
User Manual and Technical Guide

The O'Neil microFlash Series of Printers

By O'Neil Product Development



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Declaration of Conformity

Application of Council Directives: 89/336/EEC, 73/23/EEC

Manufacturer's Name: O'Neil Product Development Inc.

Manufacturer's Address: 8 Mason, Irvine, CA, 92618, USA

Importer's Name: O'Neil Product Development

Importer's Address: Witan Court, 285 Upper Forth Street
Witan Gate West, Central Milton Keys
United Kingdom, MK9 1EH

Type Of Equipment: Printers (Information Technology Equipment)

Equipment Class: Commercial and Light Industry

| <u>Models:</u> | <u>Year Mfg.:</u> | <u>Conforms to the following standards:</u> |
|----------------|-------------------|---|
| MicroFlash2 | 1997- | EN55022 (1987), EN50082-1 (1992), EN60950 (1992) A1,A2,A3 |
| MicroFlash3 | 1997- | EN55022 (1987), EN50082-1 (1992), EN60950 (1992) A1,A2,A3 |
| MicroFlash4t | 1999- | EN55022 (1995), EN50082-1 (1997), EN60950 (1992) A1,A2,A3,A4,A5 (A11) |
| MicroFlash4tCR | 1999- | EN55022 (1995), EN50082-1 (1997), EN60950 (1992) A1,A2,A3,A4,A5 (A11) |
| 2t | 1998- | EN55022 (1987), EN50082-1 (1992), EN60950 (1992) A1,A2,A3,A4 |
| 2tCR | 1998- | EN55022 (1995), EN50082-1 (1997), EN60950 (1992) A1,A2,A3,A4 |
| 2I | 1998- | EN55022 (1987), EN50082-1 (1992), EN60950 (1992) A1,A2,A3,A4 |
| 8I | 1997- | EN55022 (1987), EN50082-1 (1992), EN60950 (1992) A1,A2,A3 |

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

Place: Orange County, CA USA
Date: August 4, 1999

Full Name: Kenneth Carlson
Position: Director of Electrical Engineering



FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Industry Canada Requirement

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

Warranty

Limited Warranty

The microFlash 2/3 printer is warranted by O'Neil Product Development, Inc. to the original purchaser, to be free from defects in materials and workmanship for one (1) year from the date of original purchase. The microFlash 2t/ 2tCR/ 2I/ 2iCR/ 4t/ 4tCR printer is warranted by O'Neil Product Development, Inc. to the original purchaser, to be free from defects in materials and workmanship for (1) year from the date of original purchase (OEM's 90 days from the date of purchase). O'Neil makes no other warranties, expressed or implied, including implied warranties of merchantability and fitness for purpose.

During the warranty period, if a component is proved to be defective, O'Neil will repair or replace it, at its option, with no charge for parts or labor, when returned to O'Neil or an O'Neil Authorized Service Center with dated proof of purchase. This warranty does not apply to appearance items, batteries or to any component which has been misused, defaced, altered or modified, or which has been serviced or repaired by other than an O'Neil Authorized Service Center.

This manual and any examples herein are provided 'as is' and are subject to change without notice. O'Neil Product Development, Inc. makes no warranty of any kind with regard to this manual, including, but not limited to, implied warranties of merchantability and fitness for a particular purpose.

Acceptance of the microFlash Printer is conditional on the acceptance of this warranty. If the buyer does not accept the terms of this warranty, he is to return the product in its original condition within 10 days of receipt and O'Neil Product Development, Inc. will refund any money advanced by the buyer toward its purchase.

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If you try to repair, disassemble, or change the microFlash in any way, or use parts not provided by O'Neil without prior, written authorization, all warranties are void.

Returns / Repair

Unauthorized return of printers will not be accepted. Call O'Neil Product Development, Inc. at 949-458-0500 for return repair authorization.

Radio Frequency Interference

This equipment generates and can radiate radio frequency energy. If it is not installed and used in accordance with the User's Guide, this energy may cause harmful interference to radio and television reception.

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1996-1999

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Introduction

1



Congratulations on your purchase of an O'Neil microFlash printer. We appreciate your selection of the microFlash for your mobile computing needs.

You have purchased the world's first ruggedized printer to be compliant by the Infrared Data Association, a standards organization for the industry. The infrared data transceiver in each O'Neil printer allows a hand-held computer or notebook to send data to the printer, without wires, up to one meter away.

The microFlash was designed to be run on internal software that you can modify with the microFlash Configuration Program (see Chapter 3). This program offers complete user control of the printer. It also allows you to add enhancements as they are developed. Every time O'Neil develops a faster print speed, or other new capabilities, you can get a brand new printer just by installing new software.



Note: This book is for users of the microFlash2, microFlash3, microFlash2t /2tCR, microFlash2I /2iCR and microFlash4t/ 4tCR. When there is no difference between the two, the manual will refer to them as "the microFlash series of printers," or "the microFlash." Where there are differences, they will be referred to a model (2,3,2t,2tCR,2i,2iCR,4t,4tCR).

The microFlash2



The microFlash2 Parts List

| Printer | Part Number |
|--|------------------------|
| microFlash 2 printer (Stainless Belt Clip) | 200050-000 |
| microFlash 2 printer (Swivel Belt Clip) | 200051-000 |
| microFlash 2 printer Linerless (Stainless Belt Clip) | 200052-000 |
| microFlash 2 printer Linerless (Swivel Belt Clip) | 200053-000 |
| Cables | Part Number |
| Data Cable -DB9F -7' (non-coiled) | 210147-000 |
| Data Cable -DB9F- (coiled) | 210050-000 |
| HHP Microwand Cable –DB9M | 210050-001 |
| Symbol 3300 DB25M Cable | 210050-002 |
| Telxon DB25M Cable | 210050-005 |
| Teklogix Cable | 210050-006 |
| Timewand II Cable | 210050-007 |
| Symbol 3100 Cable | 210050-008 |
| Fujitsu AT 3000 Cable | 210082-000 |
| Power Adapters | Part Number |
| AC Power Adapter (110 Volt) | 490008-003 |
| AC Power Adapter (220 Volt) | 490017-000 |
| Cigarette Lighter Adapter, 5 Amp. 6' | 510002-002 |
| Replacement Rubber Boots | Part Number |
| O'Neil Logo (Set) | 280043-010, 280044-001 |
| Supplies | Part Number |
| microFlash2 Replacement Battery | 550019-000 |
| microFlash2 Paper Rod | 280060-001 |
| microFlash2 Cleaning Cards | 770015-000 |
| microFlash2 Paper | 740009-002 |
| microFlash2 Linerless Label | 740009-200 |
| microFlash User Guide (Includes Config. Software) | 110053-007 |

Call your O'Neil representative at (949) 458-0500 to order parts.

The microFlash3



The microFlash3 Parts List

| Printer | Part Number |
|--|------------------------|
| microFlash 3 printer (Stainless Belt Clip) | 200060-000 |
| microFlash 3 printer (Swivel Belt Clip) | 200061-000 |
| microFlash 3 printer Linerless (Stainless Belt Clip) | 200062-000 |
| microFlash 3 printer Linerless (Swivel Belt Clip) | 200063-000 |
| Cables | Part Number |
| Data Cable -DB9F -7' (non-coiled) | 210147-000 |
| Data Cable -DB9F- (coiled) | 210050-000 |
| HHP Microwand Cable -DB9M | 210050-001 |
| Symbol 3300 DB25M Cable | 210050-002 |
| Telxon DB25M Cable | 210050-005 |
| Teklogix Cable | 210050-006 |
| Timewand II Cable | 210050-007 |
| Symbol 3100 Cable | 210050-008 |
| Fujitsu AT 3000 Cable | 210082-000 |
| Power Adapters | Part Number |
| AC Power Adapter | 490008-003 |
| AC Power Adapter (220 Volt) | 490017-000 |
| Cigarette Lighter Adapter, 5 Amp. 6' | 510002-002 |
| Replacement Rubber Boots | Part Number |
| O'Neil Logo (Set) | 280103-000, 280104-000 |
| Supplies | Part Number |
| microFlash3 Replacement Battery (DR-30) | 550028-000 |
| microFlash3 Paper Rod | 280107-000 |
| microFlash3 Cleaning Cards | 770015-000 |
| microFlash3 Paper | 740009-100 |
| microFlash3 Heavy Duty Thermal Paper | 740009-102 |
| microFlash3 Linerless Label | 740009-300 |
| microFlash Handbook (Includes Config. Software) | 110053-007 |

Call your O'Neil representative at (949) 458-0500 to order parts.

The microFlash2t



The microFlash2t Parts List

| Printer | Part Number |
|--|--------------------|
| microFlash2t printer (Stainless Belt Clip) | 200070-001 |
| microFlash2t printer (Swivel Belt Clip) | 220071-001 |
| microFlash2t printer, Linerless (Stainless Belt Clip) | 200072-001 |
| microFlash2t printer, Linerless (Swivel Belt Clip) | 220073-001 |
| Cables | Part Number |
| Data Cable -DB9F- (RJ11 R/A, coiled) | 210164-000 |
| RJ11 Adapter Cable – Right Angle (Allows the 2t to use MF2/3 cables) | 210158-000 |
| Power Adapters | Part Number |
| AC Power Adapter (110 volt) | 490008-003 |
| AC Power Adapter (220 volt) | 490017-000 |
| Cigarette Lighter Adapter, Right Angle, 5 Amp. 6' | 510002-003 |
| Supplies | Part Number |
| microFlash2t Replacement Battery NMH 1800mAh | 550025-000 |
| microFlash Cleaning Cards | 770015-000 |
| microFlash2t Paper | 740023-200 |
| Swivel Belt Loop | 210156-000 |
| microFlash Handbook (Includes Config. Software) | 110053-007 |

Call your O'Neil representative at (949) 458-0500 to order parts.

The microFlash2tCR



The microFlash2tCR Parts List

| Printer | Part Number |
|--|--------------------|
| microFlash2tCR printer, Mag Stripe Reader (Stainless Belt Clip) | 200092-000 |
| microFlash2tCR printer, Mag Stripe Reader (Swivel Belt Clip) | 220093-000 |
| microFlash2tCR printer, Linerless , Mag Stripe Reader (Stainless Belt Clip) | 200094-000 |
| microFlash2tCR printer, Linerless, Mag Stripe Reader (Swivel Belt Clip) | 220095-000 |
| microFlash2tCR printer, Mag Stripe/Smart Card Reader (Stainless Belt Clip) | 200096-000 |
| microFlash2tCR printer, Mag Stripe/Smart Card Reader (Swivel Belt Clip) | 220097-000 |
| microFlash2tCR printer, Linerless , Mag Stripe/Smart Card Reader (Stainless Belt Clip) | 200098-000 |
| MicroFlash2tCR printer, Linerless, Mag Stripe/Smart Card Reader (Swivel Belt Clip) | 220099-000 |
| Cables | Part Number |
| Data Cable -DB9F- (RJ11 R/A, coiled) | 210164-000 |
| RJ11 Adapter Cable – Right Angle (Allows the 2tCR to use MF2/3 cables) | 210158-000 |
| Power Adapters | Part Number |
| AC Power Adapter (110 volt) | 490008-003 |
| AC Power Adapter (220 volt) | 490017-000 |
| Cigarette Lighter Adapter, Right Angle, 5 Amp. 6' | 510002-003 |
| Supplies | Part Number |
| microFlash2tCR Replacement Battery NMH 1800mAh | 550025-000 |
| microFlash Cleaning Cards | 770015-000 |
| microFlash2tCR Paper | 740023-200 |
| Swivel Belt Loop | 210156-000 |
| microFlash Handbook (Includes Config. Software) | 110053-007 |

Call your O'Neil representative at (949) 458-0500 to order parts.

The microFlash2i



The microFlash2i Parts List

| Printer | Part Number |
|--|--------------------|
| microFlash2i printer (Stainless Belt Clip) | 200075-001 |
| microFlash2i printer (Swivel Belt Clip) | 200076-001 |
| Cables | Part Number |
| Data Cable -DB9F- (RJ11 R/A, coiled) | 210164-000 |
| RJ11 Adapter Cable – Right Angle (Allows the 2t to use MF2/3 cables) | 210158-000 |
| Power Adapters | Part Number |
| AC Power Adapter (110 Volt) | 490008-003 |
| AC Power Adapter (220 Volt) | 490017-000 |
| Cigarette Lighter Adapter, Right Angle, 5 Amp. 6' | 510002-003 |
| Supplies | Part Number |
| microFlash2i Replacement Battery NMH 1800mAh | 550025-000 |
| microFlash2i Paper (2ply impact) | 740023-201 |
| Swivel Belt Loop | 210156-000 |
| microFlash User Guide (Includes Config. Software) | 110053-007 |
| Ink Ribbon, Black | 410007-000 |

Call your O'Neil representative at (949) 458-0500 to order parts.

The microFlash2iCR



The microFlash2iCR Parts List

| Printer | Part Number |
|--|--------------------|
| microFlash2iCR printer, Mag Stripe Reader (Stainless Belt Clip) | 200110-000 |
| microFlash2iCR printer, Mag Stripe Reader (Swivel Belt Clip) | 220111-000 |
| microFlash2iCR printer, Mag Stripe/Smart Card Reader (Stainless Belt Clip) | 200112-000 |
| MicroFlash2iCR printer, Mag Stripe/Smart Card Reader (Swivel Belt Clip) | 220113-000 |
| Cables | Part Number |
| Data Cable -DB9F- (RJ11 R/A, coiled) | 210164-000 |
| RJ11 Adapter Cable – Right Angle (Allows the 2iCR to use MF2/3 cables) | 210158-000 |
| Power Adapters | Part Number |
| AC Power Adapter (110 Volt) | 490008-003 |
| AC Power Adapter (220 Volt) | 490017-000 |
| Cigarette Lighter Adapter, Right Angle, 5 Amp. 6' | 510002-003 |
| Supplies | Part Number |
| microFlash2iCR Replacement Battery NMH 1800mAh | 550025-000 |
| microFlash2iCR Paper (2ply impact) | 740023-201 |
| Swivel Belt Loop | 210156-000 |
| microFlash User Guide (Includes Config. Software) | 110053-007 |
| Ink Ribbon, Black | 410007-000 |

Call your O'Neil representative at (949) 458-0500 to order parts.

The microFlash4t



The microFlash4t Parts List

| Printer | Part Number |
|--|--------------------|
| microFlash4t printer (Stainless Belt Clip) | 200114-000 |
| microFlash4t printer (Swivel Belt Clip) | 220115-000 |
| Cables | Part Number |
| Data Cable -DB9F- (RJ11 R/A, coiled) | 210164-000 |
| RJ11 Adapter Cable – Right Angle (Allows the MF4t to use MF2/3 cables) | 210158-000 |
| Power Adapters | Part Number |
| AC Power Adapter (110 volt) | 490008-003 |
| AC Power Adapter (220 volt) | 490017-000 |
| Cigarette Lighter Adapter, Right Angle, 5 Amp. 6' | 510002-003 |
| Supplies | Part Number |
| microFlash4t Replacement Battery Li-ion 1350mAh | 550030-000 |
| microFlash Cleaning Cards (Box of 25) | 770015-000 |
| microFlash4t Paper | 740009-400 |
| microFlash4t Paper Linerless | 740009-401 |
| Swivel Belt Loop | 210156-000 |
| microFlash Handbook (Includes Config. Software) | 110053-007 |

Call your O'Neil representative at (949) 458-0500 to order parts.

The microFlash4tCR



The microFlash4tCR Parts List

| Printer | Part Number |
|--|--------------------|
| microFlash4tCR printer, Mag Stripe Reader (Stainless Belt Clip) | 200116-000 |
| microFlash4tCR printer, Mag Stipe Reader (Swivel Belt Clip) | 220117-000 |
| microFlash4tCR printer, Mag Stripe/Smart Card Reader (Stainless Belt Clip) | 200118-000 |
| microFlash4tCR printer, Mag Stipe/Smart Card Reader (Swivel Belt Clip) | 220119-000 |
| Cables | Part Number |
| Data Cable -DB9F- (RJ11 R/A, coiled) | 210164-000 |
| RJ11 Adapter Cable – Right Angle (Allows the MF4tCR to use MF2/3 cables) | 210158-000 |
| Power Adapters | Part Number |
| AC Power Adapter (110 volt) | 490008-003 |
| AC Power Adapter (220 volt) | 490017-000 |
| Cigarette Lighter Adapter, Right Angle, 5 Amp. 6' | 510002-003 |
| Supplies | Part Number |
| microFlash4t Replacement Battery Li-ion 1350mAh | 550030-000 |
| microFlash Cleaning Cards (Box of 25) | 770015-000 |
| microFlash4tCR Paper | 740009-400 |
| microFlash4tCR Paper Linerless | 740009-401 |
| Swivel Belt Loop | 210156-000 |
| microFlash Handbook (Includes Config. Software) | 110053-007 |

Call your O'Neil representative at (949) 458-0500 to order parts.

Features and Benefits

Features

Benefits

| | |
|----------------------|---|
| Compact Design | The microFlash series of 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 microFlash2 recharges in one hour, the microFlash3 in four hours. The microFlash 2t/2tcr/2i/2icr charge in about 6-9 hours. The microFlash 4/4tcr charges in about 3 hours. |
| Extremely ruggedized | The microFlash 2/3 uses 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 2i/2iCR/2t/2tCR/4t/4tCR is entirely encased in a protective shell of blow molded high density polyethylene. The microFlash series of printers can withstand multiple, drops to concrete on every face without damage. |
| Flash Memory | O'Neil introduced "flash memory" to the mobile printing industry to provide printers that are easily personalized through software. Using the exclusive microFlash Configuration Program, the entire microFlash printer can be upgraded using a personal computer, whenever it is necessary to change fonts, operating system, graphics, or configurations. The user never has to send the printer back to O'Neil to update. 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 microFlash 2/3/2t/2tCR/4t/4tCR series of 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. |

Quick Demo

2



This chapter gives you quick setup instructions to get your microFlash series of printers up and running. The demo program provided allows your PC or hand-held computer to simulate a typical interchange between a hand-held computer and a receipt printer out in the field.

Wake Up

The self test button allows you to manually wake up the microFlash from its sleep mode and to print self tests. To wake up the printer, press the red self test button. After a moment or two, (if your beeper is turned on) you will hear a beep. Your printer is now awake.

Self Test

To print a self test, press and hold the red self test button for four seconds. The microFlash will print a self test.

Using the Demo with DOS

To run the demo, connect your personal computer to the microFlash using your microFlash download cable. Insert the microFlash Configuration disk in the "A" drive. Type "CD\sample" to change to the sample directory. Type "DIR" to see a list of files in the sample directory. Now use the DOS "type" command as in this example:

Type filename > com1

Note: "filename" is the name of the file and Com1 is the COM Port the microFlash is connected to.



Note: When printing from DOS, you may need to get your PC ready first using the MODE command. Example: The microFlash is connected to COM 1 and the PC is set at 9600 baud, no parity, 8 data bits, 1 stop bit. From the "C" prompt, type: **mode com1:9600,n,8,1**

Using the Demo Program with Windows 3.1

To run the demo, connect your personal computer to your microFlash using your microFlash download cable. Now open the Program Manager in Windows. Click on **“Main”** and then click on **“Print Manager.”** From the **Options Menu**, choose **Printer Setup**. Select the **Generic/Text Only** printer. Then click on **“Connect”** to select the COM Port that you have the microFlash connected to (confirm that the COM Port is set to N81). Choose **“Set as Default Printer.”**

Insert the microFlash Configuration disk in your floppy drive. From Program Manager, click on **Accessories** and then click on **Notepad**. From the File menu in Notepad, open the “A” drive and select any file from the sample directory on your microFlash Configuration disk (e.g. “fonts”). **Choose Page Setup and change all margins to 0.** Then choose “Print” from the file menu.

Using the Demo Program with Windows 95

Click the **Start** button, point to **Settings**, and then click **Printers**. Double click **Add Printer**. Follow the instructions on your screen being sure to select the **Generic/Text Only** printer and the COM Port your microFlash is plugged into. Set the COM port to match the printers settings



Insert the microFlash Configuration disk in your floppy drive. From Program Manager, click on **Accessories** and then click on **Notepad**. From the File menu in Notepad, open the “A” drive and select any file from the sample directory on your microFlash Configuration disk (e.g. “fonts”). **Choose Page Setup and change all margins to 0.** Then choose “Print” from the file menu.

Wireless Printing

To run the demo wirelessly, see *Chapter 3, microFlash Configuration Program*, to set up infrared communication.

Self Test

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

| Self Test | Description | Page |
|---------------------------|---|--------------|
| F/W Ver | Internal software version | Page 104 |
| Timeout | The seconds between printing and sleep mode. | Page 29 |
| Baud Rate | The speed at which the microFlash receives data. | Page 27, 28 |
| Parity | Odd, Even or None. | Page 27, 28 |
| Data Bits | Matches that of computer sending data to microFlash. | Page 27, 28 |
| Handshake | The way the printer handles flow control from host. | Page 27, 28 |
| Burn Adj | Amount of heat used to print on the thermal paper. | Page 20 |
| Paper | 1 or 2 ply. | Page 30 |
| Beeper | May be turned ON or OFF. | Page 29 |
| Batt Volt | Current voltage of the battery pack. | Page 103 |
| Batt Temp | Temperature of battery. | Page 103 |
| Flash / RAM | 1 M or 4 M Flash / 1 M or 4 M RAM | Page 105 |
| Boot Version | Boot sector firmware. | Page 104 |
| Prnhd Tmp | Between 0 and 50 degrees. | Page 83 |
| Comp Grph | Either "Pause or Immediate". If paused, and entire image is received by printer before printing. | Page 83 |
| Infrared | Set by the user to "Off" or "IrDA" or "ASK" or "ASK/CRC" or "Direct" or "Direct-CRC" or "PULSE" or "PULSE-CRC" | Page 31, 104 |
| Device Name | Shows type of device (microFlash2,3,2t,2tr,2I,2icr,4t or 4tr) | Page 31 |
| Device Nickname | Shows user name for printer. | Page 31 |
| IrDA Ver | The 1.0 refers to the IrDA standard in use. The next two digits refer to any IR modifications made by O'Neil. | Page 31 |
| Available Fonts | "LOC," shows whether a font is Resident ("R") or Downloaded ("D"). "CPI" shows characters per inch. "DESCRIPTION" describes the font. "NAMES" gives the "Easy Print" name, the Line Printer name, and the hexadecimal equivalent of that name. | Page 32, 108 |
| Available Graphics | "LOC," shows whether a font is Resident ("R") or Downloaded ("D"). "CPI" shows characters per inch. "DESCRIPTION" describes the graphic. "NAMES" gives the "Easy Print" name, the Line Printer name, and the hexadecimal equivalent of that name. | Page 34, 109 |
| Available Barcodes | All supported Barcodes supported are displayed. "DESCRIPTION" describes the graphic. "NAMES" gives the "Easy Print" name, the Line Printer name, and the hexadecimal equivalent of that name. | Page 69 |
| Card Reader Option | Shows the current Card Reader configuration. | Page 73 |

microFlash Configuration

3



The microFlash Configuration Program disk included with the microFlash series of printers allows you to configure your printer to any environment. Use the Configuration Program to prepare your printer to print a variety of fonts and graphics, to select the paper, to communicate wirelessly, and so on. Setup configurations chosen here can be saved under different file names for different applications.

Windows 3.1 Installation

Insert the microFlash configuration software in a floppy drive. Next, open the Program Manager in Windows.TM Now open the File Menu. Select RUN... At the prompt, enter:

A:\Setup (or B:\ to determine the floppy drive).

Once the microFlash **Main Menu** is open, Install should be highlighted. Press the **OK** button. Select the drive you would like to store the configuration program on. We suggest your hard drive.

The computer will then install the configuration files. The **Main Menu** will reappear. Select **Exit** and click on **OK**.

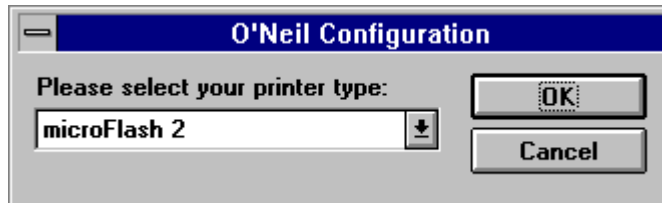
Windows 95 Installation

Insert the microFlash configuration software in a floppy drive. Next, click on the **Start** button, point to **Settings**, and click **Control Panel**. Double-click on **Add/Remove Programs**. Follow the instructions on the screen.

Flash Configuration

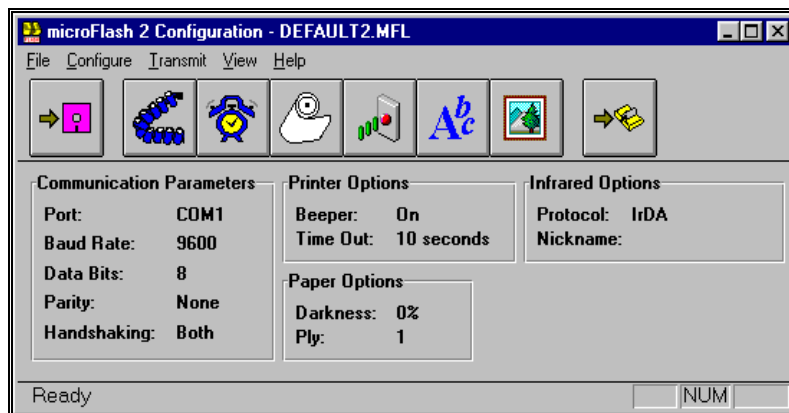


For both Windows 3.1 and Windows 95 users, the microFlash configuration icon, titled Flash Configuration will appear on the screen. Click on the Flash Configuration icon. You will be prompted to choose a printer.



Highlight the printer type to display both choices. Once you have made your selection, click on OK. You can return to this menu at a later date when sending a new configuration to a different printer. Just click on the Flash Configuration icon when you're ready to send a new configuration, and the O'Neil Configuration menu will again ask you to select a printer type. Click on OK when you've made your selection.

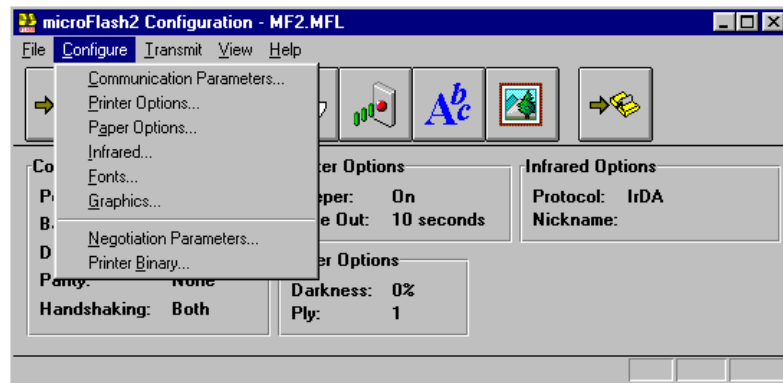
The following screen will now appear:



Buttons and Pull-Down Menus

In the screen below you can see one pull-down menu and several of the buttons representing the various functions of the microFlash Configuration Program. You can either click on a button to activate that function or use its pull-down menu.

To use a pull-down menu, click on one of the key words at the top of the screen. For example, click on “Configure” to pull down the Configure Menu, which has the options shown below.



For more on the Configure Menu and the Transmit Menu, see the Pull Down Menus sections at the end of this chapter.

Buttons displayed at the top of your screen.



Save Configuration

Will save the configuration parameters to the default file.



Communication Parameters

Will select the COM Port and other parameters.



Printer Options

Allows you to change the beeper and time out configuration.



Paper Options

Allows you to determine the darkness of the print and the number of sheets of paper you use.



Infrared Parameters

Allows you to choose the type of infrared link you want.



Fonts

Available fonts. You can add or remove fonts.



Graphics Selections

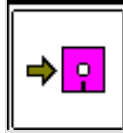
Choose graphics for download to the microFlash.



Transmit Configuration

Transmits current configuration to the microFlash. Configuration only - Not a new program, see updating microFlash.

Save Configuration



Save Configuration allows you to save the current configuration that you will be sending to the microFlash. Each time you open the microFlash Configuration software, the program will open with the last saved configuration. The default file name will be DEFAULT.MFL. You can also save configurations under other file names, but you must use the MFL extension. To save your changes to the default file, press the Save button or select Save from the File menu. To save to another file name, under the File menu, select Save As.

Communication Parameters



Communications let you adjust the microFlash to your hand-held device. The Port Settings are for downloading purposes only. *Click on “Port” as shown below to choose either COM1 or COM2 depending on which one you selected to download your configuration to the printer.*

Parameters

Port settings (COM 1 or 2)

Baud Rate MF2/3 (1200, 2400, 4800, 9600, 19200, 38400)

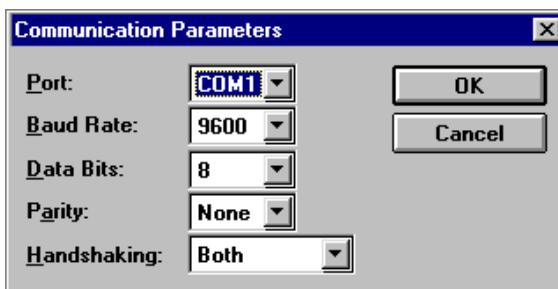
Baud Rate MF2t/2tcr/2i/2icr/4t/4tcr (2400, 9600, 38400, 57600)

Data Bits (7 or 8)

Parity (None, Even, Odd)

Handshaking (Both, None, DTR, XON/XOFF)

Click on the **Communications** button to access this screen:



Note: For all but the Port setting, you will need to check the manual that came with your hand-held to find out its communication parameters.

Warning: A data bit of 7 with Odd or Even is not a valid microFlash configuration.

Port

Select the port on your computer that the microFlash is connected to. If you have more than one free port, you can download to more than one microFlash at a time by opening the program twice, and having each program send to different COM-Ports. To select a port, click on the arrow to the right of the field to display your choices, and choose one by clicking on it.



This port setting is not related to the port setting you use when you communicate with a hand-held computer to print receipts. This setting is only used for downloading the configuration from this microFlash Configuration Program.

Note: You cannot download your current configuration to the same COM-Port that is in use by IrDA or any other device (e.g. an internal card for Fax/modem or games).

Baud Rate

The baud rate is the speed of information flow from the hand-held device to the microFlash. To select a baud rate, click on the arrow to the right of the field to display your choices. Choose one by clicking on it.

Data Bits

You must select the data bits appropriate to your hand-held device. You may choose 7 or 8 bits. To select a number click on the arrow to the right of the field to display your choices. Choose one by clicking on it.

Parity

You must also select the parity appropriate to your hand-held device. You may choose Even parity, Odd parity or No parity. Click on the arrow to the right of the field , and choose one by clicking on it. Exception: A data bit of 7 with Odd or Even is not a valid configuration.

Handshaking/Flow Control

If your hand-held device is set up to use hardware flow control, select DTR (Data Terminal Ready). If it uses software flow control, select XON/XOFF. To enable both, select both. To set the Handshaking function, click on the arrow to the right of the field, then click on the setting you want. When your communication settings are what you want them to be, click on the OK button. The new settings should appear in the Communication Parameters box.

Beeper & Timeout Options



Printer options include turning the beeper On and Off and setting the Time Out function. You may access Printer options by clicking on this button, or by choosing it under the Configure menu at the top of the window. The following dialog will appear:



Beeper

When the beeper is turned on, it will sound when you press the printer's red button and any time the printer wakes up from the sleep mode.

In some instances, a beeping noise may be disturbing to you or to those around you. In this case, you may choose to turn the beeper off. Highlight the word "On," to display both choices. Then choose "Off" by clicking on it.

Time Out

The microFlash does not have an OFF button. Instead, it uses a timer function to go into a sleep mode to conserve battery charge. The timer function allows you to set the number of seconds that will pass before the microFlash falls into its sleep mode after printing.

To wake the printer from sleep mode, press the red button. The printer can also be awakened through the use of programmed characters. See "Wake Up" section of Appendix A, Chapter 9.

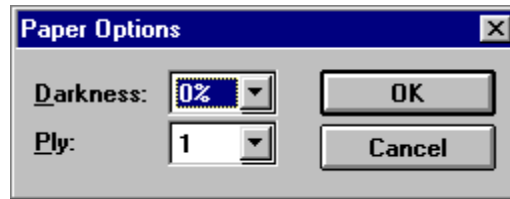
Click on the OK button to save your printer options. The new settings will appear in the Printer Options box in the Configuration program.

Paper Options



Paper Options allows you to set the printer to match the type of paper you are using.

Click on the Paper Roll button, or from the Configure menu, choose Paper Options. The following dialog will appear:



Darkness

The Darkness function sets the heat sensitivity for the type of paper you are using, and for high and low ambient temperatures (which may affect the temperature of the print mechanism in the microFlash, causing the print quality to change.)

-15% (lighter) 0% (medium) +35% (darker)



If the print appears too faint, adjust the sensitivity towards the darker end of the scale until the print is dark and crisp. It is best to avoid setting the heat sensitivity higher than what is required by the paper.

Choose the heat sensitivity rating by pressing the down arrow and clicking on the setting you want.

Linerless Labels

You may need a darker setting if using linerless labels. See Darkness section above.

Ply

Choose the one-or-two-ply setting that matches your paper by clicking on the arrow to the right of the field to display your choices, and clicking on your choice.

Click on the OK button to save your paper specifications. They will appear in the Paper Options box.

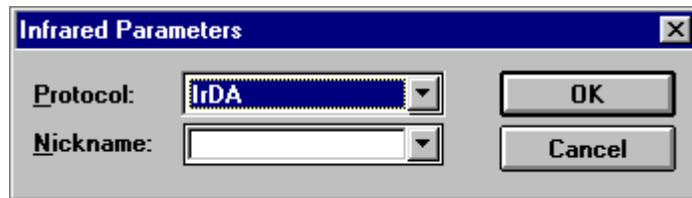
Infrared Parameters



Infrared Parameter allow you to choose the type of infrared link you want. Click on the arrow next to “Protocol” to display your options.

For example, choose IrDA (the standard established by the Infrared Data Association) for wireless printing, unless you are using a product that requires ASK (Amplitude Shift-Keying). Choose “Direct” if you always connect your hand-held computer to your printer with a cable.

Click on the arrow next to “Nickname” to choose a default name for your printer. Or type in any name you wish in the blank space.



Note: You must consult the manual that came with your hand-held or notebook computer to set up IrDA. Setting up IrDA on the microFlash alone is not sufficient to create wireless communication between your computer and printer.

A Word on IrDA

IrDA is the standard for wireless communication set by the Infrared Data Association. The O’Neil microFlash series of printers are the first ruggedized portable printers in the world to be “IrDA compliant.”

IrDA Settings

The max. IrDA baud is 38.4kbits for microFlash 2/3. The printers will receive IrDA data and print the data at the same time. If the IrDA session is broken while printing the printer will print VOID VOID VOID. The VOIDS can be removed if needed. For Instructions on removing the VOIDS contact O’Neil Product Development inc.

The max. IrDA baud is 115.2kbits for the microFlash 2t/2tcr/2i/2icr/4t/4tcr. The printers will receive IrDA data and wait for the IrDA session to end then print the data in the buffer. The IrDA data buffer is about 48kbytes. The max IrDA baud can be changed to 38.4kbits and the printer will receive and print at the same time. For receiving and printing at the same time for the microFlash 2t/2tcr/2i/2icr/4t/4tcr contact O’Neil Product development inc. for instructions on how to change.

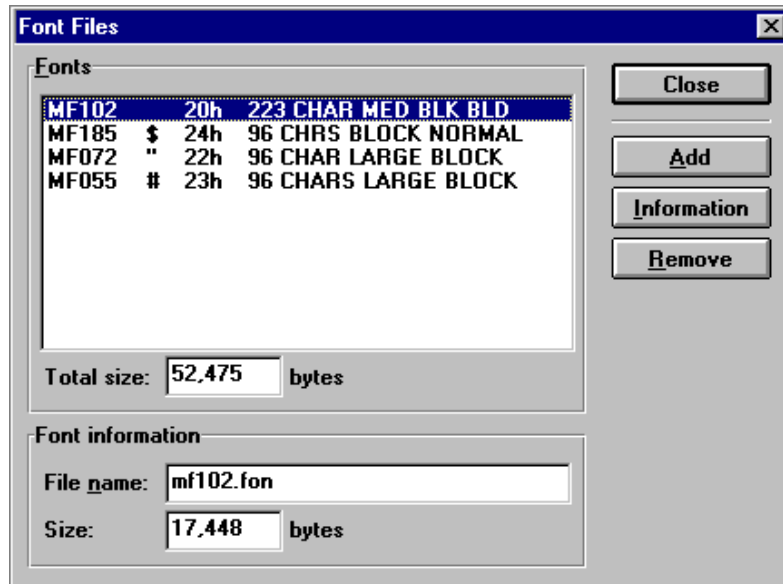
Fonts



Standard Fonts

Fonts allow you to choose from the list of available fonts. The permanent fonts are known as “resident” fonts” and cannot be removed. For a list of resident fonts, press the red self-test button on your printer and look for the “R” next to the font. The other fonts, labeled “D” on your test print out, are “downloaded” fonts, i.e. they have already been added for you (See picture below.) *You can add to this list or remove fonts from it. When you have made your changes, press the “Transmit” button to transmit the new set to your printer.*

The fonts you select will depend on your requirements and the amount of memory in your printer. For information on other available fonts, see Chapter 11 or call your O’Neil representative for the most recent additions to the O’Neil font set.



The first column shows you the name of the font. The second column refers to the ASCII name for that font. The third column shows the hexadecimal equivalent of the ASCII name. And the fourth column offers a description of the font. Click on Close to exit this screen.



Note: With the standard 1Meg. microFlash, you can have any combination of fonts as long as the “Total Size” of the fonts in memory does not exceed 42,000 bytes.

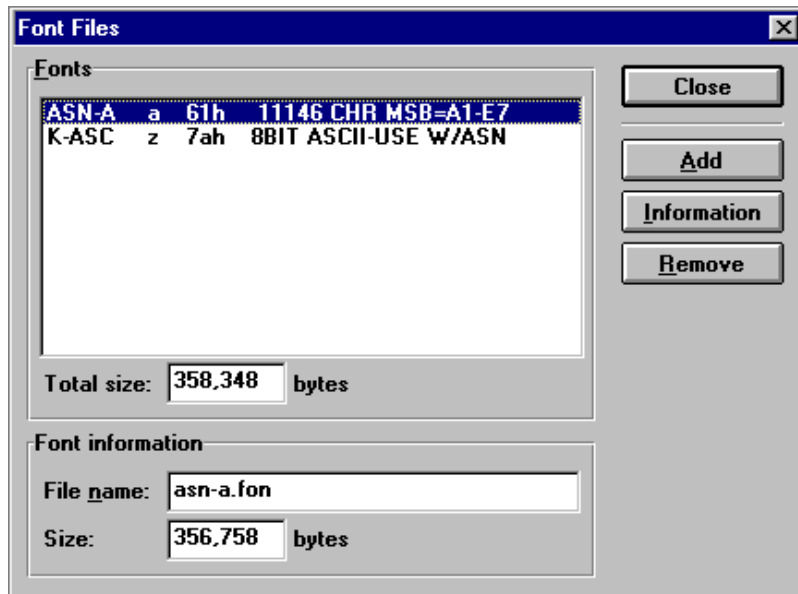
Asian Fonts

When you add an Asian font, you must add an additional font (K-ASC) to make the download complete.

Example1: If you add the font “ASN-A” you must add “K-ASC” after.

Example2: If you add the font”ASN-B” you must add “K-ASC” after.

Example2: If you add the font”SHJIS” you must add “K-ASC” after.



Graphics

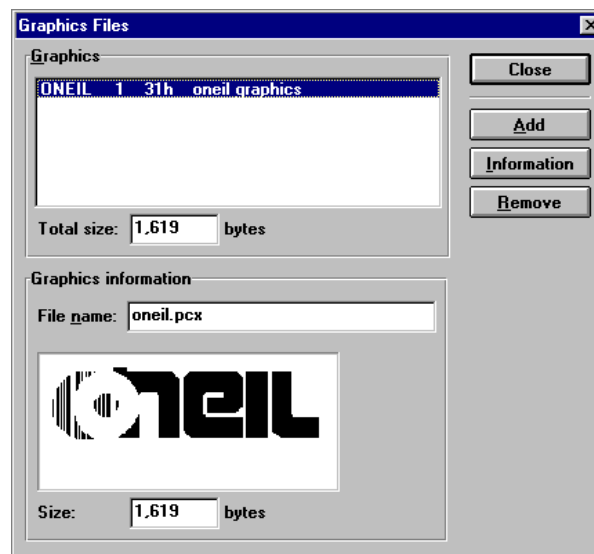


Use this button to download graphic images from your PC to your microFlash. The system checks the specifications of the graphic to ensure that it matches the criteria required by the microFlash.



All graphic files must be in a .PCX format and be saved according to specific criteria. This criteria is listed in the Graphic PCX Formats section below.

When you press the Graphics Selection button, the following window will appear:



Adding PCX Files

To add .PCX files of your own in the download to the microFlash, press the add button. Any .PCX files resident in the O'Neil directory will appear in the File Name list. Highlight any of the .PCX file names to preview that graphic. When the file you want is highlighted, press the OK button to include the file in the microFlash download file.



Note: If there are any problems with the setup of the .PCX file, the system will notify you when you try to add it to the list.

All files included in the File Name list will be downloaded to the microFlash upon transmission. The O'Neil logo PCX file is automatically copied into the O'Neil directory, and is included in the default microFlash file.

Remove a PCX File

To remove a .PCX file from your download list, simply highlight the file name and press the Remove button. The PCX file will be removed from the list. It will not be removed from your O'Neil directory. Thus, it can be added back at a later time.

Graphic PCX Formats

Graphic images are accepted in a standard .PCX format. PCX files for Graphic download must be:

1. Version 0.0, 3.0 or 5.0.
- 2 Generated for 203 dpi resolution.
3. Saved in a black and white format.

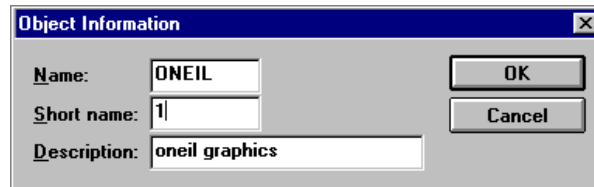
These requirements are mandatory. But most artwork packages output .PCX graphics in the proper format.

Be sure that areas on your receipt or label that will hold graphics are dimensionally defined to be the exact size, in dots, as the graphic symbol to be printed on it.

Object Information

The Information button gives you information about the graphic you have highlighted.

After checking the name and description of this graphic, click on **OK** if this is the graphic you wish to download.



Transmit



Transmit allows you to send the current configuration to the printer. Be sure you have connected your download cable to the COM port specified in your setup. Then click on this button.

This will not update your firmware. See “Updating the microFlash” at the end of this chapter to update firmware.

There will be a pause, then the printer will beep (provided the beeper is turned on). The computer will then download the configuration information to the microFlash. This will take just a few minutes, and the transmit status will appear on your computer screen. Print out a self test by pressing and holding the microFlash’s red self test button for four seconds. The self test will verify that your parameters are set to your specifications.



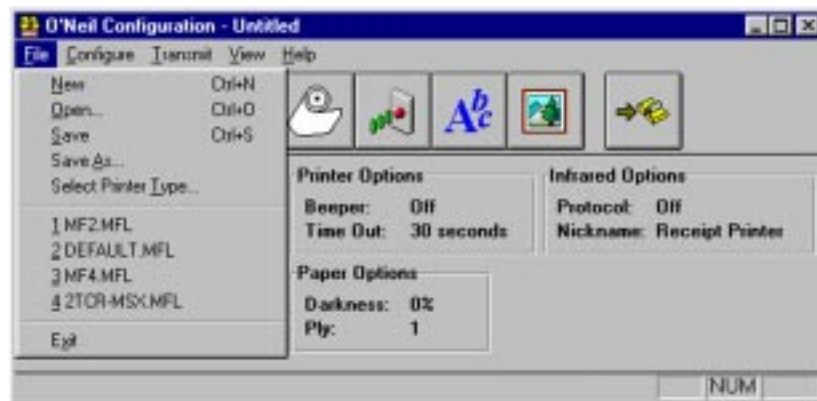
Note: You cannot download your current configuration to the same COM-Port that is in use by IrDA or any other device (e.g. an internal card for Fax/modem or games).

Pull Down Menus

Most of the pull-down menus are self-explanatory. Click on each word with an underlined letter at the top of your screen to explore. Here are some important details regarding a few of the key pull-down menus.

File Menu

Click on the word “File” to access your File menu. The following screen will appear:

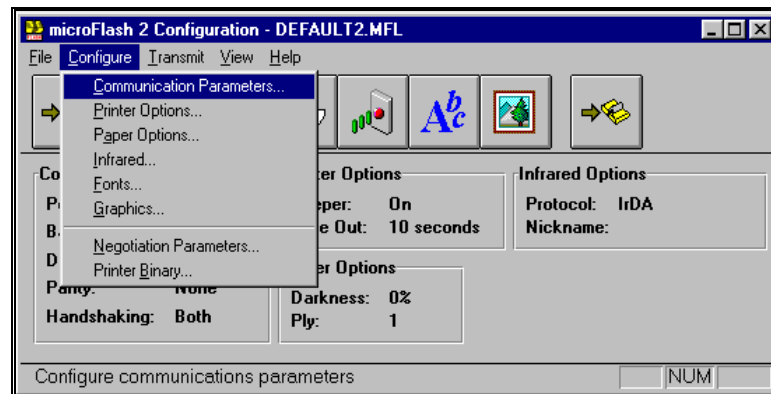


File Menu Choices

- New:** To create a new configuration.
- Open:** To open an existing configuration.
- Save:** To save the current configuration.
- Save As:** To save the new configuration under a new name.
- Select Printer Type:** To select a configuration for the microFlash.
- Exit:** To exit this menu.

Configure Menu

Click on the word “Configure” at the top of your screen to access the Configuration menu. The following screen will appear:

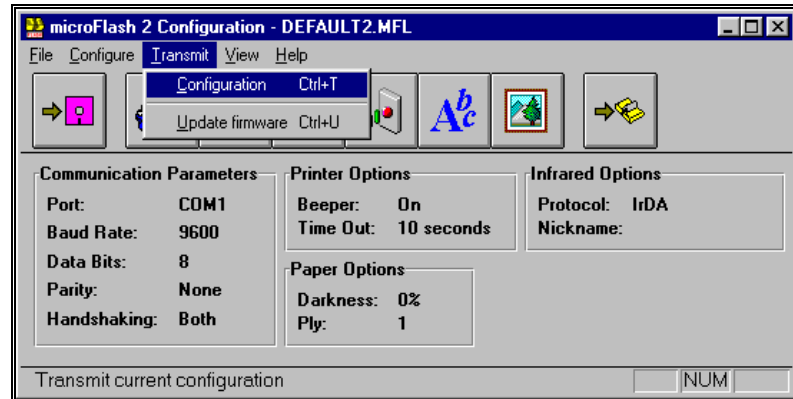


Configure Menu Choices

- Communication Parameters:** Choose parameters.
- Printer Options:** Choose beeper and time-out options.
- Paper Options:** Choose paper options.
- Infrared:** Choose infrared options.
- Fonts:** Choose fonts.
- Graphics:** Choose graphics.
- Negotiation Parameters:** Set the maximum baud rate during download.
- Printer Binary:** Choose printer type for this configuration.

Transmit Menu

Click on the word “Transmit” at the top of your screen to access the Transmit Menu. The following screen will appear:



Whether you click on the Transmit button or use the Transmit pull-down menu, Transmit allows you to send to the correct configuration. Using your pull-down menu, you can also update the printer.

Transmit Menu Choices

Configuration: Send current configuration to printer.

Update Firmware: Install new firmware, updating the microFlash.



Tip: Save your current configuration before you Update Firmware.

Updating the microFlash

Using the Transmit pull-down menu, click on Update firmware when a new version of the microFlash has been developed. Update firmware allows you to add enhancements as they are developed without ever having to purchase a new printer. It will also update the new configuration you choose before you click on Update.

Call your O'Neil representative (949) 458-0500 to find out more about future developments.



Tip: When you Update, any data, including receipt and label formats and graphics, stored in the printer's memory are deleted.

Installing the Windows Driver with Windows 3.1

If you plan to print receipts or labels using Windows-based applications, you will need to install the Windows driver.

Insert the microFlash Configuration Program in a floppy drive. Now open the Program Manager in Windows. Now click on "**Main**" and then click on "**Print Manager**." From the Options menu, choose Printer Setup. Choose the Add button. Then double click **Install Unlisted or Updated Printer**. At the "A" prompt, click on **Browse**. Select "**w31**" to install the Windows Drive with Windows 3.1. Click on OK twice. Choose the microFlash printer. If you want to change the port that is assigned to your printer, choose the Connect button. If you select a COM port, make sure that the communications settings for the port match those you have selected for the printer. If you wish to make the microFlash the default printer, double-click the printer in the Installed Printers list. Choose the close button.

Installing the Windows Driver with Windows 95

To print receipts or labels using Windows-based applications, install the Windows driver.

Click the **Start** button, point to **Settings**, and then click **Printers**. Double-click **Add Printer**. Follow the instructions on your screen. When you finish, the icon for your printer appears in the Printers folder. Your printer is ready for use with Windows applications.

Paper Loading

4



The microFlash series of printers are thermal direct printers requiring thermal paper.

Out of Paper

The printer will sound two quick beeps when it runs out of paper (MF2/3/2t/2tCR/4t/4tCR). 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 2i printer has no paper out indication and will continue to print with no paper providing the printer does not time out.

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

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

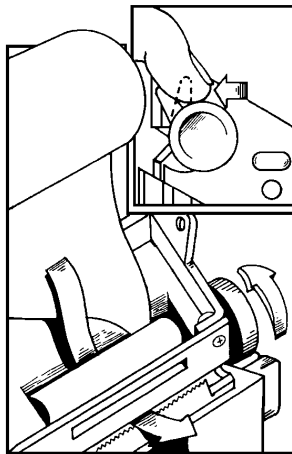
Removing Paper Core

For the MF2/3 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.

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)

For the MF2t/2tCR/2i/2iCR/4t/4tCR Un-snap the latch and lift up the cover. Wrap your index finger around the empty paper core and pull up. The paper rod will snap out. Remove the empty paper core and discard.

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 MF2/3

Press the red self test button to wake the printer. 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. 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. Insert the plastic paper rod

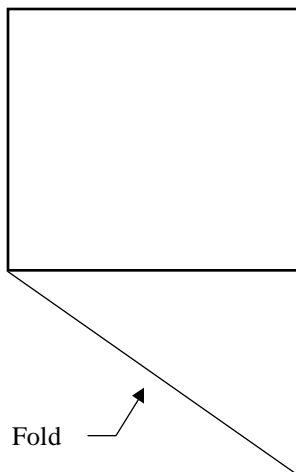
through the center of the paper roll. Place the narrow end of the rod into the small hole on the side of the paper cavity. Snap the wider end into the cutout on the opposite side of the paper cavity. Turn the paper knob clockwise to tighten the paper slack in the cavity. Replace the end boot and tear off extra paper.

Automatic Paper Loading MF2t/2tcr/2l/2icr/4t/4tcr

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. Press the red self test button to wake the printer. Push the button again while the printer is awake causes the mechanism to feed about 1" of paper. Insert the paper into the paper well with it resting on the paper rod clips. 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. Now lower the cover while placing the extra paper through the tearbar. Latch cover closed and tear off extra paper.

Manual Paper Loading MF2/3/4t/4tcr

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. Next take the edge of the paper and fold it 45 degrees. Insert the tip of the paper between the roller and the platen. 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.) Now grab the tip and pull it through until the paper is straight. Push down the paper lever. Insert the plastic paper rod through the center of the paper roll. Place the narrow end of the rod into the small hole on the side of the paper cavity. Snap the wider end into the cutout on the opposite side of the paper cavity. Turn the paper knob clockwise to tighten the paper slack in the cavity. Replace the end boot and tear off extra paper.



Manual Paper Loading MF2t/2tcr/4t/4tcr

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. Next take the edge of the paper and fold it 45 degrees. Insert the tip of the paper between the roller and the platen. 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.) Now grab the tip and pull it through until the paper is straight. Push down the paper lever. Insert the paper into the paper well with it resting in the paper rod clips. 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. Now lower the cover while placing the extra paper through the tearbar. Latch Cover closed and tear off extra paper.

Batteries

5



The microFlash2 will run using an internal Ni-Cad battery pack. The microFlash3 printer will run using an internal Nickel Metal Hydride battery (DR30). The microFlash 2t//2tCR/2i/2iCR printer will run using an internal Nickel Metal Hydride (DR10). The microFlash 4/4tcr printer uses 1 or 2 Lithium-ion battery packs. The microFlash series of printers can be charged on the road, with a cigarette lighter adapter or at home or the office with an AC adapter.

microFlash2 Battery Power

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 microFlash2 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.

The microFlash2 is charged in approximately one hour.



WARNING: Use only the batteries specified for the microFlash by O'Neil Product Development. Using non-approved batteries will void your warranty.

microFlash3 Battery Power

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.

The microFlash3 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 microFlash3 will charge in approximately four hours.

microFlash2t/2tcr/2i/2icr Battery Power

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 microFlash 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.

The microFlash2t/2tcr/2i/2icr is charged in approximately six to nine hours.

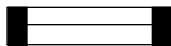
microFlash4t/4tcr Battery Power

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 4t/4tcr can use two batteries (VBATT1 and VBATT2).

The microFlash 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.

The microFlash4t/4tcr is charged in approximately three hours.

Charging the microFlash 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 microFlash printer. The battery charge light will glow red while the battery is

charging. When it is fully charged, the light will glow green. (Note: microFlash 3 users will need to slide back the round rubber boot to reveal the charge light and DC jack and microFlash 2t/2tcr/2i/2icr/4t/4tcr printers need to open the cover to insert plug).



Tip: The microFlash series of printers can be used while it's plugged in and the batteries are charging.

Charging the microFlash 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 microFlash. The battery light will glow red while the battery is charging. When it is fully charged, the light will glow green.

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. 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.

Replacement Fuse Rating

| |
|--|
| 1/4" diameter, 1-1/4" length |
| 5A 250V UL & CSA Approved |
| McMaster Carr part #7085K75, specify 5 |
| 2.5 mm DC Jack |
| Center Pin Positive |



TIP: 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 is diminished. If you notice diminished results in printing time, it is time to replace the battery.

Replacing the microFlash2 Battery

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. Press down on the clip to detach the battery connector from the printer. Push on the opposite side of the old battery to slide it through the opening. Push the new battery through the opening. Insert the plug back into the battery. You may also need to charge the new battery.

Replacing the microFlash3 Battery

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. Tap the edge of the printer (where you see its bar code label) against the heel of your hand. Lift out plug. Slide battery out. Slide the new battery in. Insert the plug back into the battery. You may also need to charge the new battery.

Replacing the microFlash2t/2tcr/2i/2icr Battery

Open the cover and slide the battery away from the printhead towards the hinge. Then lift out the battery from the tray. Slide the new battery in. You may also need to charge the new battery.

Replacing the microFlash4t/4tcr Batteries

Open the cover and gently push the battery lock tabs away while lifting the battery up. Insert the new battery in by putting the non contact area of the battery in first towards the center. Next push down on the battery near the battery lock tabs. You may also need to charge the new battery.

Battery Charging Indicator

| 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 | Timeout |
| Orange Flash Fast | Internal Error |

Custom Receipts and Labels

6



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

The microFlash 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 Mode):

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.

| Command | Description | Page |
|-------------|---|------|
| ESC C n | Set form length. Range for “n” is 1-255 | 52 |
| ESC A n | Set interline spacing; n = 0 (default) | 52 |
| CAN | Cancel line buffer | 52 |
| ESC V n1 n2 | Bit-mapped graphics mode select | 53 |
| ESC B | Begin acceptance of compressed graphics | 54 |
| ESC E | End acceptance of compressed graphics | 54 |
| SO | Set double wide print | 54 |
| SI | Condensed print | 54 |
| FF | Form feed | 55 |
| LF | Line feed | 55 |
| CR | Carriage return | 55 |
| ESC w n | Font select. Range for “n” is 21 - 26 hex | 55 |
| ESC @ | Reset the printer | 56 |
| ESC Hn | Multiply height “n” times | 57 |
| ESC Q n1n2 | Advance n1n2 from “Q” mark | 57 |
| ESC R n | International Font selection | 57 |
| ESC ! n | Set double wide and double high | 57 |
| ESC EZ | Go to Easy Print Mode | 57 |



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

```
RECEIPT
Item #1 - yellow version    $1.00
Item #2 - blue version     $1.00
Item #3 - red version      $1.00

TOTAL : $3.00
```

Example 1: 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 “←“ represents the escape character as it appears on your screen.)

Escape Sequences

ESC C n Set Form Length

Format: ESC C *n*
Dec: 27 67 *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 $(n1 * 256 + n2)$ dotlines 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.

| Printer Type | Dots Across | Bytes Across | Dots Per Inch |
|---------------------|--------------------|---------------------|-------------------------------|
| microFlash2 | 384 | 48 | 203 |
| microFlash3 | 576 | 72 | 203 |
| microFlash4t/4tCR | 832 | 104 | 203 |
| microFlash2t/2tCR | 384 | 48 | 203 |
| microFlash2i/2iCR | 240 | 30 | 127 Horizontal 69 Vertical |

ESC B, ESC E Accept Compressed Graphics

| | | | |
|----------------|----------|-------------|----------|
| Format: | ESC B | Format | ESC E |
| Dec: | 27 66 | Dec: | 27 69 |
| Hex: | 1B 42 | Hex | 1B 45 |

Function: Accepts compressed graphics data. Then it will uncompress and print.

Each compressed dotline (using a run-length encoding scheme) is preceded by an uppercase “G.” Each uncompressed dotline is preceded by an upper case “U.” Vertical white space (where several consecutive dotlines have not been printing) can be efficiently handled using an upper case “A” followed by a single byte count of the number of dotlines to advance.

Compressed dotlines 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 dotline 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 microFlash3 has 576 bits across a single line, the microFlash2/2t has 384 bits and the microFlash2i has 240 bits microFlash4t has 832 bits across a single line).

SO Set Double Wide Print

| | |
|----------------|----|
| Format: | SO |
| Dec: | 14 |
| Hex: | 0E |

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: | 0F |

Function: Will print the current font in single width.

FF Form Feed

Format: FF

Dec: 12

Hex: 0C

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. O'Neil has provided both commands for the convenience of all programmers, some of whom may be more used to using a Line Feed command, some of whom are more used to using Carriage Return. 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.)

Line Printer Mode Fonts

| 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 |
| 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 |

microFash 2i Only

| | | | | | | | |
|-------|------|---|----|----|---|---|---------------------|
| IM5X7 | 22.1 | ? | 3F | 63 | 5 | 7 | 96 chars impact 5x7 |
| IM5X8 | 22.1 | @ | 40 | 64 | 5 | 8 | 96 chars impact 5x8 |



The “(space)” in the chart above represents the space character. This is the basic list of fonts. For the entire list, See Appendix C.

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.



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 . Note: 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” dotlines from “Q” Mark. For more on the “Q” mark, see Chapter 9.

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 microFlash 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 microFlash (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.



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.

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

Command

After the left bracket, command, global options and colon, the command string consists of a series of identically formed lines all of which have this format:

@row, column, Name, Field Options|print data}

Vertical bars surround the data. Colons surround the row and column information.

Information

{Print, Global Options:

Right Bracket ends Print Request

@row,column:Name, Field Options|Data|

@row, column:Name,Field Options|Data|

@row, column:Name,Field Options|Data|

}

Data: Depending on what is printed, the data will be the text printed out on a receipt or label that is human readable, or the characters that are machine readable with a scanner.

Field Options: The user can multiply the height or width of text, graphics and bar codes.

Name: The Name of what you are printing is the style of font or bar code or line, or the file name of the graphic. An example of the name of a font is "MF102." Do not put spaces in the "Name" or the printer will reject your print request.

Row,Column: where to print text, graphics, bar codes and lines. A typical print request will consist of the word "Print" and a number of items to be printed, each at a different row and possibly at a different column. In order for text to line up properly, keep the column number the same, (e.g. @10,30 (information)| @ 60,30 (information)). Note: **There can be no spaces before or after a colon.**

Global Options: an action that refers to entire receipt or label. A global option can be used to stop the paper after a specified number of dotlines or at a specified mark, to rotate an image, or to print a specified number of copies all at once or on demand. A colon follows global options, if any.

Quick Reference for Easy Print Commands

| Command | |
|---|------------|
| Ahead | Page 64 |
| Back | Page 64 |
| LP | Page 64 |
| Print | Page 58 |
| Print Request "Global Options" | Page 65 |
| Print Request "Information" | Page 65 |
| :row, column: | Page 65 |
| Name of what is printed (Font, Bar Code, Line, Graphic) | Page 69-72 |
| Field Options used to heighten or widen image | Page 70 |
| Print Data (the bar code, graphic or text) | Page 65-66 |
| TP Self Test Printout | Page 65 |
| Query Class of Commands | Page 101 |
| | |

Easy Print Example 1

Total:\$13.15
01-01-97

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

```
Item #1 yellow  $10.00
Item #2 blue    $3.15

TOTAL $13.15
```

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 dotlines.

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, Chapter 10. The “n”s are ASCII numbers, not binary (see individual commands)

{Ahead:nnn}

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” dotlines. 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:nnn}

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” dotlines. 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. |

{LP}

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.

{TP}

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**,Global options:@row,column:Name,Field Options[data]}

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 microFlash2 is 1 - 384. The column range for the microFlash3 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. <i>The name is always five characters, even for the graphics which you name yourself.</i> |
| 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. |



Tip: 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” dotlines 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 (microFlash2/3 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| }

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

Global Options continued

QSTOPnnn **Qstop Global Option**

Format: QSTOPnnn ($1 \leq nnn \leq 65000$) (microFlash2/3/2t)

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, Chapter 9 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” dotlines 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 microFlash 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 advancing 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, Chapter 11, or call your O'Neil representative (949) 458-0500 for the latest font update. *See Chapter 3 to download fonts.*

| Font Name | CPI | Description |
|-----------------------------|------|--|
| MF055 | 5.5 | 96 characters large block (26 chars for lower case, 26 chars for upper case, plus symbols, etc.) |
| MF072 | 7.2 | 95 characters large block |
| MF102 | 10.2 | 223 characters medium block bold |
| MF107 | 10.7 | 96 characters block bold |
| MF185 | 18.5 | 96 characters block normal |
| Default Font → MF204 | 20.4 | 224 characters block normal (Default Font microFlash2/3/2t) |
| MF226 | 22.6 | 96 characters small block |

microFash 2i Only

| | | |
|--------------------------------|------|------------------------------|
| Default 2i Font → IM5X7 | 22.1 | 96 characters for impact 5X7 |
| IM5X8 | 22.1 | 96 characters for impact 5X8 |

{Print,Global Options1: @row,column:**Name**,**Field Options**|Data}

Font Field Options

These options are used to heighten or widen the font.

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



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

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

Bar Code Names

| 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) |
| 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 |

{Print,Global Options1: @row,column:**Name**,**Field Options**|Data}

Bar Code Field Options

| 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 than 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. XDIM 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 codewords |
| Level 3 adds 16 codewords |
| Level 4 adds 32 codewords |
| Level 5 adds 64 codewords |
| Level 6 adds 128 codewords |
| Level 7 adds 256 codewords |
| Level 8 adds 512 codewords |

EXAMPLE:

```
{PRINT:  
@75,10:PD417,YDIM 6,XDIM 2,COLUMNS 2, SECURITY 3|ABCDEFGHijkl|}
```

Will print a PDF-417 bar code containing ABCDEFGHIJKL 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 O'Neil PDF-417. It is optimized for the most common printing of a mixture of numbers, text, and control characters.

{Print,Global Options1:@row,column:**Name**,Field Options|Data}

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 microFlash Configuration Program to store a graphic automatically. Example 2 above makes the logo twice as big as it would be otherwise.

{Print,Global Options1:@row,column:**Name**,**Field Options**|Data}

Graphic Field Options

These options are used to widen or heighten the graphic.

| Field Option | Abbr. | Description |
|--------------|-------|-------------------------------------|
| HMULTn | HMn | Multiplies width of graphic by “n” |
| VMULTn | VMn | Multiplies height of graphic by “n” |



See Chapter 3, Graphics section, for storing graphics automatically before you print.

{Print,Global Options1: @row,column:**Name**,Field Options|Data}

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 dotlines long, and two dotlines thick. Example 2 prints a vertical line 50 dotlines long, and 2 dotlines thick. There is only a single vertical bar “|” because there is no data to enclose.

| Abbr. | Name | Description |
|-------|-----------|---------------------|
| T | HLINE | Horizontal line |
| V | VLINE | Vertical line |
| L | Lengthnnn | Sets line length |
| T | Thicknnn | Sets line thickness |

CardReader Commands

7

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 autoprint stand-alone demo

Example – turn turn T1&2 ON, T3 OFF, and the autoprint 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!} |
| Command: {SM:data} | Implemented as required (future): Smart Memory Card – requires command/data to be written to card Uses I ² C 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 μ P based card types
P:T0 or T1 for ASYNC card protocol to be used
(T1 is future)
M:I2C or SPI for I²C 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 autoprint stand-alone
demo

Example, to turn the autoprint 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 2tcr/2icr/4tcr 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 2tcr/2icr/4tcr 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.

The printer will wake up whenever a magnetic card or smart card is

inserted, or the probe is touched to a button. The button is read automatically whenever the printer is awake and the button is sensed by touching with the probe. The magnetic card is read when the printer is awake and the card is moving. This data is stored in an internal buffer in the printer and available to the host via RS-232 or IrDA. 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 2tcr/2ict/4tcr 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:

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

Cleaning Your Printer

8

Preventative Maintenance



The microFlash series of 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 microFlash and need to be removed. Clean your printer once a month if you use it frequently, or once every three months if used infrequently. O'Neil Product Development, Inc. offers a printer cleaning card that is used to clean the microFlash2/3/2t. 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.

Contact O'Neil Product Development, Inc. (949) 458-0500 to order a supply of cleaning cards.



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

Cleaning the Exterior

When the outside of your microFlash 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

9

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.

Printer Not Printing

- 1) Print a self test. If the self test will not print, check battery voltage by plugging the microFlash 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.

Charging the microFlash

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 the microFlash version 2.01, you will need to alter your application program substituting Easy Print commands for any "Template" commands you may have used with your old microFlash.
- 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

- 1) *Download via cable connect only, not infrared.*
- 2) You cannot download your current configuration (see Chapter 3) to the same COM-Port that is in use by IrDA or any other device.
- 3) 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.
- 4) Paper must be properly installed (with lever down)
- 5) Check all cable connections.
- 6) Make sure the COM-Port you selected in your microFlash Configuration Program (see Chapter 3) is the same COM-Port the printer is plugged into.
- 7) Do not toggle out of the microFlash configuration program during download, as this could interrupt the download.

Print Quality Problems

Print Roller Appears Dirty

Use the cleaning method described on in Chapter 7, *Cleaning Your Printer*. Attempts to clean the printer by other methods could result in costly damage to the print head.

Linerless Labels

Linerless label printing can cause the print head to become sticky. Use the cleaning method described on in Chapter 7, *Cleaning Your Printer*. 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 microFlash configuration 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.

Appendix A: Specifications

10

Printer Specifications



The following table details the size, weight and other specifications for the microFlash series of printers

| Specs | microFlash 2 | microFlash 3 |
|----------------|--|--|
| Dimension | 3.75 x 6.25 x 2.25 inches 95mm x 159mm x 57mm | 4 x 7 x 2.1 inches 102mm x 178mm x 53mm |
| Weight | 23 ounces (651 grams) | 36 ounces (1020 grams) |
| Print Method | Direct thermal | Direct thermal |
| Print Medium | Thermal paper, linerless | Thermal paper, linerless |
| Paper Width | 2.26 inches, 58 mm, 384 dots across | 3.15 inches, 80 mm, 576 dots across |
| Print Speed | 2 inches per second | 2 inches per second |
| Print Width | 1.85 inches, 47 mm | 2.83 inches, 72 mm |
| Print Duration | More than 2,800 inches per charge | More than 13,000 inches per charge |
| Operating | -15 to +50 degrees Celsius | -15 to +50 degrees Celsius |
| Interface | RS232C, infrared, IRDA, ASK | RS232, infrared, IRDA, ASK |
| Characters | Full IBM and internat'l char sets | Full IBM and internat'l char sets |
| Protocol | Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts. | Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts. |
| Power | Ni-Cad, 850 mAhr. | DR-30 nickel metal hydride 3500 mAhr. |
| Recharging | Internal, intelligent, automatic automatic. | Internal, intelligent, automatic |
| Flash Memory | One meg downloadable, 4 Meg option | One meg downloadable, 4 Meg option |
| Ruggedization | Survives multiple drops of 8 feet to concrete, every face. | Survives multiple 6 foot drops to concrete, every face. |
| Warranty | One year, includes print head. Extended warranties available. | One year, includes print head. Extended warranties available. |

| Specs | microFlash 2t | microFlash 2tcr |
|----------------|---|---|
| Dimension | 4.625 x 7.125 x 1.75 inches 118mm x 181mm x 44mm | 4.625 x 7.125 x 2.75 inches 118mm x 181mm x 44mm |
| Weight | 23.3 ounces (660 grams) | 28.5 ounces (808 grams) |
| Print Method | Direct thermal | Direct thermal |
| Print Medium | Thermal paper, linerless | Thermal paper, linerless |
| Paper Width | 2.26 inches, 58 mm | 2.26 inches, 58 mm |
| Print Speed | 2 inches per second | 2 inches per second |
| Print Width | 1.85 inches, 47 mm, 384 dots across | 1.85 inches, 47 mm, 384 dots across |
| Print Duration | More than 6,000 inches per charge | More than 5,000 inches per charge |
| Operating | -25 to +50 degrees Celsius | -15 to +50 degrees Celsius |
| Interface | RS232C, infrared, IrDA, ASK | RS232C, infrared, IrDA, ASK |
| Characters | Full IBM and internat'l char sets | Full IBM and internat'l char sets |
| Protocol | Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts. | Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts. |
| Power | NMH 1800mAh | NMH 1800mAh |
| Recharging | Internal, intelligent, automatic | Internal, intelligent, automatic |
| Flash Memory | 4 Meg | 4 Meg |
| Ruggedization | Survives multiple drops of 5 feet to concrete, every face. | Survives multiple drops of 5 feet to concrete, every face. |
| Warranty | 1 year, includes print head (OEMs 3 months). Extended warranties available. | 1 year, includes print head (OEMs 3 months). Extended warranties available. |

| Specs | microFlash 2l | microFlash 2lcr |
|----------------|---|---|
| Dimension | 4.625 x 7.125 x 1.75 inches 118mm x 181mm x 44mm | 4.625 x 7.125 x 2.75 inches 118mm x 181mm x 70.8mm |
| Weight | 23.3 ounces (660 grams) | 27.7 ounces (785 grams) |
| Print Method | Impact dot matrix, ink ribbon cassette | Impact dot matrix, ink ribbon cassette |
| Print Medium | Impact paper | Impact paper |
| Paper Width | 2.26 inches, 58 mm | 2.26 inches, 58 mm |
| Print Speed | 1.9 lines per second | 1.9 lines per second |
| Print Width | 1.85 inches, 48.8 mm, 240 dots across | 1.85 inches, 48.8 mm, 240 dots across |
| Print Duration | More than 2,400 inches per charge | More than 2,000 inches per charge |
| Operating | 0 to +50 degrees Celsius | 0 to +50 degrees Celsius |
| Interface | RS232C, infrared, IrDA, ASK | RS232C, infrared, IrDA, ASK |
| Characters | Full IBM and internat'l char sets | Full IBM and internat'l char sets |
| Protocol | Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts. | Easy Print Protocol for Bar Codes, Stored Graphics, Rotated Fonts. |
| Power | NMH 1800mAh | NMH 1800mAh |
| Recharging | Internal, intelligent, automatic | Internal, intelligent, automatic |
| Flash Memory | 4 Meg | 4 Meg |
| Ruggedization | Survives multiple drops of 5 feet to concrete, every face. | Survives multiple drops of 5 feet to concrete, every face. |
| Warranty | 1 year, includes print head (OEMs 3 months). Extended warranties available. | 1 year, includes print head (OEMs 3 months). Extended warranties available. |

| Specs | microFlash 4t | microFlash 4tcr |
|----------------|--|--|
| Dimension | 6.56 x 6.81 x 2.6 inches 172mm x 167mm x 66mm | 6.56 x 6.81 x 3.34 inches 172mm x 176mm x 85.5mm |
| Weight | 20.3 ounces (575 grams) | 25.2 ounces (714 grams) |
| Print Method | Direct thermal | Direct thermal |
| Print Medium | Thermal paper, linerless | Thermal paper, linerless |
| Paper Width | 4.40 inches, 112 mm | 4.40 inches, 112 mm |
| Print Speed | 2 inches per second | 2 inches per second |
| Print Width | 4.09 inches, 104 mm, 832 dots across | 4.09 inches, 104 mm, 832 dots across |
| Print Duration | More than 2200 inches per charge using a single battery. More than 4900 inches with two batteries. | More than 1800 inches per charge using a single battery. More than 4900 inches with two batteries. |
| Operating | -15 to +50 degrees Celsius | -15 to +50 degrees Celsius |
| Interface | RS232C, infrared, IrDA, ASK | RS232C, infrared, IrDA, ASK |
| Characters | Full IBM and internat'l char sets | Full IBM and internat'l char 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 1350mAh (1 or 2 packs) | Li-ion 1350mAh (1 or 2 packs) |
| Recharging | Internal, intelligent, automatic | Internal, intelligent, automatic |
| Flash Memory | 4 Meg | 4 Meg |
| Ruggedization | Survives multiple drops of 6 feet to concrete, every face. | Survives multiple drops of 6 feet to concrete, every face. |
| Warranty | 1 year, includes print head (OEMs 3 months). Extended warranties available. | 1 year, includes print head (OEMs 3 months). Extended warranties available |

Battery Specifications

| Specs | microFlash 2 | microFlash 3 | microFlash 2t/2tcr/2i/2icr | microFlash 4t/4cr |
|------------------------|------------------------------|------------------------------|-----------------------------------|------------------------------|
| Cell Size | 5 X AA | 6 X 4/3A | 5 X 4/3A | 2 X 4/3A |
| Type | Ni-Cad | 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. | -20° – 50°C (-4° – 122°F) | -20° – 50°C (-4° – 122°F) | -20° – 50°C (-4° – 122°F) | -20° – 50°C (-4° – 122°F) |
| Weight | 4.5 ounces (127 g) | 12.5 oz (354 g) | 6.6 oz (187 g) | 3.1 oz (88 g) |
| Agency | N/A | Listed UL2054 | Listed UL2054 | N/A |

Cable Specifications

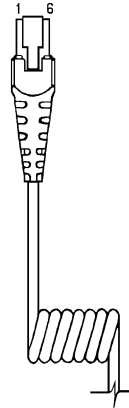
The microFlash uses an RJ-11 six position, six conductor modular jack. The printer cable is specially designed to provide strain relief.

Modular Connector

Output 1 VBATT
 Output 2 TXD
 Input 3 RXD
 Output 4 DTR
 Common 5 Ground
 Output 6 VCC

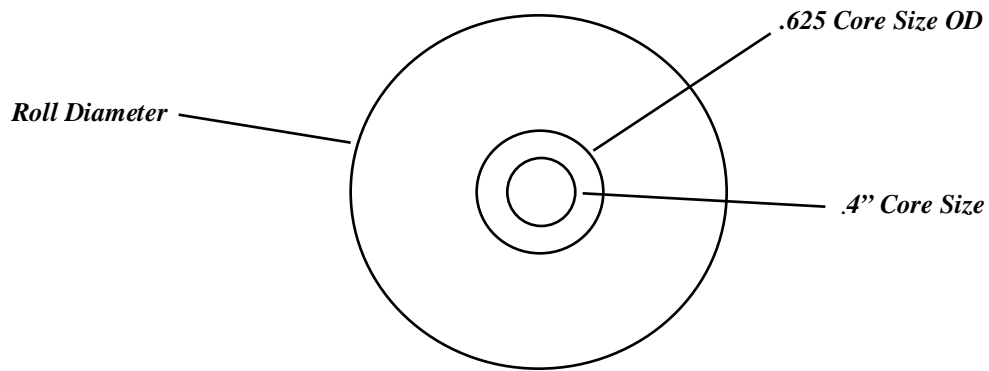
DB9F Connector

----- 2 RXD Input
 ----- 3 TXD Output
 ----- 8 CTS Input
 ----- 5 Ground Common
 1 CD
 ----- 4 DTR
 ----- 6 DSR
 7 RTS
 9 RI



Thermal Paper Specifications

| Specs | microFlash 2 | microFlash 3 | microFlash 2t/2tcr | microFlash 2i/2icr | microFlash 4t/4tcr |
|-------------------------|-----------------|-----------------|-----------------------|-----------------------|-----------------------|
| Paper Width | 2.26 inches | 3.15 inches | 2.26 inches | 2.26 inches | 4.40 inches |
| Roll Diameter | 1.75 inches | 2 inches | 2 inches | 2 inches | 2.25 inches |
| Core Size - actual core | .4 inches | .4 inches | .4 inches | .4 inches | .4 inches |
| Core Size OD | .625 inches | .625 inches | .625 inches | .625 inches | .625 inches |
| Paper Thickness | .002 inches | .002 inches | .002 inches | .005 inches | .005 inches |



Use only O'Neil Product Development's recommend paper specifications. Using other grades of paper may void the warranty.

Guidelines for Using a “Q” Mark to Align Forms (microFlash2/3/2t/4t)

- 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 microFlash printer mechanisms are 1/203 an inch per dot line.

Parking Ticket Showing "Q" Mark Area for microFlash2

The Q mark can go anywhere between the dotted lines except the .5" region shown above. The recommended location is shown below. The height of the Q mark can be between .15 and .25"

| PARKING VIOLATION | | |
|---|--------------|-------|
| Citation #: | | |
| Date | Time | |
| License Number | State | Make |
| VIN | | |
| Color | Location | Floor |
| Meter/Res Sp# | Permit # | |
| Officer# | Officer Name | |
| VIOLATION: | | |
| AMOUNT DUE: | | |
| Tow Notice Due Date: | | |
| COMMENTS: | | |
| SEE REVERSE SIDE FOR IMPORTANT INSTRUCTIONS Transportation & Parking Services Office | | |

Dimensions for the 'Q' mark area:

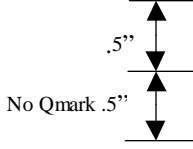
- Vertical dimension: .4" (top section), No Qmark .5" (middle section), .15-.25" (bottom section)
- Horizontal dimension: .65" (width of the mark), 1.0" (width of the area)

Parking Ticket Showing "Q" Mark Area for microFlash3

| PARKING VIOLATION | | |
|--|-------------|-------|
| CITATION # | | |
| Date | Time Issued | |
| License Number | Time Marked | |
| State | Month | Year |
| VIN | | |
| Vehicle Make | Type | Color |
| Location | Meter #/PPD | |
| Officer | Serial No. | |
| Beat | Agency | |
| IN VIOLATION OF SECTION: | | |
| AMOUNT DUE: | | |
| COMMENTS: | | |
| Payment is required not later than 21 calendar days from the date of the violation. You have 21 days to contest this citation. SEE REVERSE SIDE FOR IMPORTANT INSTRUCTIONS PAYMENT MUST BE IN U.S. FUNDS * DO NOT SEND CASH * | | |

.4"
 .5" No Qmark
 The Q mark can go anywhere between the dotted line and the edge of the paper except in the .5" region shown above. The recommended location is shown below. The height of the Qmark can be between .15 and .25"
 .15-.25"
 .6"

Parking Ticket Showing "Q" Mark Area for microFlash 2t/2tcr



No Qmark .5"

PARKING VIOLATION

Citation #:

| | | |
|----------------|--------------|-------|
| Date | Time | |
| License Number | State | Make |
| VIN | | |
| Color | Location | Floor |
| Meter/Res.Sp# | Permit # | |
| Officer# | Officer Name | |

VIOLATION:

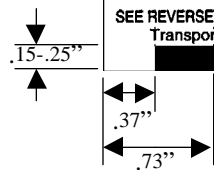
AMOUNT DUE:

Tow Notice Due Date:

COMMENTS:

SEE REVERSE SIDE FOR IMPORTANT INSTRUCTIONS
Transportation & Parking Services Office

The Qmark can go anywhere between the dotted lines except the .5" region shown above. The recommended location is shown below. The height of the Qmark can be between .15 and .25"



Parking Ticket Showing "Q" Mark Area for microFlash 4t/4tcr

PARKING VIOLATION

CITATION #

| | | |
|------------------------|------------------------|------------------------|
| Date | Time Issued | Time Marked |
| | | |
| Officer | | Beat |
| | | |
| License | State | Expiration Date |
| | | |
| VIN | Make | |
| | | |
| Violation | | |
| Description | | |
| | | |
| Code Number | Bail | |
| | | |
| Delinquent Date | Delinquent Bail | |
| | | |
| Location | | |
| Street Location | | |
| | | |
| Meter Number | | |
| | | |
| Officer Notes | | |
| | | |

The Q mark can go anywhere between the dotted line and the edge of the paper except in the .5" region shown above. The recommended location is shown below. The height of the Q mark can be between .15 and .25"

.3"

No Qmark .5"

.15-.25"

.6"

Wake-Up Characters

The microFlash automatically goes into sleep mode in the number of seconds you specified using your microFlash Configuration Program (see Chapter 3). 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/Pluse 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.

| 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.

Tip: 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

11



Queries can be sent to the microFlash 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: | 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."

Quick Reference

| Command | Format | Description |
|----------------|----------|--|
| Status | ESC{ST?} | Returns info 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 application. |
| Print head | ESC{PH?} | Returns type of print head in use and number of dots across. |
| Infrared | ESC{IR?} | Returns info about IR settings. |
| Fonts | ESC{FN?} | Returns a list of fonts available. |
| Graphics | ESC{GR?} | Returns list of downloaded graphics. |
| Formats | ESC{FM?} | Returns 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 |
| Cancel | ESC{CN!} | Cancel all demand printing |
| Reset | ESC{RE!} | Resets printer |
| Read Status | ESC{RS?} | Returns Satus of Card Reader |
| Read Mag. Data | ESC{MR?} | Returns Magnetic card data |



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

- 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.

| 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 | Lever = Up or Down |
| P | P,N | Paper = Present or Not present |
| R | nn | RAM buffer size remaining, in K bytes. |
| B | O,T, V | Battery condition - O = OK; T = out of Temperature range; V = out of Voltage range. |
| H | O,T | Printhead Temperature - O = OK, T = out of range. |

ESC{CF?}

Configuration

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.

| Query | Reply | Definition |
|----------|---------------------------------|---|
| L | LP, EZ | Default mode -Line Printer or Easy Print (EZ) |
| B | 012,024, 048,096, 192,384 | Baud rate = 1200, 2400, 4800, 9600, 19.2K or 38.4 baud |
| P | N,E,O | Parity is None, Even, or Odd |
| N | 7,8 | Number of Data Bits is 7 or 8 |
| H | N,H,S,B | Handshaking = None, Hardware, Software, or Both |
| D | -25% ...+35% | Darkness 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 | nmmn | Timeout value in seconds (9999 = always on) |

Battery

Query Format: ESC{BT?}

Reply Format: {BT!V:x;Tx}

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.

| Query | Reply | Definition |
|------------------------|------------------|--|
| V | n.n | Battery Voltage = n.n volts |
| T | ± nn.nC | Battery Temperature = +nn.n degrees C or -nn.nn degrees C |
| CH | C,F,I,N, T, W | C= Complete, F- Fast Charge, I = Initialization, N = No Charge, T = Trickle Charge, W = Wait to restart. |
| SB00..SB nn | TBD | Reserved future option for smart battery data. Query characters may change. |

ESC{VR?}

Version

| | |
|---------------------------|--|
| 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. |

| Query | Reply | Definition |
|-------|-------|--|
| F | n.nn | Firmware version is n.nn |
| B | n.nn | Boot code version is n.nn |
| D | n.n | Download (fonts, graphics, formats) version is n.n |

Memory

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 Flash Manufacturer is AMD.
RS:1M; **RAM Size = 1M.**
DT:049152; Total Flash area available for **Download** is 49,152 bytes.
DR:000512; **Download Flash memory Remaining.** Out of the 49,152 bytes, 512 bytes remain available.

| Query | Reply | Definition |
|-----------|--------------|--|
| FS | 1 Meg, 4 Meg | Flash Size = 1 Meg (128K bytes) or 4 Meg (512K) |
| FM | AMD | Flash Manufacturer is AMD |
| RS | 1 Meg | RAM Size = 1 Meg (128K bytes) |
| DT | nnnnnn | Download Total area = nnnnnn bytes |
| DR | nnnnnn | Download RAM remaining = nnnnnn bytes |

Printhead

Query: 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:LPT3245T:+25.6C;}

Reply Explanation:

PH! This is a reply to a PRINTHEAD 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.

| Query | Reply | Definition |
|-------|---------------------------|--|
| TD | Nnnn | Total Number of dots across this print head |
| DD | Nnn | Dot Density of this print head (dots per mm) |
| M | x...x (variable width) | Model number of this print head |
| T | ± nn.nC | Current Temperature of print head |

ESC{IR?}

Infrared

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:microFlash2;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:microFlash2; The device nickname is microFlash 2.
ID: The device name is 1234567890123456789.

| Query | Reply | Definition |
|-----------|--|---|
| P | OFF,IrDA,ASK, ASC-CRC, DIRECT, DIRECT-CRC | Protocol selected is OFF, IrDA, ASK, ASK with CRC, DIRECT or DIRECT with CRC |
| AV | nn | ASK software Version = nn |
| DV | nn | DIRECTS software Version = nn |
| IV | n.n-mm | Version of IrDA specifications supported is n.n; firmware version of IrDA loaded into this printer is mm. |
| IN | x..x (up to 19 chars) microflash2, microFlash3, 2t, 2i | IrDA Nickname |
| ID | x..x (up to 19 chars) | IrDA Device name |

Fonts

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.

| Query | Reply | Definition |
|-------|--------------------|----------------------------------|
| N5 | xxxxx | 5 character Name is xxxxx |
| N1 | x(nn) | 1 character Name - also in HEX |
| L | R,D | Location is Resident or Download |
| UV | x | User Version number |
| UD | mm/dd/yy | User Date- month, day, year |
| US | x..x (20 chars) | User Descriptive Summary of font |
| CPI | nn.n | Characters Per Inch is nn.nn |

Graphics

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.

| Query | Reply | Definition |
|-------|----------|--|
| N5 | xxxxx | 5 character Name is xxxxx |
| N1 | x(nn) | 1 character Name - also in HEX |
| L | R,D | Location = Resident or Download |
| UV | x | User Version number |
| UD | xx/xx/xx | User Date |
| US | x..x | 20 chars, User Descriptive Summary of font |

ESC{FM?}

Formats

| | |
|---------------------------|---|
| 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. |

| Query | Reply | Definition |
|-------|-----------------|----------------------------------|
| N5 | xxxxx | 5 character Name is xxxxx |
| L | R,D | Location is Resident or Download |
| UV | x | User Version number |
| UD | xx/xx/xx | User Date |
| US | x..x (20 chars) | User Descriptive Summary of font |

ESC{DQ?}

Demand Quantity

Query Format: ESC{DQ?}
Reply Format: nnn
Function: Returns remaining quantity of images

ESC{CN!}

Cancel

Query Format: ESC{CN!}
Reply Format: ESC{CN!}
Function: Cancels demand printing

ESC{RE!}

Reset

Query Format: ESC{RE!}
Reply Format: ESC{RE!}
Function: Resets printer.

ESC{RS?}

Status Card Reader (Card Reader Option)

Query Format: ESC{RS?}
Reply Format: ESC{RS!}
Function: Returns Card Reader Status.

ESC{MR?}

Read Magnetic Card (Card Reader Option)

Query Format: ESC{MR?}
Reply Format: ESC{MR!}
Function: Returns Magnetic Card Reader Data.

Appendix C: Fonts

12



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 nrmal |
| 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 |



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. Call O'Neil Product Development for the latest additions to the font list (949) 458-0500.

Definitions

13



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 horizontal 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-Cad 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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