Intermec
Technologies Corporation

680x Series Portable Printers

TECHNICAL REFERENCE MANUAL

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Section 1

General Information

Introduction

The 680x series of portable printers was designed to be run on internal software that you can modify with the Portable Printer Configuration Program. This program offers complete user control of the printer. It also allows you to add enhancements as they are developed. Every time we develop a faster print speed, or other new capabilities, you can get these new features just by installing new software.

680x Portable Printer Descriptions

The following pages show the location of the key components for each of the printers in this series.

The 6805a Portable Printer

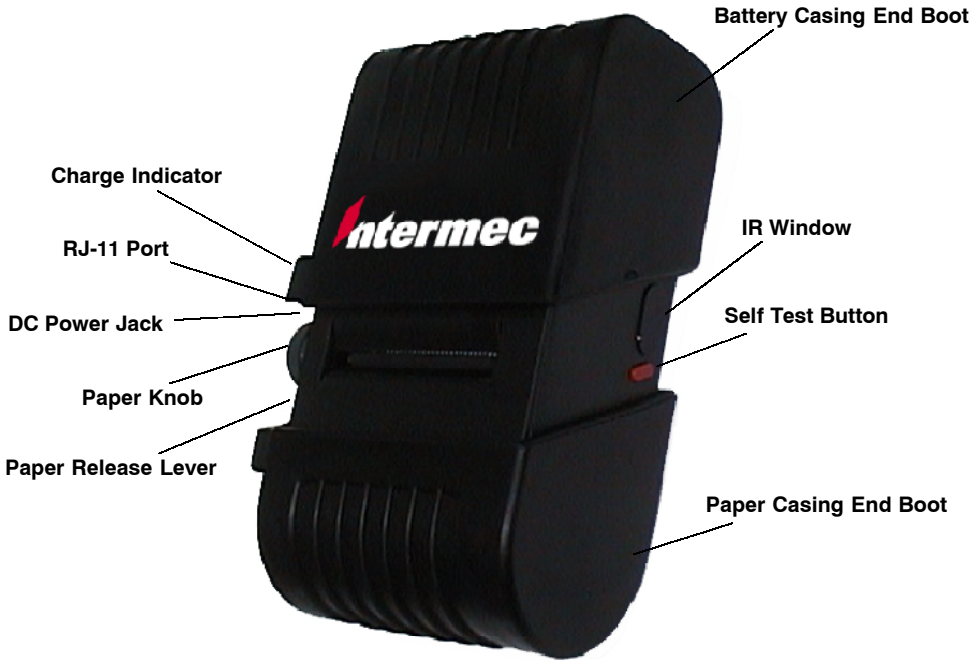


Figure 1-1
6805a Portable Printer

The 6805a Portable Printer Parts List

Printer	Part Number
6805a	320-066-004
6805a Linerless	320-066-006
Cables	**Part Number**
4000 Series and 6210 hand-held computer	226-044-001
6300 hand-held computer	216-996-001
RT1700 hand-held computer	216-994-001
Laptop download cable	320-066-032
60x to 680x serial cable (RJ-11)	226-437-001
Power Adapters	**Part Number**
AC Power Adapter (110 Volt)	320-066-042
U.K. Power Supply	320-066-043
Europe Power Supply	320-066-044
Australian Power Supply	320-066-045
Cigarette Lighter Adapter, 5 Amp. 6 in. coiled	320-066-031
Supplies	**Part Number**
Replacement NiCd Battery	320-066-041
Paper Rod	290-152-300
Thermal Cleaning Paper (25)	320-066-013
Paper	320-066-021
Linerless Paper	320-066-022

The 6806 Portable Printer

Figure 1-2
6806 Portable Printer

The 6806 Portable Printer Parts List

Printer	Part Number
6806	320-070-004
6806 Linerless	320-070-006
Cables	**Part Number**
4000 Series and 6210 hand-held computer	226-044-001
6300 hand-held computer	216-996-001
RT1700 hand-held computer	216-994-001
Laptop download cable	320-066-032
60x to 680x serial cable (RJ-11)	226-437-001
Power Adapters	**Part Number**
AC Power Adapter	320-066-042
U.K. Power Supply	320-066-043
Europe Power Supply	320-066-044
Australian Power Supply	320-066-045
Cigarette Lighter Adapter, 5 Amp. 6 in. coiled	320-066-031
Supplies	**Part Number**
Replacement DR-30Battery	320-070-041
Paper Rod	320-070-901
Thermal Cleaning Paper (25)	320-066-013
Paper	320-070-021
Linerless Paper	320-070-022

The 6804T Portable Printer

Figure 1-3
6804T Portable Printer

The 6804T Portable Printer Parts List

Printer	Part Number
6804T	320-080-001
Cables	**Part Number**
Data Cable – RJ-11F–(RF-11 R/A, coiled)	320-080-043
RJ-11F Adapter Cable – Right Angle	320-080-023
4000 Series and 6210 hand-held computer	226-044-001
6300 hand-held computer	216-996-001
RT1700 hand-held computer	216-994-001
Laptop download cable	320-066-032
60x to 680x serial cable (RJ-11)	226-437-001
Power Adapters	**Part Number**
AC Power Adapter (110 volt)	320-066-042
U.K. Power Supply	320-066-043
Europe Power Supply	320-066-044
Australian Power Supply	320-066-045
Cigarette Lighter Adapter, 5 Amp. 6 in. coiled	320-066-031
Supplies	**Part Number**
Replacement NiMH 1800mAhr Battery	320-080-022
Thermal Cleaning Paper (25)	320-066-013
Thermal Paper (50 rolls)	320-080-011

The 6804T CR Portable Printer

Figure 1-4
6804T CR Portable Printer

The 6804T CR Portable Printer Parts List

Printer	Part Number
6804T with Smart Card & Magswipe Reader	320-080-003
Cables	**Part Number**
Data Cable – RJ-11F–(RF-11 R/A, coiled)	320-080-043
RJ-11F Adapter Cable – Right Angle	320-080-023
4000 Series and 6210 hand-held computer	226-044-001
6300 hand-held computer	216-996-001
RT1700 hand-held computer	216-994-001
Laptop download cable	320-066-032
60x to 680x serial cable (RJ-11)	226-437-001
Power Adapters	**Part Number**
AC Power Adapter (110 volt)	320-066-042
U.K. Power Supply	320-066-043
Europe Power Supply	320-066-044
Australian Power Supply	320-066-045
Cigarette Lighter Adapter, 5 Amp. 6 in. coiled	320-066-031
Supplies	**Part Number**
Replacement NiMH 1800mAhr Battery	320-080-022
Thermal Cleaning Paper	320-066-013
Thermal Paper (50 rolls)	320-080-011

The 6804DM Portable Printer

Figure 1-5
6804DM Portable Printer

The 6804DM Portable Printer Parts List

Printer	Part Number
6804DM	320-080-002
Cables	**Part Number**
Data Cable -RJ11F- (RJ-11 R/A, coiled)	320-080-043
RJ-11F Adapter Cable – Right Angle	320-080-023
4000 Series and 6210 hand-held computer	226-044-001
6300 hand-held computer	216-996-001
RT1700 hand-held computer	216-994-001
Laptop download cable	320-066-032
60x to 680x serial cable (RJ-11)	226-437-001
Power Adapters	**Part Number**
AC Power Adapter (110 Volt)	320-066-042
U.K. Power Supply	320-066-043
Europe Power Supply	320-066-044
Australian Power Supply	320-066-045
Cigarette Lighter Adapter, 5 Amp. 6 in. coiled	320-066-031
Supplies	**Part Number**
Replacement NiMH 1800mAhr Battery	320-080-022
Paper (2ply impact) 50 rolls	320-080-012
Ink Ribbon, Black	805-066-001
Ink Ribbon, Purple	805-066-002

The 6804DM CR Portable Printer

Figure 1-6
6804DM CR Portable Printer

The 6804DM CR Portable Printer Parts List

Printer	Part Number
6804DM CR Mag Stripe Reader Stainless Belt Clip	320-080-004
Cables	**Part Number**
Data Cable -RJ11F- (RJ-11 R/A, coiled)	320-080-043
RJ-11F Adapter Cable – Right Angle	320-080-023
4000 Series and 6210 hand-held computer	226-044-001
6300 hand-held computer	216-996-001
RT1700 hand-held computer	216-994-001
Laptop download cable	320-066-032
60x to 680x serial cable (RJ-11)	226-437-001
Power Adapters	**Part Number**
AC Power Adapter (110 Volt)	320-066-042
U.K. Power Supply	320-066-043
Europe Power Supply	320-066-044
Australian Power Supply	320-066-045
Cigarette Lighter Adapter, 5 Amp. 6 in. coiled	320-066-031
Supplies	**Part Number**
Replacement NiMH 1800mAhr Battery	320-080-022
Paper (2ply impact)	320-080-012
Ink Ribbon, Black	805-066-001
Ink Ribbon, Purple	805-066-002

The 6808 Portable Printer

Figure 1-7
6808 Portable Printer

The 6808 Portable Printer Parts List

Printer	Part Number
6808 & Swivel Belt Clip	320-081-002
6808 Linerless & Swivel Belt Clip	320-081-006
Swivel Belt Connector	320-081-022
Swivel Belt Connector Lock Male	320-081-023
Swivel Belt Connector Lock Female	320-081-024
Cables	**Part Number**
Data Cable -RJ11F- (RJ-11 R/A, coiled)	320-080-043
RJ-11F Adapter Cable – Right Angle	320-080-023
4000 Series and 6210 hand-held computer	226-044-001
6300 hand-held computer	216-996-001
RT1700 hand-held computer	216-994-001
Laptop download cable	320-066-032
60x to 680x serial cable (RJ-11)	226-437-001
Power Adapters	**Part Number**
AC Power Adapter (110 volt)	320-066-042
U.K. Power Supply	320-066-043
Europe Power Supply	320-066-044
Australian Power Supply	320-066-045
Cigarette Lighter Adapter, 5 Amp. 6 in. coiled	320-066-031
6808 Single Charger	852-051-001
Supplies	**Part Number**
Replacement Li-Ion 1350mAhr Battery	320-081-021
Thermal Paper 130'/roll, 50/case	320-081-011
Paper Linerless 70'/roll, 50/case	320-081-012

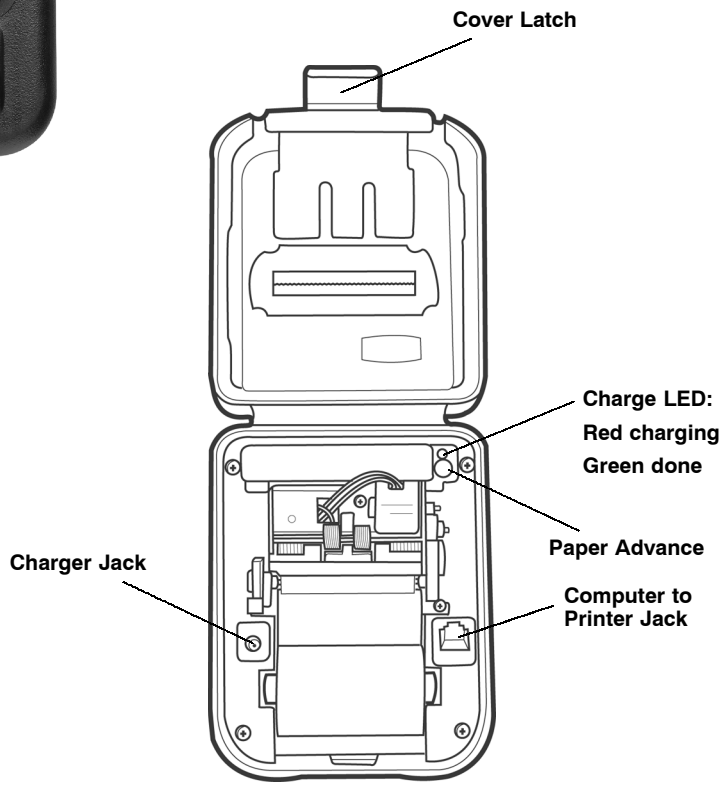
The 6808 CR Portable Printer

Figure 1-8
6808 CR Portable Printer

The 6808 CR Portable Printer Parts List

Printer	Part Number
6808 CR with Swivel Belt Clip	320-081-004
Swivel Belt Connector	320-081-022
Swivel Belt Connector Lock Male	320-081-023
Swivel Belt Connector Lock Female	320-081-024
Cables	**Part Number**
Data Cable -RJ11F- (RJ-11 R/A, coiled)	320-080-043
RJ-11F Adapter Cable – Right Angle	320-080-023
4000 Series and 6210 hand-held computer	226-044-001
6300 hand-held computer	216-996-001
RT1700 hand-held computer	216-994-001
Laptop download cable	320-066-032
60x to 680x serial cable (RJ-11)	226-437-001
Power Adapters	**Part Number**
AC Power Adapter (110 volt)	320-066-042
U.K. Power Supply	320-066-043
Europe Power Supply	320-066-044
Australian Power Supply	320-066-045
Cigarette Lighter Adapter, 5 Amp. 6 in. coiled	320-066-031
6808 Single Charger	852-051-001
Supplies	**Part Number**
Replacement Li-Ion 1350mAhr Battery	320-081-021
Thermal Paper 130'/roll, 50/case	320-081-011

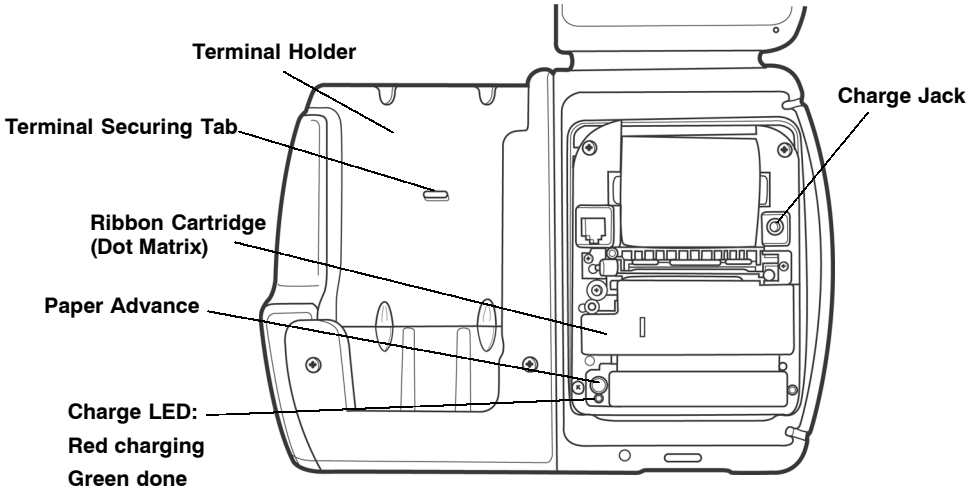
The 681 Portable Printer



The 681 Portable Printer Parts List

Printer	Part Number
681T	320-082-003
681DM	320-082-004
Cables	**Part Number**
Data Cable -RJ11F- (RJ-11 R/A, coiled)	320-080-043
4000 Series and 6210 hand-held computer	226-044-001
6300 hand-held computer	216-996-001
RT1700 hand-held computer	216-994-001
Laptop download cable	320-066-032
Mobile Computer to Printer cable (RJ-11 connector)	226-437-001
Mobile Computer to Printer cable (RJ-45 connector)	226-469-001
Power Adapters	**Part Number**
AC Power Adapter International	851-060-002
Cigarette Lighter Adapter, 5 Amp. 6 in. coiled	852-052-001
Supplies	**Part Number**
Replacement Li-Ion 1350mAhr Battery	320-081-021

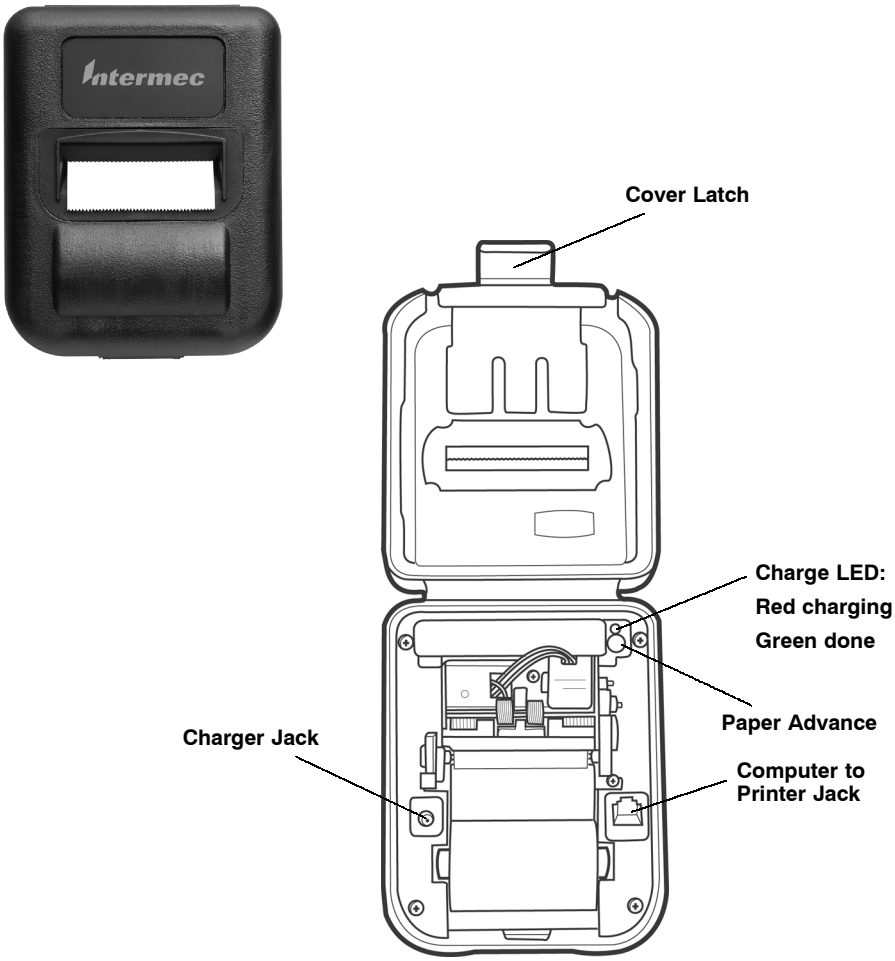
The 682 Portable Printer



The 682 Portable Printer Parts List

Printer	Part Number
681T	320-083-003
682DM	320-083-004
Cables	**Part Number**
Data Cable -RJ11F- (RJ-11 R/A, coiled)	320-080-043
Power Adapters	**Part Number**
AC Power Adapter International	851-060-002
Cigarette Lighter Adapter, 5 Amp. 6 in. coiled	851-052-001
Supplies	**Part Number**
Replacement Li-Ion 1350mAhr Battery	320-081-021

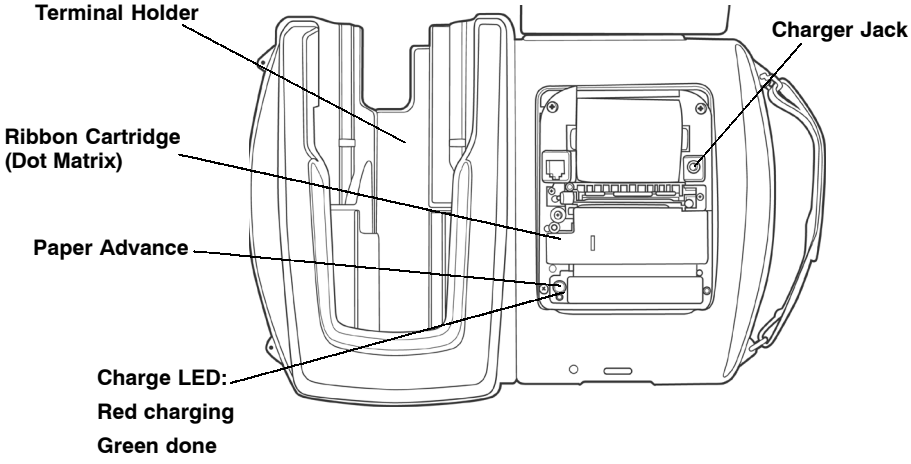
The 781 Portable Printer



The 781 Portable Printer Parts List

Printer	Part Number
781T	320-085-001
Cables	**Part Number**
Data Cable -RJ11F- (RJ-11 R/A, coiled)	320-080-043
Mobile Computer to Printer cable (RJ-11 connector)	226-437-001
Mobile Computer to Printer cable (RJ-45 connector)	226-469-001
Power Adapters	**Part Number**
AC Power Adapter International	851-060-002
Cigarette Lighter Adapter, 5 Amp. 6 in. coiled	320-066-031
Supplies	**Part Number**
Replacement Li-Ion 1350mAhr Battery	320-081-021

The 782 Portable Printer



The 782 Portable Printer Parts List

Printer	Part Number
782T	320-084-001
782DM	320-084-002
Cables	**Part Number**
Data Cable -RJ11F- (RJ-11 R/A, coiled)	320-080-043
Power Adapters	**Part Number**
AC Power Adapter International	851-060-002
Cigarette Lighter Adapter, 5 Amp. 6 in. coiled	852-052-001
Supplies	**Part Number**
Replacement Li-Ion 1350mAhr Battery	320-081-021

Features and Benefits

- Compact Design: These portable printers are rugged and light enough to be worn all day on a worker's belt.
- Infrared Technology: Wireless capabilities allow data to be sent to the printer without cables.
- Power Efficiency: Easily outlasts a typical 8-hour shift on a single charge.
  - The 6805a recharges in three hour.
  - The 6806 recharges in four hours.
  - The 6804 series recharges in about 6-9 hours.
  - The 6808, 681, 682, 781, and 782 series recharges in about 3 hours.
- Extremely ruggedized:
  - The 6805a and 6806 series provide an aluminum "roll cage" to protect the print head and other delicate electronic components from crushing, twisting and torsional types of damage. Synthetic rubber boots provide protection from impact and shock types of damage, and variable weather conditions.
  - The 6804 and 6808 series of printers are entirely encased in a protective shell of blow molded high density polyethylene.
  - The entire line of 680x series of portable printers can withstand multiple, drops to concrete on every face without damage.
- Flash Memory: Provide the capability to easily "personalize" features. Using the exclusive Portable Printer Configuration Program, the printer can be upgraded using a personal computer:
  - To change fonts
  - Operating system
  - Graphics

- Configurations.

The user never has to send the printer back to the manufacturer for updates. Flash memory also means that the print speed is fast. The printer never has to wait for a computer to send graphics.

- Linerless Labels: The entire 680x series of portable printers offer “linerless” label capabilities. Linerless labels are labels without peel-off backing. They save labor costs, because workers can apply them as they come out of the printer.

Section 2

Self Test

Introduction

This chapter gives you self-test instructions to check out your printer.

Self Test

Push the red button and hold four seconds to print a self test. Below is an explanation of the print-out.

Table 2-1
Query Quick Reference

Self Test	Description
F/W Ver	The internal software version
Timeout	The seconds between printing and sleep mode.
Baud Rate	The speed at which the printer receives data.
Parity	Odd, Even, or None
Data Bits	Matches with computer sending data to printer.
Handshake	The way the printer handles flow control from host.
Burn Adj	Amount of heat used to print on the thermal paper.
Paper	1 or 2 ply
Beeper	May be turned On or Off.

Table 2-1 (continued)
Query Quick Reference

Self Test	Description
Batt Volt	Current voltage of the batter y pack.
Batt Temp	Temperature of the battery.
Flash/RAM	1 Meg or 4 Meg Flash/ 1 Meg or 4 Meg RAM
Boot Version	Boot sector firmware.
Prnhd Tmp	Temperature of print head (between 0 and 50 degrees).
Infrared	Set by the user to “Off”, “IrDA”, “ASK”, “ASK/CRC”, “Direct”, “Direct CRC”, “PULSE”, or “PULSE–CRC”
Device Name	Shows type of device (i.e. 680x)
Device Nickname	Shows user name for printer.
IrDA Ver	The 1.0 refers to the IrDA standard in use. The next two digits refer to any IR modifications made to the configuration.
Available Fonts	“LOC” shows whether a font is Resident (R) or Downloaded (D). “CPI” shows characters per inch. “DESCRIPTION” describes the font. “NAMES” give the “Easy Print” name, the Line Printer name, and the hexadecimal equivalent of that name.
Available Graphics	“LOC” shows whether a font is Resident (R) or Downloaded (D). “CPI” shows characters per inch. “DESCRIPTION” describes the graphic. “NAMES” give the “Easy Print” name, the Line Printer name, and the hexadecimal equivalent of that name.
Available Bar Codes	All supported barcodes supported are displayed. “DESCRIPTION” describes the graphic. “NAMES” give the “Easy Print” name, the Line Printer name, and the hexadecimal equivalent of that name.
Card Reader Option	Shows the current Card Reader configuration.

Section 3

781T Printer using Wireless Printing

IrDA/Wireless Mode

Your printer comes to you as an IrDA mode printer. To switch the mode to Wireless Printing it is necessary to toggle the mode via the self-test function of the printer.

Performing the self-test indicates the current mode of the printer. The mode displays on the ticket and an audible indication sounds. Each time the self-test function is performed the mode will toggle between wireless printing and IrDA modes.

Newest Features

Tri-mode Printing

Version 4.25 of the 781T printer firmware now supports printing via three different technologies.

Serial Cable

Serial printing uses a 700 to 781T cable (p/n: 226-437-001).

IrDA Wireless

IrDA works with two different wireless printing technologies. The printer needs to know which one it should use.

The printer toggles between Bluetooth On/IrDA Off and Bluetooth Off/IrDA On each time you perform a self-test on the printer.

The current mode of the printer is indicated on the self-test ticket. Look under the RF Personal Network section to determine if Bluetooth Power is On or Off, and look under the Infrared Config section to determine if Infrared mode is On or Off. Keep in mind, that only one wireless technology is active at a time. Also, remember to self-test the printer back int the mode if was in if you self-test to look at the battery voltage or similar attribute.

Bluetooth Wireless

Bluetooth operation on the printer side of things is rather simple. Self-test the printer into Bluetooth mode and forget about it. The printer handles everything for you. Do note that if you are in Bluetooth mode and you hook up a serial cable, the printer drops out of Bluetooth mode and proceeds to take input from the serial cable.

Wireless Printing Parameters

The 781T contains some new parameters relevant to Bluetooth usage. Most of these parameters are embedded in the printer and are only visible when queried by a Bluetooth enabled 700 mobile computer. If the parameters documented here are unfamiliar to you, refer to the Bluetooth Terminology.

Bluetooth Terminology

- *Device Address*-Similar to a MAC address on an Ethernet card, this is a globally unique identifier for each Bluetooth radio. The device address will normally be seen written in the form AA.BB.CC.DD.00.11 or AA:BB:CC:DD:00:11.
- *Device Name*-A UTF-8 encoded string that can contain 248 bytes. The device name is sometimes referred to as the ”friendly” name because it usually contains human readable names such as ”Ryan’s 781T Printer”.

- *Device Inquiry*-The process of broadcasting a request that all devices in range announce themselves. The inquiry process will gather device addresses, Class of Device, and valuable clock information from all devices that respond to the inquiry. By default, a Device Inquiry will last 10.24 seconds. This interval is specified by the Bluetooth specification and provides the best opportunity to find all of the devices in range that are set to discoverable.
- *Device Discovery*-Is a Device Inquiry with the added step of a Device Name Discovery.
- *Class of Device*-Is information gathered during the Device Discovery procedure and indicates a device's type and what services it offers.
- *Bluetooth Device Class*- Helps distinguish a particular Bluetooth device from other devices that may be near. Some *Device Classes* are Computer, Phone, and Audio. The 781T has a Device Class of Peripheral.
- *Bluetooth Service Type*-Helps distinguish a particular Bluetooth service from other services that may be near. Some *Service Types* are Networking, Capturing, and Information. The 781T has a Service Type of Rendering.
- *Discoverable*-If your device is *Discoverable*, it responds to Device Inquiries from other devices. If you have no need to gather information on a particular device, it is best to leave it as undiscoverable. A good example is the 700. The 700 doesn't currently support any services. If you make it discoverable, it will only slow down the process of gathering information from the printers that are in range.
- *Connectable*-If your device is *Connectable*, it can accept requests for connection from other devices. If you have no need to connect to a particular device, it is best to leave it as unconnectable.

- *Bondable*–If your device is *Bondable*, it can participate in Bluetooth security requests. There are currently no services available on the 700, therefore there is no need to make it Bondable.

Build Information

In addition to Bluetooth Power status, the RF personal Network section of the self-test ticket also contains *Build Information*. This information is useful if you ever need to know what particular version of Bluetooth firmware is in your printer, whether that be for support or upgrade purposes.

Default Device Name

Your 781T printer comes from the factory with a “friendly” name that reflects the serial number. if you have a 781T with a serial number of 4321012, the Device Name will be 781T–4321012. this parameter is currently only configurable in the factory. If you would like the Device Name to fit your particular naming convention, please discuss that with your Intermec representative.

Default Device Class

Your 781T printer comes from the factory with a device class of ’Peripheral’. This parameter is currently only configurable at the factory. If you would like the Device Class to be something different, please discuss that with your Intermec representative.

Default Service Class

Your 781T printer comes from the factory with a service class of ’Rendering’. This parameter is currently only configurable at the factory. If you would like the Service Class to be something different, please discuss that with your Intermec representative.

Services Offered

Your 781T printer comes from the factory with one available service, Wireless Printer, Bluetooth “Serial Port” ser-

vice. This parameter is currently only configurable in the factory. If you would like the Service Offered to be something different, please discuss that with your Intermec representative.

Automatic Ticket Voiding

This feature is enabled by adding a couple of esc sequences to the beginning and ending of your session data. Once enabled, if a link loss is detected in the middle of your print job, the printer considers the print job incomplete and will automatically print a VOID marker on the output in progress.

To enable ticket voiding you must send an ESC followed by bt1 (0x1b, 0x62, 0x74, x031) to mark the beginning of the print job, and ESC followed by bt0 (0x1b, 0x62, 0x74, x030) to mark the end. If the printer sees a Bluetooth disconnect after the ESC+bt1 but before the ESC+bt0 is received, it VOIDs the ticket.

781T Preparation

1. Prepare the 781T by holding down the red button for about two seconds until you hear a short beep. This means the printer is ready to go and will be discoverable.

   Any time you press and hold the button until it beeps, you will dump any active wireless printing sessions.
2. You are ready to print wireless transactions.

Printer Self-Test

1. Press the Paper Advance (red) button for at least five seconds to run a Self-Test. This means you will be holding it long enough to hear the *beep* and complete a *paper advance*. The self-test indicates the current state of your printer. Verify the current mode by reading the Power status line from the printout. When your printer is turned off, the radio is undiscoverable and unconnectable.
2. When shipping your printer via air freight, turn the wireless printing mode off and set to IrDA so that the radio is not powered

700 Mobile Computer Preparation

1. On your mobile computer, tap the **Bluetooth™** icon located in the System tray on the **Today** screen.
2. Select **Advanced Features>Bluetooth Devices**.
3. From the **Tools** menu, select **Device Discovery**. You are presented with a couple of screens detailing the device discovery process.
4. You are now presented with a screen allowing you to modify the selection parameters. The default should work for your needs.
5. Click **Next** to proceed. A search for Bluetooth devices is performed followed by a look-up of discovered device names. The progress bars indicate the inquiry status.
6. A list of discovered devices displays.

If your remote wireless printer is discovered and presented in the list, select the **appropriate check box** and click **Next**.

If your remote device is not displayed, ensure that the device and its radio are switched ON. Click **Next**, then select **Finish**.

7. A progress bar appears indicating Service Directory is being performed.

If the discovery is successful a screen with *Successful discovery* displays. Click **Finish**. The remote device icon appears in the Bluetooth Devices Folder. Verify that this device was discovered by looking at the properties (**Device>Properties**).

If the Services tab lists *Portable Printer*, the service was discovered correctly.

If it doesn't, select the **Update** button on the *Services* tab to try to rediscover the services available (sometimes it will take a couple tries to correctly discover the services).

8. Click **Next** twice, all Wireless Printing devices within range will be discovered and displayed. You may have to repeat this step from time-to-time.
9. The **Bluetooth Serial Port** service is necessary for the virtual COM port to work. Choose COM6 in your application to use the Wireless Printing device you selected. Verify that this service was discovered by looking at the properties for this printer (**Device>Properties**).
10. Verify that your Wireless Printing device is set as your "favorite" device. In the **Bluetooth Devices Folder**, select **Tools>My Favorite**. In the **Favorites** screen, ensure your printer shows as **My Favorite Device**.

781T Questions

Why does my printer beep every five minutes when it sits unconnected?

As part of the implementation of the Serial Port Service in the printer, the service "refreshes" itself every five minutes. That refresh sends a message to the printer, which then wakes up (causing the beep) and resynchronizes with the Serial Port Service. The printer will then go back to sleep based on it's timeout.

How long should a connection to the 781T take?

The average time needed to connect to the printer is about three seconds. There are times when it can take up to seven seconds. Keep in mind, that if a connection fails, you could attempt a retry.

Development Suggestions

- Connection Retries–Just like cell phones and garage door openers, Bluetooth is a radio frequency technology. Because of that, there will be times when a connection attempt will fail. This failure can occur for many reasons (out of range, interference, etc.). To cope with this, applications should build in a retry mechanism. Our testing shows that three retries is the optimum number to code into your program. The majority of the time, the first retry will succeed if the previous connection failed due to interference or timing windows. If a connection fails on a 3rd retry, there is most likely a condition preventing the connection would should be investigated further.
- Persistent storage of printer address. Some customers will choose to use equipment that is ”tied” together. In this scenario a particular mobile computer will always be used with the same printer. If you choose to use this scenario, you can store the printer’s Device Address to the mobile computer’s storage card. That way, if you need to cold boot the unit for an application upgrade, the mobile computer can associate itself with the printer automatically without going through the Device Discovery process.

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

Section 4
Operation

Paper Loading

The 680x series of printers are thermal direct printers requiring thermal paper.

Out of Paper

The 6804 DM portable printer has no paper out indication and will continue to print with no paper providing the printer does not time out.

The remainder 680x series of portable printers will sound two quick beeps when they run out of paper. If the printer is out of paper, (or the paper release lever is up), the printer will suspend operation until the paper is present and the lever is down. The printer will continue to communicate with the hand held as long as it does not “time out.” Once the printer restarts, it will finish the rest of the print job where it left off.

The next sections will explain how to manually or automatically load paper.

See the parts lists in Chapter 1 to order paper supplies.

Removing Paper Core

6805a and 6806 Printers

1. Remove the round end boot of the printer by tucking the tips of your fingers under the edge of the boot and pulling it off with a peeling motion.

2. Wrap your index finger around the wider end of the paper rod and pull up. The paper rod will snap out. Remove the empty paper core and discard. (Save the plastic rod)

6804 and 6808 Series of Printers

1. Unsnap the latch and lift up the cover.
2. Wrap your index finger around the empty paper core and pull up. The paper rod will snap out.
3. Remove the empty paper core and discard.

Paper Loading

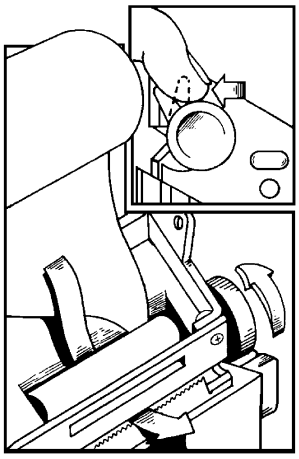


Figure 4-1
Paper Loading

Standard Paper

If you are using standard paper, you can load the paper automatically or manually. Experiment to find out which method is best for you.

Linerless Labels

If you are using linerless paper, it is recommend that you use the manual paper loading method.

Automatic Paper Loading

6805a and 6806 Printers

1. Press the red self test button to wake the printer.
2. With the loose, clean edge of the paper coming from the bottom of the roll, insert the edge of the paper between the roller and the platen.
3. If the printer is on, it will feed the paper automatically. If you have allowed the printer to fall into sleep mode, press the red self test button.
4. Insert the plastic paper rod through the center of the paper roll.
5. Place the narrow end of the rod into the small hole on the side of the paper cavity.
6. Snap the wider end into the cutout on the opposite side of the paper cavity.
7. Turn the paper knob clockwise to tighten the paper slack in the cavity.
8. Replace the end boot and tear off extra paper.

6804 and 6808 Series of Printers

1. With the loose, clean edge of the paper coming from the bottom of the roll, insert the edge of the paper between the roller and the platen.
2. Press the red self test button to wake the printer.
3. Push the button again while the printer is awake causes the mechanism to feed about 1” of paper.
4. Insert the paper into the paper well with it resting on the paper rod clips.

5. Press the red button while the printer is on and it will feed paper. You will need about 2 inches of paper coming out of the mechanism.
6. Lower the cover while placing the extra paper though the tearbar.
7. Latch cover closed and tear off extra paper.

Manual Paper Loading

6805a, 6806, and 6804 Series of Printers

1. Lift up the paper release lever. This takes the pressure off the platen. Make sure you have a clean edge on the new paper roll.
2. Take the edge of the paper and fold it 45 degrees. Insert the tip of the paper between the roller and the platen.

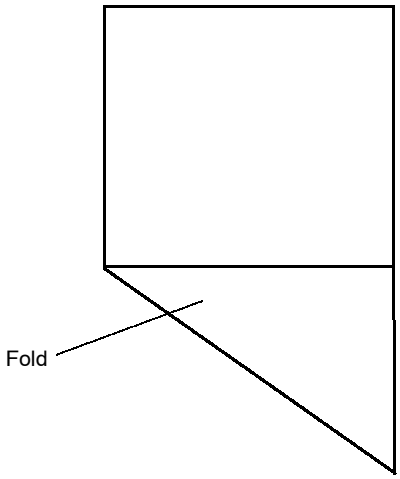


Figure 4-2
Paper Fold

3. Push on the paper until the tip is peeking out the other side. (If it seems too tight to insert the tip, disengage the paper release lever and turn the feed knob.)

4. Grab the tip and pull it through until the paper is straight.
5. Push down the paper lever and insert the plastic paper rod through the center of the paper roll.
6. Place the narrow end of the rod into the small hole on the side of the paper cavity.
7. Snap the wider end into the cutout on the opposite side of the paper cavity.
8. Turn the paper knob clockwise to tighten the paper slack in the cavity.
9. Replace the end boot and tear off extra paper.

6804 and 6808 Series of Printers

1. Lift up the paper release lever. This takes the pressure off the platen. Make sure you have a clean edge on the new paper roll.
2. Take the edge of the paper and fold it 45 degrees.

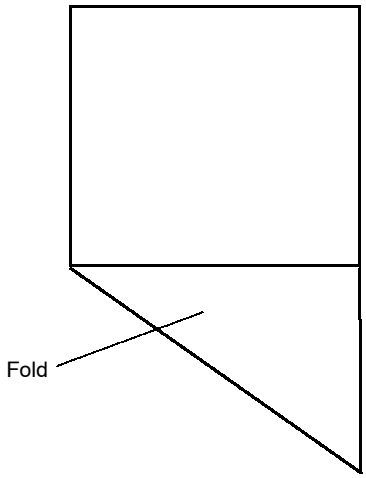


Figure 4-3
Paper Fold

3. Insert the tip of the paper between the roller and the platen.
4. Push on the paper until the tip is peeking out the other side. (If it seems too tight to insert the tip, disengage the paper release lever and turn the gear to advance the paper).
5. Grab the tip and pull it through until the paper is straight.
6. Push down the paper lever and insert the paper into the paper well with it resting in the paper rod clips.
7. Press the red button while the printer is on and it will feed paper. You will need about 2 inches of paper coming out of the mechanism.
8. Lower the cover while placing the extra paper though the tear bar.
9. Latch Cover closed and tear off extra paper.

Batteries

- The 6805a printer uses an internal NiCd battery pack.
- The 6806 printer uses an internal Nickel Metal Hydride battery (DR30).
- The 6804 series of printers uses an internal Nickel Metal Hydride (DR10).
- The 6808 series of printer uses 1 or 2 Lithium-ion battery packs.
- The entire 680x series of portable printers can be charged on the road, with a cigarette lighter adapter or at home or the office with an AC adapter.

Determining Current Battery Power

6805a Printer

To determine the current charge on the battery pack, print out a self test by pressing and holding the red self-test but-

ton for four seconds. If the battery is good, you will see the abbreviation for the word “GOOD” next to the Battery voltage print out.

This printer has a built in low battery detector. When the printer’s battery voltage is low, the printer will beep three times, indicating a Low Battery Warning. This will only happen however, if the printer is awake.

This printer recharges in approximately one hour.

WARNING: ***WARNING: Use only the batteries specified for the printer. Using non-approved batteries will void your warranty. French Canadian: Utiliser uniquement les batteries spécifiées pour l’imprimante. L’utilisation de batteries non approuvées annulera votre garantie.***

6806 Printer

To determine the current charge on the battery pack, you can print out a self test by pressing and holding the red self-test button on the side of the printer for four seconds. If the battery is good, you will see the word “GOOD” next to the battery voltage print out.

This printer has a built in low battery detector. When your printer’s battery voltage is low, the printer will beep three times, indicating a Low Battery Warning.

The 6806 Printer recharges in approximately four hours.

6804 Series

To determine the current charge on the battery pack, print out a self test by pressing and holding the red self-test button for four seconds. If the battery is good, you will see the abbreviation for the word “GOOD” next to the Battery voltage print out.

This series of printers has a built in low battery detector. When the printer’s battery voltage is low, the printer will beep three times, indicating a Low Battery Warning. This will only happen however, if the printer is awake.

This 6804 series of printers recharges in approximately six to nine hours.

6808 Series of Printer

To determine the current charge on the battery pack, print out a self test by pressing and holding the red self-test button for four seconds. If the battery is good, you will see the abbreviation for the word "GOOD" next to the Battery voltage print out. The 6808 series can use two batteries (VBATT1 and VBATT2).

This series of printers has a built in low battery detector. When the printer's battery voltage is low, the printer will beep three times, indicating a Low Battery Warning. This will only happen however, if the printer is awake.

This series of printers recharges in approximately three hours.

Charging your Printer with the AC Adapter

1. Plug the AC adapter into a standard wall outlet.
2. Plug the other end into the DC jack on the side of the printer. The battery charge light will glow red while the battery is charging. When it is fully charged, the light will glow green.

6806 Printers

To connect the ac adapter, slide back the round rubber boot to access the DC jack and charge LED.

6804 and 6808 Series of Printers

To access the charge jack, open the cover then insert the plug.

The entire 680x series of printers can be used while the batteries are being recharged.

Charging your Printer with the Cigarette Lighter Adapter

1. Plug the cigarette lighter cord into a standard cigarette lighter in your vehicle.
2. Plug the other end of the cord into the DC jack on the side of the printer. The battery light will glow red while the battery is charging. When it is fully charged, the light will glow green.

6806 Printers

To connect the lighter adapter, slide back the round rubber boot to access the DC jack and charge LED.

6804 and 6808 Series of Printers

To access the charge jack, open the cover then insert the plug.

The entire 680x series of printers can be used while the batteries are being recharged.

Replacing the Fuse

If the printer does not respond when it is connected to the cigarette lighter adapter, it is possible that the fuse in the adaptor may be blown.

1. To check, remove the cigarette lighter adapter from all power supplies and unscrew the cover over the pin.

2. Pull out the fuse. If the elements in the fuse appear broken, replace the fuse.

Replacement Fuse Rating

- 1/4” diameter
- 1 1/4” length
- 5A 250V
- UL and CSA approved
- McMaster Carr part #7085K75, specify 5 Amp
- 2.5 mm DC jack
- Center pin positive

► NOTE: *Make sure that the cigarette lighter is receiving power during the charging cycle. Many vehicles do not allow the cigarette lighter to operate when the engine is not running.*

When to Replace the Battery

A battery’s life span can be referred to as its ”Cycle Life.” The cycle life is the number of times the battery can be depleted and recharged.

Once the battery reaches the end of its cycle life, the battery’s ability to hold a charge diminishes. If you notice diminished results in printing time, it is time to replace the battery.

Replacing the Battery

6805a Printer

1. Remove the square end boot of the printer (the side with the logo on it) by tucking the tips of your fingers under the edge of the boot and pulling it off with a peeling motion.

2. Press down on the clip to detach the battery connector from the printer.
3. Push on the opposite side of the old battery to slide it through the opening.
4. Push the new battery through the opening.
5. Insert the plug back into the battery.
6. Charge the new battery.

6806 Printer

1. Remove the square end boot of the printer (the side with the logo on it) by tucking the tips of your fingers under the edge of the boot and pulling it off with a peeling motion.
2. Tap the edge of the printer (where you see its bar code label) against the heel of your hand.
3. Lift out plug and slide battery out.
4. Slide the new battery in.
5. Insert the plug back into the battery.
6. Charge the new battery.

6804 Series of Printers

1. Open the cover and slide the battery away from the print head towards the hinge.
2. Lift out the battery from the tray.
3. Slide the new battery in.
4. Charge the new battery.

6808 Series of Printers

1. Open the cover and gently push the battery lock tabs away while lifting the battery up.

2. Insert the new battery in by putting the non contact area of the battery in first towards the center.
3. Push down on the battery near the battery lock tabs.
4. Charge the new battery.

Battery Charging Indicator

Table 4-1
Battery Charging Descriptions

Battery LED	State of Charge
Solid Red	Charging in Progress
Green	Charge Completed
Red Flash Slow	Low Temperature or Battery is disconnected
Red Flash Fast	High Temperature
Red/Orange Slow	Low Voltage
Red/Orange Fast	High Voltage
Orange Flash Slow	Time out
Orange Flash Fast	Internal Error

Customer Receipts and Labels

This chapter is designed to be used by programmers, software engineers, and technicians. It assumes a basic knowledge of computer programming.

The 680x series of printers can operate in **Line Printer Mode** or **Easy Print Mode**. Both modes are used to print receipts, labels, tickets and reports. The mode you choose will depend on the sophistication of your receipt and label requirements, and on a variety of other factors discussed below.

Line Printer (Default)

Line Printer Mode is for receipts and labels with ***text and simple (bit-mapped) graphics such as a signature*** that do not need to be stored.

Easy Print

Easy Print is for receipts and labels with ***complex graphics*** or any ***graphics stored in a PCX format***. It allows you to design a custom receipt, ticket or report with borders, lines, logos, bar codes, text and stored graphics in any arrangement or rotation to suit your needs.

Line Printer Mode

Line Printer Mode allows you to create simple receipts and labels which may include signatures and graphics. The table below details the host commands available when the printer is in this mode.

Table 4-2
Line Printer Mode Descriptions

Command	Description	Page
ESC C n	Set form length. Range for "n" is 1-255	4-15
ESC A n	Set interline spacing; n = 0 (default)	4-16
CAN	Cancel line buffer	4-16
ESC V n1 n2	Bit-mapped graphics mode select	4-16
ESC B	Begin acceptance of compressed graphics	4-17
ESC E	End acceptance of compressed graphics	4-17
SO	Set double wide print	4-18
SI	Condensed print	4-18
FF	Form feed	4-18
LF	Line feed	4-18

Table 4-2 (continued)
Line Printer Mode Descriptions

Command	Description	Page
CR	Carriage return	4-19
ESC w n	Font select. Range for "n" is 21–26 hex	4-19
ESC @	Reset the printer	4-20
ESC Hn	Multiply height "n" times	4-20
ESC Q n1 n2	Advance n1 n2 from "Q" mark	4-21
ESC R n	International Font selection	4-21
ESC ! n	Set double wide and double high	4-21
ESC EZ	Go to Easy Print Mode	4-22

▶ **NOTE:** *All Line Printer Mode commands are case sensitive. Where you see lower case letters, use lower case. Where you see upper case letters, use upper case. The "n"s are binary numbers, not ASCII (see individual commands).*

Sample Receipt in Line Printer Mode

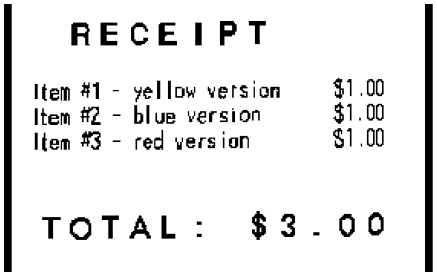


Figure 4-4
Line Printer Mode Sample Receipt

Command Strings for Text

1. ←w”
2. RECEIPT
3. ←w!
4. Item #1 - yellow version $1.00
5. Item #2 - blue version $1.00
6. Item #3 - red version $1.00
7. ←w”
8. TOTAL: $3.00
9. ←EZ

Explanation of Command Strings

- Line 1-2: The “←” character is what the ESC character looks like on your screen. Lines 1-2 print “RECEIPT” in 7.2 cpi font using←w sequence.
- Line 3-6: Print Item #1 - #3 information in a 20.4 cpi font using←w! sequence.
- Line 7-8: Prints the “Total” in a 7.2 cpi font using←w sequence.
- Line 9: Go to Easy Print Mode. (The left arrow←w represents the escape character as it appears on your screen).

Escape Sequences

ESC C n Set Form Length

- Format: ESC C *n*
- Dec: 27 6 *n*
- Hex: 1B 43 *n*
- Function:Sets the page length in character lines. In the command format, “n” represents the number of lines in the form and “n” is a single byte. The default for “n” is 20 decimal, 14 hexadecimal. The range for “n” is 1-255.

ESC A n Set Interline Spacing

- Format: ESC A *n*
- Dec: 27 65 *n*
- Hex: 1B 41 *n*
- Function: Sets the number of blank dot lines that are fed between character lines. It will add "n " (eight bit binary number) blank lines after completion of the current line and before the next line begins printing. The default for "n" is 0, where n = number of inter character blank dot lines in a single character. The range for "n" is 1-155.

CAN Cancel Line Buffer

- Format: CAN
- Dec: 24
- Hex: 18
- Function: Cancels characters received on the currently forming line (but not yet printed) to be discarded.

ESC V n1 n2 Bit-Mapped Graphics

- Format: ESC V n1n2
- Dec: 27 86 n1n2
- Hex: 1B 56 n1n2
- Function: Prints the next (n1*256 + n2) dot lines as bit-mapped graphics. "n1n2" form a 16-bit binary number set, most significant byte first.

Used to print user-generated bit map graphics across the width of the print head. After receipt of this command, the printer will dump the binary data supplied directly to the print head. As customary with bit map data, a "1" bit indicates a dot is on, "0" bit indicates the dot is off.

Graphics printed in this manner must be the exact width of the head in bits. Bit 7 of the first byte of data received will print at the left-most dot on the head as you view the head with the paper feeding away from you.

The printer will remain in bit map graphics mode until the total amount of bytes necessary to fill “n1 n2” lines of print have been received by the printer.

Table 4-3
Bit-Mapped Graphics Mode Descriptions

Printer Type	Dots Across	Bytes Across	Dots Per Inch
6805a	384	48	203
6804 & 6804TCR	384	48	203
6804DM & 68804DMCR	240	30	127 Horizontal, 69 Vertical
6806	576	72	203
6808 Series	832	104	203

ESC B, ESC E Accept Compressed Graphics

- Format**:** ESC B
- Dec: 27 66
- Hex: 1B 42
- Format: ESC E
- Dec: 27 69
- Hex: 1B 45
- Function:Accepts compressed graphics data. Then it will uncompress and print.

Each compressed dot line (using a run-length encoding scheme) is preceded by an uppercase “G.” Each uncompressed dot line is preceded by an upper case “U.”

Vertical white space (where several consecutive dot lines have not been printing) can be efficiently handled using an upper case “A” followed by a single byte count of the number of dot lines to advance.

Compressed dot lines use a single graphics byte, followed by the number of times that byte is to be repeated. Once the

compressed graphics data command (ESC B) is received, each dot line must be preceded by the “G” or “U,” or an “A” may be sent followed by the number of lines to advance.

When all data has been sent, the final bytes must be ESC E to exit compressed graphics data.

Compressed graphics mode requires a graphic image the same width as the print head in use: The 6806 has 576 bits across a single line; the 6805a and 6804 have 384 bits; the 6804DM has 240 bits; and the 6808 has 832 bits across a single line.

SO Set Double Wide Print

- Format: SO
- Dec: 14
- Hex: OE
- Function: Will print the current font in double width until an SI is received (single wide printing) or a carriage return is received.

SI Set Single Wide Print

- Format: SI
- Dec: 15
- Hex: OF
- Function: Will print the current font in single width.

FF Form Feed

- Format: FF
- Hex: 0C
- Dec: 12
- Function: Will print the current line being formed, then advance the paper to top of form.

LF Line Feed

- Format: LF

- Dec: 10
- Hex: 0A
- Function: Line feed will cause the line to print and the paper to advance.

CR Carriage Return

- Format: CR
- Dec: 13
- Hex: 0D
- Function: Like a line feed (see above), the carriage return command will cause the line to print and the paper to advance.

Both Line Feed and Carriage Return commands are provided for your programming convenience.

NOTE: *To print and advance "n" lines, use that number of CR commands (or LF commands, or CR/LF or LF/CR combinations).*

ESC w n Select Font

- Format: ESC w n
- Dec: 27 119 n
- Hex: 1B 77 n
- Function: Selects a font from the following list, given "n," a binary eight-bit number. The first three fonts in the table below are permanent fonts. The next four have been added for you but can be removed. The default font style is a 20.4 cpi font (n= 33 decimal, 21 hexadecimal.)

Table 4-4
Line Printer Mode Font Descriptions

Name	Font	ASCII	Hex	Dec	Dots Wide	Dots High	Description
MF055	5.5	#	23	35	37	39	96 chars large block
MF072	7.2	”	22	34	28	31	96 chars large block

Table 4-4 (continued)
Line Printer Mode Font Descriptions

Name	Font	ASCII	Hex	Dec	Dots Wide	Dots High	Description
MF102	10.2	(space)	20	32	20	26	223 chars medium block bold
MF107	10.7	&	26	38	19	26	96 chars block bold
MF185	18.5	$	24	36	11	24	96 chars block normal
MF204	20.4	!	21	33	10	24	224 chars block normal
MF226	22.6	%	25	37	9	24	97 chars small block
6804DM Printer Only							
IM5X7	22.1	?	3F	63	5	7	96 chars impact 5 x 7
IM5X8	22.1	@	40	64	5	8	96 chars impact 5 x 8

▶ **NOTE:** *The "(space)" in the chart above represents the space character. This is the basic list of fonts. For the entire list, See Appendix C.*

▶ **NOTE:** *To compare the fonts, run the demo program and print the sample files. See Chapter 2, Quick Demo.*

ESC @ Reset Printer

- Format: ESC @
- Dec: 27 64
- Hex: 1B 40
- Function: Resets the printer to defaults.

▶ **NOTE:** *Here's an important Easy Print command to remember when you wish to return to Line Printer Mode from Easy Print Mode: Format: {LP} Function: "{LP}" is not a Line Printer Mode command. Use it from within Easy Print Mode when you need to return to Line Printer Mode . If you do use it from within Line Printer mode by mistake, it will simply print "[LP}" on your receipt or label.*

ESC Hn Heighten Font "n" Times

- Format: ESC H n

- Dec: 27 72 *n*
- Hex: 1B 48 *n*
- Function: Multiply height of font by "n." Must apply to entire line.

ESC Q n1n2 Advance "n1n2" From "Q" Mark

- Format: ESC Q n1 n2
- Dec: 27 81 *n*
- Hex: 1B 51 *n*
- Function: Advance the paper "n1n2" dot lines from "Q" Mark. For more on the "Q" mark, see Appendix A.

ESC R n Select International Character Set

- Format: ESC R *n*
- Dec: 27 82 *n*
- Hex: 1B 52 *n*
- Function: Selects international

0 = USA	4 = Denmark
1 = France	5 = Sweden
2 = Germany	6 = Italy
3 = UK	7 = Spain

ESC Hn Set Double Wide and Double High

- Format: ESC ! n
- Dec: 27 33 *n*
- Hex: 1B 21 *n*
- Function: Selects font height and width for one line. Must apply to entire line.

  n = 10h 16d Double High

  n = 20h 32d Double Wide

  n = 30h 48d Double High and Double wide

ESC EZ Go to Easy Print Mode

- Format: ESC E Z
- Dec: 27 69 90
- Hex: 1B 45 5A
- Function: Puts the printer in Easy Print Mode. You must use the capital letters 'EZ."

Easy Print Mode

Easy Print is the easiest of all possible modes of printing. It uses "English-like" commands. ***You can go to Easy Print from Line Printer Mode by entering an ESC EZ.***

Easy Print Mode allows you to design a custom receipt, ticket or report with borders, lines, stored graphics, logos, bar codes and text in any arrangement or rotation to suit your needs. Unlike Line Printer Mode, Easy Print allows you to use stored graphics. Thus, anything you print will be printed lightning fast. You can create images that are missing only variable data, which will be supplied when the image is printed.

The 680x series of printers can store from one to 100 different formats in internal memory, depending on the size of the format and the amount of memory available in your printer (1M or 4M).

The printed receipt might contain your company logo at the top, a signature line at the bottom and an identifying bar code in the middle.

Easy Print Command General Format

There are four things to remember about all Easy Print Commands.

1. They all look like this: {**Command:Information**} where “information” is the set of instructions (if any) the printer needs to carry out a command.
2. For some commands, no “information” is necessary in the sense used above.
3. For some commands, the information the printer needs is somewhat more complex, e.g. the Print Command.
4. For some commands, there are “global options” which modify the entire command.

▶ **NOTE:** *Always use Easy Print for graphics you will use multiple times, such as a company logo. By storing a graphic in flash memory, you minimize communications between the host computer, thus increasing your print speed. Your hand-held computer sends only the variable data to the printer in order to print receipts*

▶ **NOTE:** *If the printer is asleep, null characters must precede any Easy Print or Line Printer commands. If the printer is awake, it does not need null characters in either mode.*

Print Command Format

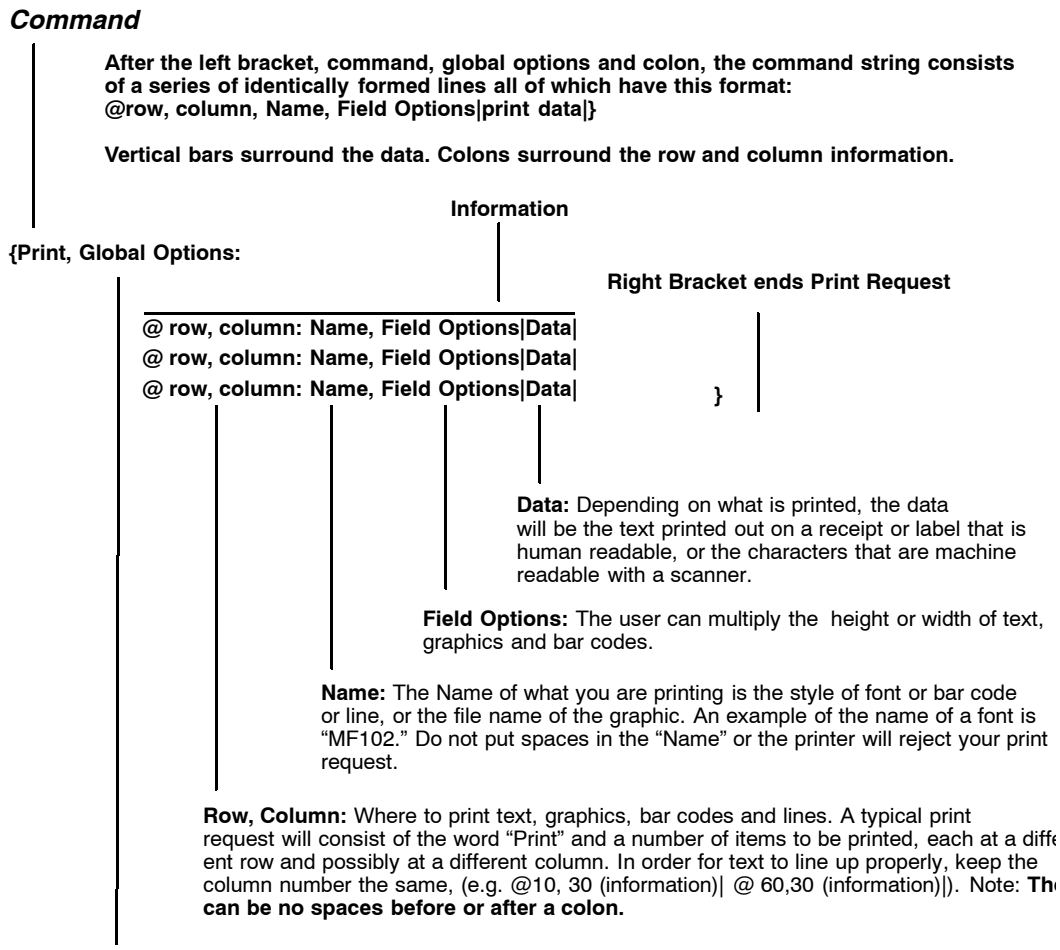
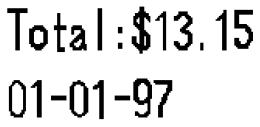


Figure 4-5
Print Command Format

Table 4-5
Quick Reference for Easy Print Commands

Command	Reference Page
Ahead	4-28
Back	4-28
LP	4-28
Self Test Printout	4-28
Print	4-28
Print Command Format	4-29
Print Global Options	4-30
Font Names	4-32
Font Field Options	4-33
Bar Code Names	4-33
Bar Code Field Options	4-34
Graphic Names	4-36
Graphic Field Options	4-37
Line Names	4-37

Easy Print Example 1



EXAMPLE 1: Text with Field Options

```
1) ← EZ
2)  {PRINT:
3)  @10,30:MF226,HMULT2,VMULT2|Total:$13.15|
4)  @60,30:MF226,HMULT2,VMULT2|01-01-97|
5)  }
```

Explanation of Command Strings

Line 1: Set to Easy Print Mode. The "←" is how the ESC character looks on the screen.

Line 2: Left bracket and "PRINT" begins print request.

Line 3: Print "Total $13.15" in a 22.6 cpi font that has been vertically and horizontally multiplied to twice its normal size. Note that there are no spaces in the row and column information, nor any spaces in the font name.

Line 4: Print the date 01-01-97 in a 22.6 cpi font that is widened and heightened to twice normal size.

Line 5: Right bracket closes Print Command set.

Easy Print Example 2

EXAMPLE 2: Text and Bar Code with Field Options

```
1) ← EZ
2) {PRINT:
3) @10,30:MF226,|Item#1 yellow  $10.00|
4) @40,30:MF226|Item#2 blue       $3.15
5) @100,30:BC39N,HIGH 20,WIDE 2|@13.15
6) @150,30:MF107|TOTAL $13.15|remarks
7) }
8) {AHEAD:200}
```

Explanation of Command Strings

Line 1: Set to Easy Print Mode. The "←" is how the ESC character looks on your screen.

Line 2: Left bracket and “PRINT” begins print request.

Line 3-4: Starting at row 10, column 30, print Item #1 and Item #2 information in a 22.6 cpi font.

Line 5: Print a Code 39 bar code that has been heightened and widened. The embedded Total doesn’t have the word “Total” because this bar code wasn’t wide enough to embed the whole word.

Line 6: Print the human-readable total underneath the bar code. *You can put remarks or comments after the vertical bar.*

Line 7: A right bracket closes the Print command set.

Line 8: The AHEAD command advances the paper 200 dot lines.

Easy Print Command Section

The rest of this chapter gives you the specifics of each Easy Print command.

Each Easy Print command has a unique format and function. All but the “Query” class of commands can be explained in 1-7 pages. Detailed information on the “Query” class can be found in Appendix B. The “n”s are ASCII numbers, not binary (see individual commands).

Ahead Command Format {AHEAD: nnn}

{ A left bracket begins the command set.

AHEAD:nnn "AHEAD:nnn" or "Ahead:nnn" or "A:nnn" advances the paper by "nnn" dot lines. Ahead is an alternative to using the paper knob and manually advancing the paper. The range for "nnn" is 1 to 65,000. The command is enclosed in left and right brackets.

} A right bracket ends the command set.

Back Command Format {BACK: nnn}

} A left bracket begins the command set.

BACK:nnn "BACK:nnn" or "Back:nnn" or "B:nnn" backs the paper by "nnn" dot lines. Use the BACK command to reposition the edge of the paper for minimum paper waste. The command is enclosed in left and right brackets.

} A right bracket ends the command set.

Line Printer Mode {LP}

{ A left bracket begins the command set.

LP "LP" puts printer in Line Printer Mode. The command is enclosed in left and right brackets.

} A right bracket ends the command set.

Self Test Printout {TP}

{ A left bracket begins the command set.

TP "TP" commands a self test print out.

} A right bracket ends the command set.

Print Command Format

The general format for the Print Command (shown below) includes all possible printer actions to stop the paper or rotate the image, all possible print images, and all possible options used to alter those images.

{Print, Global Options:@row,column:Name,Field Options|data|}

{ A left bracket begins each command set.

PRINT, A comma follows the PRINT command only if there are one or more "global options."

Global Options:"Global options" include DEMAND, QUANTITY, QSTOP, STOP, and ROT270. If more than one global option is used, each is separated from the next by a comma. Following the last global option or following "Print" if there are none is the ":"

@row,column: "@row,column:" specify the row and column where each line of text or graphics will be placed. The row and column numbers are separated by a comma with no spaces anywhere. The range for each row is 1 - 65,000. The column range for the 6805a is 1 - 384. The column range for the 6806 is 1 - 576. In a typical print request , there may be five or more "@row,col" for the single word "Print."

Name "Name" is the name of the text, bar code, line or graphic to be printed. *The name is always five characters, even for the graphics which you name yourself.*

Field Options "Field options" are used to increase the size of fonts, bar codes, graphics or lines. Each one is separated from the next by a comma.

|Data | "Data" refers to the text to be printed or embodied in a bar code. Data is surrounded by vertical bars.

} Right bracket ends the PRINT command set.

▶ **NOTE:** *A single print command can be used for multiple print lines called a print request. Thus, you don't have to repeat the word "PRINT" every time you want to print another line of text.*

Global Options

BACKnnn **Back Global Option**

Format: BACKnnn (1 ≤ nnn ≤ 200)

Function: Functions the same way as the BACK command. Backs the paper up "nnn" dot lines before beginning to print.

Example: {PRINT,BACK50:@10,30:MF107|Hi world| }

QUANTITYnnn **Quantity Global Option**

Format: QUANTITYnnn (1 ≤ nnn ≤ 999)

Function: Quantity allows you to specify how many copies of a label or receipt you wish to print.

Example: {PRINT,QUANTITY 5:@10,30: MF107|Hi|}

DEMAND **Demand Global Option**

Format: DEMAND (6805a and 6806 only)

Function: Used with the "QUANTITY" command, or alone, DEMAND allows you to print a given number of copies, stopping between each copy. Just press the red button on the printer to print each copy. You can print less than the Quantity specified. If no Quantity is specified, you can print one copy when you're ready. The remaining demands will clear when the printer falls a sleep. You can cancel the remaining demands by sending ESC{CN!}

Example: {PRINT, QUANTITY 5, DEMAND:@10,30:MF107|Hi world|}

QSTOPnnn **Qstop Global Option**

Format: QSTOPnnn (1 ≤ nnn ≤ 65000) (6805a, 6806, and 6804)

Function: Stop nnn dot lines after sensing "Q" mark. After the mark has been found, the paper advances for "nnn" dot lines and stops (even if the image is not yet complete.) If, however, there is no "Q" mark on the paper, the printer continues its search. See also the "STOP" option for use as a safeguard.

Example:{PRINT,QSTOP500:@10,30:MF107|Hi world| }

▶ **NOTE:** *The "Q" must be positioned so that it does not sit under the sensor when the paper is properly aligned. See Appendix A, for more on the Qmark.*

ROT270 **ROT270 Global Option**

Format: ROT270

Function: Will rotate image so that the left-hand edge of the landscape image prints first.

Example:{PRINT,ROT270:@10,30:MF107|Hi world| }

STOP nnn **Stop Global Option**

Format: STOP nnn (1 ≤ nnn ≤ 65000)

Function: Use the STOP option to advance the paper to the proper point for tearing. This options stops the paper "nnn" dot lines after the beginning of the label or receipt. The data "nnn" sent after the STOP option specifies the total number of dot lines high for this print image. For example, for the 680x series, which have a 203 DPI mechanism, specifying "STOP 500" will give a 2.5" total height image from the top of the paper to where it has stopped under the print head.

The STOP option can be used with the QSTOP option. Set the STOP to stop the printing just after the stop using the QSTOP option. This way, the paper will always stop ad-

vancing whether paper with "Q" marks is loaded, or regular paper is loaded.

Example:{PRINT,STOP500,QSTOP125:
@10,30:MF107|Hi world|
}

In this example, the paper will stop advancing when it has advanced 500 dot lines, or 125 dot lines after the "Q" mark has been detected, whichever occurs first.

{Print, Global options:@row,column:**Name**,Field Options|data|}

Font Names

To print text, you must specify the name of the font for the text to be printed. Each font has a five-character name. This is only a partial list. For the entire list of available fonts, see Appendix C.

Table 4-6
Printing Text Font Name Descriptions

Name	CPI	Description
MF055	5.5	96 chars large block (26 chars for lower case, 26 chars for upper case, plus symbols, etc.)
MF072	7.2	95 chars large block
MF102	10.2	223 chars medium block bold
MF107	10.7	96 chars block bold
MF185	18.5	96 chars block normal
MF204	20.4	224 chars block normal (default font for 6805a, 6806, and 6804 printers).
		6804DM Printer Only
IM5X7 (default)	22.1	96 characters for impact 5 x 7

Table 4-6 (continued)
Printing Text Font Name Descriptions

Name	CPI	Description
IM5X8	22.1	96 characters for impact 5 x 8
MF226	22.6	96 chars small block

Font Field Options

These options are used to heighten or widen the font.

Table 4-7
Font Field Option Descriptions

Field Option	Abbr.	Description
HMULTn	HMn	Widens text; $1 \leq n \leq 255$.
VMULTn	Vn	Heightens text; $1 \leq n \leq 255$.

▶ **NOTE:** *To compare the fonts, run the demo program and print the samples. See Chapter 2, Quick Demo.*

Bar Code Names

Table 4-8
Bar Code Description and Data Requirements

Name	Description	Requirements for Data
BC39N	Code 39 2:1 ratio	Can use these characters in the data field: Space $ % + . / 0–9 A – Z. Auto inserts leading and trailing "*"
BC39W	Code 39 3:1 ratio	Can use same characters as above.
COBAR	Codabar	0–9 – $: / . + a b c d, user must send leading and trailing guard bar a–d
I2of5	Int. 2 of 5 2.5:1 ratio	0–9 (digits only, must be even. Controller will insert leading zero to assure an even number of digits).

Table 4-8 (continued)
Bar Code Description and Data Requirements

Name	Description	Requirements for Data
BCI25	Int. 2 of 5 2:1 ratio	0–9 (digits only, must be even. Controller will insert leading zero to assure an even number of digits).
BC128	Code 128	Automatically selects Codes A - C, for the shortest bar code. Allows all ASCII characters.
EN128	EAN–128	Uses Codes C, for the shortest bar code. Allows all ASCII characters.
UPC–A	UPC–A	0–9 (must have 11 digits or error, controller calculates check digit).
EAN08	EAN–8	0–9 (must have 7 digits or error, controller calculates check digit).
EAN13	EAN–13	0–9 (must have 12 digits or error, controller calculates check digit).
PD417	PDF–417	See Notes on the use of PDF–417.

Bar Code Field Options

Table 4-9
Bar Code Field Option Descriptions

Field Option	Abbr.	Description
HIGHn	Hn	Changes height of bar code in 5 dot inch intervals; default is 5 dots; $1 \leq n \leq 255$.
WIDEn	Wn	Width multiplier of bar code; default is 1; W = 2 is twice as wide (1/2 density) as W = 1; $1 \leq n \leq 255$.

Notes on the use of PDF-417

Use PDF–417 the same as any other bar code:

1. After entering Easy Print using ESC+EZ, select the barcode using the name “PD417”.

2. Enter data between two '|'. If the data is long, DO NOT put CR/LF in data unless you want the CR/LF to be in the bar code.

PDF-417 has several field parameters that may be specified:

1. COLUMNS will specify the number of columns of DATA printed in each row of the bar code. If not specified, the default value of 2 DATA columns is used. The actual COLUMNS used is 4 greater then DATA COLUMNS. (2 for GARD COLUMNS and 2 for ROW indicator COLUMNS).
2. SECURITY specifies the level of error detection and correction codes, from 1 through 8. If not specified, the default value for the number of data characters to be printed is used:
   - 1-40 characters level 2
   - 40-160 characters level 3
   - 161-320 characters level 4
   - 321-863 characters level 5
3. YDIM specifies the height of each element, in units of .005 inches. Default is 1
4. WDIM specifies the width of each element, in units of .005 inches. Default is 1

PDF-417 symbols contains:

1. A maximum of 1848 text characters (fewer if mixed with arbitrary bytes)
2. A minimum of 3 rows and a maximum of 30 rows
3. A minimum of 1 column and a maximum of 30 columns
4. Error detection and correction characters vary with different security levels:
   - Level 1 adds 4 codewords
   - Level 2 adds 8 code words

- Level 3 adds 16 code words
- Level 4 adds 32 code words
- Level 5 adds 64 code words
- Level 6 adds 128 code words
- Level 7 adds 256 code words
- Level 8 adds 512 code words

EXAMPLE: {PRINT:@75,10:PD417,YDIM 6,XDIM 2,COLUMNS 2, SECURITY 3|ABCDEF-GHIJKL|}

Will print a PDF-417 bar code containing ABCDEF-GHIJKL with each element .010" wide and .030" high, with each row containing 2 data bytes and using a error detection and correction level of 3, which adds 16 error correction code words to the bar code.

You can print any characters using the PDF-417. It is optimized for the most common printing of a mixture of numbers, text, and control characters.

Graphic Names

Function: Print a stored graphic, e.g. stored under the name "alogo."

EXAMPLE 1: {PRINT: @10,30:ALOGO|}

EXAMPLE 2: {PRINT:@10,30:ALOGO,HMULT2, VMULT2|}

Explanation: Example 1 prints whatever logo has been stored under the five-character name, "ALOGO." (See Chapter 3 on how to use the "Graphics" button in the Configuration Program to store a graphic automatically.

Example 2 above makes the logo twice as big as it would be otherwise.

Graphic Field Options

These options are used to widen or heighten the graphic.

Table 4-10
Graphic Field Option Descriptions

Field Option	Abbr.	Description
HMULTn	HMn	Multiplies width of graphic by "n"
VMULTn	VMn	Multiplies height of graphic by "n"

▶ **NOTE:** *See Chapter 3, Graphics section, for storing graphics automatically before you print.*

Line Names

Format 1: Hline, length nnn, thick n

Format 2: Vline, length nnn, thick n

Function: Horizontal and vertical lines can be drawn around text or graphics.

EXAMPLE 1: {PRINT: @60,30:HLINE, length 200, thick 2|}

EXAMPLE 2: {PRINT:@60,30:VLINE, length 50, thick2|}

Explanation: Example 1 prints a horizontal line 200 dot lines long, and two dot lines thick. Example 2 prints a vertical line 50 dot lines long, and 2 dot lines thick. There is only a single vertical bar "|" because there is no data to enclose.

Table 4-11
Line Names Option Descriptions

Abbr	Name	Description
T	HLINE	Horizontal line
V	VLINE	Vertical line

Table 4-11 (continued)
Line Names Option Descriptions

Abbr	Name	Description
L	Lengthnnn	Set line length
T	Thicknnn	Set line thickness

Card Reader Commands

Operational Commands

All operational commands for the magnetic/smart card reader peripheral are IMMEDIATE commands, taking the form of Easy Print commands (bracketed by "{" and "}") and preceded by the ESC (1Bh) character. Responses vary by command. All operational commands are two characters, followed by:

! command complete, no data is expected in response

? command complete, response with data expected

: data for peripheral follows

In addition, the reader has configuration options which can be semi-"permanently" set in Flash for LED usage, Magnetic Stripe and Smart Card reader. Format for these configuration commands follows the self-writing three character configuration commands (similar to IR related configuration commands).

In all cases, the printer will respond with either a NAK (N<crc>}, or a WACK (W<crc>) indicating the printer is busy writing to flash followed by an ACK (A<crc>). The CRC is the common CRC-16.

General Reader Operational Commands

The card reader has two LEDs, red and green that may be used to give a visual status to the user for either magnetic cards or smart cards. In addition, the printer can be polled for general card reader status as well as the current state of the LEDs. Semicolons separate elements of the returned status:

Command: {**RS?**} Status – returns power, card inserted, and LED status as follows:

- P:0/1 for smart card (ICC) power off or on
- S:0/1 for card not seated or seated
- B:0/1 for button currently connected to reader
- G:0/1/F for Green Led off or on or flashing
- R:0/1/F for Red Led off or on or flashing
- Example Response – no button reader {RS!P:0;S:1;G:F;R:0}indicating ICC power off, card is seated and green led is flashing
- Example Response – with button reader {RS!P:0;S:0;B:1;G:0;R:0} indicating ICC and LEDs off, no card seated, button in contact

Command: {**RG:data**} Controls Green Led – requires 1 data byte.

Response: {RG!} if the command was received (for any data sent).

Command: {**RR:data**} Controls Red Led - requires 1 Data byte.

Response: {RR!} if the command was received (for any data sent).

RG/RR data: 0 (zero) – Turn LED off
1 (one) – Turn LED on
F (flash) – Begin flashing LED

General Reader Configuration Commands

The red and green LEDs and buzzer can be configured to be under host control, or the printer's control. The printer can control the LEDs only if EITHER the MAG card read is enabled, OR the Smart Card is enabled, but not both. If the LEDs are configured to be under host control, the MG and MR commands will override the printer's current use of the LED:

Command: {**CCR:data**} Reader LED and BEEPER configuration – requires data

CCR data: HOST – LEDs and BEEPER are under host control

AUTO – LEDs and BEEPER are under reader's control:

If MAG card enabled and ICC Smart Card disabled:

- Flashing Green – card inserted
- Solid Green (timed) + 2 short beeps – good read
- Solid Red (timed) + 1 long beep – bad read

If ICC Smart Card enabled and MAG card disabled

- Flashing Green – card inserted
- Solid Red – card inserted and ICC power ON
- Solid Green (timed) – card inserted and ICC power turned OFF

Magnetic Card Operational Commands

The magnetic card reader is always operating in the background if it is enabled. Magnetic card data is read when the card is inserted, removed, or both (default is read on removal only). That data read is stored in the printer until the data is zeroed or the printer falls asleep. Temporary

flash configuration override commands are valid only until changed by another command or the printer falls asleep.

Command: **{ME!}** Enable Magnetic card reader (temporarily overrides Flash setting)

Response: {ME!}

Command: **{MD!}** Disable Magnetic card reader (Temporarily overrides Flash setting)

Response: {MD!}

Command: **{MZ!}** Zero Magnetic card data (use to assure data is from CURRENT read)

Response: {MZ!}

Command: **{MR?}** Read Magnetic card data – all data read from card is returned,

Including start/stop characters (%?;) and delimiters (^=)

Returns data delimited as follows:

- {N} – no card data read OR:
- T1: - delimits Track 1 data (sent if track 1 is enabled)
- T2: - delimits Track 2 data (sent if track 2 is enabled)
- T3: - delimits Track 3 data (sent if track 3 is enabled)
- | - delimits data from one track to another

If there is NO data recorded on an enabled track, then an 'N' is returned in place of that data.

If the data read was bad (parity or LRC), then a 'B' is returned in place of that data.

Response example (all three tracks enabled – all good read)

{T1:<data>|T2:<data>|T3:<data>}

Response example (Track 1 data bad and Track 3 not recorded) {T1:B|T2:<data>|T3:B}.

Magnetic Card Configuration Commands

The magnetic card reader is capable of reading Tracks I, II, and III. Not all applications use all tracks, so to avoid bad

reads being reported you should enable only the tracks you expect data to read for data. In addition, the reader can read data when the card is inserted, removed or in both directions. Finally, the card reader can be globally enabled or disabled. Parameters to be set should be set in a single command, with options separated by semicolons:

Command: **{CMR:data}** Configure Magnetic Card Reader – requires data.

CMR data:

- T1:ON or OFF to enable or disable reading Track I
- T2:ON or OFF to enable or disable reading Track II
- T3:ON or OFF to enable or disable reading Track III
- E:ON or OFF to enable or disable the magnetic card read
- D:IN or OUT or BOTH for card read direction
- S:ON or OFF to enable or disable auto RS-232 send of data on reading
- A:ON or OFF to enable the auto print stand-alone demo

EXAMPLE: Turn T1&2 ON, T3 OFF, and the auto print ON:

- 1 – put the printer into Easy Print by sending 3 characters ESC+EZ
- 2 – configure by sending {CMR:T1:ON;T2:ON;T3:OFF;A:ON}

Smart Card Operational Commands

Since Smart Card applications and card types can vary widely, the printer acts only as a conduit to the card, relaying commands to the card and accepting data back from the card.

Most cards require special commands of their own. The commands shown here are commands to the reader, not to the card.

The card specific data sent to the printer as data along with these reader commands is sent to the card and any response (data and/or status word – a 2 byte sequence) from the card is returned to the host. Consult ISO-7816 part 4 for T=0 commands to the smart card, which are included as the data for the SR and SW commands to the card reader and meaning of responses.

Command: {**SP:data**} Controls Power to the Smart card – requires data.

Response for power ON: {SP:<ATR data>}

Where ATR data is Answer To Reset data returned by card

Response for power OFF: {SP!}

SP data: 0 (zero) – Turn power off

1 (one) – Turn power on (printer returns ATR for async card)

Command: {**SW:data**} ICC card write – requires command to be written to card (ISO-7816)

Uses Sync or if Async, protocol selected at configuration

Returns status response from card preceded by {SW!

Command: {**SR:data**} ICC card read – requires command/data to be written to card (ISO-7816)

Uses Sync or of Async, protocol selected at configuration

Returns data and status response with data from card preceded by {SR!

Implemented as required (future):

Command: {**SM:data**} Smart Memory Card – requires command/data to be written to card

Uses I^2C or SPI communications to card

Subcommands for read and write control the reader as well as the card

Smart Card Configuration Commands

The smart card reader can be enabled and disabled. The reader can support smart Asynchronous (T=0 and T=1/future) and Synchronous (future) smart cards, microprocessor based cards as well as memory cards (future). But it must be configured for the type of card that is to be used. Parameters to be set should be set in a single command, with options separated by semicolons:

Command: {**CSR:data**}Configures the smart card reader – requires data

CSR data: T:MEM or ASYNC or SYNC for memory or async or sync μP based card types

P:T0 or T1 for ASYNC card protocol to be used (T1 is future)

M:I2C or SPI for I^2C or SPI type memory card interface (future)

E:ON or OFF to enable or disable the smart card reader

C:BIN or HEX to send commands to the card in binary or ASCII Hex

R:BIN or HEX to receive status&data responses from card in binary or ASCII Hex

A:ON or OFF to enable the auto print stand–alone demo

EXAMPLE: To turn the auto print demo ON:

- 1 – put the printer into Easy Print by sending three characters: ESC+EZ
- 2 – configure the printer by sending {CSR:A:ON}

Operational Scenarios

General

The magnetic card and button data are read automatically by the 6804TCR and 6808 printers, and buffered internally

until the host requests the data. Data is flushed either when the host explicitly requests that the buffer is zeroed or when the printer falls asleep.

Smart cards, however, vary widely and many have specific security issues (such as passwords, cryptographic keys, and application knowledge of file structure) that must be presented to gain access to data stored on the card. For smart card applications, the 6804 and 6808TCR printers acts as a conduit for commands and data from the host, and returns data sent from the card.

In normal operation, the printer will probably be asleep when any card or button transaction begins.

1. The printer will wake up whenever a magnetic card or smart card is inserted, or the probe is touched to a button.
2. The button is read automatically whenever the printer is awake and the button is sensed by touching with the probe.
3. The magnetic card is read when the printer is awake and the card is moving.
4. This data is stored in an internal buffer in the printer and available to the host via RS-232 or IrDA.
5. Data directly from the smart card can be read by command from via RS-232 or IrDA

Magnetic Card Reader

Although insertion type card readers such as the one used on the reader can read cards either upon insertion or withdrawal, the read rate is much higher upon withdrawal with virtually all readers of this type (e.g. the gas pump readers). This is because the card is unstable and the rate of movement can change drastically when the card is first inserted.

If the reader is already awake, and more than one card could be inserted, the application may choose to zero the

buffer before prompting the insertion of the card to assure the data is from the card about to be inserted, and not a previously read card.

An application, then, may choose the following sequence if the operator of the equipment is trained (i.e. not a "consumer" end user); this uses the automatically generated LED/Buzzer status indicators

- Handheld prompts the user to insert, then remove card
- Operator inserts card (waking up the reader) and waits for green LED, then removes card
- Handheld polls the 6804 and 6808 TCR printers waiting for data to be available

Or, if the operator is an "untrained consumer", the application may choose a more step-by-step approach and handle handheld screen prompts and LED/Buzzer as required:

1. Handheld prompts the user to insert their card
2. User inserts the magnetic card into the card reader slot waking up the reader
3. Handheld polls the reader looking for the card to be inserted
4. When the handheld sees the card is inserted, it prompts user to remove card
5. 6804 TCR automatically reads and buffers card data from any or all of Tracks I, II, and III
6. Handheld polls the reader looking for the card to be removed
7. Handheld requests card data from reader

Smart Card Reader

Smart cards vary widely (some are microprocessor based, some are memory only; all may have security). In addition, memory cards have data organization and microprocessor-based cards have a file structure that is defined by the application.

Most smart card operating systems (inside the smart card) do not provide a method of "reading the directory (file structure)". The file structure and security features are unique to the application. So although the reader gives access to "standard card types" (as defined in ISO-7816), it is not possible to "automatically" read and buffer the smart card data.

Each application should have a predefined card type as well as use of that card; the handheld should then have that knowledge. The application, then, might choose to handle a microprocessor-based smart card as follows:

- Handheld prompts the user to insert their card.
- User inserts the smart card into the card reader slot waking up the reader>
- Handheld polls the reader looking for the card to be inserted.
- Handheld commands reader to power up the card; reader returns the card's answer to reset (unique to each card type).
- Handheld commands reader to pass commands and data to the card, selecting files and providing passwords and cryptographic keys as required.
- Reader returns smart card's response to each command and data sent from the handheld, allowing the handheld to determine if proper access has been attained.
- Handheld requests data from the card, and reader returns that data.
- Handheld provides command with data to be written to the card, and the reader passes that command and data to the card and returns the card's response.
- When the transaction is complete, the handheld prompts the reader to power down the card, then prompts the user to remove the card.

Section 5

Maintenance and Troubleshooting

Cleaning Your Printer

The 680x series of portable printers require little maintenance. They were designed to be rugged and attractive without constant attention. However, with continued use, the printer will collect dirt and residue and require some cleaning.

Cleaning the Interior

Dirt, adhesive and residue will collect on the print head of the printer and need to be removed. Clean your printer once a month if you use it frequently, or once every three months if used infrequently.

We offers a printer cleaning card that is used to clean the 6804, 6805a, and 6806 printers. It is a paper-sized card that has been saturated with a cleaning solution.

1. Tear open the pouch containing the cleaning card and remove the card.
2. Remove the receipt paper from the printer and insert the cleaning card into the paper feed.
3. Press the red self-test button on the side of the printer for 4 seconds. Conduct self tests until the card feeds all the way through the printer.
4. Allow a few seconds for the print head to dry and insert it through the printer again.

5. Remove the Cleaning Card and throw it away.

WARNING: ***Do not attempt to clean the internal areas of the printer in any other way than that described above! This could result in damage to the print head and void your warranty***
French Canadian: Vous devez suivre cette procédure pour nettoyer les parties internes de l'imprimante. Si vous ne suivez pas cette procédure, vous pouvez endommager la tête d'impression et annuler ainsi votre garantie.

Cleaning the Exterior

When the outside of your portable printer needs cleaning, use a soft cloth and mild cleanser if necessary. Do not use abrasive cleanser, chemicals or scrubbing pads, as your printer's finish could become marked.

Troubleshooting

Paper Loading Problems

If the paper feed mechanism does not feed correctly on the first part of a new paper roll, remove two to three feet of paper from the outside of the roll. The length of paper rolls can vary by as much as five feet, making the roll too thick in diameter for the printer to accommodate.

If the printer is out of paper (or the paper release lever is disengaged) this condition will interrupt a batch of receipts, and the printer will suspend operation until the condition is cleared. The printer will continue to communicate with the hand held as long as it does not "time out."

Once the printer is operational, the suspended print batch (if any) will continue to print, insuring that all receipts are properly printed.

Not Printing

1. Print a self test. If the self test will not print, check battery voltage by plugging the printer into a wall outlet using the AC adapter. Repeat the self test, and check the Battery Voltage print out. Charge battery if necessary or replace.
2. Check cable connections. Make sure the modular connector is inserted and clipped in.
3. Check to see if your cable has been damaged by excessive pulling. A cable may also be damaged if it is bent at sharp angles.
4. Make sure the paper is properly installed (with lever closed).
5. Turn the print head knob to ensure that paper is not jammed.
6. Use only the recommended battery pack for the printer.
7. Printer will not print on wrong side of paper. Re–load if necessary.

Print Quality Problems

Print Roller Appears Dirty

Clean Your Printer.

Linerless Labels

Linerless label printing can cause the print head to become sticky. Use the cleaning method described in the Preventative Maintenance portion of this section. Attempts to clean the printer by other methods could result in costly damage to the print head.

Print is Too Light

If you are not getting satisfactory darkness, connect your printer to the personal computer containing your Configu-

ration Program and click on the Paper Options button. Adjust the Darkness setting to a higher percentage until the print is dark and crisp. See Chapter 3, page 18, for details.

Charging Problems

Using an AC Adapter

If the printer does not respond when it is connected to an AC adapter, there could be a problem with the adapter or with the wall outlet.

Using a Cigarette Lighter Adapter

If the printer does not respond when it is connected to a cigarette lighter adapter, it is possible that the fuse may be blown. To check, remove the cigarette lighter adapter from all power supplies and unscrew the cover over the pin. Pull out the fuse. If the elements in the fuse appear broken, replace the fuse.

Programming Problems

1. Check to see that you have installed all of the correct settings as required by your particular hand-held computer. Using the information in Chapter 3, you should have chosen the communications settings (baud rate, handshaking, etc.) (However, if you are using IrDA, the infrared standard set by the Infrared Data Association, you will not have to worry about baud rate or parity or data bit settings as they are set automatically).
2. Updating your firmware will delete any data stored in the printer's internal memory. Thus, you may need to add your old format files to your new setup program before updating your configuration.

3. If you are upgrading from version 2.01, you will need to alter your application program substituting Easy Print commands for any "Template" commands you may have previously used.
4. Be sure that your Easy Print "Print" command strings refer only to fonts and bar codes that you have downloaded.
5. Be sure that the format is correct for your Easy Print or Line Printer Mode commands. Refer to Chapter 6 for the escape sequences involved in Line Printer Mode and for the English-like commands used in Easy Print. Remember the rules below when formulating an Easy Print command.

Easy Print Command Format

You must follow the exact format for Easy Print commands:

{Command, Global Options:@row,col:Name,Field Options|data|}

If anything is wrong in the Easy Print request, the image will not print

1. Be sure you use the correct names for Global and Field options (e.g. "QSTOPn" or "WIDEn" where "n" is a number in the proper range). A typo in the global or field option (e.g. "VNULT" instead of "VMULT") will cause the command to be ignored.
2. A colon ":" follows the dot row and dot column information (e.g. where the image will be printed on the receipt or label). There can be no spaces either before or after a colon.
3. If the column numbers are too large for the receipt paper, or the print request skips from one row to a row too much further down the paper, the print request will be unsuccessful.

4. The “Name” (see format above) is the name of the bar code, font, graphic or line. There can be no spaces in the name. A typo in the font name (e.g. MF225 instead of MF226) is a common error.
5. A vertical bar “|” follows the Name of what will be printed and its field options (if any). A vertical bar “|” signals the end of the data.
6. A right bracket “}” signals the end of the command.

Downloading Problems

Download via cable connect only, not infrared.

1. You cannot download your current configuration (see Chapter 3) to the same COM-Port that is in use by IrDA or any other device.
2. Prior to downloading, check battery by printing a self-test and checking the “Batt Volt” to see that it is “GOOD.” Alternatively, you can have the charger plugged into the printer prior to download.
3. Paper must be properly installed (with lever down)
4. Check all cable connections.
5. Make sure the COM-Port you selected in your Configuration Program (see Chapter 3) is the same COM-Port the printer is plugged into.
6. Do not toggle out of the Configuration Program during download, as this could interrupt the download.

Appendix A
Specifications

Table A-1
Printer Specifications

Specs	6805a	6806
Dimension	3.75 x 6.25 x 2.25 in. (95 x 159 x 57 mm)	4 x 7 x 2.1 in. (102 x 178 x 53 mm)
Weight:	23 oz. (651 g)	36 oz. (1020 g)
Print Method:	Direct thermal	Direct thermal
Print Medium:	Thermal paper, linerless	Thermal paper, linerless
Paper Width:	2.26 in. (58 mm)	3.15 in. (80 mm)
Print Width:	1.85 in. (47 mm), 384 dots across	2.83 in. (72 mm), 576 dots across
Print Speed:	2 in. per second	2 in. per second
Duration:	More than 2,800 in. per charge	More than 13,000 in. per charge
Operating Temp:	+5 to +122° F (–15 to +50° C)	+5 to +122° F (–15 to +50° C)
Interface:	RS-232C, Infrared, IrDA, ASK	RS-232C, Infrared, IrDA, ASK
Characters:	Full IBM and international character sets	Full IBM and international character sets
Protocol:	Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts.	Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts.
Power:	NiCd, 850 mAhr	DR–30 NMH 3500 mAh
Recharging:	Internal, intelligent, automatic	Internal, intelligent, automatic
Flash Memory:	4 Meg	4 Meg
Drop Test:	Five feet to concrete	Five feet to concrete
Warranty:	One year, includes print head. Extended warranty available.	One year, includes print head. Extended warranty available.

Table A-2
Printer Specifications

Specs	6804 T	6804 T CR
Dimension	4.625 x 7.125 x 1.75 in. (118 x 181 x 44 mm)	4.625 x 7.125 x 2.75 in. (118 x 181 x 70.8 mm)
Weight:	23 oz. (651 g)	28.5 oz. (808 g)
Print Method:	Direct thermal	Direct thermal
Print Medium:	Thermal, linerless	Thermal, linerless
Paper Width:	2.26 in. (58 mm)	2.26 in. (58 mm)
Print Width:	1.85 in. (47 mm), 384 dots across	1.85 in. (47 mm), 384 dots across
Print Speed:	2 in. per second	2 in. per second
Duration:	More than 6,000 in. per charge	More than 5,000 in. per charge
Operating Temp:	-4 to +122° F (-25 to +50° C)	+5 to +122° F (-15 to +50° C)
Interface:	RS-232C, Infrared, IrDA, ASK	RS-232C, Infrared, IrDA, ASK
Characters:	Full IBM and international character sets	Full IBM and international character sets
Protocol:	Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts.	Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts.
Power:	NMH 1800 mAh	NMH 1800 mAh
Recharging:	Internal, intelligent, automatic	Internal, intelligent, automatic
Flash Memory:	4 Meg	4 Meg
Drop Test:	Five feet to concrete	Five feet to concrete
Warranty:	One year, includes print head. Extended warranty available.	One year, includes print head. Extended warranty available.

Table A-3
Printer Specifications

Specs	6804 DM	6804 DM CR
Dimension	4.625 x 7.125 x 1.75 in. (118 x 181 x 44 mm)	4.625 x 7.125 x 2.75 in. (118 x 181 x 70.8 mm)
Weight:	23.3 oz. (660 g)	27.7 oz. (785 g)
Print Method:	Impact dot matrix, ink ribbon cassette	Impact dot matrix, ink ribbon cassette
Print Medium:	Impact paper	Impact paper
Paper Width:	2.26 in. (58 mm)	2.26 in. (58 mm)
Print Width:	1.85 in. (48.8 mm), 240 dots across	1.85 in. (48.8 mm), 240 dots across
Print Speed:	1.9 lines per second	1.9 lines per second
Duration:	More than 2,400 in. per charge	More than 2,000 in. per charge
Operating Temp:	+32 to +122° F (0 to +50° C)	+32 to +122° F (0 to +50° C)
Interface:	RS-232C, Infrared, IrDA, ASK	RS-232C, Infrared, IrDA, ASK
Characters:	Full IBM and international character sets	Full IBM and international character sets
Protocol:	Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts.	Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts.
Power:	NMH 1800 mAh	NMH 1800 mAh
Recharging:	Internal, intelligent, automatic	Internal, intelligent, automatic
Flash Memory:	4 Meg	4 Meg
Drop Test:	Five feet to concrete	Five feet to concrete
Warranty:	One year, includes print head. Extended warranty available.	One year, includes print head. Extended warranty available.

Table A-4
Printer Specifications

Specs	6808	6808 CR
Dimension	6.56 x 6.81 x 2.6 in. (172 x 167 x 66 mm)	6.56 x 6.81 x 3.34 in. (172 x 167 x 85.5 mm)
Weight:	20.3 oz. (575 g)	25.2 oz. (714 g)
Print Method:	Direct thermal	Direct thermal
Print Medium:	Thermal paper, linerless	Thermal paper, linerless
Paper Width:	4.40 in. (112 mm)	4.40 in. (112 mm)
Print Width:	4.09 in. (104 mm), 832 dots	4.09 in. (104 mm), 832 dots
Print Speed:	2 in. per second	2 in. per second
Duration:	More than 2,200 in. per charge using a single battery. More than 4900 inches with two batteries.	More than 1,800 in. per charge using a single battery. More than 4900 inches with two batteries.
Operating Temp:	+5 to +122° F (-15 to +50° C)	+5 to +122° F (-15 to +50° C)
Interface:	RS-232C, Infrared, IrDA, ASK	RS-232C, Infrared, IrDA, ASK
Characters:	Full IBM and international character sets	Full IBM and international character sets
Protocol:	Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts.	Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts.
Power:	Li Ion 1350 mAh (1 or 2 packs)	Li Ion 1350 mAh (1 or 2 packs)
Recharging:	Internal, intelligent, automatic	Internal, intelligent, automatic
Flash Memory:	4 Meg	4 Meg
Drop Test:	Six feet to concrete	Six feet to concrete
Warranty:	One year, includes print head. Extended warranty available.	One year, includes print head. Extended warranty available.

Table A-5
Printer Specifications

Specs	681T/681DM	682T/682DM
Dimension	5.65 x 4.39 x 2.4 in. (143.5 x 111.5 x 60.96 mm)	10 x 7.06 x 2.4 in. (254 x 179.32 x 60.96 mm)
Weight:	20.3 oz. (575 g)	682T 22.72 oz. 682DM 23.52 oz (654 g) (668 g)
Print Method:	Direct thermal/Dot Matrix	Direct thermal/Dot Matrix
Print Medium:	Thermal paper, linerless/Dot Matrix	Thermal paper, linerless/Dot Matrix
Print Speed:	681DM .33 in. per second 681T 2 in. per second	682DM .33 in. per second 682T 2 in. per second
Duration:	More than 2,200 in. per charge using a single battery. More than 4900 inches with two batteries.	More than 1,800 in. per charge using a single battery. More than 4900 inches with two batteries.
Operating Temp:	681DM +32 to +122°F (0 to +50°C) 681T -4 to +122°F (-25 to +50°C)	682DM+32 to +122°F (0 to +50°C) 682T -4 to +122°F (-25 to +50°C)
Interface:	RS-232 serial and IrDA	RS-232 serial and IrDA
Characters:	Full IBM and international character sets	Full IBM and international character sets
Protocol:	Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts.	Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts.
Power:	Li Ion 900 mAh	Li Ion 900 mAh
Recharging:	9 hours to fully charge	9 hours to fully charge
Flash Memory:	4 Meg	4 Meg
Drop Test:	Six feet to concrete	Six feet to concrete
Warranty:	One year, includes print head. Extended warranty available.	One year, includes print head. Extended warranty available.

Table A-6
Printer Specifications

Specs	781T/781DM	782T/782DM
Dimension	5.65 x 4.39 x 2.4 in. (143.5 x 111.5 x 60.96 mm)	11.42 x 8.4 x 2.63 in. (290.07 x 213.36 x 66.80 mm)
Weight:	20.3 oz. (575 g)	782T 22.22 oz.(800 g)
Print Method:	Direct thermal/Dot Matrix	Direct thermal/Dot Matrix
Print Medium:	Thermal paper, linerless/Dot Matrix	Thermal paper, linerless/Dot Matrix
Print Speed:	781DM .33 in. per second 781T 2 in. per second	782DM .33 in. per second 782T 2 in. per second
Duration:	More than 2,200 in. per charge using a single battery. More than 4900 inches with two batteries.	More than 1,800 in. per charge using a single battery. More than 4900 inches with two batteries.
Operating Temp:	781DM +32 to +122°F (0 to +50°C) 781T –4 to +122°F (–25 to +50°C	782DM +32 to +122°F (0 to +50°C) 782T – 4 to +122°F (– 20to +50°C)
Interface:	RS-232 serial and IrDA	RS-232 serial and IrDA
Characters:	Full IBM and international character sets	Full IBM and international character sets
Protocol:	Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts.	Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts.
Power:	Li Ion 900 mAh (1 or 2 packs)	Li Ion 900 mAh (1 or 2 packs)
Recharging:	9 hours to fully charge	9 hours to fully charge
Flash Memory:	4 Meg	4 Meg
Drop Test:	Six feet to concrete	Five feet to concrete
Warranty:	One year, includes print head. Extended warranty available.	One year, includes print head. Extended warranty available.

Battery Specifications

Table A-7
Battery Specifications

Specs	6805a	6806	6804 Series	6808 Series
Cell Size:	5 x AA	6 x 4 AAA	5 x 4 AAA	2 x 4 AAA
Type:	NiCd	DR30 NMH	DR10 NMH	LIP260 Li Ion
Nom. Voltage:	6.0 V	7.2 V	6.0 V	7.2 V
Rated Capacity:	.85 Ah	3.5 Ah	1.8 Ah	1.35 Ah
Operating Temp:	-4 to +122°F (-20 to +50°C)	-4 to +122°F (-20 to +50°C)	-4 to +122°F (-20 to +50°C)	-4 to +122°F (-20 to +50°C)
Weight:	4.5 oz. (127 g)	12.5 oz. (354 g)	6.6 oz. (187 g)	3.1 oz. (88 g)
Agency Approval:	N/A	Listed UL2054	Listed UL2054	N/A
Specs	**681**	**78x**		
Cell Size:	2 cells wrapped	2 cells wrapped		
Type:	NEC	NEC		
Nom. Voltage:	7.6 V	7.6 V		
Rated Capacity:	.90 Ah	.90 Ah		
Operating Temp:	-4 to +122°F (-20 to +50°C)	-4 to +122°F (-20 to +50°C)		
Agency Approval:	N/A	N/A		

Cable Specifications

The 680x series of printers use an RJ-11 six position, six conductor modular jack. The printer cable is specially designed to provide strain relief.

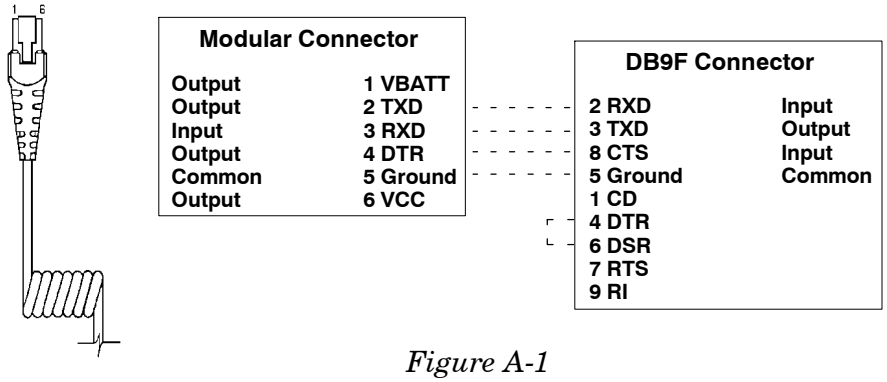


Figure A-1
Modular and DB9F Connector Pin-outs

Thermal Paper Specifications

Table A-8
Thermal Paper Specifications

Specs	6805a	6806	6804T & CR 681T, 682T, 781T, and 782T	6804DM & DM CR, 681DM and 682DM	6808 Series
Paper Width:	2.26 in.	3.15 in.	2.26 in.	2.26 in.	4.40 in.
Roll Diameter:	1.75 in.	2 in.	2 in.	2 in.	2.25 in.
Core Size (actual core):	.4 in.	.4 in.	.4 in.	.4 in.	.4 in.
Core Size (OD):	.625 in.	.625 in.	.625 in.	.625 in.	.625 in.
Paper Thickness:	.002 in.	.002 in.	.002 in.	.005 in.	.005 in.

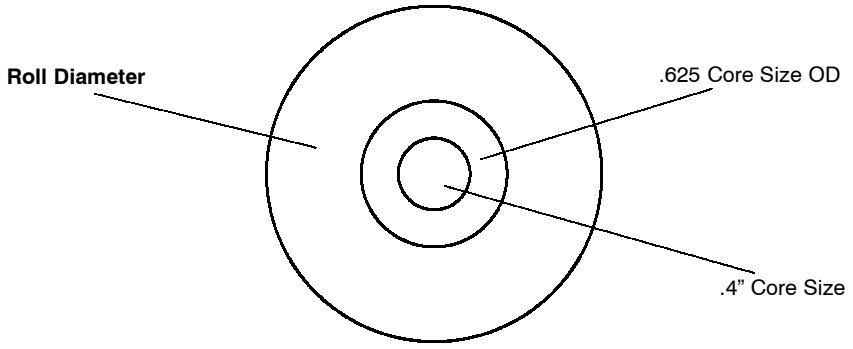


Figure A-2
Thermal Paper Specifications

▶ **NOTE:** *Use only recommended paper specifications. Using other grades of paper may void the product warranty.*

Guidelines for Using a "Q" Mark to Align Forms (6805a, 6806, 6804, and 6808)

1. The "Q" mark *must* be of a high carbon content black to assure sensing. If the "Q" mark is not high carbon content (McBeth >1.3 on a scale of 0–2), it can still look very black to the human eye, but not be sensed by the controller.
2. The "Q" mark must be printed on the thermally sensitive side on the paper. The "Q" mark can be either a strip across the entire width of the bottom of the stock, or a small strip at the bottom aligned to the paper sensor. The height of the strip should be between 0.15 inch and 0.25 inch.
3. Since a single sensor is used for both paper out and "Q" mark sensing, it is important that the "Q" mark not sit under the sensor when the paper has stopped. This will cause a paper-out condition. Therefore, there is an area on the top of form where the "Q" mark cannot be located. By on top we mean that the top of form would emerge from the print mechanism and then the "Q" mark would emerge after top of form.
4. Although the "Q" mark may be located in different areas (following the guidelines above), it *must* always be located in exactly the same position relative to the top of form. Alignment during printing will be only as good as the position of the "Q" mark relative to the top of form.
5. When printing, the value sent with the "QSTOP" global option adjusts the precise stopping position. That value represents the number of dot lines that pass *after* the "Q" mark has been detected until the paper advancement stops. The 680x series of portable printer mechanisms are 1/203 an inch per dot line.

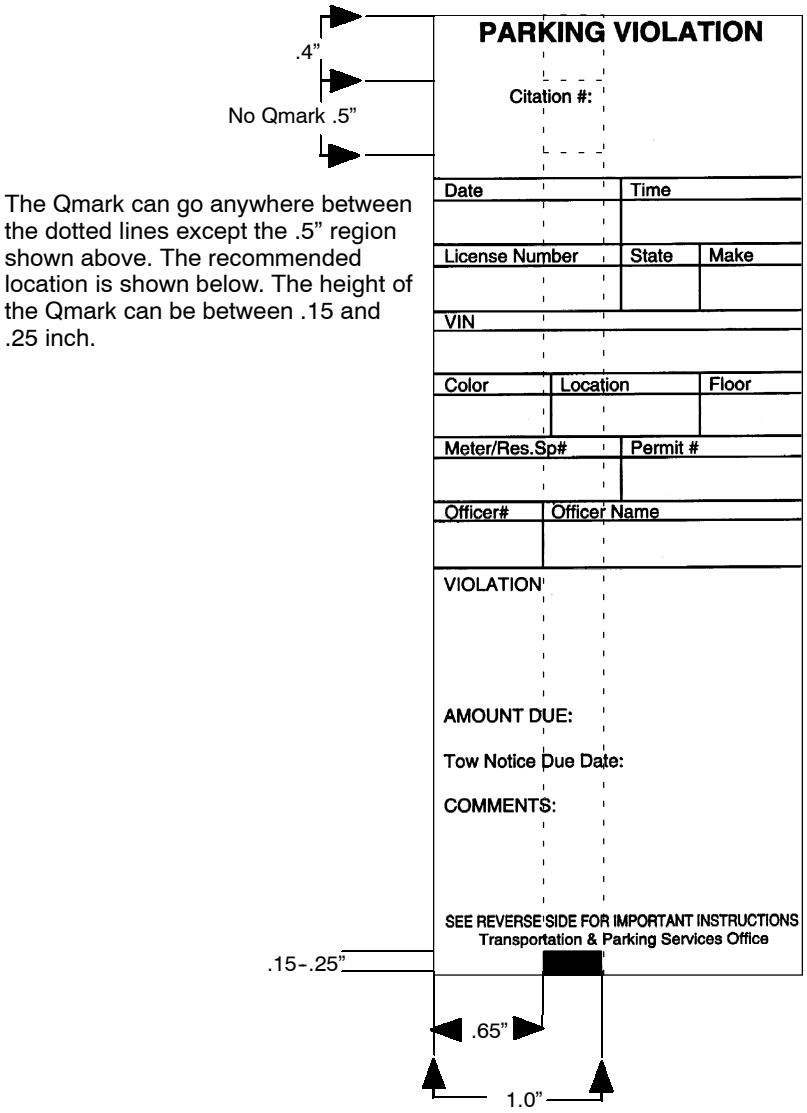


Figure A-3
Parking Ticket Q Mark for 6805a Portable Printer

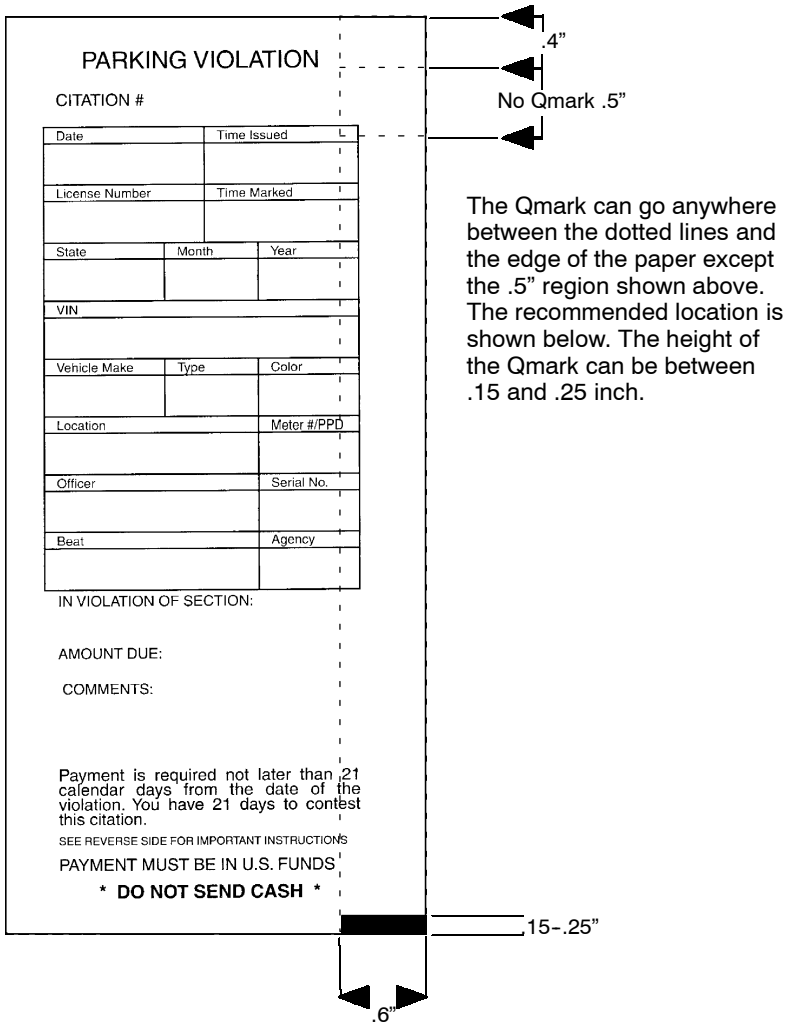


Figure A-4
Parking Ticket Q Mark for 6806 Portable Printer

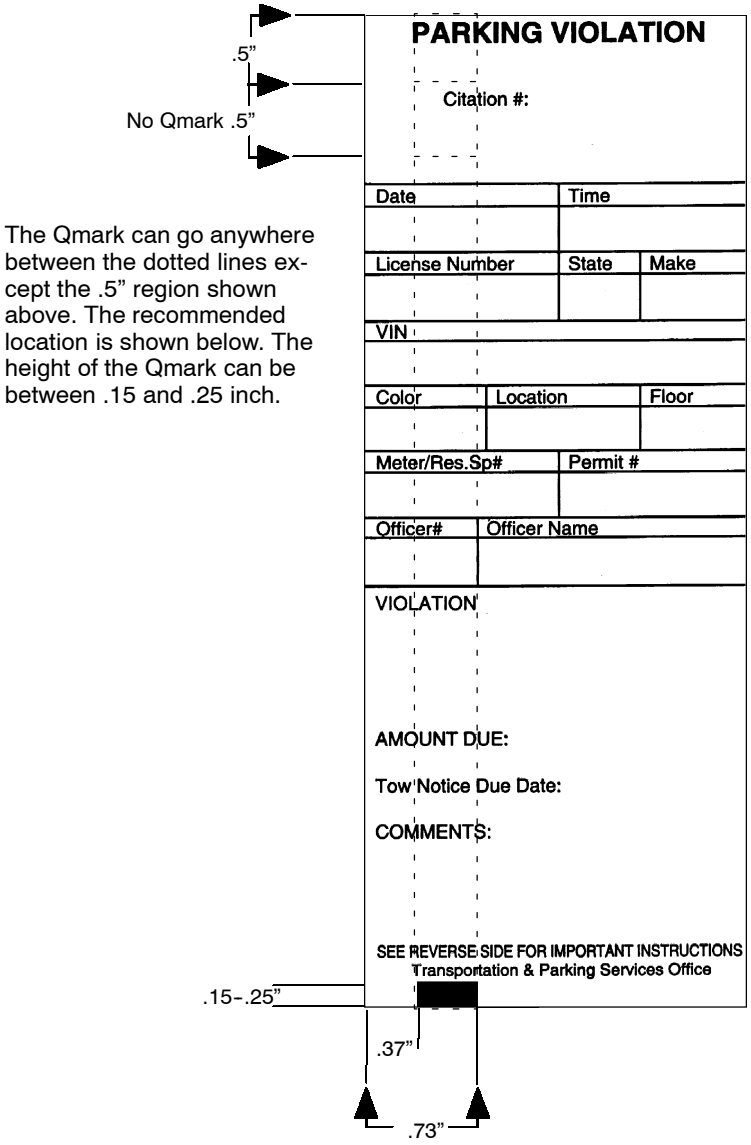


Figure A-5
Parking Ticket Q Mark for 6804 and 6804TCR Portable Printers

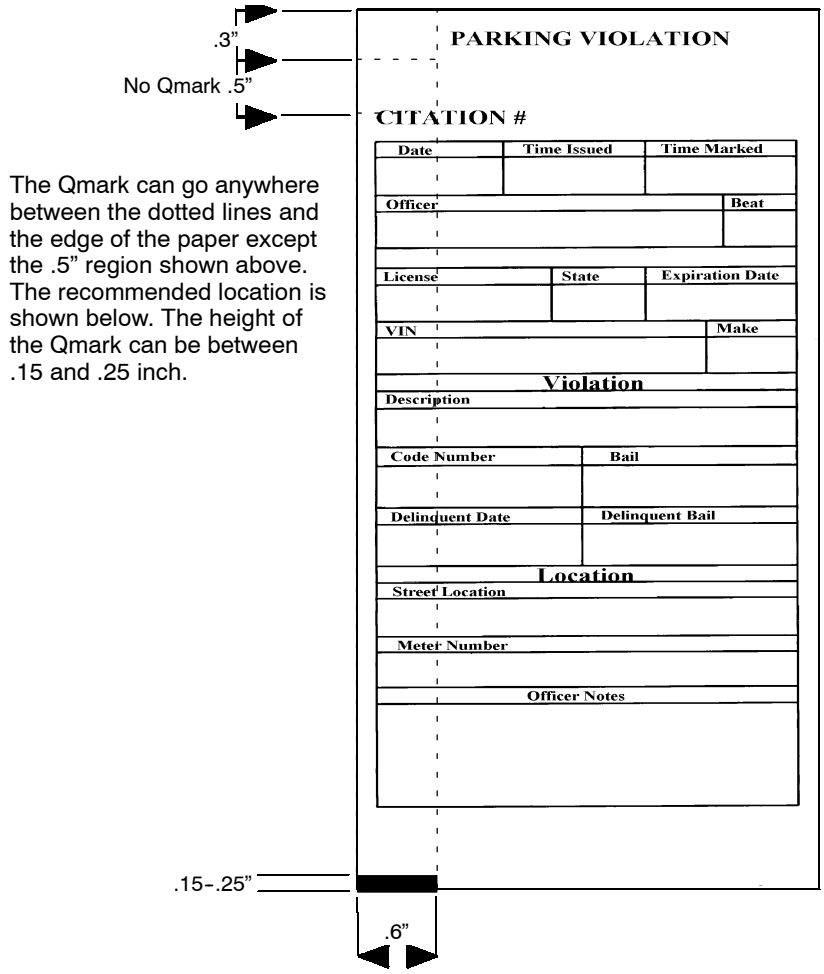


Figure A-6
Parking Ticket Q Mark for 6808 Series Portable Printers

Wake-Up Characters

The printer automatically goes into sleep mode in the number of seconds you specified using your Configuration Program. Thus, you must wake up the printer for it to receive data and print. To do this, you may program a wake-up character sequence into your hand-held device. Program the wake-up character listed below at least six times for baud rates of 9600 to the RS-232 port. You will need more wake-up characters for faster speeds. No wake-up characters are needed for IrDA. For ASK/Pulse about 150 wake-up characters are needed at 9600 baud.

The first character sent wakes up the printer; the next few null characters will be lost during power-up.

Table A-9
ASCII Character Codes

Decimal	Hexadecimal	Control Character	Character
000	00H	NUL	(null)

► **NOTE:** *If you use the timer function, you may program wake-up characters into your hand-held device. Refer to the manual that came with your hand-held for programming information.*

► **NOTE:** *Any character will wake up the printer. If a printable character is used, you will see extra characters printed only if you use too many to wake up the printer.*

Appendix B

Query

Introduction

Queries can be sent to the 680x series portable printer via the infrared link or the RS-232 data link. The printer's reply to a query returns information about the printer or the print request. There are three steps involved.

1. Frame your query using the correct command format.
2. Send the Query (e.g. via an applications program or a terminal emulator such as "Terminal" in the Windows Accessories group).
3. Use the appropriate table to interpret the printer's reply.

Query Format

Query Format

Query Format: ESC{Query?}

Reply Format: {Query!Query1:Reply1;...QueryN:ReplyN}

Function: The word "Query" in the Query Format above is replaced in each case by a specific command. For example, send the string {BT?}.

Interpreting the Reply to a Query

Consult the table for each Query command to interpret the reply. Each reply will contain several pairs of letters. The first letter or "query character." is separated from the reply character by a colon "**:**" and the pair is followed by a semi-colon "**;**". Example: **E:N;** (part of the reply to a STATUS query). According to the STATUS table, the "E" refers to "errors" in Easy Print Commands. An "N" means "no errors."

Table B-1
Query Quick Reference

Command	Format	Description
Status	ESC{ST?}	Returns information about ability of printer to print next image, and reports any errors from the last print request, e.g. paper condition, command errors, buffer size, battery voltage.
Configuration	ESC{CF?}	Returns information about configuration options, e.g. baud rate, default mode, time-out, etc.
Battery	ESC{BT?}	Returns current battery voltage, temperature, and conditions.
Version	ESC{VR?}	Returns version number of loaded firmware, boot code, and download files.
Memory	ESC{MY?}	Returns the size of all memory available, the amount used, and amount remaining for applications.
Print head	ESC{PH?}	Returns type of print head in use and number of dots across.
Infrared	ESC{IR?}	Returns information about IR settings.
Fonts	ESC{FN?}	Returns a list of fonts available.
Graphics	ESC{GR?}	Returns a list of downloaded graphics.
Formats	ESC{FM?}	Returns a list of all formats. Shows Easy Print commands with variable and fixed data that represent a unique print layout.
Demand	ESC{DQ?}	Returns remaining quantity of images.

Table B-1 (continued)
Query Quick Reference

Command	Format	Description
Cancel	ESC{CN!}	Cancels all demand printing.
Reset	ESC{RE!}	Resets printer.

▶ **NOTE:** *The order of the printer's reply to a query may change, and new queries will be added. Therefore, the programmer should search for the "Query character" to find data whenever interpreting the reply to a query.*

Status ESC{ST?}

Query Format: ESC{ST?}

Reply Format: {ST!**E**:x;**L**:x;**P**:x;**R**:x;**B**:x;**H**:x}

Function: Shows whether next print request is doable, or returns info about errors from the last request.

Reply Example: {ST!**E**:N;**L**:D;**P**:P;**R**:62;**B**:O,**H**:O}

Reply Explanation:

- ST! This is a reply to a STATUS query.
- **E**:N; There are no errors.
- **L**:D; The paper release lever is down, ready to print.
- **P**:P; Paper is present.
- **R**:62; 62K bytes remain in the input buffer.
- **B**:O; Acceptable battery voltage and temperature.
- **H**:O; Print head temperature is in acceptable range.

*Rows marked with asterisk apply to Easy Print and Line Printer Mode. Rows without an asterisk apply only to Easy Print.

Table B-2
Status Reference

Query	Reply	Definition
E	N	**N** = no error*
E	c	**c** = command error (invalid command)
E	d	**d** = data error (e.g. letter in numeric–only bar code)
E	f	**f** = font not available
E	g	**g** = global parameter error
E	o	**o** = overrun of buffer*
E	p	**p** = field parameter error
E	q	**q** = qmark not found
E	r	**r** = row/column error
E	s	**s** = syntax error
L	U,D	**L**ever = **U**p or **D**own
P	P,N	**P**aper = **P**resent or **N**ot present
R	nn	**R**AM buffer size remaining, in K bytes.
B	O,T,V	**B**attery condition – **O** =OK; **T** = out of Temperature range; **V** = out of Voltage range.
H	O,T	**P**rint head **T**emperature – **O** = OK, **T** = out of range.

Configuration ESC{CF?}

Query Format: ESC{CF?}

Reply Format: {CF!**L**:x; **B**:x; **P**:x; **N**:x; **H**:x;**D**:x;**Y**:x;**S**:x;**T**:x}

Function: Returns information about configurable options .

Reply Example: {CF!**L**:LP;**B**:096;**P**:N;**N**:8;**H**:B;**D**:+10%; **Y**:1;**S**:Y;**T**:0060}

Reply Explanation:

- CF! This is a reply to a Configuration query.
- **L**:LP; The default mode is Line Printer.
- **B**:096; The baud rate is 9600.
- **P**: N; No parity is set.
- **N**:8; There are 8 data bits.
- **H**:B; Hardware and software handshaking are enabled.
- **D**:+10%; The darkness (burn time) is set to +10%.
- **Y**:1; The paper is 1 ply.
- **S**:Y; The sound is on.
- **T**:0060 The time-out is set for 60 seconds.

Table B-3
Configuration Reference

Query	Reply	Definition
L	LP, EZ	Default mode - **L**ine **P**rinter or Easy Print (**EZ**)
B	012,024,048, 096,192,384	**B**aud rate = 1200, 2400, 4800, 9600, 19.2K or 38.4 baud
P	N,E,O	**P**arity is **N**one, **E**ven, or **O**dd
N	7,8	**N**umber or Data Bits is **7** or **8**
H	N,H,S,B	**H**andshaking = **N**one, **H**ardware, **S**oftware, or **B**oth
D	-25% ...+35%	**D**arkness can be -25%, -20%, -15%, -10%, -05%, +10%, +15%, +20%, +25%, +35%
Y	1,2	Ply of paper = **1** or **2**
S	Y,N	Beeper (Sound) = **Y** (Yes) or **N** (No)
T	nnnn	**T**ime out value in seconds (9999 = always on)

Battery ESC{BT?}

Query Format: ESC{BT?}

Reply Format: {BT!**V**:x;**T**x}

Function: Returns current battery voltage and temperature.

Reply Example: {BT!**V**:6.8;**T**:+25.8C,**CH**:C}

Reply Explanation:

- BT! This is a reply to a BATTERY query.
- **V**:6.8; The current battery voltage is 6.8 Volts.
- **T**:+25.8 Battery temperature is 25.8 degrees Centigrade.
- **CH**:C Complete charge.

Table B-4
Battery Reference

Query	Reply	Definition
V	n.n	Battery **V**oltage = n.n volts
T	±nn.nC	Battery **T**emperature = +nn.n degrees C or -nn.nn degrees C.
CH	D,F,I,N,T,W	C = Complete, F = Fast Charge, I = Initialization, N = No Charge, T = Trickle Charge, W = Wait to restart.
SBOO...SBnn	TBN	Reserved future option for smart battery data Query characters may change.

Version ESC{VR?}

Query Format: ESC{VR?}

Reply Format: {VR!**F**:x;**B**:x;**D**:x}

Function: Firmware, boot code, and download file #.

Reply Example: {VR!**F**:4.09;**B**:2.05;**D**:1.0}

Reply Explanation:

- VR! This is a reply to a VERSION query.
- **F**:4:09; The firmware (main program) version is 4.09.
- **B**:2.05; The boot code version is 2.05.
- **D**:1.0; The download file version is 1.0.

Table B-5
Version Reference

Query	Reply	Definition
F	n.nn	**F**irmware version is n.nn
B	n.nn	**B**oot code version is n.nn
D	n.n	**D**ownload (fonts, graphics, formats) version is n.nn

Memory ESC{MY?}

Query Format: ESC{MY?}

Reply Format: {MY!**FS**:x;**FM**:x;**RS**:x;**DT**:x;**DR**:x}

Function: Returns the size of all memory available in the printer, including the amount used and the amount remaining for the application.

Reply Example: {MY!**FS**:1M;**FM**:AMD;**RS**:1M;**DT**:049152;**DR**:000512}

Reply Explanation:

- MY! This is a reply to a MEMORY query.
- **FS**:1M; This printer contains a 1M bit flash memory
- **FM**:AMD; The **F**lash **M**anufacturer is AMD.
- **RS**:1M; **R**AM **S**ize = 1M.
- **DT**:049152; **T**otal Flash area available for **D**ownload is 49,152 bytes.

- **DR**:000512; **D**ownload Flash memory **R**emaining. Out of the 49,152 bytes, 512 bytes remain available.

Table B-6
Memory Reference

Query	Reply	Definition
FS	1 Meg, 4 Meg.	**F**lash **S**ize = 1 Meg (128K bytes) or 4 Meg (512K)
FM	AMD	**F**lash **M**anufacturer is AMD
RS	1 Meg	**R**AM **S**ize = 1 Meg (128K bytes)
DT	nnnnnn	**D**ownload **T**otal area = nnnnnn bytes
DR	nnnnnn	**D**ownload **R**AM remaining = nnnnnn bytes

Print Head ESC{PH?}

Query Format: ESC{PH?}

Reply Format: {PH!**TD**:x;**DD**:x;**T**:x;**M**:x}

Function: Returns the type of print head in use in this printer and the total number of dots across.

Reply Example: {PH!**TD**:0384;**DD**:203;**M**:LPT3245**T**:+25.6C;}

Reply Explanation:

- **PH**! This is a reply to a PRINT HEAD query.
- **TD**:0384; The print head in this printer has 384 dots across.
- **DD**:203; The dot density is 203 dots per mm.
- **M**:LPT3245 The print head model number is LPT3245.
- **T**:+25.6C; The current print head temperature is +25.6 degrees Centigrade.

Table B-7
Print Head Reference

Query	Reply	Definition
TD	Nnnn	**T**otal **N**umber of dots across this print head.
DD	Nnn	**D**ot **D**ensity of this print head (dots per mm)
M	x...x (variable width	**M**odel number of this print head.
T	±nn.nC	Current **T**emperature of print head.

Infrared ESC{IR?}

Query Format: ESC{IR?}

Reply Format: {IR!**P**:x;**AV**:x;**DV**:x;**IV**:x;**IN**:x;**ID**:x}

Function: Returns information about the current infrared settings.

Reply Example: {IR!**P**:IrDA;**AV**:00;**DV**:00;**IV**:1.02;

IN:6805a printer;**ID**:1234567890123456789}

Reply Explanation:

- IR! This is a reply to an INFRARED query.
- **P**:IrDA; This printer has the IrDA protocol turned on.
- **AV**:00; The ASK version is 00.
- **DV**:00; The DIRECT version is 00.
- **IV**:1.0-06; The IrDA version specification supported is 1.0. and the firmware is version 06.
- **IN**:6805a printer; The device nickname is 6805a.
- **ID**: The device name is 1234567890123456789.

Table B-8
Infrared Reference

Query	Reply	Definition
p	OFF, IrDA, ASK, ASC-CRC, DIRECT, DIRECT-CRC	**P**rotocol selected is OFF, IrDA, ASK, ASK with CRC, DIRECT or DIRECT with CRC.
AV	nn	**A**SK software **V**ersion = nn
DV	nn	**D**IRECTS software **V**ersion = nn
IV	n.n-mm	**V**ersion of **I**rDA specifications supported is n.n; firmware version of IrDA loaded into this printer is mm.
IN	x..x (up to 19 chars) 6805a, 6806, 6804, 6804DM	**I**rDA **N**ickname
ID	x..x (up to 19 chars)	**I**rDA **D**evice name

Fonts ESC{FN?}

Query Format: ESC{FN?}

Reply Format: {FN!**N5**:x,**N1**:x,**L**:x,**UV**:x, **UD**:x,**US**:x, **CPI**:x}

Function: Returns a list of fonts, both permanent and downloaded. Within a complete font definition, each query character is separated from the next with a comma. A semicolon, carriage return and line feed (";"<CR>, <LF>) separates each font.

Reply Example: {FN!**N5**:MF107,**N1**:&(26),**L**:R,**UV**:1,

UD:01/02/96,**US**:96CHARS BLOCKBOLD, **CPI**:10.7**;** **N5**:MF204, **N1**:!(21),**L**:D,**UV**:1, **UD**:01/02/96, **US**:224 CHR BLOCK NORMAL, **CPI**:20.4}

Reply Explanation:

- FN! This is a reply to a FONT query.
- **N5**:MF107, The first font has the name MF107.
- **N1**:&(26), The one-character name is "&", or 26H.
- **L**: The first font is a resident font.
- **UV**:1, The user version is 1.
- **UD**:01/02/96 The user date is 01/02/96.
- **US**:96chars blockbold The font is a 96 character block bold font.
- **CPI**:10.7 The font has 10.7 characters per inch.
- **N5**:MF204, The next font begins and is read similarly.

Table B-9
Fonts Reference

Query	Reply	Definition
N5	xxxxx	**5** character **N**ame is xxxxx
N1	x(nn)	**1** character **N**ame - also in HEX
L	R,D	**L**ocation is **R**esident or **D**ownload
UV	x	**U**ser **V**ersion number
UD	mm/dd/yy	**U**ser **D**ate - month, day, year
US	x.. (20 chars)	**U**ser **D**escriptive Summary of font
CPI	nn.n	**C**haracters **P**er **I**nch is nn.nn

Graphics ESC{GR?}

Query Format: ESC{GR?}

Reply Format: {GR!**N5**:x,**N1**:x,**L**:D,**UV**:x,**UD**:x,**US**:x}

Function: Returns a list of all graphics currently downloaded to the printer. The response is similar to that for FONTS, without the FONT related information:

Reply Example: {GR!**N5**:LOGO1,**N1**:z(7A),**L**:D, **UV**:1,UD:05/29/96,**US**:Big Logo }

Reply Explanation:

- GR! This is a reply to a GRAPHICS query.
- **N5**:LOGO1, The graphic has a five-character name, “LOGO1.”
- **N1**:z(7A), The graphic has a one-character name of ”z”, or 7AH.
- **L**:D, This is a downloaded graphic.
- **UV**:1, The user version is 1.
- **UD**:05/29/96 The user date is 5/29/96.
- **US**:Big Logo The user descriptive summary is Big Logo.

Table B-10
Graphics Reference

Query	Reply	Definition
N5	xxxxx	**5** character **N**ame is xxxxx
N1	x(nn)	**1** character **N**ame - also in HEX
L	R,D	**L**ocation is **R**esident or **D**ownload
UV	x	**U**ser **V**ersion number
UD	xx/xx/xx	**U**ser **D**ate
US	x.. (20 chars)	**U**ser **D**escriptive Summary of font

Formats ESC {FM?}

Query Format: ESC{FM?}

Reply Format: {FM!**N5**:x,**L**:x,**UV**:x,**UD**:x,**US**:x}

Function: Returns a list of all formats currently downloaded to the printer. The response is similar to that for FONTS, without the FONT related information:

Reply Example: {FM!**N5**:LABEL, **L**:D,**UV**:1,**UD**:05/29/96, **US**:PROPERTY ID LABEL-BC}

Reply Explanation:

- FM! This is a reply to a FORMATS query.
- **N5**:LABEL, The format has a 5 character name of LABEL.
- **L**:D, The format is a downloaded format.
- **UV**:1, The user version is 1.
- **UD**:05/29/96, The user date is 05/29/96.
- **US**:PROPERTY ID LABEL-BC The user descriptive summary is PROPERTY ID LABEL-BC.

There is no other format loaded.

Table B-11
Formats Reference

Query	Reply	Definition
N5	xxxxx	**5** character **N**ame is xxxxx
L	R,D	**L**ocation is **R**esident or **D**ownload
UV	x	**U**ser **V**ersion number
UD	xx/xx/xx	**U**ser **D**ate
US	x.. (20 chars)	**U**ser **D**escriptive Summary of font

Demand Quantity ESC{DQ?}

Query Format: ESC{DQ?}

Reply Format: nnn

Function: Returns remaining quantity of images

Cancel ESC{CN!}

Query Format: ESC{CN!}

Reply Format: ESC{CN!}

Function: Cancels demand printing

Reset ESC{RE!}

Query Format: ESC{RE!}

Reply Format: ESC{RE!}

Function: Resets printer.

Status Card Reader ESC{RS?}

Query Format: ESC{RS?}

Reply Format: ESC{RS!}

Function: Returns Card Reader Status.

Read Magnetic Card ESC{MR?}

Query Format: ESC{MR?}

Reply Format: ESC{MR!}

Function: Returns Magnetic Card Reader Data.

Appendix C
Available Fonts

This is an ever-expanding list of available fonts.

Dots Wide	Dots High	chars per inch	"n" in ASCII	"n" in Hex	"n" in Dec	Easy Print	Description
20	26	10.2		20	32	MF102	223 chr med blk bld
10	24	20.4	!	21	33	MF204	224 chr blk normal
28	31	7.2	”	22	34	MF072	96 chr large block
37	39	5.5	#	23	35	MF055	96 chr large block
11	24	18.5	$	24	36	MF185	96 chr blk normal
9	24	22.6	%	25	37	MF226	97 chr small block
19	26	10.7	&	26	38	MF107	96 chr block bold
13	27	15.6	*	2A	42	MF156	224 Chs Cd Pg 8859-1
4	5	50.7	A	41	65	PT04A	64 chr small block
6	9	33.8	B	42	66	PT05H	96 chr small block
6	24	33.8	B	42	66	PT05T	96 chr tall block
8	12	25.3	C	43	67	PT06H	96 chars small block
8	12	25.3	C	43	67	PT06X	193 chars small block
11	15	18.4	D	44	68	PT08H	96 chr small block
14	20	14.5	E	45	69	PT10B	96 chr small bold
16	25	12.6	F	46	70	PT12F	96 chr bld w/ serif
16	25	12.6	G	47	71	PT12G	96 chr lrg blk bld
24	35	8.4	H	48	72	PT18T	96 chr lrg blk
24	35	8.4	H	48	72	PT18B	96 chr lrg blk bld

32	49	8.4	J	4A	74	PT24B	96 chr lrg blk bld
32	49	6.3	K	4B	75	PT24F	96 chr lrg blk w/serf
19	31	10.7	(	28	40	OCRA	113 chr OCR-A
19	31	10.7	)	29	41	OCRB	126 chr OCR-B
19	26	10.7	‘	60	96	FC107	224 Chs Cd Pg 8859-1
16	25	12.6	]	5D	93	FC12G	224 Chs Cd Pg 8859-1
9	26	22.6	[	5B	91	FC226	224 Chs Cd Pg 8859-1
16	16	12.6	a	61	97	ASN-A	11146 chr MSB=A1-E7
16	16	12.6	b	62	98	ASN-B	3374 chr MSB=A1-C8
16	16	12.6	c	63	99	SHJIS	7000 chr Shift JIS
8	16	25.3	z	7A	122	K-ASC	8 Bit ASCII- Use w/ASN
4-30	30	Prop.	d	64	100	ARABT	Arabic Simplified
4-30	30	Prop.	e	65	101	ARABS	Arabic Traditional
10	30	20.4	+	2B	43	A-ASC	Arabic Compliment to T/S

▶ **NOTE:** *To view a few of these fonts, run the demo program. See Chapter 2, Quick Demo. To view the rest, download them using the instructions in Chapter 3 and then create command strings incorporating the fonts you've chosen.*

Glossary

ASCII Name

The character that corresponds to a given hexadecimal or decimal value. Use the IBM Family Character Set for the ASCII equivalent of each hexadecimal and decimal value.

ASK

ASK or “Amplitude Shift-Keying” is a form of wireless communication between a hand held or notebook computer and a peripheral device, such as a printer.

Bit-Mapped Graphics

This is the type of graphics that can be printed in Line Printer Mode. It is a type of graphics which can be viewed as a bit map where each dot in the graphic corresponds to a given bit in the memory map.

Baud Rate

The speed of communications between the PC or hand-held and a peripheral device, such as the microFlash printer.

Boot Version

The version of the boot sector firmware.

Burn Adjust

The heat sensitivity of the type of paper which can be set by using the “Darkness” menu item in the “Paper Options”

pull-down menu (see Chapter 3). Setting the burn adjust higher results in darker print.

COM Port

The COM Port allows your PC to communicate to your microFlash printer or some other peripheral device. The COM Port is the opening in the back of the computer into which you insert a cable that is attached to your printer. COM Port "A" is equivalent to COM Port 1, and COM Port "B" is equivalent to COM Port 2.

Compressed Graphics

Graphics which have been reduced to the smallest possible size in order to speed data transmission.

CRC- Cyclic Redundancy Check

As used in the Easy Print Store Graphic command, the CRC is a number calculated by your program which is matched against the number calculated by the printer after the graphic is received. If the printer's CRC number and the program's CRC number match, the data was received in its entirety. Otherwise, the graphic will be rejected. Interference with the data can be caused by electrical noise.

Device Name

The IrDA name of the device in use, e.g. the microFlash2, microFlash3, 2t, or 2i.

Device Nickname

The IrDA name the user assigns to each printer, for easy reference.

Dots

The unit of measure for each mark made on paper. There are 203 dots per inch for the microFlash2/3/2t series of printers (8dots/mm). For the microFlash2i there are 128 dots per inch horzontal and 64 dots per inch vertical.

Easy Print Mode

Easy Print is a programming method used to produce receipts and labels with complex or stored graphics. It allows you to design a custom receipt, ticket or report with borders, lines, logos, bar codes, text and stored graphics in any arrangement or rotation to suit your needs.

Field Option

An option used in Easy Print Mode that allows the user to enlarge the size of a font, bar code or graphic.

Firmware Version

The version of the internal software that controls the microFlash.

Flash Memory

Memory that is programmable and changeable. Flash memory allows a user to upgrade a printer using a personal computer, whenever it is necessary to change operating system, fonts, graphics, or configurations. The user never has to send the printer back to the factory for an update. The printer never has to wait for a computer to send graphics, since graphics are stored in flash memory.

Flow Control

A method of controlling the communications between a hand-held computer and a peripheral device, such as the microFlash.

Format

Refers to the lay-out of the receipt that will be stored for repeated use. Includes the location of every object on the receipt, such as the bar code, signature, and graphics. The format is given a name for later reference.

Global Option

An option in Easy Print Mode which allows a user to rotate an image or stop the paper at a specified number of dot-lines or at a given mark on the paper.

Handshaking

The method of controlling the communications between a computer and a peripheral device such as the microFlash.

Infrared

Any form of wireless communications.

IrDA

IrDA is a term that is often used interchangeably with "wireless." It refers to the wireless standard of communication developed by the Infrared Data Association. Devices which are "IrDA compliant" provide quick and reliable wireless communication. Any IrDA-compliant computer can communicate with any IrDA-compliant printer, regardless of the other features of each device.

Line Printer Mode

Line Printer Mode is a method producing receipts and labels with text and simple graphics (e.g. a signature) that do not need to be stored.

Linerless Labels

Labels without peel-of backing. They can be applied as they come out of the printer, saving labor costs.

LI-ION Battery Pack

Rechargeable Lithium-Ion batteries assembled into a pack for portable printing.

Ni-Cd Battery Pack

Rechargeable Nickel Cadmium batteries assembled into a pack for portable printing.

Nickel Metal Hydride Battery Pack

Nickel-metal hydride batteries delivers high energy density in a rechargeable pack for portable printing.

1M or 4 M Memory

“1M” refers to one megabit of memory. “4M” refers to four megabits.

Parity

One of the communications parameters that must match the same parameter in a hand-held computer during download of a configuration to the microFlash.

PCX Format

A commonly used graphic file format.

Print head Temperature

The print head is that part of the printer which turns the paper black. When the temperature of the print head is higher, the print job speeds up. When the temperature is low, the print job slows down.

RS-232

The standard cable connection.

Stored Graphic

A graphic, such as a company logo, that is stored in the printer's flash memory. Since the graphic need not be fetched from the computer's memory, it can be printed in a flash.

Time Out

The amount of time a microFlash printer stays on before going into sleep mode.

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