (for NPCP)
Bit Rate	19.2K

C Printer Font Test Jobs

For each of our 6820 Fonts, Intermec Systems test department has a special test print job. This appendix contains a sample print job from each font available on your 6820 Printer.

You can perform these tests yourselves. Load the font of choice from the Toolkit CD into flash memory. After downloading the desired font, use any of the sample print jobs to reveal the character locations within the printer memory. The sample test print jobs are formated as a memory mapped and could be referenced to select a desired character.

These test print jobs originated from running a C program by a person with specific knowledge of how to generate such a report (print job). The C program demonstrates how a programmer could access the printer font modules within flash memory to select desired character.

You do not need more than one font module loaded. Any ONE of: NFT00932.MOD, NFT00936.MOD, NFT00949.MOD, or even NFT00950.MOD Asian fonts can be used. These are distributed via the NPTK6820 toolkit (including the source code).

These print jobs are in this appendix:

Big 5 Traditional Chinese Character Set

This program generates a text file, BIG5950.TXT, to copy to a 6820 Printer. The textfile illustrates the use of the BIG 5 traditional Chinese character set. Install the BIG 5 character font, NFT00950.MOD, in the printer flash using the configuration tool to have BIG5950.TXT print correctly.

1 Use the Microsoft C version 7.00 compiler.

```
cl big5.c /link slibce graphics
```

2 Run BIG5.EXE to create BIG5950.TXT

3 Copy this text file to the appropriate printer port.

Simplified Chinese Character Set

This program generates a text file, GB2312.TXT, that to copy to a 6820 Printer. The textfile illustrates the use of the Simplified Chinese character set. Install the Simplified Chinese character font, NFT00936.MOD, in the printer flash using the configuration tool to have GB2312.TXT print correctly.

1 Use the Microsoft C version 7.00 compiler.

```
cl china.c /link slibce graphics
```

2 Run CHINA.EXE to create GB2312.TXT.

3 Copy this text file to the appropriate printer port.

IBM 437 Codepage Character Set

This program generates a text file, IBM437.TXT, to copy to a 6820 Printer. The textfile illustrates the use of the IBM 437 codepage character set. Install the IBM 437 character font, NFT00437.MOD, in the printer flash using the configuration tool to have IBM437.TXT print correctly.

1 Use the Microsoft C version 7.00 compiler.

```
cl ibm437.c /link slibce graphics
```

2 Run IBM437.EXE to create IBM437.TXT.

3 Copy this text file to the appropriate printer port.

Japanese (Shift JIS) Character Set

This program generates a text file, JIS932.TXT, to copy to a 6820 Printer. The textfile illustrates the use of the JIS character set. Install the JIS character font, NFT00932.MOD, in the printer flash using the configuration tool to have JIS932.TXT print correctly.

1 Use the Microsoft C version 7.00 compiler.

```
cl japan.c /link slibce graphics
```

2 Run JAPAN.EXE to create JIS932.TXT.

3 Copy this text file to the appropriate printer port.

Korean Character Set

This program generates a text file, KOREA.TXT, to copy to a 6820 Printer. The textfile illustrates the use of the KSC5601 character set. Install the KSC5601 character font, NFT00949.MOD, in the printer flash using the configuration tool to have KOREA.TXT print correctly.

1 Use the Microsoft C version 7.00 compiler.

```
cl korea.c /link slibce graphics
```

2 Run KOREA.EXE to create KOREA.TXT.

3 Copy this text file to the appropriate printer port.

International Character Set

This program generates a text file, NATION.TXT, to copy to a 6820 Printer. The textfile illustrates the international character sets available for use in the default character set. Install the default character set font, NFT00000.MOD, the printer flash using the configuration tool to have NATION.TXT print correctly.

1 Use the Microsoft C version 7.00 compiler.

```
cl nation.c /link slibce graphics
```

2 Run NATION.EXE to create NATION.TXT.

3 Copy this text file to the appropriate printer port.

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The General Index covers all topics. Those in italics are figures, those in bold are tables.

The Files Index is to assist you in locating descriptions for device drivers, applications, utilities, batch files, or other files within this publication.

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