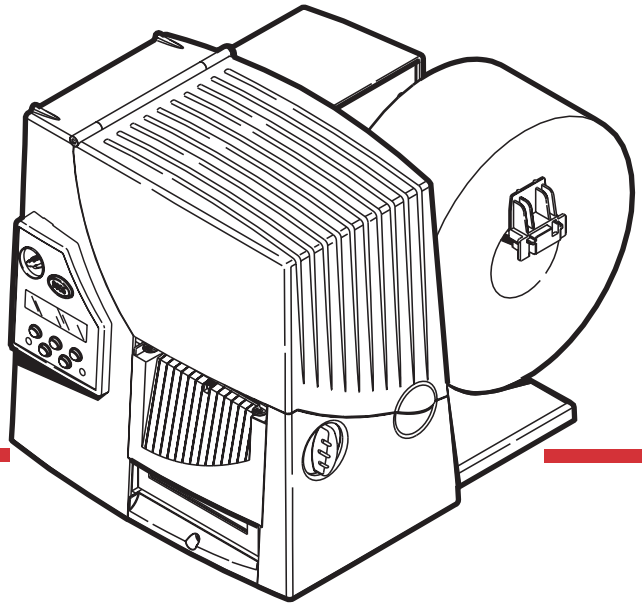
Packet Reference Manual

Monarch® 9825® and 9855® Printers



TC9800PM Rev DR
10/15

AVERY DENNISON | Printer & Fastener Solutions

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GETTING STARTED

1

Before you read this manual, review the printer information in the *Operator's Handbook*. This manual provides the necessary information to design, write and print a Monarch® Printer Control Language II (MPCLII) format. The following printers support this type of format:

- 9825® (V. 1.0 or greater)
- 9855® (V. 1.0 or greater)

See Appendix E, "Printer Differences" for a description of each printer's features.

About This Manual

You do not need to be a programmer to use this manual, but you must be familiar with creating text files and using basic MS-DOS® commands. This chapter describes how to

- create and download a sample MPCLII packet.
- use the Supply Layout Grid and Format Worksheet.
- categorize data into field types and select fonts to use in your format.

See "Defining Text Fields" in Chapter 3 for a list of available fonts for your printer. See Chapter 4, "Defining Field Options," for a list of available options for your printer.

Before You Begin

1. Connect the printer to the host. Refer to the *Quick Reference* for more information.
2. Load supplies in the printer. Refer to the *Quick Reference* for more information.
3. Turn on the printer.
4. Set the communication parameters and configure the printer. The communication parameters at the printer must match those at the host. See Chapter 2, "Configuring the Printer," for more information.
5. Design your format. See "Starting with a Design" for more information.
6. Download your format to the printer. See Chapter 6, "Printing," for more information.

Creating an MPCLII Format Packet

A format defines which fields appear and where the fields are printed on the label. The printer requires this information in a special form, using Monarch® Printer Control Language II (MPCL). This section describes how to create a sample MPCLII format packet.

Make sure supplies are loaded, the printer is connected to the host and is ready to receive data. Refer to the *Operator's Handbook* for more information.

For detailed information about the format header, text, constant text, and bar code fields, see Chapter 3, "Defining Fields." For information about batch packets, see Chapter 6, "Printing."

1. Type the following format header in any text editor:

   ```
   {F,25,A,R,E,200,200,"FMT-25" |
   ```

2. Type the following constant text field:

   ```
   C,140,40,0,1,2,1,W,C,0,0,"SAMPLE FORMAT",0 |
   ```

3. Type the following bar code field:

   ```
   B,1,12,F,85,40,1,2,40,5,L,0 |
   ```

4. Type the following text field:

   ```
   T,2,18,V,50,50,1,1,1,1,B,L,0,0,1 | }
   ```

You have created a format packet for your MPCLII printer. Now, a batch packet must be created before you can print the format.

5. Type the following batch header, after the text field line:

```
{B,25,N,1 |
```

6. Type the following bar code data:

```
1,"02802811111" |
```

7. Type the following text field data:

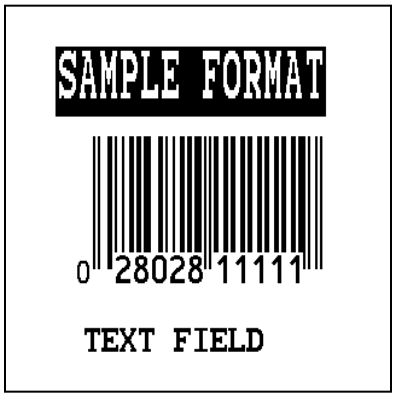
```
2,"TEXT FIELD" | }
```

8. Save your file as SAMPLE.FMT.

9. Type MODE COM1:9600,N,8,1 at the DOS prompt if you are using serial communications. This sets the communication parameters at your host. These communication parameters must match those at your printer. See “Setting Communication Parameters,” in Chapter 2, or your hosts documentation for more information.

10. Type COPY SAMPLE.FMT COM1. The following 2 inch by 2 inch label prints:

```
{F,25,A,R,E,200,200,"Fmt 25" |
C,140,40,0,1,2,1,W,C,0,0,"SAMPLE FORMAT",0 |
B,1,12,F,85,40,1,2,40,5,L,0 |
T,2,18,V,50,50,1,3,1,1,B,L,0,0,0 | }
```



Sample Batch Packet

```
{B,25,N,1 |
1,"02802811111" |
2,"TEXT FIELD" | }
```

See “Starting with a Design” to design your format and Chapter 3, "Defining Fields" to create text, bar code, and line fields.

Daily Startup Procedures

You may want to design a checklist for operators to follow each day. Here are a few suggested items: Turn on the printer and host, make sure ribbon and supplies are loaded, make sure communication parameters are set, and download packets from the host to the printer.

You may want to keep records of supplies that have been printed. A good way to do this is to design a print log for operators to complete at the end of the day. Here are some suggestions for types of information to include in a print log: date, operators name, format name, supply size, quantity printed, evaluation of print quality, and problems/comments.

Keep backup copies of your format, batch data, check digit, and graphic packets.

Starting with a Design

Before you create a format packet, you must design your label. There are several steps to designing a custom label:

1. Decide which fields should appear on your label. See “Determining Format Contents” for more information.

2. Determine your label size. Labels are available from us in a wide variety of sizes. Your application and the amount of data you need to print determines the supply size. Contact your Account Manager or Technical Support for more information.

3. Draw a rough sketch of your label. You may want to draw several variations to see what works best. See “Drawing Rough Sketches” for more information.

4. Identify the field types that appear on your label. See “Considering Field Types” for more information.
5. Decide which fonts you want to use. See “Considering Fonts” for more information.
6. Fill out your Format Worksheet. See “Using the Format Worksheet” for more information.

At this point, you are ready to send your design to the printer. To do this:

7. Create a format packet, based on how you filled out your worksheet. See Chapter 3, “Defining Fields,” for more information.
8. Download your format packet to the printer. See Chapter 6, “Printing,” for more information.

Determining Format Contents

Before you lay out your format, answer these questions. How large is your supply, which fonts do you want to use, do you want to include a bar code, and do you want to include graphics?

Determining the Print Area

The “bottom” (or leading edge) is the edge that exits the printer first. The 0,0 point is at the bottom left corner of the label. The print area is in the center of the label.

Printer	Unit of Measure	Max. Supply (Wid x Len)	Max. Print Area (Wid x Len)	Min. Supply (Wid x Len)	Min. Print Area (Wid x Len)
9825	English Metric Dots	425 x 1750 1080 x 4445 863 x 3553	400 x 1600 1016 x 4064 812 x 3248	75 x 50 191 x 127 152 x 102	75 x 50 191 x 127 152 x 102
9855	English Metric Dots (203) Dots (300)	425 x 1750 1080 x 4445 863 x 3553 1275 x 5250	400 x 1600 1016 x 4064 812 x 3248 1200 x 3900	75 x 32 191 x 81 152 x 65 225 x 96	75 x 32 191 x 81 152 x 65 225 x 96

Note: You can create longer images if you reallocate memory to increase your image buffer. See "Defining the Memory Packet" in Chapter 2 for more information.

The following non-print zones are *recommended* for the printers:

All Supplies .050 inches on either edge of the label.

All Supplies .020 inches at the end of the label.

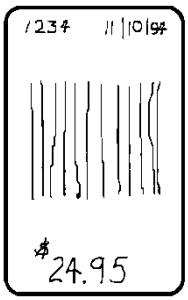
If using the optional verifier, allow a minimum no-scan zone on the trailing edge of the label of 0.5 inch (13 mm). The trailing edge is the edge of the label that exists the printer last; regardless of how the format is designed on the label.

Use the following formulas to convert inches to dots and metric:

```
Dots = inches x 203 (or 300 dots per inch)
Metric (1/10mm) = inches x 254
English (1/100 inch) = 100 x (dots/203) or (dots/300)
Dots = Metric (1/10 mm) x 799/1000 (or 1181/1000)
300 dpi depends on your printer.
```

Drawing Rough Sketches

After you decide what information you want to print, sketch how you want the information to appear on the label. Note any areas that are preprinted on the label, such as a logo.



As soon as you know what information to include on the label, and you have a rough sketch, you can use a supply layout grid to help you layout and size your label. If you do not want to use a grid, go to "Considering Field Types" to choose what information you want on your label.

Using Supply Layout Grids

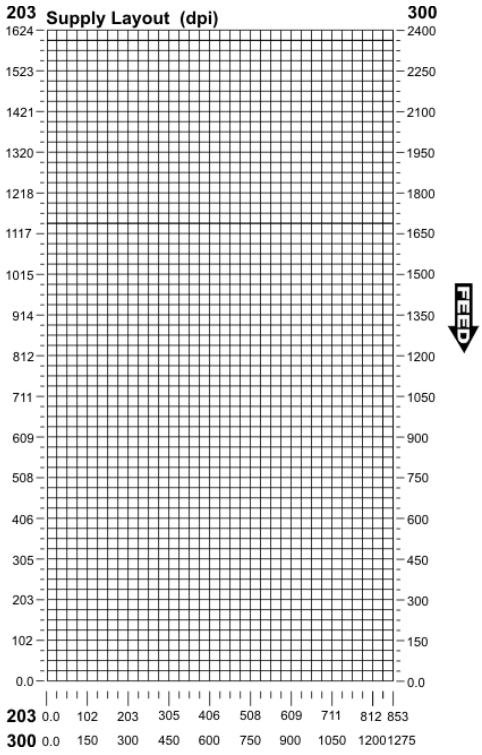
A supply layout grid contains measurement markers. These markers help you accurately position information on your label.

Decide whether you want to design formats using English, Metric, or Dot measurements. Choose from the following grids:

English	The English grid is measured in 1/100 inches.
Metric	The Metric grid is measured in 1/10 millimeters (mm).
Graphic	The printer uses dots to print images on a label. The printhead has 203 dots per inch (dpi) or an optional 300 dots per inch printhead.

Choose English or Metric units when designing formats to use with different printers. English or Metric units allow more direct use of formats on printers with different density printheads.

If you want to use the supply layout grids, a copy of each is in Appendix D, "Format Design Tools."



Considering Field Types

After you select a supply size, the next step in designing a format is to decide what information you want to print on the label. For example, you may want to print your company name, price of an item, and a bar code that combines information from other places. Everything you want to print falls into one of the following categories.

Field Type	Description	Examples
Text	Contains letters, numbers, or symbols you want to print.	item number, item description, department number, price, date
Non-Printable Text	Holds data for use later, such as for merging into another field. The printer does not print non-printable text fields.	city, state, and zip code to be included in a bar code
Bar Code	Used for printing bar codes that can be scanned.	item or serial numbers, zip codes, information you do not want to have visible to customers
Constant Text	Prints fixed characters that print without changing.	company name, company address
Line or Box	Highlights or separates items.	line marking out the regular price, border around the supply
Graphic	Contains a bitmap image or a compliance label overlay.	logos
Verifier	Specifies a verifier configuration to use for each format.	Mode 2, mode 19
RFID	Contains the RFID data to program into the RFID tag.	Class 1 Gen1, Class 1 Gen2, EPC data

All of the above field types except graphics are discussed in Chapter 3. See Chapter 5, “Creating Graphics” for information on including graphics in your format.

Considering Fonts

When working with fonts, you have three considerations: font appearance, font size (scalable or bitmapped), and font spacing (monospaced or proportional).

The TrueType® scalable font, EFF Swiss Bold™ (font 50) is standard on the printers. See Appendix B, “Fonts,” for samples of each font.

Interchanging Packets

You can use an MPCLII format that was designed for another MPCLII printer on a 9800 series printer. However, the format may appear smaller (fields will be shorter), because most of the 9800 series printers use a 203 dpi printhead. The 9855 printer has an optional 300 dpi printhead.

Using the Format Worksheet

The Format Worksheet is divided into sections that list the field types. Each section has boxes to fill in with parameters that define your format. A format worksheet is included in Appendix D, “Format Design Tools.”

Filling in the Format Worksheet

Decide what type of field to use on your label.

1. Make a copy of the Format Worksheet.
2. Define the Format Header. See “Defining the Format Header” in Chapter 3 for more information.
3. Define all non-printable text fields before you define the ones you want to print. See “Defining Non-Printable Text Fields” in Chapter 3 for more information.
4. Define options as you require them. See Chapter 4, “Defining Field Options” for more information.

CONFIGURING THE PRINTER

2

This chapter discusses how to

- set communication parameters.
- upload the printers configuration or font information.
- configure the printer using online configuration packets.
- use immediate commands to control the printers operation at any time.

Setting Communication Parameters

Use the following information if you are using serial communications. See “Using Parallel Communications” for information about parallel communications.

The communication parameters at the printer must match those at the host.

You can use the communication settings packet to set communication parameters for your printer.

On MS-DOS computers, you can use the MODE command to set communication values on your PC.

For example

```
MODE COM1:9600,N,8,1
```

This command sets your host to these communication values: 9600 baud, no parity, an 8 bit word length, 1 stop bit.

Using Parallel Communications

If your printer supports parallel communications, the parallel port is IEEE-1284 or Centronics® mode. You can set which mode to use through the control panel. Refer to the *Operator’s Handbook* for control panel information. The communication settings are automatically configured for you. There are no operator settings required.

We recommend waiting at least two seconds (or longer) when switching between the serial and parallel ports to send data, because data may be lost. Be careful when using print spoolers, because data transmission occurs in the background of the operating system. This makes data transmission completion difficult to determine when switching between ports.

Here are some guidelines to follow when using MPCLII.

MPCLII Punctuation

Use the following symbols when creating MPCLII packets:

Character	Decimal Value	Description
{ (left bracket)	123	start of header
} (right bracket)	125	end of header
| (vertical bar)	124	field separator*
, (comma)	044	parameter separator
"ABC" (quotation marks)	034	Quotation marks enclose character strings. Empty quotes (" ") identify null strings or unused fields.
‘comment’ (single quotation marks)	039	Grave accents enclose comments. Any data enclosed in grave accents is ignored. Do not embed comments within a quoted string. Grave accents are also used to reject mainframe data.

***** The field separator is the split vertical bar (|). The decimal value is 124. To enter this character, use the Shift key plus the Split Vertical Bar key on your computer’s keyboard. Depending on your text editor, it may appear as a solid vertical bar or as a split vertical bar.

Note: These MPCL characters are the default.

Standard Syntax Guidelines

When creating MPCLII packets:

- Begin each packet with a **start of header** (**{**).
- End each packet with an **end of header** (**}**).
- Define no more than **1000** fields in a format. Each | indicates one field. However, options are not counted as fields. The actual number of fields a format can have may be less, because the number of fields is limited by the available memory.
- The field number (**0** to **999**) must be unique. We recommend starting at 1, instead of 0.
- Do not use a field number more than once per format.
- Define all fields in the order to image/print them. The printer does not print in field number order.
- Separate all parameters with a **Parameter Separator** (**,**).
- End each field with a **Field Separator** (**|**).
- Enter all information in CAPITAL letters, except words or phrases within quotation marks.
- Include all parameters for a field unless documented as optional.
- Define non-printable text fields before the field to which they apply.
- Define options immediately after the field to which they apply.
- Multiple options can be used with most fields. Options can be used in any combination except as noted with each definition. Options are processed in the order they are received.
- Keep in mind that proportionally spaced fonts need wider fields than monospaced fonts. For variable field data, use a letter W to determine the maximum field size.

- Do not place a new line (return) or any other non-printing character within a field definition. However, a carriage return or line break after each | makes your formats easier to read.

```
T,1,20,V,30,30,1,1,1,1,B,C,0,0,0 |
T,2,10,V,50,30,1,1,1,1,B,C,0,0,0 |
```

- Spaces are ignored, except within character strings.
- Indenting options improves readability of your formats.

```
T,1,18,V,30,30,1,1,1,1,B,C,0,0,0 |
  R,42,1 |
```

- Use a tilde (~) followed by a 3-digit ASCII code in a quoted string to send function codes or extended characters or send the 8-bit ASCII code.

You can modify formats and fields with the optional entry method. See “Optional Entry Method” in Chapter 6 for more information.

Using Online Configuration Packets

Use online configuration packets to change the printer’s settings. You can send an individual configuration packet or a single packet containing all the configuration packets. Supply all parameters for each packet. Leave the parameters blank that you do not need to change. For example,

```
{I,A,,,,1 | }
```

prints a slashed zero and uses the last sent online System Setup parameters.

Make a copy of the online configuration worksheet in Appendix D, “Format Design Tools,” and save the original. Packets A-M are listed on the worksheet.

When you turn off the printer, all the information in the online configuration packets is saved and used when the printer is turned back on. After you change the printer’s configuration, resend the format, batch, or graphic to the printer before the changes take effect.

Configuration Packet Header

Always include an **I**, immediately after the left bracket **{** and before the packet identifier (A, B, C, etc.). The **I** parameter identifies the data stream as a configuration packet.

Note: Include the **I** parameter with each packet if you are sending them individually. Include it only at the beginning of a data stream if you are sending multiple packets.

This is the syntax to use when you create online configuration packets:

Syntax

```
{                                   Start of Header
I,                                  Configuration Header
1 - 9 optional records
A, parameter 1...parameter 5 |      System Setup
B, parameter 1...parameter 6 |      Supply Setup
C, parameter 1...parameter 7 |      Print Control
D, parameter 1...parameter 3 |      Monetary Formatting
E, parameter 1...parameter 9 |      Control Characters
F, parameter 1...parameter 5 |      Communication Settings
G, parameter 1...parameter 3 |      Backfeed Control
M, parameter 1...parameter 3 |      Memory Configuration
X, parameter 1   parameter 5 |      RFID Setup for UHF
}                                   End of Header
```

Syntax for single packet

{	Start of Header
I,	Configuration Header
A, parameter 1...parameter 5 |	System Setup
}	End of Header

You can also add a configuration to RAM or specify units for supply, print, margin, and cut positions. If you use the optional parameters with the **I** packet, any online configuration packets following the split vertical bar (|) must specify distances using the selected units. However, the test labels display the units in dots, even if you entered them in English or Metrics units.

Syntax **{header,ID#,action,device | }**

1. header	Constant **I**.
2. ID#	ID. Use **0**.
3. action	Action. Options: **A** Add configuration. **U** Upload User Configuration.
4. device	Storage Device. Use **R** (Volatile RAM).
5. units	Units. (Optional parameter.) Options: **E** English **M** Metric **G** Dots

Example **{I,0,A,R,E |**
C,0,25,0,0,0 | }

Adds a configuration to volatile RAM and specifies English units. It also uses the default contrast, moves print 0.25 inches closer to the bottom of the supply and does not change the margin adjustment, prints at the default print speed, and uses the default printhead width.

If you do not use the optional parameters, the syntax for the online configuration packets does not change. For example,

{**I**,C,0,50,0,0,0 | }

uses the default contrast, moves print 50 dots (0.25) inches closer to the bottom of the supply and does not change the margin adjustment, prints at the default print speed, and uses the default printhead width.

Example **{I,0,U,R | }**

Uploads the printer configuration from volatile RAM and returns the following to the host.

```
A,0,0,0,1,0 |
B,1,1,0,0,0 |
C,0,0,0,0,0,0 |
D,1,0,2 |
E,"~123~044~034~124~125~126","","~013~010" |
F,3,1,0,0,1 |
G,0,65,65 |
M,R,76365,45190,N,0,0 |
M,R,R,640 |
M,T,R,640 |
M,I,R,3300 |
M,D,R,640 |
M,F,R,1280 |
M,V,R,3840 |
X,0,5,12,12,6 |
```

The parameters for each packet (**A-X**) are displayed. In the first line that begins with **M**, 30715 is the total volatile memory available, 24215 is the memory available in volatile RAM. There is no non-volatile RAM available. The remaining lines beginning with **M** list the buffer sizes in 1/10K for the Receive, Transmit, Image, Downloadable Fonts, Formats, and Scalable Fonts Buffers.

Configuration Syntax Guidelines

When creating a printer configuration packet:

- Follow the Standard Syntax Guidelines listed at the beginning of this manual.
- The first character after the **start of header** (**{**) is the **configuration header** (**I**).
- Download multiple configuration packets within one packet or download a single configuration packet.
- If you change any of the online configuration packets, resend the format packet to the printer, so the configuration changes take effect.
- Include the first five ANSI codes, at a minimum, in the control characters packet.
- Send configuration packets once per session (each time the printer is turned off and then back on), not with every format or batch packet.

Making Print Adjustments

You can adjust where the printer prints on your supply by adjusting the supply, print, or margin positions. However, keep in mind the following:

- Supply adjustments across the width of your supply, such as the margin position, are based in dots- either 203 dpi or 300 dpi, depending on your printhead density.
- Supply adjustments for the length of your supply, such as supply position or print adjustment, are always measured in 1/203 of an inch, regardless of your printhead density.

Defining the System Setup Packet

Use the system setup packet (A) to select the power up mode, display language, print separators between batches, print a slashed zero, and select the symbol set.

Syntax **`{I,A,powup_mode,language,sep_on,slash_zero,symbol_set | }`**

A1. A System Setup Packet

A2. powup_mode Online Mode. **0** is the default. Options:

0 online mode
1 offline mode (9855)

A3. language Display Language. **0** is the default. Options

0	English		
1	French	**7**	Swedish
2	German	**8**	Spanish2 (MX)
3	Spanish (ES)	**9**	Danish
4	Japanese	**10**	Dutch
5	Portuguese	**11**	Finnish
6	Italian	**12**	Norwegian

A4. sep_on Batch Separators. **0** is the default. Options:

0 Does not print a separator
1 Prints a separator
2 Double-length separator – print 2 tags (9855)

Note: Do not use batch separators with continuous (non-indexed) supply. If using a stacker, the batch separator is 3.66 inches long.

A5. slash_zero Slash Zero. **0** is the default. Options:

0 Print a standard zero
1 Print a zero with a slash through it

A6. symbol_set Symbol Set. **0** is the default. Options:

0 Internal
1 ANSI
2 Code Page 437 (Latin U.S.)
3 Code Page 850 (Latin 1)
4 Code Page 1250 (Latin 2)
5 Code Page 1251 (Cyrillic)
6 Code Page 1252 (Latin 1)
7 Code Page 1253 (Greek)
8 Code Page 1254 (Turkish)
9 Code Page 1255 (Hebrew)
10 Code Page 1256 (Arabic)
11 Code Page 1257 (Baltic)
12 Code Page 1258 (Vietnamese)
13 DOS Code Page 852 (Latin 2)
14 DOS Code Page 855 (Russian)
15 DOS Code Page 857 (IBM Turkish)
16 DOS Code Page 860 (Portuguese)
17 Wingdings
18 Macintosh
19 Unicode
20 BIG5
21 GB2312
22 SJIS to SJIS (CP 932, Japanese)
23 GB2312 to GB2312 (CP 936, Simplified Chinese)
24 BIG5 to BIG5 (CP 950, Traditional Chinese)
25 KSC5601
26 Unicode UTF-8

Note: The Standard, Reduced, Bold, OCRA and HR fonts only support the Internal Symbol Set (0). The CG Triumvirate™ typefaces only support the ANSI (1) and DOS Code Page 437 (2) and 850 (3) Symbol Sets. The scalable font (font#50) does not support Code Page 1256 Arabic (10). Code pages 13-16 and 4-12 are for downloaded TrueType fonts or the scalable font. Code pages 19-26 require a downloaded International TrueType font. TrueType fonts are designed to be regionally specific; therefore, all code pages may not be supported in a given font. See Appendix C, “Symbol Sets/ Code Pages” for more information.

Example **{I,A,0,0,1,1,0 | }**

Powers up the printer in the online mode, displays prompts in English, prints a separator after each batch, prints zeros with slashes through them, and uses the internal symbol set.

Defining the Supply Setup Packet

Use the supply setup packet (B) to select supply type, ribbon, feed mode, supply position, and cut position.

Syntax **{I,B,supply_type,ribbon,feed_mode,supply_posn,cut_posn, skip_index | }**

B1. B Supply Setup Packet

B2. supply_type Supply Type. **1** is the default. Options:

0 Black mark supply
1 Die Cut/edge aperture supply
2 Continuous (non-indexed) supply
3 Center Aperture supply (9855)
4 Reserved
5 Tag Edge Aperture (9855 RFMP or for cutting tags with Version 7.0 or greater firmware)

Note: You must use continuous supply in continuous mode. Do not use continuous supply with extended backfeed or 94x5 emulation.
If your supply has black marks, always use black mark sensing whether or not the supply has attacher holes.
Use 1 for edge aperture supplies with printers prior to Version 7.0.
Use 5 for edge aperture RFID supplies.
Use 5 to cut edge aperture supplies with Version 7.0 or greater.

B3. ribbon Ribbon. **1** is the default. Options:

0 Ribbon not installed
1 Ribbon installed
2 High Energy Ribbon (9855)
Use a print speed of 2.5 IPS with the high energy ribbon. Serial bar codes cannot be printed using this ribbon. Settings for ribbon and supply type must match the supplies loaded in the printer; otherwise, an error occurs. To clear the error, turn off the printer and change the configuration packet. Turn on the printer and resend the packet.

B4. feed_mode Feed Mode. **0** is the default. Options:

0 Continuous operation
1 On-demand mode

B5. supply_posn Supply Position. Range: **-300** to **300** in 1/203 inch. **0** is the default. Adjusts the machine to print at the vertical 0,0 point on the supply. This adjustment accounts for mechanical tolerances from machine to machine. The supply position adjustment only needs to be made on the initial machine setup. Adjust the supply position if formats do not start at the 0,0 point on the supply. Increase the supply position to move print up, decrease to move print down on the label. To verify the 0,0 point, print a test label. See “Printing a Test Label” in Chapter 8 for more information.

For the RFID printer, adjust the supply position according to the Monarch® RFID Printer Setup Utility.

You can not change the supply position while the printer is active. Changing the supply position effects the print position, dispense position, and backfeed distance. Once the supply position is set, use the print control packet and backfeed control packet to adjust printing and the dispense position.

B6. cut_posn Cut position. Use **0** for the 9825. Adjusts where the tag is cut. The printer adjusts the cut position according to the black marks on the supply. You may need to adjust for aperture supplies. Increase to move the cut up, decrease to move the cut down. .

Note: We do not recommend setting a positive cut position for any supply while using extended backfeed. You may cut off the leading edge of the next tag. Use **0**.

B7. skip_index Skip index mode. **0** is the default. Options:

0 Disable skip index mode
1 Enable skip index mode. Allows the printer to skip (ignore) a sense mark and print an image over multiple labels.

Example **{I,B,0,0,1,10,50,1 | }**

Indicates black mark and thermal direct stock has been loaded, causes the printer to operate in on-demand mode, feeds the supply approximately .05 inches up before printing the format on each label (10/203 inches), feeds the supply .25 inches (50/203 inches) before cutting, and enables skip index mode.

Defining the Print Control Packet

Use the print control packet (C) to set the contrast, print, and margin adjustment, print speed, and printhead width.

Syntax **{I,C,contrast,print_adj,margin_adj,speed_adj,ph_width | }**

C1. C Print Control Packet

C2. contrast Print Contrast. Range: **-699** to **699**. **0** is the default. Using 399 or higher displays a warning message on the 9855 printer and tracks high energy inches.
Solid black print cannot exceed 30% of any given square inch of the supply.

C3. print_adj Print adjustment (position). Range: -99 to 99 (9825) or -450 to 450 (9855) in 1/203 inch for 203 dpi or 1/300 inch for 300 dpi. **0** is the default. Adjusts where data prints vertically on the supply. Increase the print position to move print up, decrease to move print down. For the RFID printer, adjust the print position according to the Monarch® RFID Printer Setup Utility.

C4. margin_adj Margin adjustment (position). Range: -99 to 99 in 1/203 inch or 1/300 inch for 300 dpi printers). **0** is the default. Adjusts where data prints horizontally on the supply. Increase the margin position to move print to the right, decrease to move print to the left. Margin and print position are format adjustments. They do not effect the supply position, dispense position, or backfeed distance.

C5. speed_adj Print Speed in inches per second (ips). **0** is the default. Options:

0 formats with serial bar codes automatically print at 2.5 ips
25 2.5 ips (default for serial bar codes)
40 4.0 ips (recommended for supply lengths less than 1.2 inches)
60 6.0 ips (default)
80 8.0 ips (9855)
100 10.0 ips (9855 with 203 dpi)
120 12.0 ips (9855 with 203 dpi and high speed option)

Note: Serial bar codes with an 8-dot narrow element do not automatically print at 2.5 ips. Serial bar codes printed at speeds greater than 2.5 ips may not scan properly. However, the printer can print 203 dpi serial bar codes with narrow elements of 3 dots (or greater) at 4.0 ips. You must use a print speed of 2.5 ips with the high energy ribbon. See “Special 9855 Printing Considerations,” in Chapter 6 for more information.

C6. ph_width Width of the printhead in dots. Use **0**.

Example **{I,C,0,-20,-10,0,0 | }**

Uses the default contrast, moves print 0.1 inch closer to the bottom of the supply (20/203 inches) and .05 inch to the left on the supply (10/203 inches), prints at six inches per second, and uses the default printhead width.

Defining the Monetary Formatting Packet

The monetary formatting packet (D) selects the monetary symbols to print for a price field. Use the monetary formatting packet to select primary and secondary monetary symbols, and designate the number of digits to appear at the right of a decimal.

Syntax **{I,D,cur_sym,secondary,decimals | }**

D1. D Monetary Formatting Packet

D2. cur_sym Currency Symbol. **1** is the default. Options:

0 No symbol
1 USA ($, Dollar)
2 UK (£, Pound)
3 Japan (¥, Yen)
4 Germany (, Deutsche Mark)
5 France (F, Franc)
6 Spain (P, Peseta)
7 Italy (L., Lira)
8 Sweden (Kr, Krona)
9 Finland (, Markka)
10 Austria (, Shilling)
11 India (Rs, Rupee)
12 Russian (, Ruble)
13 Korean (, Won)
14 Thai (, Baht)
15 Chinese (¥, Yuan)
16 Euro (€)

Note: To use these symbols, select the internal symbol set.

D3. secondary Secondary Sign. Secondary symbols only print if you designate at least one decimal place. **0** is the default. Options:

0 No secondary sign
1 Print secondary sign

D4. decimals Number of digits to the right of the decimal. **2** is the default. Options:

0 No digits
1 One digit
2 Two digits (default)
3 Three digits

Example **{I,D,1,1,2 | }**

Prints the dollar sign, uses a secondary symbol, and places two digits to the right of the decimal.

Defining the Control Characters Packet

Use the control characters packet (E) to change the MPCLII control characters, enable and disable the immediate commands, and change the default terminator character for job requests and ENQs.

Changes take effect with the first character following the end of header character of the configuration packet. Each control character must be unique and cannot appear anywhere else in your packet, except within quotation marks. You can customize the trailer characters to work with your host.

Note: Wait two seconds for the new characters to take effect before sending packets using the new characters.

If using symbol set 110 (Unicode UTF-8) to print International characters, set the MPCL control characters (start of header, etc.) to decimal values between 0 and 128; otherwise, errors may occur with the Unicode data entered.

Use the following syntax for the control characters packet. Notice all but the first parameter is within quotation marks.

Syntax **`{I,E,"ANSI_cd","string1","string2" | }`**

E1. E Control Characters Packet

E2. "ANSI_cd"

~123	Start of header	{	(left bracket)
~044	Parameter separator	,	(comma)
~034	Quoted strings	"	(quotes)
~124	Field separator	|	(vertical bar)

The field separator is the split vertical bar (|). The decimal value is 124. To enter this character, use the Shift key plus the Split Vertical Bar key on the computers keyboard. Depending on the text editor, it may appear as a solid vertical bar or as a split vertical bar.

~125	End of header	}	(right bracket)
~126	Data escape character (optional)	~~	(double tilde)

defined character Immediate command character (optional). Up to any 3 characters in the **0** to **255** decimal range. The character must be defined before this command can be used. The caret (~094) is normally used.

Note: "ANSI_cd" includes seven separate parameters. The first five parameters are required. The other parameters are optional.

E3. "string 1" Terminator for status requests and ENQ requests. Up to any 3 characters in the **0** to **255** decimal range. "**013**" is the default. Sending "" disables this sequence.

E4. "string 2" Terminator for job requests and data uploads. Up to any 3 characters in the **0** to **255** decimal range. **None** is the default. Sending "" disables this sequence.

After you change these parameters, all packets, including any future configuration packets, must use the new control characters. We recommend using the tilde and ASCII character code sequence when sending this packet multiple times. Also, set the packet delimiters to characters within the 21 hex to 7E hex range.

You must send the control characters packet to enable the immediate commands. An immediate command executes immediately, even if it is embedded within quotation marks, and all data following the command in the string is ignored.

Example **{I,E,"~123~063~034~124~125~126~094" | }**

Changes the parameter separator character from , to ?. The other control characters remain unchanged. It also enables the immediate commands by defining the ^ symbol as the command identifier.

Resetting Control Characters

You can change the characters in the previous example back to their original settings by downloading this packet:

{I?E?"~123~044~034~124~125~126~094" | }

Notice that the parameter separator is ? in this packet. This is the parameter separator that was set before this packet. Once the packet is received by the printer, the new parameter separator (a comma, in this case) is valid.

Be careful when using this feature. If you forget what the control characters were changed to, print a test label. (The test label lists the current control characters.) See “Printing a Test Label,” in Chapter 8 for more information.

Using Immediate Commands

Immediate commands effect printer operation as soon as the printer receives them, even if they are included within a packet or used inside quotation marks.

You can use immediate commands to change immediate command or status polling control characters, reset the printer, or cancel and repeat batches.

Enabling Immediate Commands

When the printer is first turned on, these commands are not available. To use these commands, you must first send the control characters packet and define the immediate command control character. The immediate command control character is saved in non-volatile RAM so it is not lost after you turn off the printer. Once the immediate command control character is defined, the immediate commands are enabled.

Sending Immediate Commands

Immediate commands consist of a three- or four-character sequence you can send in a packet or embed in your application. Each command must be sent separately.

Syntax **control character_immediate command**

The printer can accept only one immediate command at a time. Sending a command before the previous one is completed can result in an error.

Example **^CB**

Immediately cancels the batch currently printing unless an error exists in the printer. This example assumes that the defined immediate command control character is the caret (^).

Note: To use the immediate command control character or the status polling character within your data, use the tilde sequence.

The table represents the defined immediate command control character as **^** and the defined status polling control character as **d**. You may define these characters to suit your needs.

Command	Parameter
^CA	Cancels all the batches in the printer's queue unless an error exists on the printer. **Note:** This does not cancel batches in the printer's receive buffer.
^CB	Cancels only the current batch being printed unless an error exists.
^DD or ^DCd	Disables the MPCL data escape character (the tilde) and inhibits MPCL from acting on ANY data escape sequence from the host. Sets the MPCL data escape character to the ASCII value given by the **d** parameter. The value can be any ASCII character.
^EA	Aborts an error condition. This command is the same as pressing **ESCAPE/CLEAR** to clear an error. May need to be sent multiple times. Use ^RB to reprint batch. **CAUTION:** This command causes the current batch to stop and the condition that caused the error to remain uncorrected.
^ER	Resets the error. This command is the same as pressing **FEED/CUT** to acknowledge an error. Normal operation resumes.
^FD	Feeds a label when printer is idle. Simulates the operation of pressing **FEED/CUT** and dispenses the next label if printer is in the on-demand mode. **Note:** Printer ignores this command if printing.
^FF1	Formats flash memory
^FF2	Returns the amount (in bytes) of the available flash memory.
^GD	Disables the conversion of formats designed in 203 dpi dot units to 300 dpi.
^GE	Enables the conversion of formats designed in 203 dpi dot units (not English or Metric) to 300 dpi.
^ID or ^ICd	Disables the Immediate Command feature by turning off the Immediate Command escape character. Sets the Immediate Command escape character to the ASCII value given by the d parameter. The value can be any ASCII character. Use ^IE to enable immediate commands.
^LE	Uploads the last successful EPC encoded data in ASCII Hex format to the last-used communication port/channel. (^).
^MC	Returns the customer ID or RPQ version to the host. (00 to 99)
^MD	Returns the printhead dot density to the host. 00 = 203 dpi 01 = 300 dpi
^MI	Returns the customer ID or RPQ revision level to the host. (00 to 99)
^MM	Returns the model number to the host. M17 = 9825 M18 = 9855
^MP	Returns the prototype number to the host. (00 to 99)
^MR	Returns the revision number to the host. (00 to 99)
^MV	Returns the version number to the host. (00 to 99)
^PR	Resets the printer. This command takes five seconds to complete and then the printer is ready to receive data. It has the same effect as turning off and then turning on the printer. **Note:** Command should be used only when the printer is not printing.
^RB	Repeats the last printed batch, printing the same number of labels as specified in the original batch. This command does not work if using batch separators. **Note:** Printer ignores this command if printing.

Command	Parameter
^RM	Checks the RFID hardware version.
^RS	Resynchronizes supply when supply roll is changed. **Note:** Printer ignores this command if printing.
^SD or ^SCd	Disables the status polling feature by turning off the status polling control character. Sets the status polling control character to the ASCII value given by the **d** parameter. The value of **d** can be any ASCII character.
^SFa	Loads script with host response.
^SFb	Loads script without host response.
^SFc	Enables script.
^SFd	Disables script.
^SFe	Uploads script version information.
^SFf	Deletes script.
^SFg	Turns on ENQ status polling before it reaches the script.
^SFh	Turns off ENQ status polling before it reaches the script.
^SFi	Turns on immediate commands before it reaches the script.
^SFj	Turns off immediate commands before it reaches the script.
^TP	Prints a test label. **Note:** Printer ignores this command if printing.
^VLC	Only clears the data that has been uploaded, not all the logged data. Data is cleared with this command after a successful upload. We recommend clearing the log file after uploading.
^VLD	Disables verifier data logging (default when the printer is reset).
^VLE	Enables verifier data logging.
^VLU	Uploads the log file to the last port that received host data (serial, parallel, USB, or Ethernet). Repeat this command until data is successfully uploaded. Data can be cleared after it has been uploaded.

Defining the Communication Settings Packet

Use the communication settings packet (F) to set the baud rate, word length, stop bits, parity, and flow control for serial communications. To set parallel communications, see “Using Parallel Communications.”

Changing the communication settings takes approximately two seconds. Communications sent during this interval will be lost. Make sure the host communication values match the values on the printer and the host is capable of communicating at the speed you select for the printer.

Do not add any characters, such as a carriage return/line feed, in your communication settings packet or communications errors may occur.

Syntax **`{I,F,baud,word_length,stop_bits,parity,flow_control | }`**

F1. F Communication Settings Packet

F2. baud Baud Rate. **3** is the default. Options:

0	1200	**1**	2400
2	4800	**3**	9600
4	19200	**5**	38400
6	57600	**7**	115200

F3. word_length Word Length. **1** is the default. Options:

0 7-bit word length
1 8-bit word length

F4. stop_bits Stop Bits. **0** is the default. Options:

0 1-stop bit
1 2-stop bits

F5. parity Parity. **0** is the default. Options:

0 None
1 ODD parity
2 EVEN parity

F6. flow_control Flow Control. **1** is the default Options:

0	None	**2**	(CTS)
1	DTR	**3**	XON/XOFF

Note: If you use the DOS COPY command to download your formats, set Flow Control to DTR (not XON/XOFF).

Example **`{I,F,3,1,0,0,1 | }`**

Uses 9600 baud, an 8-bit word length, one stop bit, no parity, and the DTR mode.

Defining the Backfeed Control Packet

Use the backfeed control packet (G) to enable or disable the backfeed option, set the dispense position and the backfeed distance. Backfeed works by advancing each printed label to the desired dispense position. Once that label is removed, the next label to be printed is backed up underneath the printhead. In continuous mode, only the last label in the batch is advanced to the dispense position. You may need to adjust the dispense position to allow labels to be removed, die cut labels to be removed easily, or to prevent them from falling off.

Extended backfeed is available on the 9855 printer with a knife installed. Extended backfeed feeds a tag far enough out to be cut and backfeeds the next tag to the printhead line. You can not change the backfeed distance while the printer is active.

Extended backfeed eliminates printed tags being left between the printhead and knife. Extended backfeed **does not** work with non-indexed (continuous) supply/mode. **We do not recommend using extended backfeed when sensing on attacher-hole supplies.**

Do not use backfeed (normal or extended) with supplies less than 0.75 inches. We recommend using 0.5-inch gap supplies in peel mode when backfeed is disabled.

The dispense position and backfeed distance are optional parameters and do not have to be specified. However, they allow for greater precision when positioning the supply.

Syntax **{I,G,action,dis_pos,bkfd_dis | }**

G1. G Backfeed Control Packet

G2. action Action. If using one-inch RFID supplies, do not use backfeed. **0** is the default. Options:

0 disable backfeed
1 enable backfeed (use on any printer without a knife)
2 enable extended backfeed (use on any printer with a knife)

Note: We do not recommend setting a positive cut position for any supply while using extended backfeed. You may cut off the leading edge of the next tag.

G3. dis_pos Dispense Position. Adjusts the stopping point of the label. Range: **50** to **200** dots. **65** dots is the default.

G4. bkfd_dis Backfeed Distance. Amount to move label backwards. **20** to **200** dots. **65** dots is the default. This distance can not be greater than the dispense position. The backfeed distance should equal the dispense position. An exception is if you are tearing instead of peeling. Then, the backfeed distance must be 30 dots (.150 inches) less than the dispense position. However, you will have a 30 dot non-print zone on your supply. The 30-dot difference accounts for improper tearing of butt cut supplies, because you do not want any exposed adhesive under the printhead.

Example **{I,G,2 | }**

Enables extended backfeed and cuts any tags remaining between the knife and printhead and moves the supply backwards so the next tag is underneath the printhead. Using cut mode 4, you do not have to press FEED/CUT to cut the last tag.

Example **{I,G,1,50,20 | }**

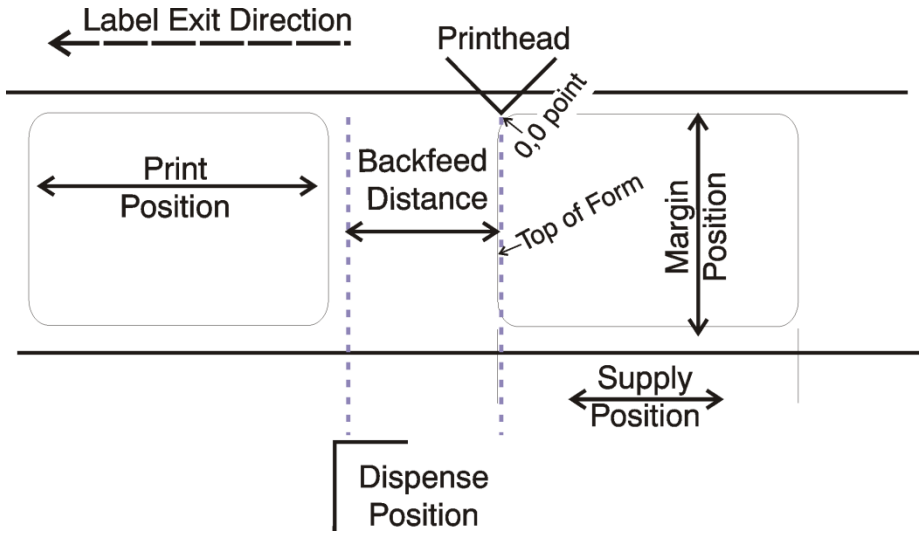
Enables backfeed and sets the dispense position to 0.25 inches (50/203) and the backfeed distance to 0.10 inches (20/203).

Special Considerations When Using Backfeed

Make a note of the following items:

- Be careful when tearing supplies, because the adhesive can adhere to the printhead or platen roller.
- Backfeed affects each label in the on-demand mode or the first and last label of the batch in continuous mode.
- When backfeed is enabled and multiple batches are sent, the printer may not backfeed between each batch.
- Backfeed should only be used when you need to advance labels to the desired dispense point.
- Backfeed does not interfere with the supply, print, or margin positions you have set.
- If the supply inter-label gap is not between .07 inch to .15 inch (14 to 30 dots), you must adjust the dispense position and backfeed distance accordingly.

See the following graphic for a representation of the following adjustments: dispense position, backfeed distance, supply position, print position, and margin position.



Defining the Memory Configuration Packet

Use the memory configuration packet (M) to customize the size of the printer's buffers, which allows greater flexibility in your formats.

Memory must be allocated in 1/2K increments. The memory configuration packet does not accept decimals, so enter whole numbers. Multiply the amount to reallocate (in K) by 10. For example,

To reallocate (in K)	Enter this amount
1	10
1.5	15
2	20
2.5	25
153	1530
229.5	2295

Each buffer's allocated memory remains in effect until that buffer is reallocated. For this reason, reallocate all the buffers when reallocating any buffer. Reallocating more memory than what is available causes an error.

Syntax **`{I,M,buffer,device,buffer_size | }`**

M1. M Memory Configuration Packet

M2. buffer Buffer type. Options:

- **D** Downloadable Fonts
- **F** Format
- **I** Image
- **R** Receive
- **T** Transmit
- **V** Scalable (vector) fonts

M3. device Storage type. Options:

- **F** Flash Memory
- **R** Volatile RAM. Packets stored in volatile RAM are deleted when the printer is turned off.

Note: You cannot reallocate flash memory.

M4. buffer size Buffer size in 1/10K ranges. The following table lists the configured buffer sizes and min-max values for the printer. The printer's configuration is stored in non-volatile RAM and saved when the printer is turned off. The maximum value for each buffer is listed; however, the sum of all the buffers cannot exceed the maximum available memory of the printer.

Buffer	Type	9825 (1 Meg Volatile RAM)	9855 (8 Meg Volatile RAM)
Transmit	Volatile	2K (.5K- 4K)	64K (.5K- 128K)
Receive	Volatile	8K (2K- 64K)	64K (2K- 128K)
Image	Volatile	330K (41.5K- 640K)	330K (41.5K- 6144K)
Downloadable Fonts	Volatile	64K (8K- 640K)	64K (8K- 8192K)
Scalable Fonts	Volatile	64K (32K-640K)	384K (32K-8192K)
Formats	Volatile	64K (16K- 640K)	128K (16K- 1024K)
Internal	NA	cannot reallocate	cannot reallocate

Note: The 9825 and 9855 printers do not have non-volatile RAM; however, you can store formats, fonts, and graphics in flash memory. Change the storage device of your packets to "F" instead of "N." The 9855 printer has an optional flash memory expansion (approx. 13 Meg) for fonts, formats, or ADK scripts. However, it cannot be reallocated.

Example **{I,M,I,R,1530 | }**

Stores the image buffer in volatile RAM and allocates 153K for it.

Checking Current Buffer Sizes

Send a configuration upload packet to check the sizes of the buffers. See “Configuration Packet Header” for more information. After checking the current buffer sizes, begin reallocating memory.

To increase the image buffer and not use downloaded fonts, add that memory into the image buffer.

Example

{I,M,R,R,20 |	Receive buffer	2K
M,T,R,10 |	Transmit buffer	1 K
D,R,80 |	Downloadable fonts buffer	8K
M,V,R,160 |	Scalable fonts buffer	16K
M,I,R,3200 |}	Image buffer	320K

Make sure memory is available before adding memory to a buffer. In the above example, if the image buffer (M,I,R,3200) was defined before the downloadable fonts (M,D,R,80) and scalable fonts buffers (M,V,R,160) were defined, an error would have occurred.

About Memory Buffers

Transmit Buffer

Used to send ENQ, job, and upload responses. This buffer must be allocated as volatile (**R**) RAM.

Receive Buffer

Used to save data received from the host before it is processed by the printer. Changing this buffer size affects the amount of data the printer can receive without using flow control. This buffer must be allocated as volatile (**R**) RAM.

Image Buffer

Used to image the current format. The printers support two 4-inch by 8-inch buffers. Images up to 16 inches long can be defined without reallocating memory. The image buffer is cleared after a printer reset.

Use the formula below to calculate the approximate image buffer size.

```
21K x Length (for 203 dpi) OR
46K x Length (for 300 dpi)
```

Length is the length of your label in inches.

203 DPI Example

```
21K x 25 = 525
```

(Multiply by 10 and round up to the next whole number if necessary)

```
525K x 10 = 5250
```

Enter 5250 for the Image buffer.

300 DPI Example

```
46K x 26.75 = 1230.5
```

(Multiply by 10 and round up to the next whole number if necessary)

```
1230.5 x 10 = 12305
```

Enter 12305 for the Image buffer.

Format Buffer Used to store formats, batch data, and graphics. Use the following formula to calculate the required format buffer size:

`Linecount x 50/1024`

Linecount is the number of lines in the format packet including the format header and all the options.

The result of the above calculation is in kilobytes. Formats remain in memory when you turn off the printer.

Downloadable Fonts Buffer Used to store downloaded (bitmapped or TrueType) fonts. To determine the size of your downloadable fonts, send a font packet. For TrueType fonts, the file size, in bytes, is the minimum amount needed in this buffer. See “Using the Font Packet” for more information. Fonts stored in this buffer are deleted when the printer is turned off. We recommend storing downloaded fonts into flash memory.

Scalable (Vector)Fonts Buffer Used to image the scalable or downloaded (TrueType or bitmapped) font characters. Increasing this buffer size allows more characters to be saved in cache memory, so the characters do not have to be re-built the next time they are printed. Use 0 if you are not using scalable/TrueType fonts. This buffer must be allocated as volatile (**R**) RAM.

The printer does not print the fonts if there is not enough memory in this buffer to image them.

Buffer Worksheet

Make copies of this page to use as a buffer worksheet.

	HEADER	BUFFER	DEVICE	BUFFER SIZE
DOWN LOADABLE FONTS BUFFER	M	D		
FORMAT BUFFER	M	F		
IMAGE BUFFER	M	I		
RECEIVE BUFFER	M	R	R	
TRANSMIT BUFFER	M	T	R	
SCALABLE FONTS BUFFER	M	V	R	

Buffer Allocation Considerations

Keep these items in mind when allocating memory.

- Do not allocate more memory than what is available.
- Free memory from one buffer *before you add it to another buffer.*
- Reallocate all the buffers if reallocating any buffer.
- Send all buffer (re)allocations in one packet. The printer evaluates each individual buffer allocation separately. If one buffer allocation is invalid, the entire packet is invalid. If a defined buffer size exceeds the maximum value, an error occurs. However, no information is lost.
- Whenever the printer accepts a memory configuration packet, it takes effect immediately, causing a printer reset. Any information contained in the buffers is lost. Resend your formats, batches, graphics, or fonts to the printer.
- When remapping the image buffer, make sure the length and width specified in the format header are not too large for the current image buffer. For example, remapping for a 4 x 4 inch label and then printing a 4 x 6 inch label causes an error, until the format header is changed or the image buffer is increased.

Memory Considerations with Downloaded TrueType Fonts

- The size of the TrueType font file, in bytes, is the minimum amount of memory that must be available in the downloadable fonts buffer.
- The scalable (vector) fonts buffer is used to image the downloaded fonts (TrueType). To use several downloaded TrueType fonts may require 100K or more in this buffer. The printer does not print the fonts if there is not enough memory in the scalable (vector) fonts buffer.
- To use large point sizes (greater than 60 point), reconfigure memory to increase the size of the scalable (vector) fonts buffer.
- Font storage is limited on the 9825 printer, because there is no extended memory available.

About Flash Memory

Items stored in flash memory are saved when the printer is turned off. **Flash memory cannot be reallocated.**

Flash memory can contain formats, fonts, graphics, ADK scripts, and check digits. Store formats in flash to use the printer offline (not connected to a host). When formats, graphics, and check digits are saved in flash (a copy is automatically placed in RAM). Any of these packets saved in flash cannot exceed the memory available in RAM. For this reason, **we recommend only storing fonts or ADK scripts in flash memory**. (Fonts and ADK scripts saved in flash are not copied into RAM.)

Before sending packets to flash memory, it must be formatted.

Formatting Flash Memory

Formatting flash memory **is required once during initial printer setup**. From the Main Menu, select Setup, Flash Memory, then Format Flash. The process takes a few minutes.

Note: When formatting flash memory, all packets (formats, fonts, graphics, etc.) stored in flash memory are deleted and must be resent to the printer.

Checking Available Flash Memory

To check the amount of available flash memory in the printer, from the Main Menu, Select Setup, Flash Memory, then Unused Flash. The number (in bytes) of available flash memory is shown. Divide this number by 1024 to get the number of available kilobytes and make sure the font or ADK script files do not exceed this amount. For example, if your printer displays “Unused Flash 1048576,” there is 1024K (1 Meg) of available flash memory for fonts or ADK script files. If the printer displays “Unused Flash 13631488,” the memory expansion option (approx. 13 Meg) is installed.

Flash Memory Guidelines

Use these basic guidelines for storing files in the printer’s flash memory. The printer has volatile RAM (packets deleted when the printer is off) and flash memory (packets saved when the printer is off). **Flash memory cannot be reallocated.**

- Flash memory must be formatted before any packets can be saved. See “Formatting Flash Memory” for more information.
- Formats, graphics, and check digits can be saved in flash (a copy is automatically placed in RAM). Any of these packets saved in flash cannot exceed the memory available in RAM.
- Packets with the same number should not be added to flash memory. If two packets with the same number are stored in flash, only the last packet sent can be used. For example, if you send the following packets to flash memory, only the Textiles format can be used.

  ```
  {F,10,A,F,E,300,200,"UPC" | }
  {F,10,A,F,E,300,200,"Textiles" | }
  ```

- Fonts are stored differently in flash. For example, the 9825 printer has very limited flash font memory and one TrueType font may exceed that limit. For TrueType or double-byte fonts, use a 9855 printer with the memory expansion option.
- There is not a 1-to-1 ratio between the RAM memory (formats, graphics, and check digits) in the printer and the memory in the PC. For example, a file that is 5K in Windows may require 15-20K to store in your printer.
- When using graphics, use the lowest-resolution graphic possible. If the printer uses a 203 dpi printhead, the graphics resolution should be 150 to 200 dpi. In fact, 96 dpi may work. Try to create the smallest file size possible.

- Use temporary storage for graphics that are only used once or twice. However, for a logo that is used on multiple formats, save the graphic in flash. Try to create the smallest file size possible.
- Each line in a packet requires the same amount of memory. The smaller the format, the less memory required to save it.

Clearing Packets from Memory

You may want to remove packets from the printer to increase memory storage capacity or if the formats/fonts are no longer needed. In some cases, turning the printer off may clear the packets from memory. If not, send a format clear packet.

Syntax **{header,packet#,action,device | }**

1. header	Identifies the packet. Options: **A** Check Digit Scheme **F** Format **G** Graphic **W** Font
2. packet#	Identification number of the packet to clear (**1** to **999**) or font number (**0** to **9999**). **0** is for all fonts (default).
3. action	Action. Enter **C** to clear the packet.
4. device	Storage device. **R** is the default. Options: **F** Flash **R** Volatile RAM

Example **{F,1,C,R | }**

Clears Format #1 from volatile RAM.

Using the Font Packet

Use a font packet to add or clear downloaded fonts from memory, upload the font buffer, or upload the cell size information for a particular font. The font packet is useful when downloading fonts. If using downloaded fonts, the font number and the number of bytes each downloaded font uses is listed.

This packet does not list the number of bytes the standard printer fonts use.

Use the MONARCH® MPCL Toolbox Font Utility (available on our Web site) to create the font header and data. Refer to the online help for more information.

Syntax **`{W,font#,action,device,data_length,data_record | }`**

W1. W Writable Font Header.

W2. font# The font identifier from **0** to **9999**. **0** is for all fonts (default). **1** - **5** digits is the font number.
Example: 3 is the standard printer font, Bold.

W3. action Action. Options:

A Adds the specified font.
C Clears all or specified fonts, except ones in flash.
H Uploads font size information.
M Uploads font memory usage information.

Note: C does not clear (erase) fonts saved in the printer's flash memory. To erase ALL fonts from the printer's flash memory, format flash.

W4. device Device. **R** is the default. Options:

F Flash
R Volatile RAM
Z All devices (use for upload).

W5. data_length The length of the font data. The range is 68 to 16384. This is optional.
If you are creating fonts, include the font data with this packet..

W6. data_record Multiple data records define the font. The first character is either an **H** (hex) or an **R** (run-length), referring to the algorithm. The rest of the record is up to 2710 characters of font data in double quotes. Separate the algorithm and the data with a comma, and end the record with **|**. This is optional.

Example **`{W,0,M,R | }`**

Selects all fonts and checks the memory usage in RAM. The printer returns the following to the host:

```
{W,0,M,R |
Number of bytes free, Number of bytes used | }
```

Example **{W,0,H,Z | }**

Selects all fonts and uploads the font size information for any downloaded fonts.

The 9855 printer returns the following to the host:

```
{W,0,H,Z|
0,1,0,"Standard",0,0,0,14,22,14,22,3|
0,1,1,"CGTriBd9",1,0,7,25,31,10,15,0|
0,1,437,"CGTriBd9",1,0,7,25,31,10,15,0|
0,1,850,"CGTriBd9",1,0,7,25,31,10,15,0|
0,10,0,"CGTriBd9",1,0,7,25,31,10,15,0|
0,10,1,"CGTriBd9",1,0,7,25,31,10,15,0|
0,10,437,"CGTriBd9",1,0,7,25,31,10,15,0|
0,10,850,"CGTriBd9",1,0,7,25,31,10,15,0|
0,2,0,"Reduced",0,0,0,7,14,7,14,1|
0,2,1,"CGTriumv6",1,0,5,17,21,5,10,0|
0,2,437,"CGTriumv6",1,0,5,17,21,5,10,0|
0,2,850,"CGTriumv6",1,0,5,17,21,5,10,0|
0,11,0,"CGTriumv6",1,0,5,17,21,5,10,0|
0,11,1,"CGTriumv6",1,0,5,17,21,5,10,0|
0,11,437,"CGTriumv6",1,0,5,17,21,5,10,0|
0,11,850,"CGTriumv6",1,0,5,17,21,5,10,0|
0,3,0,"Bold",0,0,0,24,34,24,34,3|
0,4,0,"OCRA",0,0,0,13,24,13,24,3|
0,5,0,"HR1",0,0,0,12,20,12,20,2|
0,6,0,"HR2",0,0,0,10,16,10,16,1|
0,15,0,"CGTriumv7",1,0,7,21,28,9,14,0|
0,15,1,"CGTriumv7",1,0,7,21,28,9,14,0|
0,15,437,"CGTriumv7",1,0,7,21,28,9,14,0|
0,15,850,"CGTriumv7",1,0,7,21,28,9,14,0|
0,510,0,"CGTriumv7",1,0,7,21,28,9,14,0|
0,510,1,"CGTriumv7",1,0,7,21,28,9,14,0|
0,510,437,"CGTriumv7",1,0,7,22,28,9,14,0|
0,510,850,"CGTriumv7",1,0,7,22,28,9,14,0|
0,16,0,"CGTriumv9",1,0,8,28,35,12,18,0|
0,16,1,"CGTriumv9",1,0,8,28,35,12,18,0|
0,16,437,"CGTriumv9",1,0,8,28,35,12,18,0|
0,16,850,"CGTriumv9",1,0,8,28,35,12,18,0|
0,511,0,"CGTriumv9",1,0,8,28,35,12,18,0|
0,511,1,"CGTriumv9",1,0,8,28,35,12,18,0|
0,511,437,"CGTriumv9",1,0,8,29,35,12,18,0|
0,511,850,"CGTriumv9",1,0,8,29,35,12,18,0|
0,17,0,"CGTriumv11",1,0,9,31,40,13,22,0|
0,17,1,"CGTriumv11",1,0,9,31,40,13,22,0|
0,17,437,"CGTriumv11",1,0,9,31,40,13,22,0|
0,17,850,"CGTriumv11",1,0,9,31,40,13,22,0|
0,512,0,"CGTriumv11",1,0,9,31,40,13,22,0|
0,512,1,"CGTriumv11",1,0,9,31,40,13,22,0|
0,512,437,"CGTriumv11",1,0,9,33,40,13,22,0|
0,512,850,"CGTriumv11",1,0,9,33,40,13,22,0|
0,18,0,"CGTriumv15",1,0,13,47,59,20,31,0|
0,18,1,"CGTriumv15",1,0,13,47,59,20,31,0|
0,18,437,"CGTriumv15",1,0,13,47,59,20,31,0|
0,18,850,"CGTriumv15",1,0,13,47,59,20,31,0|
0,513,0,"CGTriumv15",1,0,13,47,59,20,31,0|
0,513,1,"CGTriumv15",1,0,13,47,59,20,31,0|
0,513,437,"CGTriumv15",1,0,13,49,59,20,31,0|
```

Font Style/Number

Symbol Set

Font Name

Spacing

Type

Baseline

CellWidth

Cell Height

Nominal Width

Nominal Height

Inter-Character Gap

```
0,513,850,"CGTriumv15",1,0,13,49,59,20,31,0|
0,70,0,"Paxar15",1,0,7,32,42,22,42,0|
0,71,0,"Paxar18",1,0,9,34,51,27,51,0|
0,72,0,"Nafta15",1,0,6,32,42,32,41,0|
0,73,0,"Nafta18",1,0,8,48,51,46,50,0|
0,21,0,"ZIAFont",0,0,0,5,9,5,9,1 |
0,22,0,"ZIBFont",0,0,0,7,11,7,11,2 |
0,23,0,"ZICFont",0,0,0,10,18,10,18,2 |
0,24,0,"ZIDFont",0,0,0,10,18,10,18,2 |
0,25,0,"ZIEFont",0,0,0,15,28,15,28,5 |
0,26,0,"ZIFFont",0,0,0,13,26,13,26,3 |
0,27,0,"ZIGFont",0,0,0,40,60,40,60,8 |
0,50,0,"EffSwissBold",1,1,92248 |
0,56,0,"PaxSymbols",1,1,12260 | }
```

Note: The CG Triumvirate™ typefaces are trademarks of Monotype Imaging, Inc. Fonts 21-27 are only for the 9855 MLI™ printer.

Fonts 510, 511, 512, and 513 are the same as fonts 15, 16, 17, and 18.

Spacing	Monospaced (0) or proportional (1).
Type	Bitmapped (0) or scalable (1).
Baseline	Bottom of the font.
Cell Width	Horizontal number of dots to contain the widest character.
Cell Height	Vertical number of dots to contain the tallest character.
Nominal Width	Average width for lower-case letters.
Nominal Height	Average height for lower-case letters.
Inter-Character Gap	Default spacing between characters in monospaced fonts.
Printhead Density	Displays whether a 203 (0) dpi or 300 (1) dpi printhead is used. The scalable font (font 50) does not display which printhead (203 dpi or 300 dpi) is used.

Uploading Format Header Information

Upload format header information from the formats in memory to check the supply length and width for each format. Formats stored in flash memory are loaded into RAM when the 9855 printer boots. However, the formats remain in flash memory when you turn off the printer.

Syntax **`{header,format#,action,device | }`**

F1. header	Format Header
F2. format#	Format number from **0** to **999**. **0** is for all formats in memory (default).
F3. action	Action. Options: **A** Adds the specified format **C** Clears the specified format **H** Uploads format header information
F4. device	Device. Options: **F** Flash **R** Volatile RAM **Z** All devices (use for upload)

Example **`{F,0,H,Z | }`**

Selects all formats in memory and returns the following:

Example **{F,0,H,Z |**
Fmt_1,406,406 |
Fmt_10,324,406 |
Fmt_15,812,812 |
Fmt_20,305,609 |
Fmt_25,1218,406 | }

Displays the format number, supply length and supply width (in dots) for each format in memory.

Example **{F,1,H,Z | }**

Selects format1 and returns the following to the host:

```
{F,1,H,Z |
Fmt_1,406,406 | }
```

Displays the supply length and supply width (in dots) for format1.

Defining a Network Console Packet

Use the network console packet to send console commands directly to the network card via the printer's serial port. If the network card does not appear to be communicating with the printer, you can use the network console packet to change the SSID, IP Address, etc. of the network card.

Syntax **{N,number,action,device,"name" |**
C,"con_comds" | }

N1. N	Network Console Packet.
N2. number	Number from **0** to **999** to identify the network console packet.
N3. action	Action. Enter **A** to add a network console packet.
N4. device	Storage device. Enter **T** to pass the packet through the printer and store the packet in the network card.
N5. "name"	Packet name, **0** to **8** characters, enclose within quotation marks.
C1. C	Command field.
C2. "con_comds"	Console commands. Must be enclosed within quotation marks. Each command must be on a separate line. The maximum number of characters per command is 100. Refer to the list of console commands in the *MonarchNet2 Operating Instructions* for more information.

Note: The maximum number of commands per packet is twenty five (25).

Example **{N,1,A,T,"mystore" |**
C,"set ip me static" |
C,"init" |
C,"exit" | }

Sends the network console packet 1 my store directly to the network card (**T**) and sets the IP method to static for determining the IP Addresses. The Init and Exit commands must be used to save changes and initialize the network card.

Defining a Verifier Configuration Packet

Use the verifier configuration packet to customize the verifier for each format. Select which bar codes to scan, the acceptable ANSI grade levels, quiet zone, X-dimension range, etc.

Syntax **V,format#,action,device,"name" |**
D,"vfr_comds" |

V1. V — Verifier Configuration Packet.

V2. format# — Number from **0** to **999** to identify the format number that corresponds to this particular verifier configuration packet. Assign a verifier configuration packet to any format even if the format number is not changed. See "Defining Verifier Fields" in Chapter 3 for more information.

Note: Specify up to 50 different verifier configurations for the formats.

V3. action — Action. Enter **A** to add a verifier configuration.

V4. device — Storage device. Options:

- **F** Flash. Stores the verifier configuration in the printer. Packets stored in flash memory are saved when the power is turned off.
- **T** Temporary. Passes the packet through the printer and stores the packet in the verifier. Packets stored in temporary memory are lost when the power is turned off.

V5. "name" — Packet name, **0** to **8** characters, enclose within quotation marks. The name entered here is shown as a custom configuration on the menu for MODE. Refer to your verifier's *Operating Instructions* (available on our Web site) for more information.

D1. D — Non-Printable Text/Data Field.

D2. "vfr_comds" — Verifier commands. Must be enclosed within quotation marks. Refer to the SV Series Operators Guide for the complete list of verifier commands.

Example **V,1,A,T,"BEAMON" | D,"~LV02" |**

The verifiers configuration packet ID is "1" and named "BEAMON." The verifier packet is added to temporary memory. It uses Mode 2.

Defining the RFID Setup Packet (9855 RFMP Printer Only)

This packet is only valid on 9855 RFMP printers. Use the RFID setup packet (X) to set the protocol, write attempts, read power, write power, signal adjust, verify the programmed data, retry printing, and check for multiple RFID inlays in the printer's programmable RF field. RFID hardware version 00000003 using version 8.0 or greater firmware includes retry print, and mutli-tag check parameters.

Use the *Monarch® RFID Printer Setup Utility* to calculate the settings for your RFID supplies.

Note: If using version 7.0 or earlier firmware with a Sirit RFID module, call Technical Support.

Syntax **{I,X,protocol,write_attem,read_power,write_power,signal_adjust, verify_write,retry_print,RF_inly_pos,singulate, mult_tg_ck | }**

X1. X RFID Setup Packet.

X2. *protocol* Select the UHF protocol. Use **0**.

X3. *write_attem* Number of times the interrogator tries to program the RFID tag. Use **3**.

X4. *read_power* Not used – enter **-7**.

X5. *write_power* Amount of power to write/program an RFID tag. The range is **-7** to **27**. **-7** is the default.

X6. *signal_adj* The strength of the RF Field emitted by the printer's antenna. Use **2**.

X7. *verify_write* The printer confirms the read data matches the programmed data after writing the RFID. **0** is the default. Options:

0 Disabled. The printer does not verify the programmed data.
1 Enabled. The printer verifies the programmed value.

X8. *retry_print* The printer tries to reprint and program a label where a supply error occurred. The printer uses the same EPC data from the errored label on the next label. **0** is the default. Options:

0 Enabled. The printer reprints and re-programs the EPC data from a label when a supply error occurs.
1 Disabled. The printer does not reprint/re-program the EPC data.

Note: Retry_print must be used with incrementing batches. If disabled, the printer does not reprint a label using the EPC data from the label with a supply error. For example, printing a batch of 100 labels prints 99 labels (or less) if a supply error occurs. If multiple 728 errors occur, disable retry_print.

X9. *RF_inly_pos* Not used – enter **0**.

X10. *singulate* Not used – enter **0**.

X11. *mult_tg_ck* Before printing, the printer checks for more than one RFID tag within the programmable RF Field's range. **0** is the default. Options:

0 Check the first tag. The printer checks for multiple RFID tags in the field.
1 Check each tag. The printer checks for multiple RFID tags in the field before each tag in the batch.

Example **{I,X,0,3,10,10,2,1,0,0,0,1 | }**

This example is for hardware version 00000003 using version 8.0 or greater firmware. Uses the default protocol (Class 1 Gen 2) and write attempts (3), sets the read and write power to 10, uses the default signal adjustment (2), the printer verifies the read value matches the programmed value, does not reprint a label if a supply error occurs, and checks for multiple RFID tags in the programmable field before each tag is printed.

Example **{I,X,0,3,10,10,6 | }**

Uses the default protocol (Class 1 Gen 2), sets the number of write attempts to 3, sets the read and write power to 10 and the signal adjustment to 6.

DEFINING FIELDS

3

This chapter provides a reference for defining

- the format header
- text and constant text fields
- bar code fields
- line and box fields
- verifier fields
- RFID fields.

Defining the Format Header

A Format Header begins a format file.

Syntax **{F,format#,action,device,measure,length,width,"name" |**

F1. F Format Header.

F2. format# Unique number from **1** to **999** to identify the format. **1** is the default.

F3. action Action. Enter **A** to add the format to the printer.

F4. device Format storage device. **R** is the default. Options:

F Flash (saved when the printer is turned off.) Format flash before use. See “Formatting Flash” and “Flash Memory Guidelines” in Chapter 2 for more information.

R Volatile RAM (deleted when the printer is turned off).

F5. measure Unit of measure. **G** (dots) is the default. See the following table.

Printer	Unit of Measure	Length	Width
9825	English Metric 203 dpi Dots	50-1600 127-4064 102-3248	75-400 191-1016 152-812
9855 (203 dpi)	English Metric 203 dpi Dots	32-1600 81-4064 65-3248	75-400 191-1016 152-812
9855 (300 dpi)	English Metric 300 dpi Dots	32-1200 81-3048 96-3600	75-400 191-1016 225-1200

F6. length Printable length of the supply in selected units. **600** is the default. Use the table above for values.

Note: The *length* may require adjustment for RFID supplies. Refer to the *RFID Application Notes* for more information.

You can create longer images if you reallocate memory to increase your image buffer. See "Defining the Memory Packet" in Chapter 2 for more information.

F7. width Print width, from left to right, in selected units. **400** is the default. Use the table above for values.

F8. “name” Format name (optional), **0** to **8** characters, enclose within quotation marks. **“”** is the default. The range is **1** to **256** characters for the 9855 XML-enabled printer.

Example **{F,1,A,R,E,300,200,"TEXTILES" |**

Adds Format 1 (“TEXTILES”) to the printer. It uses a three inch long by two inch wide label.

Create a separate definition for each text field. If text falls on two lines, each line of text requires a separate definition.

Syntax **`T,field#,# of char,fix/var,row,column,gap,font,hgt mag,wid mag,color,alignment,char rot,field rot,sym set |`**

T1. T Text Field.

T2. field# Unique number from **1** to **999** to identify this field. **1** is the default.

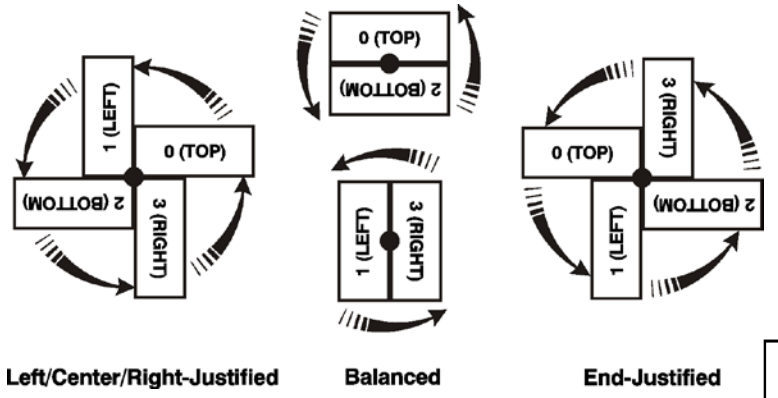
T3. *# of char* Maximum number of printed characters (**0** to **2710**) in the field. **30** is the default.

T4. *fix/var* Fixed or variable length field. **V** is the default. Options:

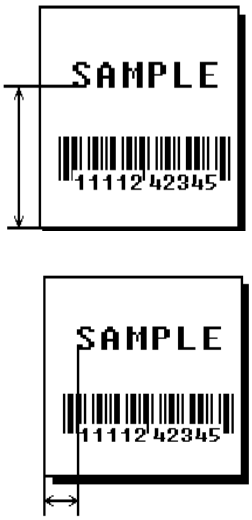
F Fixed length
V Variable length

T5. row Row location – distance from the bottom of print area to the pivot point. **10** is the default. See the following table. For monospaced fonts, distance from bottom of print area to the pivot point. The pivot point varies depending on how text is justified.

For proportionally spaced fonts, distance from bottom of print area to baseline of characters in field.



Printer	Unit of Measure	Row or End Row	Column or End Column
9825 9855 (203 dpi)	English Metric 203 dpi Dots	0-1599 0-4061 0-3246	0-399 0-1013 0-810
9855 (300 dpi)	English Metric 300 dpi Dots	0-1199 0-3045 0-3597	0-399 0-1013 0-1197



T6. column Column location - distance from the left edge of the print area to the pivot point to find the column location. **10** is the default. Use the previous table for values.

T7. gap Number of dots between characters in 203 dpi (or 300 dpi for 9855 printer). Range: **0** to **99. 0** is the default.

Note: For monospaced fonts, the additional spacing is added to the existing inter-character gap. This is also true for proportionally spaced fonts, but remember that the inter-character gap varies with character combinations.

Any number other than 0 or the default number affects the field width. Default spacing:

Standard	3 dots
Reduced	1 dot
Bold	3 dots
OCRA-like	3 dots
CG Triumvirate™ Typeface Bold	varies with each letter
CG Triumvirate™ Typeface	varies with each letter

T8. font Style of font. **1** is the default. Options:

1	Standard	**10**	CG Triumvirate™ Typeface Bold
2	Reduced	**11**	CG Triumvirate™ Typeface
3	Bold	**15**	7 pt. CG Triumvirate™ Typeface
4	OCRA-like	**16**	9 pt. CG Triumvirate™ Typeface
5	HR1	**17**	11 pt. CG Triumvirate™ Typeface
6	HR2	**18**	15 pt. CG Triumvirate™ Typeface
		50	EFF Swiss Bold (TrueType® Scalable)
		56	PaxarSymbols

Or a valid downloaded font selector number.
Fonts 5 and 6 are for numeric data only. The CG Triumvirate™ typefaces support only the ANSI and DOS Code Page 437 and 850 Symbol Sets. The scalable font does not support Code Page 1256 (Arabic). See Appendix C for more information.

T9. hgt mag Height magnifier, **1** to **7** times (**4** to **255** points for scalable/downloaded TrueType fonts). **1** is the default. Use a magnifier of 1 with proportionally spaced fonts, because characters lose smoothness at higher magnifications. See Appendix B, "Fonts," for more information about fonts.

T10. wid mag Width magnifier, **1** to **7** times (**4** to **255** points for scalable/downloaded TrueType fonts). **1** is the default. Proportionally spaced fonts do not have a set width. To estimate the size of the field, use the letter "W" for the widest field or an "L" for an average width field. Find the selected font and the desired width in Appendix B, "Fonts."

T11. color Field color overlay attributes. **B** is the default.

Transparent	The overlay field (text or constant text) does not block out (or "erase") existing fields.
Opaque	The overlay field blocks out (or "erases") existing fields.

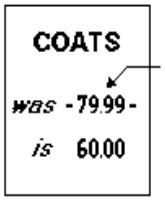
Options for standard printer fonts:

B	Opaque, Normal, Black, Normal
D/R/W	Opaque, Normal, White, Normal
O	Transparent, Normal, Black, Normal

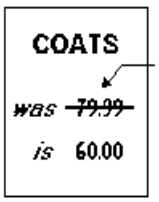
Options for scalable fonts:

A	Opaque, Normal, Black, Bold
B	Opaque, Normal, Black, Normal
E	Opaque, Italics, Black, Bold
F	Opaque, Italics, Black, Normal
N	Transparent, Normal, Black, Bold
O	Transparent, Normal, Black, Normal
S	Transparent, Italics, Black, Bold
T	Transparent, Italics, Black, Normal

Note: Solid black print should not exceed 30% on a given square inch of the label, or the printhead life may be decreased.



Line field blocked out by opaque field using attribute B



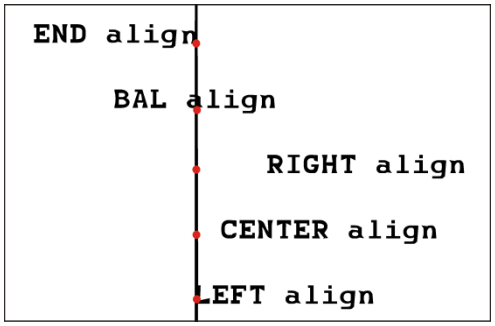
Line field not blocked out by transparent field using attribute O

Field placement in the packet is an important consideration when using field color attributes. If a line field is defined before the overlay (text or constant text) field, the line field is blocked out by the overlay field, depending on the overlay field's color attribute. If a line field is defined after the overlay field, the line field is not blocked out by the overlay field, regardless of the overlay field's color attribute.

T12. alignment Alignment of text in the field. **L** is the default. Options:

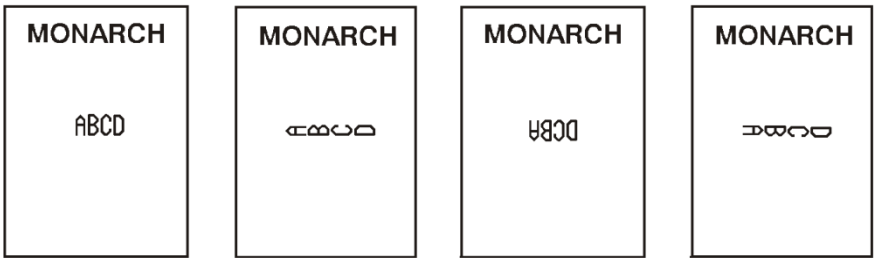
L Align on left side of field.
C Center text within field (monospaced fonts only)
R Align on right side of field (monospaced fonts only)
B Align at midpoint of field
E Align at endpoint of the field
Use **L**, **B**, or **E** for any font.

The red dot indicates the field origin and the line indicates the column position for each field in the following graphic.



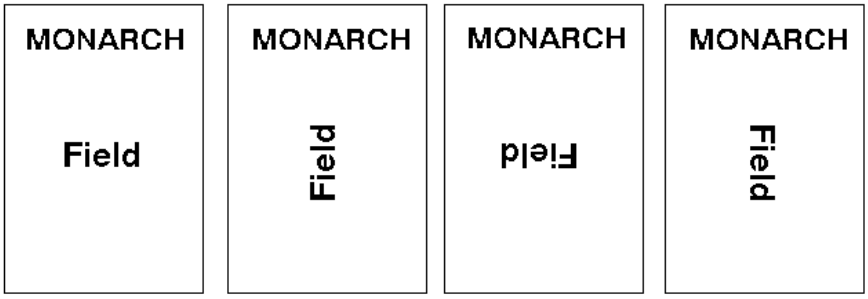
T13. char rot Character rotation. **0** is the default. The field or supply does not rotate, only the characters do. Options:

0 Top of character points to top of field
1 Top of character points to left of field
2 Top of character points to bottom of field
3 Top of character points to right of field



T14. field rot Field rotation. **0** is the default. Field rotation rotates the whole field, not just the characters. Rotation is affected by the pivot point, which varies depending on how text is justified. Lower left corner of field is the pivot point. Options:

0 Top of field points to top of supply
1 Top of field points to left of supply
2 Top of field points to bottom of supply
3 Top of field points to right of supply



T15. sym set Symbol set. Use **0** for the Internal Symbol Set.
For scalable or TrueType® fonts, use:

1	ANSI Symbol Set
100	Macintosh
101	Wingdings
102	Unicode (user input) for particular mapping
103	BIG5 (user input) for Unicode mapping
104	GB2312 (user input) for Unicode mapping
105	SJIS (user input) for Unicode mapping (CP 932, Japanese)
106	GB2312 (user input) for GB2312 mapping (CP 936, Simplified Chinese)
107	BIG5 (user input) for BIG5 mapping (CP 950, Traditional Chinese)
110	Unicode UTF-8
437	DOS Code Page 437 (Domestic)
850	DOS Code Page 850 (International)
852	DOS Code Page 852 (Latin 2)
855	DOS Code Page 855 (Russian)
857	DOS Code Page 857 (IBM Turkish)
860	DOS Code Page 860 (MS-DOS Portuguese)
1250	Code Page 1250 (Latin 2)
1251	Code Page 1251 (Cyrillic)
1252	Code Page 1252 (Latin 1)
1253	Code Page 1253 (Greek)
1254	Code Page 1254 (Turkish)
1255	Code Page 1255 (Hebrew)
1256	Code Page 1256 (Arabic)
1257	Code Page 1257 (Baltic)
1258	Code Page 1258 (Vietnam)

Note: The Standard, Reduced, Bold, OCRA and HR fonts only support the Internal Symbol Set (0). The CG Triumvirate™ typefaces only support the ANSI (1) and DOS Code Page 437 (2) and 850 (3) Symbol Sets. The scalable font (font#50) does not support Code Page 1256 Arabic (10). Code pages 852-860 and 1250-1258 are for downloaded TrueType fonts or the scalable font. Code pages 102-110 require a downloaded International TrueType font. TrueType fonts are designed to be regionally specific; therefore, all code pages may not be supported in a given font. See Appendix C, “Symbol Sets/ Code Pages” for more information.

If using symbol set 110 (Unicode UTF-8), set the MPCL control characters (start of header, etc.) to decimal values between **0** and **128**; otherwise, errors may occur with the Unicode data entered. See Chapter 2, "Configuring the Printer" for more information about the MPCL control characters.

Example **`T,2,10,V,250,80,0,1,1,1,B,C,0,0,0 |`**

Defines a text field (field #2) with a variable length of up to 10 characters. The field begins at row 250, column 80. There is no additional gap between characters, and the Standard font is used without any additional magnification. The printing is black on white and centered. No field or character rotation is used. The internal symbol set is used.

Each bar code field requires a separate definition.

Syntax **B,field#,# of char,fix/var,row,column,font,density,height, text,alignment,field rot,type,sep_height,segment |**

B1. B Bar Code Field.

B2. field# Unique number from **1** to **999** to identify this field. **1** is the default.

B3. # of char Maximum number of characters. If the bar code uses a check digit, allow an extra character for the check digit. The actual maximum number of characters is limited by the size of the label and bar code density. Range: **0** to **2710**. **30** is the default.

Bar Code	Number of Characters
Aztec	0 - 2710
Codabar (NW7)	0 – 2710
Code 16K	0 – 2710
Code 39 (w/ or w/o CD) or MOD43	0 – 2710
Code 93	0 – 2710
Code 128	0 – 2710
Data Matrix	0 – 2710 numeric 0 – 2335 alphanumeric
EAN8	8
EAN8+2	10
EAN8+5	13
EAN13	13
EAN13+2	15
EAN13+5	18
EAN13+Price CD	13
GS1 DataBar Bar Code Type (B13)	
1 - GS1 DataBar 14	13 - no check digit input
2 - GS1 DataBar 14 Truncated	13 - no check digit input
3 - GS1 DataBar 14 Stacked	13 - no check digit input
4 - GS1 DataBar 14 Stacked Omni directional	13 - no check digit input
5 - GS1 DataBar Limited	13 - no check digit input
6 - GS1 DataBar Expanded	*
7 - UPCA	11 - no check digit input
8 - UPCE	10 - no check digit input
9 - EAN13	12 - no check digit input
10 - EAN8	7 - no check digit input
11 - UCC/EAN128 and CC A/B	If not enough characters are entered, the bar code pads to the left with zeros. If too many characters are entered, unpredictable results may occur.
12 - UCC/EAN128 and CC C	

If FNC1 (function 1) is supported, use the pound sign (#) in the batch data to invoke it. Refer to the *GS1 General Specification* for more information.

Bar Code	Number of Characters
Intelligent Mail	31

Refer to the *USPS® Intelligent Mail® Specification* for more information. This bar code is only available on the 9855 printer using version 7.1 or greater firmware.

Interleaved 2 of 5 or Interleaved I 2 of 5 with Barrier Bar	0 - 2710
MaxiCode*	0 to 93 (alphanumeric) 0 to 128 (numeric)
MSI	0 – 14
PDF 417	0 – 2710
POSTNET™	9 or 11

Quick Response (QR) Code Data Type	Model 1	Model 2
Numeric Data	1167	2710
Alphanumeric data	707	2710
8-byte data	486	2710
Kanji data	299	1817

Note: The maximum number of characters depends on the selected level of error correction. When increasing the error correction level, the maximum number of characters decreases.

See “Entering Batch Data for QR Code” in Chapter 6 to enter data for the QR Code.

UPCA	12
UPCA+2	14
UPCA+5	17
UPCA+Price CD	12
UPCE	7
UPCE+2	9
UPCE+5	12

Note: For more information about two-dimensional bar codes, see Appendix A, "Samples."

B4. fix/var Fixed (F) or variable (V) length field.

Bar Code	Fixed or Variable
Aztec*	Fixed or Variable
Codabar (NW7)	Fixed or Variable
Code 16K	Variable
Code 39 (w/ or w/o CD) or MOD43	Fixed or Variable
Code 93	Variable
Code 128	Fixed or Variable
Data Matrix*	Variable
EAN8	Fixed
EAN8+2	Fixed
EAN8+5	Fixed
EAN13	Fixed
EAN13+2	Fixed
EAN13+5	Fixed
EAN13+Price CD	Fixed
GS1 DataBar	Fixed or Variable
Intelligent Mail®*	Fixed
Interleaved 2 of 5 or Interleaved I 2 of 5 with Barrier Bar	Fixed or Variable
MaxiCode*	Fixed or Variable
MSI	Fixed or Variable
PDF 417	Fixed or Variable
POSTNET™	Fixed
Quick Response*	Variable
UPCA	Fixed
UPCA+2	Fixed
UPCA+5	Fixed
UPCA+Price CD	Fixed
UPCE	Fixed
UPCE+2	Fixed
UPCE+5	Fixed

* For more information about the two-dimensional bar codes, see Appendix A, “Samples.”

B5. row

Row location - distance from bottom of the print area to the pivot point of the field. The pivot point varies, depending on how the field is justified. **10** is the default. See the following table. Pivot points:

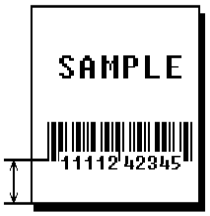
Remember to include text or numbers that may appear with the bar code for the row measurement.

Left/Center/Right-Justified Fields

Balanced Fields

End-Justified Fields

Printer	Unit of Measure	Row or End Row	Column or End Column
9825 9855 (203 dpi)	English Metric 203 dpi Dots	0-1599 0-4061 0-3246	0-399 0-1013 0-810
9855 (300 dpi)	English Metric 300 dpi Dots	0-1199 0-3045 0-3597	0-399 0-1013 0-1197



B6. column

Column location - distance from the lower left edge of the print area to the pivot point. **10** is the default. Use the previous table for values.

Allow a minimum of 1/10 inch between the scan edge of bar code and label edges or other data. If using the optional verifier, allow a minimum of 1.3 inches (33 mm) between the bar code and the top of the label. See “Determining the Print Area” in Chapter 1 for more information.

B7. font

Bar code. **4** is the default. Options:

1	UPCA	**17**	EAN13 +5
2	UPCE	**22**	POSTNET
3	Interleaved 2 of 5	**23**	Code 93
4	Code 39 (no cd)	**24**	Intelligent Mail (9855 printer version 7.1)
5	Codabar	**31**	Code 16K
6	EAN8	**32**	PDF417
7	EAN13	**37**	Aztec
8	Code 128	**38**	GS1 DataBar
9	MSI	**40**	Code 39 (MOD 43 cd)
10	UPCA +2	**36**	Quick Response
11	UPCA +5	**33**	MaxiCode
12	UPCE +2	**35**	Data Matrix (ECC-200)
13	UPCE +5	**41**	UPCA & Price CD
14	EAN8 +2	**44**	EAN13 & Price CD
15	EAN8 +5	**50**	Interleaved 2 of 5 with Barrier Bar
16	EAN13 +2		

B8. density

Bar code density. Use the following tables.

Bar Code Type	Density Selector	Density (% or cpi)	Narrow Element (dots/mils)	Narrow to Wide Ratio	Data Length	Appearance Codes	Char Set
UPCA +2/+5 Price CD	**2** 4	76% 114%	2/9.9 3/14.8	N/A	11 or 12 14/17	1, 5, 6, **7** or 8	0 to 9
UPCE+2/+5	**2** 4	76% 114%	2/9.9 3/14.8	N/A	6 or 7 9/12	1, 5, 6, **7** or 8	0 to 9
EAN8+2/+5	**2** 4	76% 114%	2/9.9 3/14.8	N/A	7 or 8 10/13	1, 5, 6, **7** or 8	0 to 9
EAN13+2/+5 Price CD	**2** 4	76% 114%	2/9.9 3/14.8	N/A	12 or 13 15/18	1, 5, 6, **7** or 8	0 to 9
Interleaved 2 of 5or I2of5with Barrier Bar	1 2 3 4 5 6 7 8 9 10 11 **12** 13	1.1 2.1 3.2 4.2 5.6 6.3 7.5 8.8 9.6 11.2 11.0 12.7 14.5	21/103.4 12/59.1 7/34.5 6/29.6 4/19.7 4/19.7 3/14.8 3/14.8 3/14.8 2/9.9 2/9.9 2/9.9 2/9.9	1:3.0 1:2.5 1:3.0 1:2.5 1:3.0 1:2.5 1:3.0 1:2.3 1:2.0 1:3.0 1:3.0 1:2.5 1:2.0	0 to 2710	8	0 to 9
(Code 39 or MOD43 (Extended Code 39)	1 2 3 4 6 **7** 11 12 20	1.4 1.7 3.5 4.2 6.3 7.0 3.9 12.7 3.0	10/49.3 8/39.4 4/19.7 3/14.8 2/9.9 2/9.9 4/19.7 1/4.9 5/24.6	1:2.5 1:2.5 1:2.5 1:3.0 1:3.0 1:2.5 1:2.0 1:3.0 1:2.2	0 to 2710	8	SPACE $%*+-./ 0 to 9 A to Z
Codabar (NW7)	2 3 4 5 7 **8** 9	2.1 3.0 4.6 5.1 8.4 9.2 10.1	8/39.4 6/29.6 4/19.7 4/19.7 2/9.9 2/9.9 2/9.9	1:3.0 1:2.5 1:2.5 1:2.0 1:3.0 1:2.5 1:2.0	0 to 26	8	$+-./ 0 to 9 a to d
Code 128 or Code 16K	20 4 6 **8**	3.5/7.0 4.4/8.7 5.8/11.7 8.7/17.5	5/24.6 4/19.7 3/14.8 2/9.9	N/A	0 to 2710	8	00H to 7FH

Note: The start (*) and stop (+) characters are automatically added for Code 39. Code 93, density 12, produces a one-dot narrow bar. This density is intended for special U.S.P.S. ACT-tag applications only. Synthetic supplies are recommended to produce scannable bar codes.

Bar Code Type	Density Selector	Density (% or cpi)	Narrow Element (dots/mils)	Narrow to Wide Ratio	Data Length	Appearance Codes	Char Set
CODE 93	3 4 5 **7** 10	3.7 4.5 5.6 7.5 11.2	6/29.6 5/24.6 4/19.7 3/14.8 2/9.9	N/A	0 to 2710	8	00H to7FH
MSI	4 5 **7**	4.2 5.6 7.2	4/19.7 3/14.8 2/9.9	1:2.0 1:2.0 1:2.5	0 to 14	8	0 to 9
POSTNET	**0** (fixed at 4.3 cpi)	24/118.2	10/49.3	4/19.7 (5 dot gap)	0,5,6,9 or 11	8	0 to 9
Intelligent Mail	**0** (fixed at 4.3 cpi)	24/118.2	10/49.3	4/19.7 (5 dot gap)	0,5,6,9 or 11	8	0 to 9
MaxiCode	**7**	N/A	N/A	N/A	99	8	00H to FFH

Bar Code Type	Density Selector	Element Width (dot/mils)	Row Height (dots/mils)	Aspect Ratio	Data Length	Appearance Codes	Char Set
PDF417	1 2 3 4 5 6 **7** 8 9	2/9.8 2/9.8 2/9.8 3/14.8 3/14.8 3/14.8 4/19.7 4/19.7 4/19.7	2/9.8 4/19.7 6/29.6 3/14.8 6/29.6 9/44.3 4/19.7 8/39.4 12/59.1	1:1 1:2 1:3 1:1 1:2 1:3 1:1 1:2 1:3	0 to 2709	8	00H toFFH

203/300 DPI Bar Code Densities

Bar Code Type	Density Selector	Data Length
Quick Response (QR Code) Models 1 and 2	**0**	Model 1: 0 - 1167 Numeric;0 - 707 Alphanumeric; 0 - 486 (8-bit); 0 - 299 (Kanji) Model 2: 0 - 2710 Numeric, Alphanumeric and 8-bit; 0 - 1817 Kanji

Note: Values in bold indicate the default.

Bar Code	Size Row x Col.	Density Selector	Max. Data Length Num. X Alphanum.	Appearance Codes	Char Set
Data Matrix Square symbols	10 x 10	1	6 x 3	8	OOH to FFH
	12 x 12	2	10 x 6		
	14 x 14	3	16 x 10		
	16 x 16	4	24 x 16		
	18 x 18	5	36 x 25		
	20 x 20	6	44 x 31		
	22 x 22	7	60 x 43		
	24 x 24	8	72 x 52		
	26 x 26	9	88 x 64		
	32 x 32	10	124 x 91		
	36 x 36	11	172 x 127		
	40 x 40	12	228 x 169		
	44 x 44	13	288 x 214		
	48 x 48	14	348 x 259		
	52 x 52	15	408 x 304		
	64 x 64	16	560 x 418		
	72 x 72	17	736 x 550		
	80 x 80	18	912 x 682		
	88 x 88	19	1152 x 862		
	96 x 96	20	1392 x 1042		
	104 x 104	21	1632 x 1222		
	120 x 120	22	2100 x 1573		
	132 x 132	23	2608 x 1954		
	144 x 144	24	2710 x 2335		
		0 default (bar code size automatically determined by data)			

Bar Code	Size Row x Col.	Density Selector	Max. Data Length Num. X Alphanum.	Appearance Codes	Char Set
Data Matrix Rectangular symbols	8 x 18	25	10 x 6	**8**	00H to FFH
	8 x 32	26	20 x 13		
	12 x 26	27	32 x 22		
	12 x 36	28	44 x 31		
	16 x 36	29	64 x 46		
	16 x 48	30	98 x 72		
		0 default (bar code size automatically determined by data)			

Note: The printers support printing a Data Matrix symbol with an X-dimension of 13 mils or greater (3 dots @203 dpi). Ifusing a denser bar code, make sure the bar code scans in that particular application. Our “premium” supplies and increasing the print contrast are recommended for denser bar codes. Depending on your application, additional densities are available.

Bar Code Type	Density Selector	Narrow Element (dots/mils)	Data Length	Char Set
GS1 DataBar	**2** 3 4 5 6 7 8	2/9.9 3/14.8 4/19.7 5/24.6 6/29.6 7/34.5 8/39.4	0 to 2710	00H to FFH
Aztec	**2** 3 4 5 6 7 8 9 10 11 12 13 14 15	0.0099 0.0148 0.0197 0.0247 0.0296 0.0345 0.0394 0.0444 0.0493 0.0542 0.0592 0.0641 0.0690 0.0740	0 to 2710	00H to FFH

Note: Values in bold indicate the default.

Bar Code Type	Density Selector	Density (% or cpi)	Narrow Element (dots/mils)	Narrow to Wide Ratio	Data Length	Appearance Codes	Char Set
UPCA +2/+5 Price CD	**2** 4	77% 103%	3/10 4/13.3	N/A	11 or 12 14/17	1, 5, 6, **7** or 8	0 to 9
UPCE+2/+5	**2** 4	77% 103%	3/10 4/13.3	N/A	6 or 7 9/12	1, 5, 6, **7** or 8	0 to 9
EAN8+2/+5	**2** 4	77% 103%	3/10 4/13.3	N/A	7 or 8 10/13	1, 5, 6, **7** or 8	0 to 9
EAN13+2/+5 Price CD	**2** 4	77% 103%	3/10 4/13.3	N/A	12 or 13 15/18	1, 5, 6, **7** or 8	0 to 9
Interleaved2 of 5 or I2of5 with Barrier Bar	1 2 3 4 5 6 7 8 9 10 11 **12** 13	1.1 2.1 3.3 4.2 5.6 6.2 8.3 9.4 9.9 11.1 11.1 13.0 14.3	31/103.4 18/60.1 10/33.4 9/30.0 6/20.0 6/20.0 4/13.3 4/13.3 4/13.3 3/10 3/10 3/10 3/10	1:3.0 1:2.5 1:3.0 1:2.4 1:3.0 1:2.5 1:3.0 1:2.5 1:2.3 1:3.0 1:3.0 1:2.3 1:2.0	0 to 2710	8	0 to 9
(Code 39 or MOD43 (Extended Code 39)	1 2 3 4 6 **7** 11 12 20	1.4 1.7 3.4 4.7 6.2 7.1 3.8 11.5 3.1	15/50.0 12/40.0 6/20.0 4/13.3 3/10.0 3/10.0 6/20.0 2/6.7 7/23.4	1:2.5 1:2.5 1:2.5 1:3.0 1:3.0 1:2.5 1:2.0 1:3.0 1:2.2	0 to 2710	8	SPACE$%* +-./ 0 to 9 A to Z
Codabar (NW7)	2 3 4 5 7 **8** 9	2.3 3.4 5.0 5.6 9.1 10.4 11.1	12/40.0 9/30.0 6/20.0 6/20.0 3/10.0 3/10.0 3/10.0	1:3.0 1:2.5 1:2.5 1:2.0 1:3.0 1:2.5 1:2.0	0 to 26	8	$+-./ 0 to 9 a to d
Code 128 or Code 16K	4 6 **8** 20	4.5 6.8 9.1 3.9	6/20.0 4/13.3 3/10.0 7/23.4	N/A	0 to 2710	8	00H to 7FH

Note: The start (*) and stop (+) characters are automatically added for Code 39. Code 93, density 12, produces a one-dot narrow bar. This density is intended for special U.S.P.S. ACT-tag applications only. Synthetic supplies are recommended to produce scannable bar codes.

300 DPI Bar Code Densities

Bar Code Type	Density Selector	Density (% or cpi)	Narrow Element (dots/mils)	Narrow to Wide Ratio	Data Length	Appearance Codes	Char Set
CODE 93	3 4 5 **7** 10	3.7 4.8 5.6 8.3 11.1	9/30.0 7/23.4 6/20.0 4/13.3 3/10.0	N/A	0 to 2710	8	00H to 7FH
MSI	4 5 **7**	4.2 6.2 7.5	6/20.0 4/13.3 3/10.0	1:2.0 1:2.0 1:2.3	0 to 2710	8	0 to 9
POSTNET	**0** (fixed at 4.3 cpi)	24/118.2	10/49.3	6/20.0 (5 dot gap)	0, 5, 6, 9 or 11	8	0 to 9
Intelligent Mail	**0** (fixed at 4.3 cpi)	24/118.2	10/49.3	4/19.7 (5 dot gap)	0,5,6,9 or 11	8	0 to 9
MaxiCode	**7**	N/A	N/A	N/A	99	8	00H to FFH

Bar Code Type	Density Selector	Element Width (dot/mils)	Row Height (dots/mils)	Aspect Ratio	Data Length	Appearance Codes	Char Set
PDF417	1 2 3 4 5 6 7 8 9	3/10.0 3/10.0 3/10.0 4/13.3 4/13.3 4/13.3 6/20.0 6/20.0 6/20.0	3/10.0 6/20.0 9/30.0 4/13.3 9/30.0 12/40.0 6/20.0 12/40.0 18/60.0	1:1 1:2 1:3 1:1 1:2 1:3 1:1 1:2 1:3	0 to 2709	8	00H to FFH

300 DPI Bar Code Densities

Bar Code Type	Density Selector	Narrow Element (dots/mils)	Data Length	Char Set
GS1 DataBar	**2** 3 4 5 6 7 8	3/9.8 4/13.1 5/16.4 7/23 8/26.2 10/32.8 11/36.1	0 to 2710	00H to FFH
Aztec	**2** 3 4 5 6 7 8 9 10 11 12 13 14 15	0.0100 0.0133 0.0167 0.0233 0.0266 0.0333 0.0366 0.0433 0.0466 0.0533 0.0566 0.0633 0.0666 0.0733	0 to 2710	00H to FFH

Note: Values in bold indicate the default.

B9. height Bar code height, in 1/100 inches, 1/10 mm, or dots. Minimum values:

English **19**
Metric **48**
203 Dots **38**
300 Dots **57**

Height	Bar Code Type	Description
0	Aztec Intelligent Mail PDF 417 PostNet MaxiCode	These bar codes have a fixed height. Use **0**.
0	Data Matrix QR Code	The printer determines the size of the symbol, but the user's scanner determines the functional size (minimum height) of the symbol. Small Data Matrix and QR Codes may not be scannable. The Data Matrix and QR Code's height depends on the number entered for this parameter. For example, 80 means the symbol could be smaller than 0.80," but it will not be greater than the amount specified in this parameter. The symbol arranges the data according to rows and columns within the specified height.
0	GS1 DataBar	This height is only for the linear bar code used with UCC/EAN family *types* listed in *B13*. Use **0** for all other GS1 DataBar *types*.
20	Code 93	**20** is the default for Code 93.
40	UPCA/UPCE/EAN I 2of5 Codabar Code 39 Code 128 MSI	**40** is the default for UPCA/UPCE/EAN, I 2of5, Codabar, Code 39, Code 128, and MSI.

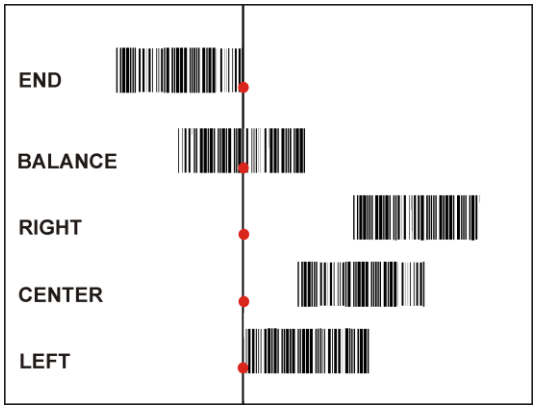
B10. text Appearance of text with bar code. Options:

Appear.	Bar Code Type	Description
0	MaxiCode QR Code	MaxiCode Mode 0 (obsolete) QR Code Model 2
1	UPC/EAN QR Code	No check digit or number system QR Code Model 1
2	MaxiCode QR Code	MaxiCode Mode 2 (Numeric Postal Code) QR Code Model 2
3	MaxiCode	MaxiCode Mode 3 (Alphanumeric Postal Code)
5	UPC/EAN	Number system at bottom, no check digit
6	UPC/EAN	Check digit at bottom, no number system
7	UPC/EAN	Check digit and number system at bottom (default)
8	MaxiCode All other bar codes	MaxiCode (auto detect modes 0, 2, 3, or for compressed data) default No text, bar code only (default)

B11. alignment Choose **L, R, C, B** or **E** to align the bar code data correctly in the field. **L** is the default.

Alignment	Bar Code Type	Description
L	All Aztec, Data Matrix, GS1 DataBar, Intelligent Mail, MaxiCode, QR Code (Quick Response)	Align on left side of field. Must use **L** for these bar codes.
C	Code 39, Codabar, I 2of5, MSI	Center within field.
R	Code 39, Codabar, I 2of5, MSI	Align on right side of field.
B	All except where noted.	Align at midpoint of field; centers variable width bar codes, which may not allow pad-character centering.
E	All except where noted.	Align at endpoint of the field; right justifies variable-width bar codes.

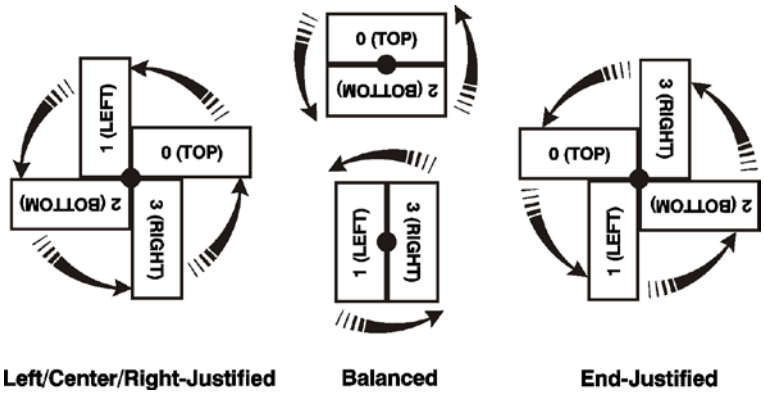
The red dot indicates the field origin and the line indicates the column position for each field in the following graphic.



B12. field rot Field rotation. Field rotation rotates the whole field, not just the characters. Rotation is affected by the pivot point, which varies depending on how text is justified. Lower left corner of field is the pivot point. Options:

0 Top of field points to top of supply (use for MaxiCode)
1 Top of field points to left of supply
2 Top of field points to bottom of supply
3 Top of field points to right of supply

Note: Serial bar codes with an 8-dot narrow element do not automatically print at 2.5 IPS. Serial bar codes printed at speeds greater than 2.5 IPS may not scan properly.



Left/Center/Right-Justified **Balanced** **End-Justified**

B13. type Select from the bar code family. *This parameter only applies to the GS1 DataBar bar code.* **1** is the default. For other bar codes, do not include this parameter. Options:

1 GS1 DataBar 14 (default)
2 GS1 DataBar 14 Truncated
3 GS1 DataBar 14 Stacked
4 GS1 DataBar 14 Stacked Omni directional
5 GS1 DataBar Limited
6 GS1 DataBar Expanded
7 UPCA
8 UPCE
9 EAN13
10 EAN8
11 UCC/EAN128 and CC A/B
12 UCC/EAN128 and CC C

B14. sep_height Height of the separator between the linear bar code and 2D bar code. *This parameter only applies to the GS1 DataBar bar code.* For other bar codes, do not include this parameter. The value is **1** or **2**. **1** is the default.

B15. segment Width of the segment. *This parameter only applies to the GS1 DataBar bar code.* For other bar codes, do not include this parameter. The range is even numbers from **2** to **22**. **22** is the default.

Example **B,3,12,V,50,40,1,2,80,7,L,0 |**

Defines a bar code field (field #3) with 12 characters of variable length starting at row 150, column 40. A UPCA bar code with a density of 2 and a height of 80 is used. The check digit and number system are shown at the bottom. The bar code is left aligned without any field rotation.

Example **B,1,30,V,5,5,38,4,0,0,L,0,1,2,22 |**

Defines a bar code field (field #3) with up to 30 characters of variable length starting at row 5, column 5. The GS1 DataBar uses a density of 4. No text is shown with the bar code. The bar code is left-aligned with no field rotation.

Defining Non-Printable Text Fields

Non-printable text fields hold entered data without printing it in its entered form. Typically, non-printable fields hold data that later combines with other fields to form a merged field. Define non-printable text fields before defining the field where the information prints.

When copying this field into another field, the maximum number of characters for the final field is **2710**. Allow only as many characters as needed, because extra characters use up space. Also, if copying into a bar code field, the maximum number of characters in the destination bar code is determined by the bar code specification (UPCA-12, EAN-13, etc.). Apply field options to manipulate the text entered in this field. Copying data from this field into another field is an example. See "Using Option 4 Copy Data" in Chapter 4 for more information.

In the following example, data is entered into four non-printable fields and merged to form field 5, and is then printed as a bar code. See "Merging Fields" in Chapter 4 for more information.

Field	Data	Field Type
1	20374	Non-printable
2	339	Non-printable
3	8	Non-printable
4	15	Non-printable
5	20374339815	Bar Code

Each non-printable text field requires a separate definition.

Syntax **`D,field#,# of char |`**

D1. D	Non-Printable Text Field.
D2. field#	Unique number from **0** to **999** assigned to this field. **1** is the default.
D3. # of char	Maximum number of characters in this field: **0** to **2710**. **30** is the default.

Example **`D,4,20 |`**

Defines a non-printable text field (field #4) with a maximum of 20 characters.

Defining Constant Text Fields

A constant text field is a set of fixed characters that prints on all labels. Define each constant text field separately. This field is not assigned a field number, but is counted as a field (keep this in mind, as the printer allows a maximum of **1000** fields per format). The characters in this field cannot be changed by batch data. Field options do not apply to constant text fields. Mark the pivot point of the field, which varies depending on the fields' justification.

Syntax **C,row,column,gap,font,hgt mag,wid mag,color,alignment, char rot,field rot,"fixed char",sym set |**

C1. C Constant Text Field.

C2. row Row location – distance from the bottom of print area to the pivot point. **10** is the default. See the following table.
For monospaced fonts, distance from bottom of print area to the pivot point.
For proportionally spaced fonts, distance from bottom of print area to baseline of characters in the field. (Bottom exits the printer first.)

Printer	Unit of Measure	Row or End Row	Column or End Column
9825 9855 (203 dpi)	English Metric 203 dpi Dots	0-1599 0-4061 0-3246	0-399 0-1013 0-810
9855 (300 dpi)	English Metric 300 dpi Dots	0-1199 0-3045 0-3597	0-399 0-1013 0-1197

C3. column Column location - distance from the left edge of the print area to the pivot point to find the column location. **10** is the default. Use the previous table for values.

C4. gap Number of dots between characters (203 dots per inch). Range: **0** to **99**. **0** is the default.

Any number other than **0** or the default number affects the field width. Default spacing:

Standard	3 dots
Reduced	1 dot
Bold	3 dots
OCRA-like	3 dots
CG Triumvirate™ Typeface Bold	varies with each letter
CG Triumvirate™ Typeface	varies with each letter

C5. font Style of font. **1** is the default. Options:

1	Standard	**10**	CG Triumvirate™ Typeface Bold
2	Reduced	**11**	CG Triumvirate™ Typeface
3	Bold	**15**	7 pt. CG Triumvirate™ Typeface
4	OCRA-like	**16**	9 pt. CG Triumvirate™ Typeface
5	HR1	**17**	11 pt. CG Triumvirate™ Typeface
6	HR2	**18**	15 pt. CG Triumvirate™ Typeface
		50	EFF Swiss Bold (TrueType® Scalable)
		56	PaxarSymbols

Or a valid downloaded font selector number.
Fonts 5 and 6 are for numeric data only. The CG Triumvirate™ typefaces support only the ANSI and DOS Code Page 437 and 850 Symbol Sets. The scalable font does not support Code Page 1256 (Arabic). See Appendix C for more information.

C6. hgt mag Height magnifier, **1** to **7** times (**4** to **255** points for scalable/downloaded TrueType fonts). **1** is the default. Use a magnifier of 1 with proportionally spaced fonts, because characters lose smoothness at higher magnifications. See Appendix B, "Fonts," for more information about fonts.

C7. wid mag Width magnifier, **1** to **7** times (**4** to **255** points for scalable/downloaded TrueType fonts). **1** is the default. Proportionally spaced fonts do not have a set width. To estimate the size of the field, use the letter "W" for the widest field or an "L" for an average width field. Find the selected font and the desired width in Appendix B, "Fonts,"

C8. color There are two types of field color overlay attributes:

Transparent The overlay field (text or constant text) does not block out (or "erase") existing fields.

Opaque The overlay field blocks out (or "erases") existing fields.

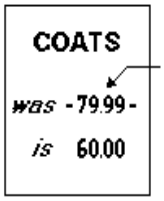
Options for standard printer fonts:

B Opaque, Normal, Black, Normal (default)
D/R/W Opaque, Normal, White, Norma
O Transparent, Normal, Black, Normal

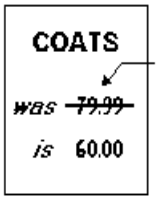
Options for scalable fonts:

A Opaque, Normal, Black, Bold
B Opaque, Normal, Black, Normal
E Opaque, Italics, Black, Bold
F Opaque, Italics, Black, Normal
N Transparent, Normal, Black, Bold
O Transparent, Normal, Black, Normal
S Transparent, Italics, Black, Bold
T Transparent, Italics, Black, Normal

Note: Solid black print should not exceed 30% on a given square inch of the label, or the printhead life may be decreased.



Line field blocked out by opaque field using attribute B



Line field not blocked out by transparent field using attribute O

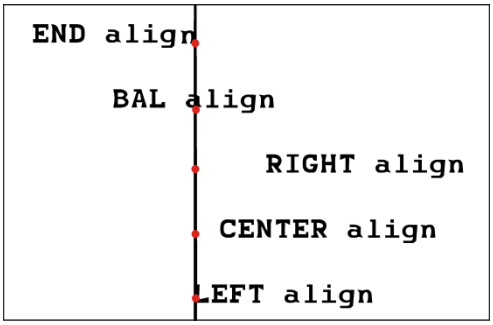
Field placement in the packet is an important consideration when using field color attributes. If a line field is defined before the overlay (text or constant text) field, the line field is blocked out by the overlay field, depending on the overlay field's color attribute. If a line field is defined after the overlay field, the line field is not blocked out by the overlay field, regardless of the overlay field's color attribute.

C9. alignment

Alignment of constant text in the field. **L** is the default. Options:

L Align on left side of field
C Center text within field (monospaced fonts only)
R Align on right side of field (monospaced fonts only)
B Align at midpoint of field
E Align at endpoint of the field
Use **L**, **B**, or **E** for any font.

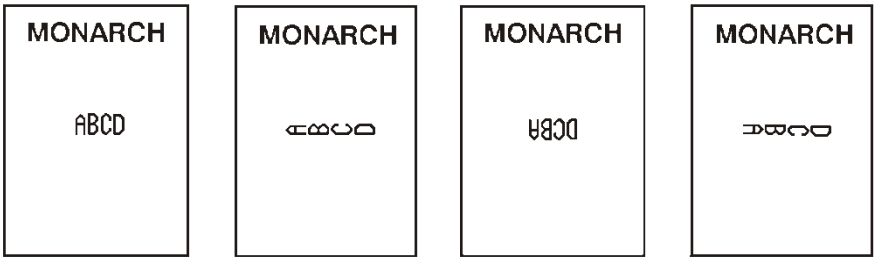
The red dot indicates the field origin and the line indicates the column position for each field in the following graphic.



C10. char rot

Character rotation. **0** is the default. The field or supply does not rotate, only the characters do. Options:

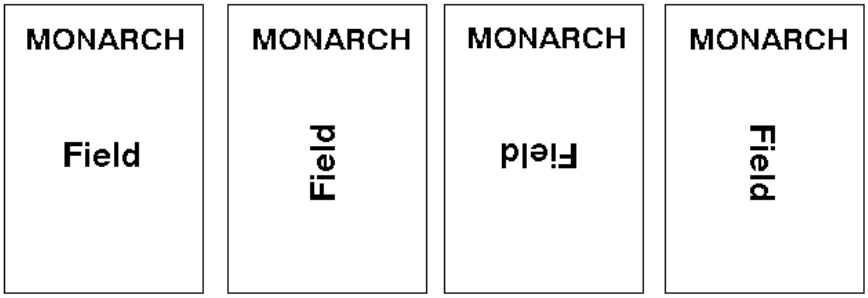
0 Top of character points to top of field
1 Top of character points to left of field
2 Top of character points to bottom of field
3 Top of character points to right of field



C11. field rot

Field rotation. **0** is the default. Field rotation rotates the whole field, not just the characters. Rotation is affected by the pivot point, which varies depending on how text is justified. Lower left corner of field is the pivot point. Options:

0 Top of field points to top of supply
1 Top of field points to left of supply
2 Top of field points to bottom of supply
3 Top of field points to right of supply



C12. "fixed char" Fixed characters to appear in the field. Maximum **2710** characters. **""** is the default. Enclose in quotation marks.

C13. sym set Symbol set. Use **0** for the Internal Symbol Set. **0** is the default. For scalable or TrueType® fonts, use:

1	ANSI Symbol Set
100	Macintosh
101	Wingdings
102	Unicode (user input) for particular mapping
103	BIG5 (user input) for Unicode mapping
104	GB2312 (user input) for Unicode mapping
105	SJIS (user input) for Unicode mapping (CP 932, Japanese)
106	GB2312 (user input) for GB2312 mapping (CP 936, Simplified Chinese)
107	BIG5 (user input) for BIG5 mapping (CP 950, Traditional Chinese)
110	Unicode UTF-8
437	DOS Code Page 437 (Domestic)
850	DOS Code Page 850 (International)
852	DOS Code Page 852 (Latin 2)
855	DOS Code Page 855 (Russian)
857	DOS Code Page 857 (IBM Turkish)
860	DOS Code Page 860 (MS-DOS Portuguese)
1250	Code Page 1250 (Latin 2)
1251	Code Page 1251 (Cyrillic)
1252	Code Page 1252 (Latin 1)
1253	Code Page 1253 (Greek)
1254	Code Page 1254 (Turkish)
1255	Code Page 1255 (Hebrew)
1256	Code Page 1256 (Arabic)
1257	Code Page 1257 (Baltic)
1258	Code Page 1258 (Vietnam)

Note: The Standard, Reduced, Bold, OCRA and HR fonts only support the Internal Symbol Set (0). The CG Triumvirate™ typefaces only support the ANSI (1) and DOS Code Page 437 (2) and 850 (3) Symbol Sets. The scalable font (font#50) does not support Code Page 1256 Arabic (10). Code pages 852-860 and 1250-1258 are for downloaded TrueType fonts or the scalable font. Code pages 102-110 require a downloaded International TrueType font. TrueType fonts are designed to be regionally specific; therefore, all code pages may not be supported in a given font. See Appendix C, "Symbol Sets/ Code Pages" for more information.

If using symbol set 110 (Unicode UTF-8), set the MPCL control characters (start of header, etc.) to decimal values between 0 and 128; otherwise, errors may occur with the Unicode data entered. See Chapter 2, "Configuring the Printer" for more information about the MPCL control characters.

Example **`C,30,10,0,1,1,1,B,L,0,0,"MADE IN USA",0 |`**

Defines a constant text field starting at row 30, column 10. It does not have any additional inter-character gap. The Standard font is used without any additional magnification. The printing is black on white and left justified. No field or character rotation is used. "MADE IN USA" is printed in this field. The internal symbol set is used.

Use lines to form borders and mark out original prices. Define each line separately. This field is not assigned a field number, but is counted as a field (keep this in mind, as the printer allows a maximum of **1000** fields per format). Define any line length and a thickness up to 99 dots, as long as the solid black print does not exceed 30 percent of any given square inch of the label.

Line Types

Create horizontal and vertical lines. There are two ways to define lines.

Segments Select the starting point and ending point.

Vectors Select the starting point, the angle, and the length of the line.

Syntax **`L,type,row,column,angle/end row,length/end col,thickness, "pattern" |`**

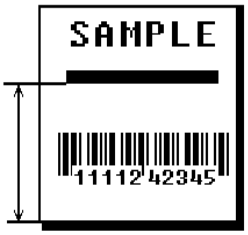
L1. L Line Field.

L2. type Type of line. Only vertical and horizontal lines are supported. **S** is the default. Options:

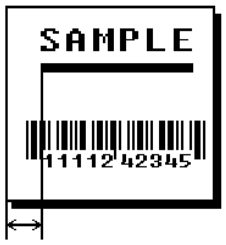
S Segment. Select the starting point and ending point.
V Vector. Select the starting point, angle, and length.

L3. row Row location - distance from bottom of print area to the starting point. **10** is the default. See the following table.

Printer	Unit of Measure	Row or End Row	Column or End Column
9825 9855 (203 dpi)	English Metric 203 dpi Dots	0-1599 0-4061 0-3246	0-399 0-1013 0-810
9855 (300 dpi)	English Metric 300 dpi Dots	0-1199 0-3045 0-3597	0-399 0-1013 0-1197

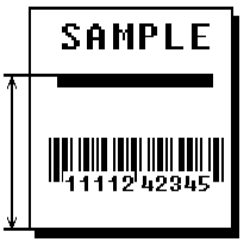


L4. column Column location - distance from left edge of the print area to line origin. **10** is the default. Use the previous table for values.



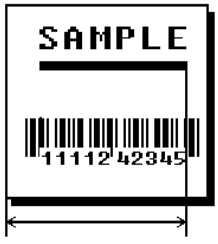
L5. angle /end row If Using *Segments*:
Row location of ending point. Measure from bottom of print area. On horizontal lines, this value must match item L3. **100** is the default.

If Using *Vectors*:
Angle of line. Options: **0**, **90**, **180**, or **270**. **0** is the default.



L6. length/ end col If Using *Segments*:
Column location of end point. Measure from left edge of print area. On vertical lines, this value must match parameter **L4**. **100** is the default.

If Using *Vectors*:
Length of the line in selected units. **10** is the default.



L7. thickness Using the chart below for reference, write the line thickness (**1** to **99**) in box **L7. 2** is the default. Line thickness fills upward on horizontal lines, or to the right on vertical lines. Measured in dots.

Dots	Thickness
1	
10	
24	
48	
96	

L8. "pattern" Line pattern. Enter **""**.

Example **`L,S,110,30,110,150,10,"" |`**

Defines a horizontal line field as a segment starting at row 110, column 30 and ending at row 110, column 150. The line thickness is 10 dots.

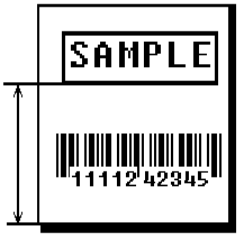
Defining Box Fields

Use boxes to form borders or highlight items of interest. Define each box field separately. This field is not assigned a field number, but is counted as a field (keep this in mind, as the printer allows a maximum of **1000** fields per format). Define any line length and a thickness up to 99 dots, as long as the solid black print does not exceed 30 percent of any given square inch of the label.

Syntax **`Q,row,column,end row,end col,thickness,"pattern" |`**

Q1. Q Box (Quadrilateral) Field.

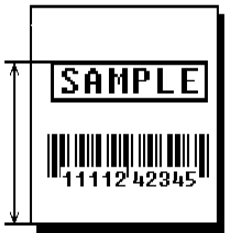
Q2. row Row location - distance from bottom of print area to lower left corner of box.
10 is the default. See the following table.



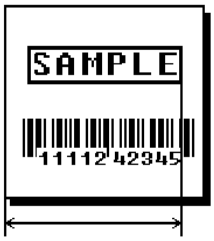
Printer	Unit of Measure	Row or End Row	Column or End Column
9825 9855 (203 dpi)	English Metric 203 dpi Dots	0-1599 0-4061 0-3246	0-399 0-1013 0-810
9855 (300 dpi)	English Metric 300 dpi Dots	0-1199 0-3045 0-3597	0-399 0-1013 0-1197

Q3. column Column location - distance from left edge of print area to lower left corner of box. **10** is the default. Use the previous table for values.

Q4. end row Distance from bottom of print area to upper right corner of box. **100** is the default. Use the previous table for values.



Q5. end col Distance from left edge of print area to upper right corner of box. **100** is the default. Use the previous table for values. Ranges same as *column*.



Q6. thickness Using the chart below for reference, write the desired line thickness (**1** to **99**) in box Q6. **2** is the default. Boxes fill inward, so make sure boxes do not overwrite other fields. Measured in dots.

Dots	Thickness
1	
10	
24	
48	
96	

Q7. "pattern" Line pattern. Enter **""**.

Example **Q,240,30,270,150,3,"" |**

Defines a box field starting at row 240, column 30. It ends at row 270, column 150. It has a thickness of 3 dots.

Defining Verifier Fields

The verifier field in a format references the verifier configuration packet ID to use for this particular format. Every format can have a specific verifier configuration packet. See "Defining a Verifier Configuration Packet," in Chapter 2 for more information.

If a particular verifier configuration packet is not specified, the last sent verifier configuration packet is used.

Note: Include the verifier field after the format header in the format packet.

Syntax **V,vfrID |**

V1. *V* Verifier Field.

V2. *vfrID* Unique number from **1** to **999** to identify the verifier configuration packet to use with this format.

Example
```
{F,25,A,R,M,508,508,"FMT-25" |
V,3 |
B,1,12,F,110,115,1,2,120,5,L,0 |}
```

Specifies verifier configuration packet #3 starting with format 25 until another verifier configuration packet is specified.

Defining the RFID Data Field (9855 RFID Printer Only)

The RFID Data Field contains the information you want programmed into the RFID tag. The syntax of the RFID Data Field is similar to the standard non-printable text field format. RFID is only supported on the 9855 printer.

Printing over the RFID tag (or transponder) causes printing irregularity.

Note: If using version 7.0 or earlier firmware with a Sirit RFID module, call Technical Support.

Syntax **`X,field#,# of char,data_type |`**

X1. *X* — RFID Data Field.

X2. *field#* — Unique number from **0** to **999** assigned to this field. **1** is the default.

X3. *# of char* — This number must be equal to or greater than the total number of characters in the RFID Data Field. Range: **0** to **2710**. **30** is the default. The amount varies according to your RFID data, protocol, and module type. For example, C1Gen2 can be up to 496 bits, **plus** the access password, lock code, etc.

Note: An error 715 occurs if the printer does not receive the correct amount of data. Pad data to ensure the correct amount of bits. See "Using Option 30," in Chapter 4 for more information.

X4. *data_type* — Data type. Use **0** (ASCII Hex - ASCII representation of Hex), which uses characters **A** to **F** and **0** to **9**. For example, the letter A in ASCII Hex has a value of 41 and is represented in MPCL batch data as "414141414141414141414141".

Note: **Do not** use the ASCII file separator character (1C) in RFID batch data.

Example **`X,5,24,0 |`**

Defines an RFID Data Field (field #5) with exactly 24 ASCII Hex characters for a 96-bit RFID tag.

DEFINING FIELD OPTIONS

4

This chapter provides a reference for defining

- field options in formats
- check digit packets.

Note: When using multiple options on the printer, options are processed in the order they are received.

Applying Field Options

Field options further define text, bar code, and non-printable text fields. The text, constant text, or bar code field must be previously defined *before* applying any field option to it.

Note: Define field options immediately after the field to which they apply.

Combining Field Options

Multiple options can be used with most fields. Options can be used in any combination except as noted with each definition. Options are processed in the order they are received.

For example, use Option 4 to copy data from another field, and then use Option 30 to pad the field. When using multiple options for the same field, place the options in the order to apply them in the format.

Restrictions

Some options cannot be used together. For example, incrementing (Option 60) and price field (Option 42) options cannot be applied to the same field. See each Option's section for specific combinations to avoid.

Option 4 (copy a field) is the only option that can be repeated for a single field.

Syntax **`R,option#,parameter...parameter |`**

R1. R Indicates field option header.

R2. option# Option number:

- **1** Define fixed characters
- **2** Data type restrictions
- **3** Data entry template
- **4** Copy data from previous field
- **5** Define data entry sources
- **6** Upload field data
- **20** Define data entry prompts
- **21** Define extended field names (XML-enabled printer)
- **30** Pad data to left or right with specified character
- **31** Generate check digit
- **42** Format as a price field
- **50** Define bar code densities
- **51** Define security and truncation of PDF417 bar codes
- **52** Define width or length of PDF417 bar codes
- **53** Define optional settings for Aztec bar codes
- **60** Define incrementing or decrementing field
- **61** Reimage fields
- **62** Do not scan/verify a particular bar code
- **64** Program the AFI Field for UHF RFID tags

R3. parameter(s) Varies per option. See the following option descriptions.

Using Option 1 (Fixed Data)

Fixed data is information (a company name or store number) to print on all labels. Define fixed characters for an entire field or for part of a field.

Syntax **R,1,"fixed char" |**

R1. R Option Header.

R2. 1 Option **1**.

R3. "fixed char" Characters to insert. Enclose in quotation marks. If defining fixed characters for part of a field, place underscores(_) in non-fixed positions. Any spaces in the phrase are fixed characters. Range: **0** to **2710**.

Note: Underscore characters are stripped out and the data is compressed if no data is supplied by the batch and the field length is variable.

Example **R,1,"_ _ _%$_ _ _ _ _" |**

Uses fixed characters (%$) in positions 4 and 5. The other positions are variable.

Example **R,1,"MONARCH" |**

"MONARCH" appears as a fixed field in this example.

To fill in the non-fixed portion of the field, see "Defining Batch Data Fields" in Chapter 6. As an alternative, apply Option 4 to copy data into the non-fixed character positions.

Using Option 2 (Data Type Restrictions)

This option restricts the data type for a particular field. You can use Options 2 or 3 only once per field. Do not use with Option 3 (Data Entry Templates). If batch data is entered in the batch packet, **do not** apply Options 2 and 3. Only use these options for *offline* batch entry.

Note: Option 2 is only available on the 9855 printer. Use the Monarch® 939™ keyboard for offline data entry. We do not recommend entering more than 100 characters in offline mode.

Syntax **R,2,char_code |**

R1. R Option Header.

R2. 2 Option **2**.

R3. char code Character type for the field. **1** is the default. Options:

1 Numeric only (0..9)
2 Letters only (A..Z,a..z)
3 Symbols only (printable characters other than letters or numbers)
4 Letters and numbers only
5 Numbers and symbols only
6 Letters and symbols only

Spaces are permitted in all categories. Use a combination of any two (letter, numbers, or symbols) character types.

Note: A use for this option is a quantity field, where the operator could enter only numeric data.

Example **R,2,2 |**

Restricts the field data to letters only (A-Z or a-z).

Using Option 3 (Data Entry Templates)

This option provides more specific restrictions than Option 2. This option can be used to select certain letters (such as A through F or the numbers 1 through 4) from a character set. Use this option to create a template of allowable characters for a field. Do not use with Option 2 (Data Type Restrictions).

Use this option only for offline batch entry. Define a template up to 30 characters long, but the printer only displays 16 characters at a time. The character template must contain the same number of characters as the field.

Note: Option 3 is only available on the 9855 printer. Use the Monarch® 939™ keyboard for offline data entry. We do not recommend entering more than 100 characters in offline mode.

Syntax **R,3,code,chars |**

R1. R Option Header.

R2. 3 Option **3**.

R3. code Data types. **T** is the default. Options

- **S** Defines a specific set of characters for the entire field. The string length does not have to match the field length. Maximum is **30** characters.
- **T** Creates a template of allowable data types by placing character indicators in each character position. The number of characters in the string must match the length of the field.

Note: A sample use for this option is a field on a patient record containing blood type. Acceptable characters would be A, B, O, +, or -.

R4. chars Characters to include in a field or a specific template. **“”** is the default. Must be enclosed within quotation marks. Indicators can be

- ***** any printable character
- # any digit 0-9
- @ any letter a-z, A-Z
- **-** no user input for this position (for fixed data or copied data)

Example **R,3,S,"ABC1234567890" |**

Restricts the field data to letters A, B, and C, and all digits.

Example **R,3,T,"***#_ _ _ _" |**

Creates a template that allows any printable character in positions 1, 2, and 3; digits in position 4; and reserves positions 5 through 8 for fixed or copied data.

Using Option 4 (Copy Data)

Use option 4 to create a field that uses data from another field. This is useful for creating merged fields or sub-fields. Copy the information from multiple fields into one field by applying the copy procedure more than once. Copy data is the only option that can be applied to a field more than once.

The maximum number of characters defined in **T3** (`# of char`) or **B3** (`# of char`) must allow for the number of characters that will be placed in the field, including any price, check digit, or fixed characters inserted by the printer. The maximum number of characters in the field into which data is copied cannot exceed **2710** or the maximum number of characters permitted by the **bar code**.

Note: When copying from more than one field, copy into the destination field from left to right. Option 4 can be applied to an RFID Data Field.

Syntax **`R,4,src fld,src start,# to copy,dest start,copy code |`**

R1. R	Option Header.
R2. 4	Option **4**.
R3. src fld	Field number from which data is copied. Range: **0** to **999**. **1** is the default.
R4. src start	Position number in the source field of the first character to be copied. Character positions are numbered **1** to **2710**, starting from the left. **1** is the default.
R5. # to copy	Number of characters to copy. Range: **1** to **2710**. **1** is the default.
R6. dest start	Position number where copied characters are to begin printing in the destination field. Range: **1** to **2710**. **1** is the default.
R7. copy code	Copy Method. **1** is the default. **1** Copy field as is (including price symbols, pad characters, check digits, etc.). **2** Copy unformatted data (without price characters, pad characters, etc.).

Example **`R,4,3,1,3,1,1|`**

Copies data from field #3, starting at the first position and copying three characters. In the destination field, the information is placed in position 1 and copied as formatted data.

Merging Fields

Copy data to merge the contents of fields. Use the copy data option as many times as necessary to copy all the appropriate fields into the merged field. RFID Data Fields can be merged.

In the following example, two text and two non-printable fields are shown. Data from these fields is merged to form field 5, and is then printed as a bar code.

Field	Data	Field Type
1	203	Non-printable
2	339	Non-printable
3	8	Text
4	BLUE	Text
5	2033398BLUE	Bar Code

To create this sequence:

1. Define fields 1, 2, 3, and 4.
2. Define field 5 as a bar code. Allow enough characters in the bar code field to hold all the copied characters.
3. Apply Option 4 to field 5 once for every source field.

Sub-Fields

Copy a segment of data from one field into a new location, called a sub-field. For example, extract part of the data in a bar code and display it in text form in a sub-field. Then, use the copy data option.

Using Option 5 (Define Data Entry Sources)

Defines how data is entered into a field. Option 5 is required for offline data entry. If the field holds all fixed characters or copied data only, eliminate the operator prompt. Use Option 5 only once per field. You must use the 939 keyboard for offline data entry.

Use this option to read pre-programmed data in the RFID chip embedded within the supply. Using Option 5 stops the printer while reading each label; regardless of the print speed. If using a batch quantity greater than one, the data is read from each label.

Note: The EM4122 protocol requires Option 5 to read the pre-programmed data.

When reading data, make sure the maximum number of characters in the field is equal to or greater than the number of characters being read. If not, the data may be incomplete.

Use option 6 (Upload Field Data) with Option 5 to upload the data from the RFID chip to a host.

Syntax **R,5,code |**

R1. R Option Header.

R2. 5 Option **5**.

R3. code Input code for the data in the field. Options:
K Keypad
R RFID (read data from the RFID chip). This is ignored on non-RFID printers.

Note: Option 5 re-images each label in the batch.

Example **R,5,K |**

Allows data to be entered from a keyboard.

Example **T,2,10,V,250,50,0,1,1,1,B,C,0,0,0 |**
R,5,R |

Reads the pre-programmed data from the RFID chip and saves that data into the text field.

Using Option 6 (Upload Field Data)

Upload data from any field using Option 6. When uploading multiple fields of data, the data is comma separated.

Data is uploaded to the last port that received host data (serial, parallel, USB, or Ethernet) at the end of the batch or label, depending on the other options used as follows:

- When using a batch quantity of one without Option 60, data is uploaded at the end of the batch.
- When using a batch quantity greater than one with Option 60, data is uploaded after each label.

Note: To upload data on a field that did not change, apply Option 60 to that field.

Syntax **R,6,device |**

R1. R	Option Header.
R2. 6	Option **6**.
R3. device	Last port that received host data. Use **H** (host).

Example **T,2,10,V,250,50,0,1,1,1,B,C,0,0,0 |**
R,6,H |

Uploads the text field's data to a file.

Example **B,3,12,F,50,50,1,2,60,7,L,0 |**
R,6,H |
R,60,I,0 |

Uploads the UPCA bar code field's data to a file and uploads data for each label in the batch.

Example **T,150,V,230,130,0,1,1,1,B,L,0,0 |**
R,5,R |
R,6,H |

Reads the RFID data from the RFID chip embedded in the supply. Uploads the data to the last-used port.

Example **{F,1,A,R,E,600,400,"RDCI" |**
X,5,24,0 |
T,6,20,V,415,270,0,50,15,15,B,L,0,2 |
R,4,5,1,16,1,0 |
R,6,H | }

Copies data from field 5 (RFID Data Field) to field 6 (Text field). Uploads the data to the last-used port.

Sample Upload Packet

Example **R,5,R |**
R,6,H |

Returns the following pre-programmed data in the RFID chip in the upload packet:

313233343536373839303132

Example **B,3,12,F,50,50,1,2,60,7,L,0 |**
R,6,H |

Returns the following UPCA bar code data entered from the batch in the upload packet:

123456789012

Using Option 20 (Define Data Entry Prompts)

This option defines the operator prompt and it is not recommended on fields filled entirely by fixed characters or copied data. This option must be defined before Option 5, or the prompt does not display during data entry. Use the 939 keyboard for offline data entry.

Note: Option 20 is only available on the 9855 printer.

Syntax **R,20,"prompt" |**

R1. R	Option Header.
R2. 20	Option **20**.
R3. "prompt"	Displays the exact phrase you want to prompt the operator. Must be enclosed within quotations. The prompt must be **15** characters or less.

Example **R,20,"Order Number" |**

Displays the prompt Order Number for the operator when this field is imaged.

Using Option 21 (Define Extended Field Names)

This option defines names for each field in a format, which can be longer than eight characters. This option is only available on the 9855 XML-enabled printer.

Syntax **R,21,"field_name" |**

R1. R	Option Header.
R2. 21	Option **21**.
R3. "field_name"	Specifies the field name. Must be enclosed within quotations. The name can be **1** to **256** characters, excluding non-printable control characters and the quotation mark (“). **“”** is the default. This name must match the one specified in the variable name attribute.

Example **T,2,10,v,250,50,0,1,1,1,B,C,0,0,0 |**
R,21,"SALEPRICE_FIELD" |

Defines the name for text field 2 as “SALEPRICE_FIELD.”

Using Option 30 (Pad Data)

Add characters to one side of a field to “pad” the field. Padding fills in the remaining spaces when the entered data does not fill an entire field. If a variable length field is not completely filled with batch data, this option fills the remaining positions in the field with the character designated by Option 30.

Note: Option 30 can be applied to an RFID Data Field.

Syntax **R,30,L/R,"character" |**

R1. R	Option Header.
R2. 30	Option **30**.
R3. L/R	Indicates type of padding. **R** is the default. **L** Pad field on left side **R** Pad field on right side
R4. “character”	Pad character must be within the **0** to **255** decimal range and enclosed inside quotation marks. The pad character must be in ASCII Hex format. Do not use on fixed length fields.

Example **R,30,L,"X" |**

Pads data with an “X” on the left side of the field.

Example **X,2,24,0 |**
R,30,R,"0" |

Pads the data in the RFID Data Field with a “0” on the right side of the data. This example uses a 96-bit RFID tag.

Sample Use for Padding

Use pad characters to make a variable length bar code occupy a fixed amount of space on the supply. If the maximum number of characters in the bar code is 15, but the batch packet only has 10 characters, the padding option fills the remainder of the field with pad characters.

Using Option 31 (Calculate Check Digit)

The printer generates a check digit when Option 31 is applied to the field. Do not use this option if the field contains a UPC, EAN, or Code 39 (with the MOD43 check digit) bar code.

Syntax **R,31,gen/ver,check digit # |**

R1. R	Option Header.
R2. 31	Option **31**.
R3. gen/ver	Enter **G** to generate a check digit.
R4. check digit #	Specifies a check digit scheme. Enter a number that identifies a check digit scheme that has been defined. For more information, see “Using Check Digits.” Range: **1** to **10**. **1** is the default.

Example **R,31,G,5 |**

Generates a check digit using the previously defined check digit scheme 5.

Using Option 42 (Price Field)

Apply options to automatically insert monetary symbols. Do not use this option with Option 31 (define a check digit) or Option 60 (increment or decrement a field). This option is not recommended for bar codes. When determining the maximum number of characters, add the maximum number of digits and the monetary symbols.

Syntax **R,42,appear_code |**

R1. R	Option Header.
R2. 42	Option **42**.
R3. appear_code	Enter **1** to print the price field in standard notation, as defined by the country setting. Use the monetary formatting packet to select monetary notations and symbols by country setting. See "Defining the Monetary Formatting Packet" for more information. See Appendix C, "Symbol Sets/Code Pages," to make sure the monetary symbol is printable in the font selected for this field. For monetary symbols other than the dollar sign, use the internal symbol set.

Example **R,42,1 |**

Uses a price field that prints the monetary symbol and notations as defined in the monetary formatting packet.

Using Option 50 (Bar Code Density)

Apply this option to bar code fields to create custom densities. This option overrides the density value in the bar code field. When using this option, set the density parameter in the bar code field to the default value. Only use this option once for each bar code field.

Bar codes produced using Option 50 may not be scannable. Code 39, density 12, produces a one-dot narrow bar. This density is intended for special U.S.P.S. ACT-tag applications only. Synthetic supplies are recommended to produce scannable bar codes.

The additional character gap, narrow space, and wide space parameters are valid **only** with Code 39 and Codabar. If these parameters are specified for any other bar codes, they will be ignored by the printer. Do not use Option 50 with fixed density bar codes.

Option 50 can be used with PDF417 bar codes for specific customer ratios. With PDF417 bar codes, use only the narrow and wide parameters. The narrow parameter defines the individual bar width in dots and the wide parameter is used to define the height of each individual stacked bar code. Option 50 can also be used with Option 52 to further customize the dimensions of a PDF417 bar code. Option 52 allows customization of the number of columns or number of rows for the bar code.

Syntax **R,50,narrow,wide,gap,nar_space,wide_space |**

R1. R	Field Option Header.
R2. 50	Option **50**.
R3. narrow	Dot width of the narrow element. Range: **1** to **99**. **1** is the default.
R4. wide	Dot width of the wide element. Range: **1** to **99**. **1** is the default.
R5. gap	Additional dot space between characters. Enter a value of **1** to 99. (Code 39 and Codabar only.) **1** is the default.
R6. nar_space	Additional dot width of the narrow bar code space. (Code 39 and Codabar only). Range: **1** to **99**. **1** is the default.
R7. wide_space	Additional dot width of the wide bar code space. (Code 39 and Codabar only). Range: **1** to **99**. **1** is the default.

Example **R,50,4,8,4,4,8 |**

Creates a custom bar code density with a narrow element of 4 dots, a wide element of 8 dots, a gap of 4 dots, 4 additional dot widths for the narrow bar code space, and 8 additional dot widths for the wide bar code space (if this is a Code 39 or Codabar bar code).

Example **B,1,40,V,100,100,32,1,0,8,L,0 |**
R,50,2,10 |

Creates a custom PDF417 bar code density for 203 dpi printers. The narrow element width is 2 dots and the height is 10 dots.

Example **B,1,40,V,100,100,32,1,0,8,L,0 |**
50,3,15 |

Creates a custom PDF417 bar code density for 300 dpi printers. The narrow element width is 3 dots and the height is 15 dots.

Using Option 51 (PDF417 Security/Truncation)

Define a security level and choose whether or not to truncate a PDF417 bar code. Higher security levels add data to a bar code, improving scan reliability. Some damaged bar codes may still be scannable if the security level is high enough. You can use this option to create standard PDF417 bar codes or use the truncated option to create a narrower bar code. This option can appear only once per PDF417 field, in any order, following the bar code field.

As the security level is increased, so is the size of the PDF417 bar code. For each level increased, the bar code doubles in size.

Syntax **R,51,security,stand/default |**

R1. R	Option Header.
R2. 51	Indicates Option **51**.
R3. security	Security level ranges from **0** to **8. 0** is the default. Higher security levels add data to a bar code, improving scan reliability. Some damaged bar codes may still be scannable if the security level is high enough.
R4. stand/def	Truncation selector. **S** is the default. Valid values: **S** (default) a standard PDF417 bar code **T** truncated

Example **R,51,2,S |**

Defines a security level of 2 for a standard PDF417 bar code.

Using Option 52 (PDF417 Width/Length)

This option defines the image width or length of a PDF417 bar code. If defining a fixed number of columns (width), the bar code expands in length. If defining a fixed number of rows (length), the bar code expands in width. Column value does not include start/stop or left/right indicator columns. If this option does not immediately follow the PDF417 bar code field, the default settings are used. You can only use this option once per PDF417 bar code field.

Syntax **R,52,row/column,dimension |**

R1. R	Option Header.
R2. 52	Indicates Option **52**.
R3. row/column	Indicates the number of rows or columns. If rows are specified, the bar code expands in columns, or vice versa. **R** Row **C** Column
R4. dimension	The number of rows or columns defined for the bar code. The default is **4**. Valid values: **3-90** for rows. **3** is the default for rows. **1-30** for columns. **1** is the default for columns.

Example **R,52,C,10 |**

Defines the column width of 10, which expands the PDF417 bar code length by 10.

Using Option 53 (Optional Settings for Aztec)

Use Option 53 to set the error control level, enable ECI data, enable a menu symbol, and add appended data to an Aztec bar code.

Note: Typically, these settings are not used. When using Option 53, the printer may take longer to image the bar code and require more time to print the format.

Syntax **R,53,error_ctrl,ECI,menu_sym,str_append,"string" |**

R1. R	Option Header.
R2. 53	Option **53**.
R3. error_ctrl	Error control level. Some damaged bar codes may still be scannable if the error control level is high enough. **0** is the default. Options: **0** Default level **1-99** **101-104** **201-232** **300**
R4. ECI	Sets the ECI Data flag. **0** is the default. Options: **0** Disable **1** Enable
R5. menu_sym	Sets the Menu Symbol flag. **0** is the default. Options: **0** Disable **1** Enable
R6. str_append	Structured append information. Range: **1** to **26**. **1** is the default.
R7. "string"	String to append. Range: **0** to **24**. **""** is the default. Must be enclosed in quotation marks.

Example **R,53,0,0,0,1,"" |**

Uses option 53 to set the error control to 0, disables the ECI data and menu symbol flags, and does not append any data to the bar code.

Using Option 60 (Incrementing/Decrementing Fields)

Applications such as serial numbers require a numeric field to increment (increase in value) or decrement (decrease in value) on successive labels within a single batch. Incrementing or decrementing can be applied to **numeric** data only. If a field includes letters and digits, apply incrementing or decrementing to only the portion of the field that contains digits. Do not use with Option 42 (price field).

When using Option 60 with RFID Data Fields or EPC data:

- Use caution when incrementing an RFID field if data is coming directly from a host because the field must be incremented in ASCII Hex.
- The data increments by **one** as follows: 0 to F (0123456789ABCDEF), then back to 0.
- Parameters *R3 and R4* are ignored for RFID and EPC data fields.
- Using version 7.1 or greater firmware, the printer increments EPC data.

Syntax **R,60,I/D,amount,l pos,r pos |**

R1. R	Option Header.
R2. 60	Option **60**.
R3. I/D	Increment or decrement. **I** is the default. **I** incrementing field **D** decrementing field (not valid for RFID)
R4. amount	Amount to increase or decrease. Range: **0** to **999**. **1** is the default.
R5. l pos	Leftmost position in inc/dec portion of field. If this value is not entered, the default value 1 is used. Range: **0** to **2710**. **1** is the default. Using version 8.8 or greater, *l pos* is supported for RFID and EPC data fields.
R6. r pos	Rightmost position in inc/dec portion of field. If this value is not used, the entire field length is used as the default. Range: **0** to **2710**. **2710** is the default. Using version 8.8 or greater, *r pos* is supported for RFID and EPC data fields.

Example **R,60,I,5,1,6 |**

Increments a field by 5 each time the field is printed. The field increments beginning with the first left position and ending with the sixth position.

Incrementing EPC Data Example

```
{F,1,A,R,E,400,400,""|
T,1,30,V,50,70,0,1,1,1,B,L,0,0|
R,60,I,1|
B,2,12,F,10,130,1,4,50,8,L,0|
R,60,I,1|
X,3,100,0|
R,60| }
```

RFID Data Field Incrementing Option

```
{B,1,N,3|
1,"001"|
2,"123456789012"|
3,"12345678123456781234561B~028~028~02812345678~02812345678~02800000~028"
| }
```

RFID Data Field Batch Data in ASCII Hex with EPC Data included

This example uses option 60 to increment the EPC RFID data by one.

Fixing the First Number in the Incrementing Sequence

There are two ways to enter the first number in the incrementing sequence. You can use batch data or use Option 1 to define the first number as a fixed character. The first number in the sequence must contain the same amount of digits as the highest number to be counted. For example, to count the numbers **1** to **999**, the first number in the sequence must be entered as **001**.

Using Option 61 (Re-image Field)

This option redraws (reimages) a constant field when you have a constant field next to a variable field on your label. It can be used on text, constant text, bar code, line, or box fields.

These printers do not redraw an area if the field data does not change. When a field changes, that area is cleared and the new field data is imaged. However, the new field data may require a larger area than the previous field did. In some cases, neighboring fields that do not change (constant fields) may be covered with white space from the changing field's (variable fields) area. Use this option to reimage the constant field, or it may appear broken.

Note: The most common use for this option is with incrementing fields on your label, because they may cover a constant field.

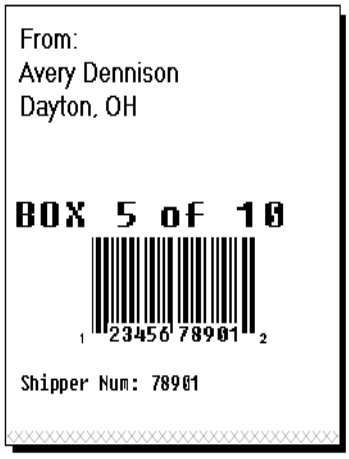
Syntax **R,61 |**

R1. R Option Header.
R2. 61 Option **61**.

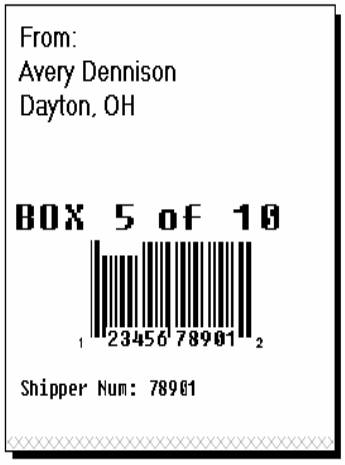
Example **R,61 |**

Reimages the constant field that appears next to a variable field.

In this example, Option 61 is applied to the bar code field to keep the incrementing field (Box #) from blocking out the bar code field.



Re-Image ON



Re-Image OFF

Using Option 62 (Bypass Bar Code)

This option allows the optional verifier to bypass (skip) bar code(s) on a format. The verifier does not scan any bar code with Option 62 applied to it.

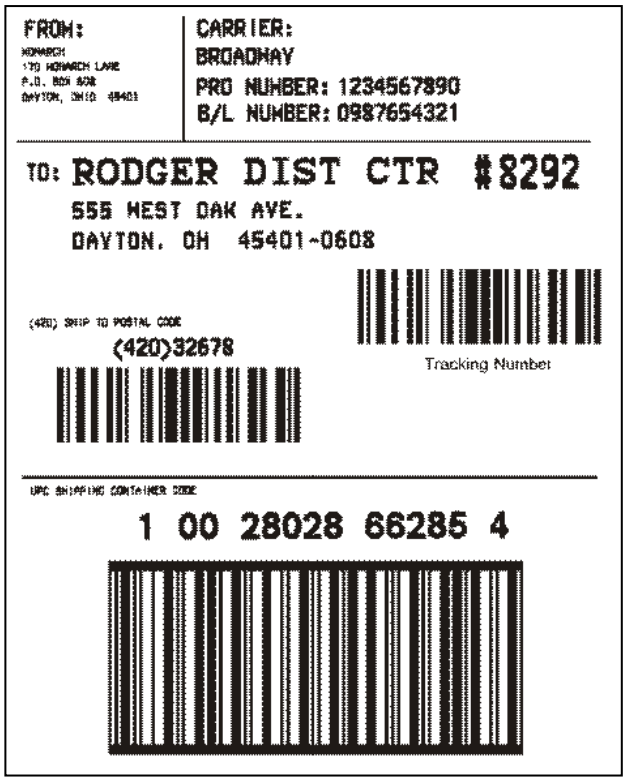
Syntax **R,62 |**

R1. R Option Header.

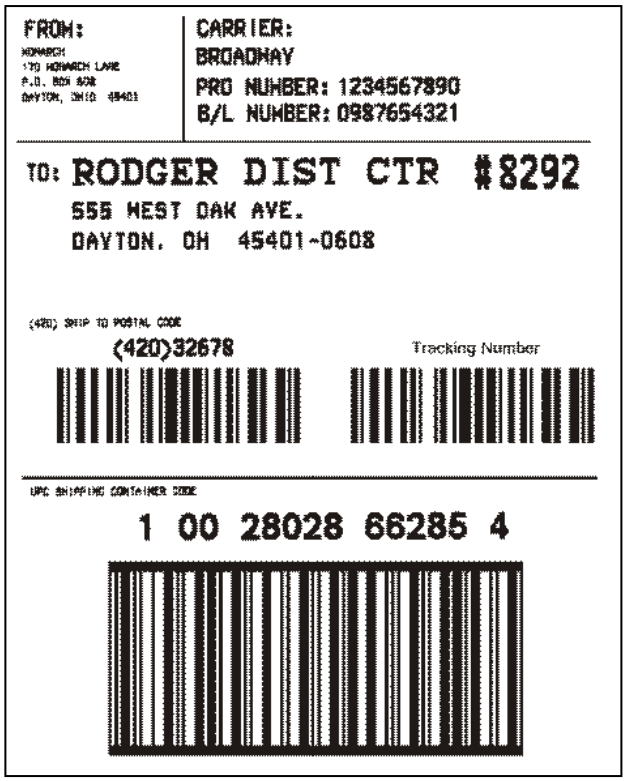
R2. 62 Option **62**. The verifier does not scan the bar code associated with this option.

Note: Adjacent bar codes on a format need to start and end on the same row (be the same height). Also, both adjacent bar codes (or neither bar code) must be scanned. However, do not apply Option 62 to all bar codes on a format or 764 errors appear.

The verifier's beam scans the entire width of the label. It cannot scan half the labels width. The verifier errors if Option 62 is applied to only ONE of the adjacent bar codes.



Option 62 can be applied to any bar code on this format.



Option 62 must be applied to BOTH adjacent bar codes.

Example **B,1,12,F,110,115,1,2,120,5,L,0 | R,62 |**

The verifier does not scan or verify this UPCA bar code on the format.

Verifier Information

- There is a 0.50-inch no scan zone on the trailing edge of each label.
- You cannot verify adjacent bar codes that do not start and end on the same print row. See the following graphic.

```
B,3,13,V,310,28,8,4,50,8,L,0|
B,4,13,V,355,200,8,4,50,8,L,0 |
```

Postal Code Bar code
Tracking Number Bar code

The verifier cannot verify the "postal code" and "tracking number" bar codes, because they do not start and end on the same row.

Using Option 64 (Program AFI Field for UHF RFID)

Use Option 64 to program the AFI memory in the EPC memory bank (field) for UHF RFID tags.

Note: Do not apply a lock to the EPC memory bank since the AFI memory is part of the EPC memory bank. If the EPC memory bank is locked, the AFI memory cannot be programmed (the printer errors).

Syntax **R,64,field,"code",lock |**

R1. R	Option Header.
R2. 64	Option **64**.
R3. field	Memory field to program. Use **A** (AFI).
R4. "code"	Byte code. This is an 8-bit (1 byte) character to program, enclosed within quotation marks. Range: **0** to **255**. **""** is the default. Use the ASCII character or the tilde followed by the equivalent three-character decimal value. For example, the letter A can be entered as A or ~041.
R5. lock	Lock code. Use **0** (no lock).

Example **X,5,16,0,0 |**
R,64,A,"A",0 |

Programs the character A into the **A**FI memory field. The data is not locked (**0**).

Example **X,5,16,0,0 |**
R,64,A,"~046",0 |

Programs the character F into the **A**FI memory field. The data is not locked (**0**).

Using Check Digits

Check digits are typically used to ensure that a text or bar code field scans correctly. If you apply Option 31, the printer calculates a check digit. A check digit scheme determines how the printer calculates a check digit. When you define a check digit scheme, you assign a number to identify it. This number is later entered in **R4** (**check digit #**) when you apply Option 31 to a field. You can use check digits with text or bar code fields. Check digit calculations are performed on numeric data only.

Do not use check digits with price fields. Do not define a check digit scheme for UPC, EAN, Code 39 (with the MOD43 check digit), and Code 93 bar codes, because they have predefined check digits.

Syntax **{A,selector,action,device,modulus,fld_length, D/P,**
"weights" | }

A1. A	Check Digit Header.
A2. selector	Assign a number from **1** to **10** to this check digit formula. **1** is the default.
A3. action	The action to perform. Enter **A** to add the check digit scheme.
A4. device	Format storage device. **R** is the default. Options: **F** Flash (must be formatted first. See "Formatting Flash" and "Flash Memory Guidelines" in Chapter 2 for more information.) **R** Volatile RAM
	Note: Check digits stored in flash are saved when the printer is turned off.
A5. modulus	Number from **2** to **11**. The modulus is used to divide the sum of products or the sum of digits.
A6. fld_length	The maximum number of characters the field will contain. Range: **0** to **2710**. **2710** is the default.

A7. D/P Algorithm. The algorithm determines how the check digit is calculated. Options:

D sum of digits
P sum of products

A8. "weights" String of digits used for calculation. A weight string is a group of two or more numbers that is applied to a field. The number of digits in this string should equal the number in fld_length. Enclose in quotation marks. Range: **0** to **2710**. **""** is the default.

Example **{A,1,A,R,10,5,P,"65432" | }**

Adds check digit scheme number 1 to the printer's memory. The modulus is 10, the maximum number of characters in the field is 5. The check digit is calculated by using the Sum of Products and the string of digits used in the calculation is "65432."

Sum of Products Calculation

This is an example of how the printer uses Sum of Products to calculate a check digit for this data:

5 2 3 2 4 5 2 1 9

1. Weights are applied to each digit, starting with the last digit in the weight string. They are applied right to left, beginning at the right-most position of the field. Remember, a weight string must contain at least two different numbers. This example has a weight string of **1,2,3,4**:

field:	**5 2 3 2 4 5 2 1 9**
weight string:	**4 1 2 3 4 1 2 3 4**

2. Each digit in the field is multiplied by the weight assigned to it:

field:	**5 2 3 2 4 5 2 1 9**
weight string:	**4 1 2 3 4 1 2 3 4**
products:	**20 2 6 6 16 5 4 3 36**

3. Next, the product of each digit is added together. This is the sum of the products.

20 + 2 + 6 + 6 + 16 + 5 + 4 + 3 + 36 = 98

4. Divide the sum of the products by the modulus (10 in this case), only to the whole number. The balance is called the remainder.

```
   9
10|98
  90
   8
```

5. Subtract the remainder from the modulus.
The result becomes the check digit. In this case, the check digit is 2.

10 - 8 = 2

Sum of Digits Calculation

This is an example of how the printer uses Sum of Digits to calculate a check digit for this data:

5 2 3 2 4 5 2 1 9

1. Weights are applied to each digit, starting with the last digit in the weight string. They are applied right to left, beginning at the right-most position of the field. Remember, a weight string must contain at least two different numbers. This example has a weight string of **1,2,3,4**:

field:	**5 2 3 2 4 5 2 1 9**
weight string:	**4 1 2 3 4 1 2 3 4**

2. Each digit in the field is multiplied by the weight assigned to it:

field:	**5 2 3 2 4 5 2 1 9**
weight string:	**4 1 2 3 4 1 2 3 4**
products:	**20 2 6 6 16 5 4 3 36**

3. Next, the digits of the products are added together. Two-digit products are treated as two separate digits. This is the sum of the digits.

   2 + 0 + 2 + 6 + 6 + 1 + 6 + 5 + 4 + 3 + 3 + 6 = 44

4. Divide the sum of the digits by the modulus (10 in this case), only to the whole number. The balance is called the remainder.

   ```
      4
   10 44
      40
      4
   ```

5. Subtract the remainder from the modulus. The result becomes the check digit. In this case, the check digit is 6.

   10 - 4 = 6

CREATING GRAPHICS

5

This chapter provides information on how to

- map out the graphic image using the hexadecimal (hex) or run length method.
- create a graphic packet using a graphic header, bitmap, duplicate, next-bitmap, text, constant text, line, and box fields.
- place a graphic image into a format.
- use the compressed graphics packet.

You can use graphic packets to create bitmapped images. To include a graphic packet within your format, your format **must** contain a graphic field. See “Placing the Graphic in a Format” for more information.

Overview of Compliance Labels

You can create compliance labels by using a graphic packet for the fixed fields and a format packet for the variable fields of your compliance label. The fixed fields of a compliance label are composed of text, lines, or boxes, which are repeated on each label. The variable fields are composed of text, bar codes, and order information, which changes with each label. Using a graphic packet for the fixed fields saves time, because the printer does not have to image all the lines or boxes each time the compliance label is printed.

Also, using a graphic packet for a compliance label reduces the number of fields in your format. Formats have a maximum number of fields per packet (**0** to **999**). However, you can bypass that requirement by placing your compliance layout in a graphic packet. When you process your formats, you only need one line in the format packet to reference the graphic packet.

The following example shows how to reference a graphic packet from within a format packet.

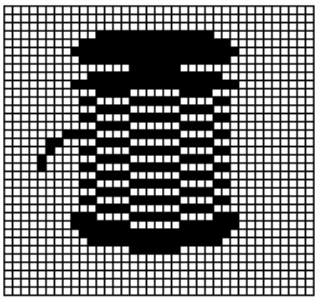
```
{                                       start of header
F,1,A,R,E,400,400,"RDCI" |              format header
G,57,0,0,0,0 |                          reference to graphic packet
C,40,10,0,2,2,2,B,L,0,0,"To:",0 |       constant text field
B,2,13,V,310,30,8,4,50,8,L,0 |          bar code field
}                                       end of header
```

Once you have your compliance label format set, all you need to do is add the variable sections (bar codes, addresses, and order information) to the format packet.

To see a sample compliance label graphic packet, see “Sample Compliance Graphic Packet.” To see a sample compliance label using a graphic packet within a format, see “Sample Compliance Label.”

Overview of Bitmapped Images

A printed image is formed through a series of dots. Each square on the grid below represents a dot on the printhead. The graphic image is created by blackening dots in a specific pattern. You can print varying shades of gray according to the concentration of dots on the image. When the dots are printed together, the end result is a graphic image.



Determining a Method

You can use one of two methods to map out your graphic image:

Hex Method — The dot sequences are segmented into binary numbers and then converted to hex numbers. A graphic using gray-scaling, several slanted lines, or several vertical lines typically translates more efficiently with hex representation.

Run Length Encoding Method — The dot sequences are segmented into black and white strings within a row. The total count of each white string is converted to a lower-case letter, corresponding to numeric value. The total count of each black string is converted to an uppercase letter, corresponding to numeric value. This method can reduce imaging time for graphics that contain repetitive rows of dots. A graphic with horizontal lines or very few white-to-black borders typically translates more efficiently with run length encoding.

The most efficient encoding method depends on how complicated your graphic image is and whether or not imaging time is a concern. You may want to experiment with both encoding methods to get optimal performance.

Designing Compliance Labels

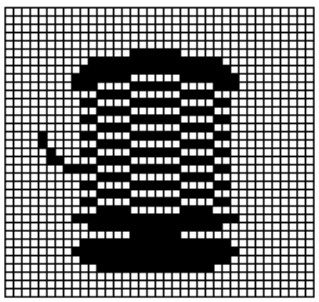
To use a graphic packet to design your compliance label:

1. Decide which fields are fixed (constant text, lines, boxes) and which fields are variable (addresses and shipping information).
2. Design your compliance label as you would any other format.

Designing Bitmapped Images

Once you determine the encoding method to use, you can begin mapping out your graphic image.

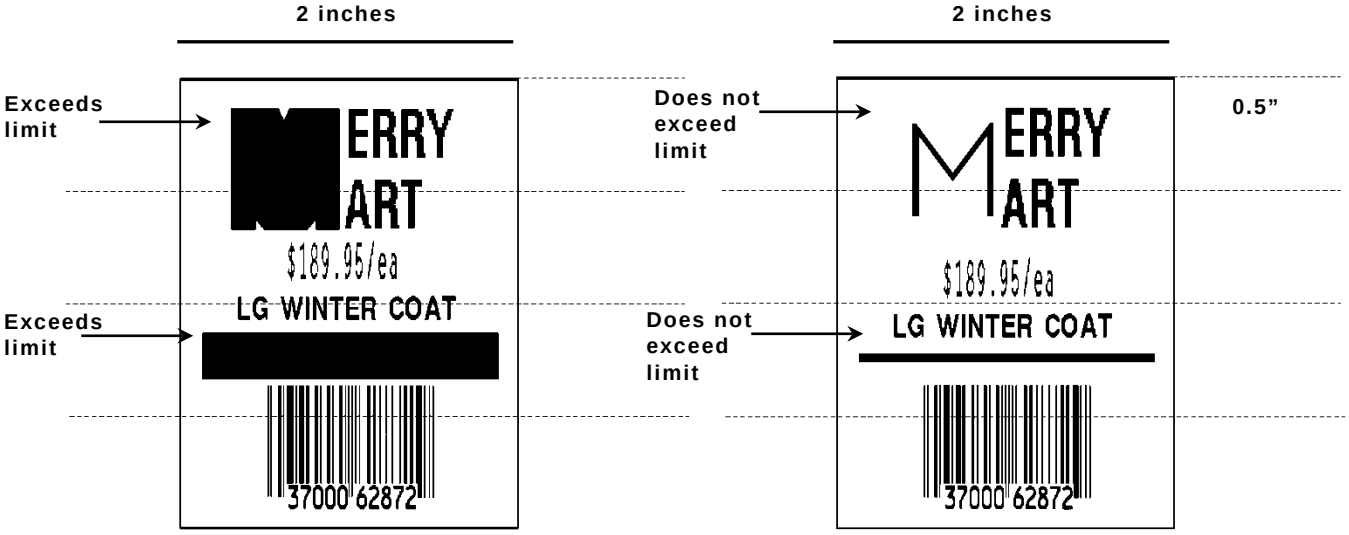
Note: The image that you map must be an upside down mirror image of the final result.



Special Considerations

Solid black print cannot exceed 30% of any given square inch of the supply. If the black print exceeds this limit, you may lose data or damage the printhead.

In the first label, the large “M” logo and thick black line exceed the allowed black to white print ratio. In the second label, the large “M” logo does not exceed the black to white print ratio.



Using the Hex Method

The following steps explain how to derive a hex character string from a bitmapped graphic.

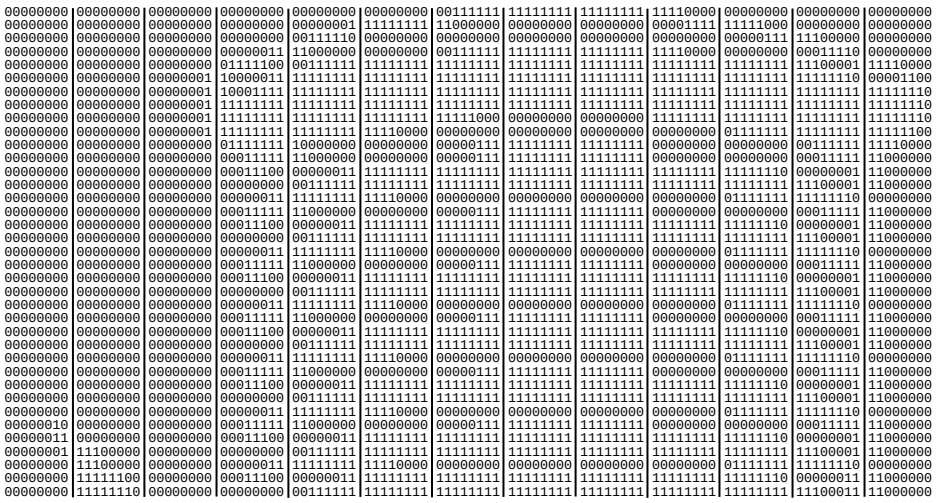
Each square on the grid represents a dot. A black square indicates the dot is ON, and a white square indicates the dot is OFF. A sequence of binary numbers, called a bit pattern or bitmap, determines what dots are on and off. The numbers “0" and ”1" are used for this purpose. The number “1" turns a dot on and ”0" turns a dot off.

All hex numbers must be two digits. For example, write hex 0 as 00, or hex E as 0E.

1. Assign 1 to every black square and 0 to every white square.

```
00000000000000000000000000000000000000000000000011111111111111111111111111000000000000000000000000000000
00000000000000000000000000000000000000001111111111000000000000000000000000001111111100000000000000000000
00000000000000000000000000000000011111000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000011110000000000000011111111111111111111111100000000000000011110000000000000
00000000000000000000000000001111000011111111111111111111111111111111111111111111111111111111000011110000
00000000000000000000000011000011111111111111111111111111111111111111111111111111111111111111111111000100
00000000000000000000000110001111111111111111111111111111111111111111111111111111111111111111111111111110
00000000000000000000001111111111111111111111111111111111111111111111111111111111111111111111111111111110
00000000000000000000011111111111111111111111111000000000000000000000000011111111111111111111111111111110
00000000000000000000111111111111111111111111100000000000000000000000000000000011111111111111111111111100
00000000000000000001111111111111111111111000000000000000000000000000000000000000000000000000000000000000
00000000000000000011111111111111111111000000000000000000000000000000000000000000000000000000000000000000
00000000000000000111111111111111111100000000000000000000000000000000000000000000000000000000000000000000
00000000000000001111111111111111111000000000000000000000000000000000000000000000000000000000000000000000
00000000000000011111111111111111110000000000000000000000000000000000000000000000000000000000000000000000
00000000000000111111111111111111100000000000000000000000000000000000000000000000000000000000000000000000
00000000000001111111111111111111000000000000000000000000000000000000000000000000000000000000000000000000
00000000000011111111111111111110000000000000000000000000000000000000000000000000000000000000000000000000
00000000000111111111111111111100000000000000000000000000000000000000000000000000000000000000000000000000
00000000001111111111111111111000000000000000000000000000000000000000000000000000000000000000000000000000
00000000011111111111111111110000000000000000000000000000000000000000000000000000000000000000000000000000
00000000111111111111111111100000000000000000000000000000000000000000000000000000000000000000000000000000
00000001111111111111111111000000000000000000000000000000000000000000000000000000000000000000000000000000
00000011111111111111111110000000000000000000000000000000000000000000000000000000000000000000000000000000
00000111111111111111111100000000000000000000000000000000000000000000000000000000000000000000000000000000
00001111111111111111111000000000000000000000000000000000000000000000000000000000000000000000000000000000
00011111111111111111110000000000000000000000000000000000000000000000000000000000000000000000000000000000
00111111111111111111100000000000000000000000000000000000000000000000000000000000000000000000000000000000
01111111111111111111000000000000000000000000000000000000000000000000000000000000000000000000000000000000
11111111111111111110000000000000000000000000000000000000000000000000000000000000000000000000000000000000
```

2. Section off the grid in columns of eight. If any rows are not divisible by 8, add enough 0's to complete a column.



3. One row at a time, convert each group of eight binary digits to hex.

```
starting at position 49 ...

00111111 = 3F
11111111 = FF
11111111 = FF
11110000 = F0
```

4. Write the hex values for each row as a continuous string.

```
row 1, position 49 = 03FFFFFF00000
```

5. Repeat steps **3** through **4** for each row on the grid.

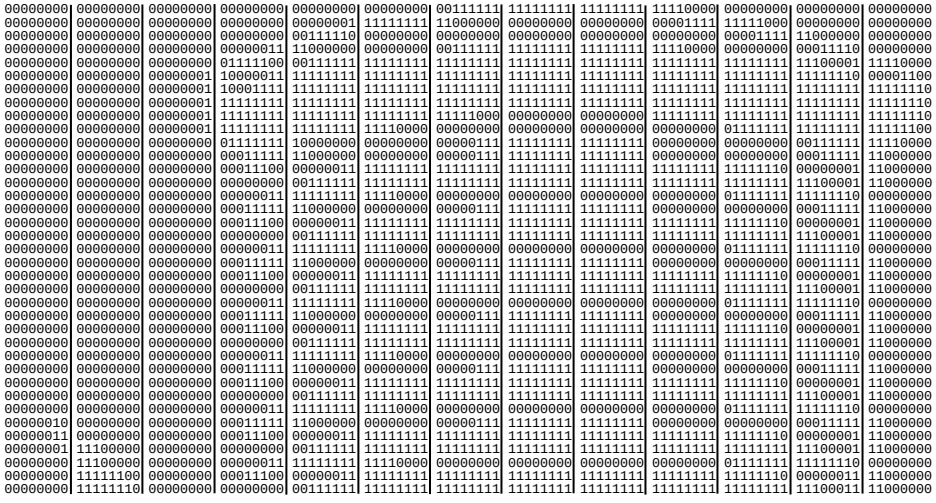
6. Insert the hex values in syntax format.

Using the Run Length Encoding Method

The following steps explain how to derive a run length character string from a bitmapped graphic.

Each square on the grid represents a dot. A black square indicates the dot is ON, and a white square indicates the dot is OFF.

Note: The following example shows "1" to indicate when a square is ON, and "0" to indicate when a square is OFF. You do not have to convert your dots when using the run length method.



1. Count the number of consecutive OFF or ON dots in a row. Write the number of consecutive dots in sequence for the first row on the grid. Write “ON” or “OFF” after each number to indicate ON or OFF dots.

```
(row 1, position 50) 26 on
(row 2, position 39) 11 on, 26 off, 9 on
(row 3, position 34) 5 on, 45 off, 6 on
```

2. Replace each number you have written with its corresponding code from the Dot to Run Length Encoding Chart provided in Appendix C, “Symbol Sets/Code Pages.” Be sure to use CAPITAL letters for black dots and lower-case letters for white dots.

```
26 on (Z)11 on (K), 26 off (z), 9 on (I)..
```

   If the number is greater than 26, write z, followed by the letter corresponding to the amount over 26. For example, to represent 45 off dots, write zs.

```
5 on (E), 45 off (zs), 6 on (F)..
```

3. Write the letter codes in sequence, uninterrupted, for each row.

```
(row 1,position 50) Z
(row 2,position 39) KzI
(row 3,position 34) EzsF
(row 4,position 30) DpZoD..
```

Note: If the end of the line specifies OFF dots (lower-case letters), the ending lower-case letters can be omitted. For example, uZFu can be written as uZF.

4. Repeat steps **1** through **5** for each row on the grid.

5. Insert the code values in syntax format.

Determining How to Store the Image

Once you have mapped out your graphic image, determine how to store it.

- Flash
- Volatile RAM
- Temporary Storage

Using Flash

Use flash memory when the graphic image is used by several formats, because the graphic only has to be sent once. This eliminates the need to send the graphic image repeatedly. See “Placing the Graphic in a Format,” for more information about using the graphic packet in a format.

Format flash memory before you can use it. From the Main Menu, select Setup, Flash Memory, then, Format Flash. The process takes a few minutes. **Graphics stored in flash memory are saved when the printer is turned off**. You may need to clear flash memory, refer to your *Operator’s Handbook*.

Using Volatile RAM

You should use RAM when the graphic image is used by several formats, because you only have to send the graphic image once. This eliminates the need to send the graphic image repeatedly. See “Placing the Graphic in a Format,” for more information about using the graphic packet in a format. Store graphics smaller than approximately 1/2 inch by 1/2 inch in printer RAM and reference by the graphic ID number.

Note: Graphics are stored in the format buffer and remain there until another graphic packet is sent or the printer is turned off.

Using Temporary Storage

You should use temporary storage when the graphic image is used only in one format or your graphic image is very large. Graphic data in temporary storage is held in the image buffer until the graphic is printed and then it is cleared from memory. Temporary graphics are also cleared from memory when you send a new batch or update batch. You can use the same graphic image multiple times on a format. Send the graphic image to the printer after the format to which it applies.

If a graphic is stored in temporary storage, do not place a graphic field in the format. This will cause an error. Instead, position the graphic image by using the row and column locations in the graphic packet header. Image memory (temporary storage) will accept a graphic packet 1218 rows long with 811 dots per row.

Creating a Graphic Packet

Your graphic packet can contain

- bitmapped fields (for bitmapped images)
- constant text fields
- lines
- boxes

Images using hex representation or run length encoding are bitmapped images. See “Designing Bitmapped Images” to design your bitmapped image.

Once you design your graphic image, you are ready to define a graphic packet. This packet generates the graphic image you use in a format.

Positioning the Graphic Image

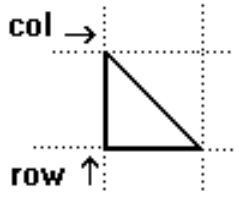
This section explains how to position the graphic image within a graphic packet header, a field of a graphic packet, or within a format.

Within the Graphic Packet Header

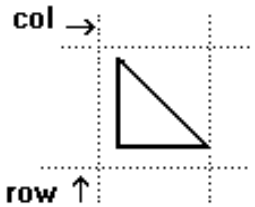
When you are using RAM, the row and column parameters in the graphic header are usually **0,0**, because placement is controlled by the graphic field in your format. This is especially true when designing a compliance label overlay.

When you are using temporary storage, these parameters control the placement of the graphic image on the supply.

The area enclosed within the dotted lines represents the graphic image starting at **0,0** (as defined in the graphic header).



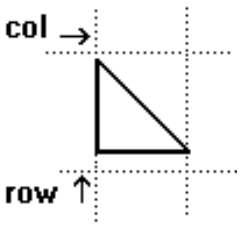
If you want a fixed amount of white space around your graphic image, use something other than 0 for row and/or column. The area enclosed within the dotted lines represents the graphic image starting at **0,0** with a fixed amount of white space (**10,10**) around the graphic image.



Within the Field

In a bitmap, constant text, line, or box field, the row and column parameters control where an individual field or bitmapped row begins in relation to the coordinates defined in the graphic header.

The bottom of the triangle in this example represents the first field of the graphic packet starting at **10,0**.



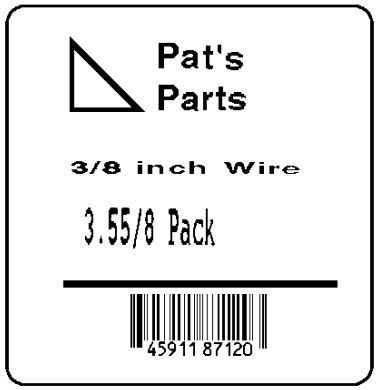
Within a Format

When you define the graphic field within your format, the *row* and *column* parameters represent where on the **format** to place the graphic image.

If you are doing a compliance label, these numbers are usually **0,0**, because your compliance label covers the entire supply. See “Placing the Graphic in a Format,” for a sample compliance label.

If you are placing a graphic (a logo, for example) within a certain area on your supply, enter the starting position (bottom left corner) of the graphic image.

This label shows the triangle “logo” beginning (the bottom left corner) at **400, 75** as defined in the graphic field.



Defining the Graphic Header

Every graphic packet must contain a graphic header. This is the first thing you enter. It identifies and provides important measurement and formatting information for the graphic. Bitmap, duplicate, next-bitmap, constant text, line, and box fields follow the graphic header, if they are used.

Syntax **`{G,graphID,action,device,units,row,col, mode,"name" |`**

G1. G Graphic Header.

G2. graphID Unique number from **1** to **999** to identify the graphic image. **1** is the default.

G3. action Use **A** to add the graphic to the printer.

G4. device Graphic storage device. **R** is the default.

F Flash (saved when the printer is turned off)
R Volatile RAM
T Temporary storage

G5. units Unit of measure. For bitmapped graphics, **G** (dots) is the default.

G6. row Distance between the *bottom* of the graphic image area and the first bitmap line. This is usually **0**, unless you want a fixed amount of white space around the graphic image. **10** is the default. See “Positioning the Graphic Image,” for more information.

Printer	Unit of Measure	Row or End Row	Column or End Column
9825 9855 (203 dpi)	English Metric 203 dpi Dots	0-1599 0-4061 0-3246	0-399 0-1013 0-810
9855 (300 dpi)	English Metric 300 dpi Dots	0-1199 0-3045 0-3597	0-399 0-1013 0-1197

G7. col Distance between the *left edge* of the graphic image area and the left edge of first bitmap line. This is usually **0**, unless you want a fixed amount of white space around the graphic image. **10** is the default. See “Positioning the Graphic Image,” for more information. Use the previous table for values.

G8. mode Imaging mode. Enter **0**.

G9. “name” Graphic name (optional), **0** to **8** characters, enclose within quotation marks. **“”** is the default.

Example **{G,99,A,R,G,0,0,0,"99Wire" |**

Adds a graphic image identified by number 99 to volatile RAM. The graphic uses dot measurement. The image will be placed according to the row and column parameters in the graphic field. The imaging mode is 0 and the image is called 99Wire.

Creating Bitmap Fields

This defines one row of dots, starting at a specific row and column within the graphic image. Each unique row of dots requires a bitmap field. Repeat a bitmap field using a duplicate field.

Syntax **B,row,col,algorithm,"data" |**

B1. B Bitmap Field.

B2. row Distance (in dots) from the graphic image's bottom margin to the bitmap line. **10** is the default. See the following table:

Printer	Unit of Measure	Row or End Row	Column or End Column
9825 9855 (203 dpi)	English Metric 203 dpi Dots	0-1599 0-4061 0-3246	0-399 0-1013 0-810
9855 (300 dpi)	English Metric 300 dpi Dots	0-1199 0-3045 0-3597	0-399 0-1013 0-1197

B3. col Distance (in dots) from the graphic image's left edge to the bitmap line. **10** is the default. Use the previous table for values.

B4. algorithm Coding method for bitmap data:

H Hex Representation
R Run Length Encoding

B5. "data" Character string made up of hex or run length encoding. Do not put spaces or any other character between the numbers. Range: **0** to **2710**. **2710** is the default.

Example **B,39,56,H,"3FFFFFF0" |**

Defines a bitmapped graphic field. The image begins 39 dots from the bottom and 56 dots from the left edge of the graphic area. Hex representation is used.

Creating Next-Bitmap Fields

This field uses the previous field's row and column locations. It allows you to use the bitmap or duplicate field data without having to recalculate row and column locations. This field represents one row of dots on the image.

Syntax **N,adjdir,adjamt,algorithm,"data" |**

N1. N Next-Bitmap Field.

N2. adjdir Increments or decrements the row count. Inserts the duplicate line after or before the current row. **0** is the default.

0 Increments (inserts after)
1 Decrements (inserts before)
For example:
```
B,50,35,R,"GsSsG" |
N,0,1,R,"DpZoD" |
```
prints a next-bitmap field on row 51 at column 35.

N3. adjamt Amount of row adjustment in dot rows. Using **0** overwrites the sameline. Range: **0** to **999**.

N4. algorithm Coding method for bitmap data:

H Hex Representation
R Run Length Encoding

N5. "data" Character string made up of hex or run length encoding. Do not put spaces or any other character between the hex numbers or run length code letters.
Range: **0** to **2710**. **2710** is the default.

Example **B,39,56,H,"3FFFFFF0" |**
N,0,1,H,"000000E00000" |

Defines a next-bitmap graphic field beginning on row 40. The row count increments by 1. Hex representation is used.

Creating Duplicate Fields

If a line of data is identical to a previous bitmap or next-bitmap field, the duplicate field allows you to repeat the dot sequence without retyping the data. A duplicate field represents one row of dots on the image.

Note: Duplicate fields are useful when you have a graphic with a lot of repetition.

Syntax **D,adjdir,adjamt,count |**

D1. D Duplicate Field.

D2. adjdir Increments or decrements the row count. Inserts the duplicate line after or before the current row. **0** is the default.
0 Increments (inserts after)
1 Decrements (inserts before)
For example:
`B,50,35,R,"GsSsG" |`
`D,0,20,2 |`
inserts row 50 again at row 70 and row 90. Rows 70 and 90 do not have to be defined later.

D3. adjamt Amount of row adjustment in dot rows. Range: **0** to **999**. **1** is the default. The above example adjusts the duplicate field to image on row 70 and 90 (adding 20 to the current row count).

D4. count Number of times to duplicate the line. Range: **0** to **999**.

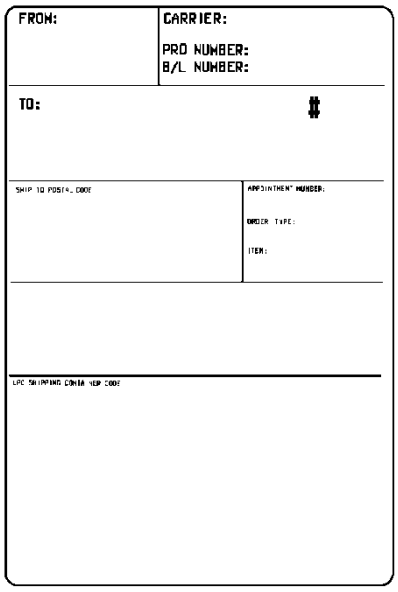
Example **B,117,24,H,"03FFFFFFFFFFFFFFFFFC" |**
D,0,1,2 |

Defines a duplicate field that is imaged after the bitmap line. This field duplicates the preceding bitmap line twice (at row 118 and 119).

You can use constant text, line, or box fields in a graphic packet to create a compliance label overlay. See Chapter 3, "Defining Fields," for more information about these fields.

Sample Compliance Graphic Packet

A sample compliance graphic packet is shown below.




```
{G,57,A,R,E,0,0,0,"OVERLAY" |
L,V,500,155,90,85,3 |
L,V,298,245,90,102,3 |
L,V,500,2,0,390,3 |
L,V,400,2,0,390,3 |
L,V,298,2,0,390,3 |
L,V,200,2,0,390,5 |
C,560,10,0,2,2,2,B,L,0,0,"FROM:",0 |
C,560,160,0,2,2,2,B,L,0,0,"CARRIER:",0 |
C,529,160,0,2,2,2,B,L,0,0,"PRO NUMBER:",0 |
C,511,160,0,2,2,2,B,L,0,0,"B/L NUMBER:",0 |
C,472,10,0,2,2,2,B,L,0,0,"TO:",0 |
C,387,10,0,2,1,1,B,L,0,0,"SHIP TO POSTAL CODE",0 |
C,391,250,0,2,1,1,B,L,0,0,"APPOINTMENT NUMBER:",0 |
C,358,250,0,2,1,1,B,L,0,0,"ORDER TYPE:",0 |
C,327,250,0,2,1,1,B,L,0,0,"ITEM:",0 |
C,190,8,0,2,1,1,B,L,0,0,"UPC SHIPPING CONTAINER CODE",0 |
C,548,6,0,2,1,1,B,L,0,0,"MONARCH PRINTERS",0 |
C,538,6,0,2,1,1,B,L,0,0,"170 MONARCH LANE",0 |
C,528,6,0,2,1,1,B,L,0,0,"P.O. BOX 608",0 |
C,518,6,0,2,1,1,B,L,0,0,"DAYTON, OHIO 45401",0 |
C,462,313,0,2,4,3,B,L,0,0,"#",0 | }
```

The sample compliance label overlay was created with this packet, using the format provided in “Placing the Graphic in a Format.”

Sample Hex Graphic Packet

```
{G,99,A,R,G,0,0,0,"99WIRE" |
B,39,48,H,"3FFFFFF0" |
B,40,32,H,"01FFC000000FF8" |
B,41,32,H,"3E00000000000FC0" |
B,42,24,H,"03C0003FFFFF0000F" |
B,43,24,H,"7C3FFFFFFFFFFFE1F0 |
B,44,16,H,"0183FFFFFFFFFFFFFF06" |
B,45,16,H,"018FFFFFFFFFFFFFFFFE" |
B,46,16,H,"01FFFFFFFFFFFFFFFFFE" |
B,47,16,H,"01FFFFF80001FFFFFFFE" |
B,48,16,H,"01FFFFF0000000007FFFC" |
B,49,24,H,"7F800007FFFF00003FF0" |
B,50,24,H,"1FC00007FFFF00001FC0" |
D,0,4,4 |
B,51,24,H,"1C03FFFFFFFFFFE01C0" |
D,0,4,4 |
B,52,32,H,"3FFFFFFFFFFFFE1C0" |
D,0,4,4 |
B,53,24,H,"03FFF0000000007FFE" |
D,0,4,4 |
B,70,0,H,"0400001FC00007FFFF00001FC0" |
B,71,0,H,"0600001C03FFFFFFFFFFE01C0" |
B,72,0,H,"030000003FFFFFFFFFFFFE1C0" |
B,73,0,H,"01000003FFF0000000007FFE" |
B,74,8,H,"FC001C03FFFFFFFFFFFE00C0" |
B,75,8,H,"FE00003FFFFFFFFFFFFFE0C0" |
B,76,8,H,"1FF803FFF0000000007FFE" |
B,77,8,H,"0FFFCFFC00000000000001C0" |
B,78,16,H,"FFDF000FFFFFFFFF8003C0" |
B,79,16,H,"7FFFC00007FFFF00001FC0" |
B,80,24,H,"1C03FFFFFFFFFFE01C0" |
D,0,4,4 |
B,81,32,H,"3FFFFFFFFFFFFFE1C0" |
D,0,4,4 |
B,82,24,H,"03FFF0000000007FFE" |
D,0,4,3 |
B,83,24,H,"1FC00007FFFF00001FC0" |
D,0,4,3 |
B,98,24,H,"03FFFFFFFFFFFFFF0" |
B,99,24,H,"07FFFFFFFFFFFFFFC" |
B,100,24,H,"1FF9FFFFFFFFFFFF" |
B,101,24,H,"3FFE0007FFFF8000FF80" |
B,102,24,H,"391E0027FFFF803FFFC0" |
B,103,24,H,"1C7FFFFFFFFFFFFFFC0" |
B,104,24,H,"1FC1FFFFFFFFFFF1FC0" |
B,105,24,H,"0FFDFFFFFFFFFE0FF" |
B,106,24,H,"FFFFFFFFFFFFFFF8" |
B,107,32,H,"3FFFFFFFFFFFFE0" |
B,108,32,H,"03FFFFFFFFFFF" |
B,109,48,H,"07FFFF80" |
D,0,1,2 |
B,111,48,H,"FFFFFFFF" |
B,112,32,H,"FFFF00000000FFE0" |
B,113,24,H,"078000FFFFFFFF001F" |
B,114,24,H,"78FFFFFFFFFFFFFE060" |
B,115,16,H,"0187FFFFFFFFFFFFFC18" |
B,116,16,H,"027FFFFFFFFFFFFFFFF2" |
B,117,16,H,"03FFFFFFFFFFFFFFFFFC" |
D,0,1,2 |
B,120,16,H,"01FFFFFFFFFFFFFFFFF8" |
B,121,24,H,"FEFFFFFFFFFFFFFFFE0" |
B,122,24,H,"07FFFFFFFFFFFFFFC" |
B,123,32,H,"FFFFFFFFFFFFFC0" |
B,124,32,H,"01FFFFFFFFF8" | }
```

```
{G,99,A,R,G,0,0,0,"99WIRE" |
B,39,50,R,"Z" |
B,40,39,R,"KzI" |
B,41,34,R,"EzsF" |
B,42,30,R,"DpZoD" |
B,43,25,R,"EdZZEdE" |
B,44,23,R,"BeZZMeB" |
B,45,23,R,"BcZZW" |
B,46,23,R,"ZZZA" |
B,47,23,R,"ZDsZE" |
B,48,24,R,"TzkU" |
B,49,25,R,"HtRqJ" |
B,50,27,R,"GsSsG" |
D,0,4,4 |
B,51,27,R,"ChZWgC" |
D,0,4,4 |
B,52,34,R,"ZZEdC" |
D,0,4,4 |
B,53,30,R,"NzkN" |
D,0,4,4 |
B,70,5,R,"AuGsSsG" |
B,71,5,R,"BtChZWgC" |
B,72,6,R,"DxZZEdC" |
B,73,7,R,"CtNzkN" |
B,74,8,R,"FmChZWhC" |
B,75,8,R,"GsZZEdC" |
B,76,11,R,"JiNzkN" |
B,77,12,R,"NbJzzeC" |
B,78,16,R,"JaElZKmD" |
B,79,17,R,"QsSsG" |
B,80,27,R,"ChZWgC" |
D,0,4,4 |
B,81,34,R,"ZZEdC" |
D,0,4,4 |
B,82,30,R,"NzkN" |
D,0,4,4 |
B,83,27,R,"GsSsG" |
D,0,4,4 |
B,98,30,R,"ZZJ" |
B,99,29,R,"ZZM" |
B,100,27,R,"JbZZE" |
B,101,26,R,"MnToI" |
B,102,26,R,"CbHnTiP" |
B,103,27,R,"CcZZC" |
B,104,27,R,"GeZWcG" |
B,105,28,R,"JaZReH" |
B,106,32,R,"ZZI" |
B,107,34,R,"ZZE" |
B,108,38,R,"ZQ" |
B,109,53,R,"T" |
D,0,1,2 |
B,111,48,R,"ZF" |
B,112,33,R,"PzfK" |
B,113,29,R,"CpZBoE" |
B,114,25,R,"DcZZGfB" |
B,115,23,R,"BdZZMeB" |
B,116,22,R,"AbZZVbA" |
B,117,22,R,"ZZZB" |
D,0,1,2 |
B,120,23,R,"ZZZ" |
B,121,25,R,"ZZV" |
B,122,29,R,"ZZM" |
B,123,32,R,"ZZF" |
B,124,39,R,"ZT" | }
```

Placing the Graphic in a Format

To include a graphic within a format:

1. Design the graphic image as shown in "Designing Bitmapped Images."
2. If you are using RAM, place a graphic field in the format file to reference the graphic. See the following section, "Defining the Graphic Field," for more information.

Note: If you are using temporary storage, you do not need a graphic field in your format to reference the graphic image.

3. Download all the necessary packets (check digit, format, etc.).
4. Send the graphic file to the printer, if you have not already done so. See "Creating a Graphic Packet" for more information.

Defining the Graphic Field

The graphic field in a format references the graphic image by the graphID in the graphic header. This field is required only if the graphic will be stored in RAM.

Syntax **`G,graphID,row,col,mode,rotation |`**

G1. G Graphic Field.

G2. graphID Unique number from **1** to **999** to identify the graphic image. **1** is the default.

G3. row Distance between the *bottom* of the print area on the supply to the bottom of the graphic image. **10** is the default. Measured in selected units. See the following table.

Printer	Unit of Measure	Row or End Row	Column or End Column
9825 9855 (203 dpi)	English Metric 203 dpi Dots	0-1599 0-4061 0-3246	0-399 0-1013 0-810
9855 (300 dpi)	English Metric 300 dpi Dots	0-1199 0-3045 0-3597	0-399 0-1013 0-1197

The row specified in the constant text, bitmap, line, or box field is added to the *row* value above to determine the actual position in the format.

G4. column Distance between the *left edge* of the print area on the supply and the left edge of the graphic. Measured in selected units. **10** is the default. Use the previous table for values. The column specified in the constant text, bitmap, line, or box field is added to the *col* value above to determine the actual position in the format.

G5. mode Imaging mode. Enter **0**.

G6. rotation The orientation of the graphic on the supply. Enter **0**.

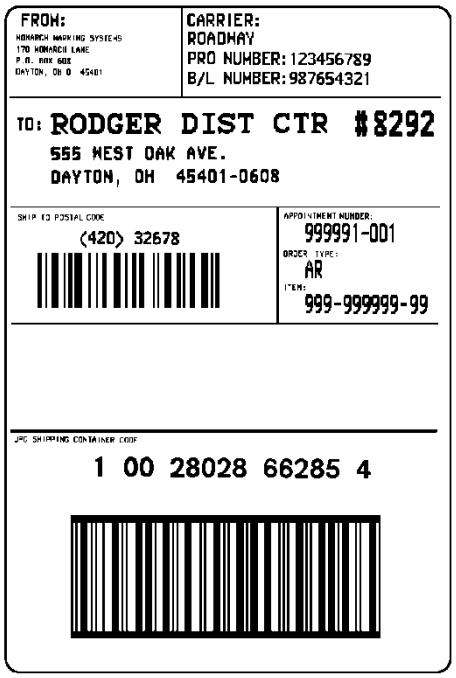
Example **`G,57,0,0,0,0 |`**

Defines a graphic field that is identified by the number 57. The image begins at 0,0. The imaging mode is 0 and there is no rotation.

Sample Compliance Label

This sample format packet uses the graphic packet in “Creating a Graphic Packet.”

```
{F,1,A,R,E,600,400,"RDCI" |
G,57,0,0,0,0 |
T,1,15,V,529,252,0,2,2,2,B,L,0,0,0 |
T,2,15,V,511,252,0,2,2,2,B,L,0,0,0 |
B,3,13,V,311,28,8,4,50,8,L,0 |
B,4,14,V,17,60,50,5,110,8,L,0 |
T,5,30,V,161,080,0,3,1,1,B,L,0,0,0 |
T,6,15,V,467,40,4,1,2,2,B,L,0,0,0 |
T,7,10,V,462,330,6,2,4,3,B,L,0,0,0 |
T,8,20,V,545,160,0,2,2,2,B,L,0,0,0 |
T,9,30,V,446,40,4,2,2,2,B,L,0,0,0 |
T,10,30,V,426,40,4,2,2,2,B,L,0,0,0 |
T,11,30,V,406,40,4,2,2,2,B,L,0,0,0 |
T,12,20,V,368,270,0,2,3,2,B,L,0,0,0 |
T,13,5,V,335,270,0,2,3,2,B,L,0,0,0 |
T,14,15,V,304,270,0,2,3,2,B,L,0,0,0 |
T,15,15,V,366,65,0,2,2,2,B,L,0,0,0 |
R,1,"(420)" | }
```



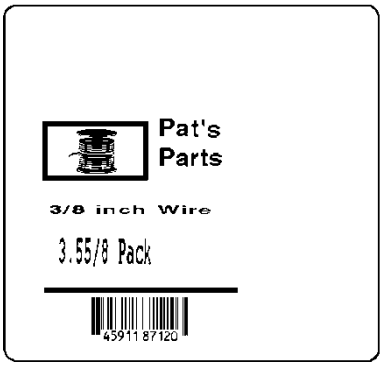
Sample Batch Packet

```
{B,1,N,1 |
1,"123456789" |
2,"987654321" |
3,"42032678" |
4,"10028028662854" |
5,"1 00 28028 66285 4" |
6,"RODGER DIST CTR" |
7,"8292" |
8,"BROADWAY" |
9,"555 WEST OAK AVE." |
10,"DAYTON, OH 45401-0608" |
11," " |
12,"999991-001" |
13,"AR" |
14,"999-999999-99" |
15,"32678" | }
```

Sample Bitmap Graphic Image

The following format shows the graphic packets (hex and run length) in a sample format.

```
{F,2,A,R,E,400,400,"FMT2" |
G,99,227,35,0,0 |
Q,240,15,300,125,10," " |
T,1,5,V,285,137,0,10,2,2,B,L,0,0,0 |
T,2,5,V,255,137,0,10,2,2,B,L,0,0,0 |
T,3,15,V,180,25,0,10,1,2,B,L,0,0,0 |
T,4,15,V,121,35,0,1,3,1,B,L,0,0,0 |
L,S,94,15,94,235,10,"" |
B,5,12,F,50,65,1,2,40,1,L,0 | }
```



Sample Batch Packet

```
{B,2,N,1 |
1,"Pat's" |
2,"Parts" |
3,"3/8 inch Wire" |
4,"3.55/8 Pack" |
5,"345911871209" | }
```

PRINTING

6

This chapter describes how to

- download files to the printer
- define the batch header, batch control, and batch data files
- create DOS batch files.

This chapter also lists some special printing considerations.

Turn on the printer and make sure it is ready to receive data before you download. See your host's documentation, system administrator, or "Downloading Methods" for information on ways to download.

When downloading, send your packets in this order:

1. Memory configuration packet (M)
2. Configuration packets (A-X)
3. Any of the following:
   - Check digit packets (see Chapter 4)
   - Format packets (see Chapter 3)
   - Graphic packets (see Chapter 5)
4. Batch data (see "Defining the Batch Header")

Downloading Files

To download from a PC:

1. Check that the PC and the printer are connected.
2. Check that communications have been established between the PC and the printer.
3. Send the communication settings packet to select the printer's communication settings. See "Defining the Communication Settings Packet" in Chapter 2 for more information (only used for serial communication). If you change the printer's communication settings, make sure they match those at the host before sending any packets to the printer.
4. Type this command at the DOS prompt:

   `COPY LABEL1.FMT COM1` Transmits a file called "LABEL1.FMT" to COM1.

   `COPY LABEL1.BCH COM1` Transmits a batch called "LABEL1.BCH" to COM1.

If you use the COPY command to download your formats, set flow control to DTR (not XON/XOFF). Also, do not use the MS-DOS prompt from inside Windows, because you will get a framing error.

Refer to the *Operator's Handbook* or keyboard's *Operating Instructions* for offline data entry and more printing information. We do not recommend entering more than 100 characters in offline mode.

About Batch Packets (Print Jobs)

A batch packet containing batch data is required for all print jobs.

Batch data is the actual information printed on the supply. Batch data fills in the format's text, bar code, and non-printable text fields.

A batch packet consists of the following:

batch header identifies the format and how many labels to print. For example: **{B,1,N,1|**

batch control defines the print job. For example: **E,0,1,1,1,3,0,0,0,1|**

batch data (optional) defines the information printed on the label. For example: **1,"Size 5" | }**

Label Design software may create this packet for you.

To record batch data, make a copy of the worksheet in Appendix D, "Format Design Tools."

Defining the Batch Header

The batch header specifies which format the batch uses and how many labels to print.

Syntax **{B,format#,N/U,quantity |**

B1. B	Batch Header.
B2. format#	Format number (**1** to **999**) to use. **1** is the default.
B3. N/U	Controls how image is generated. **N** is the default. **N** New. Erase image and re-image all fields using online data. Any missing fields will be blank. **U** Update last image with one or more fields. All other fields remain the same as the last queued batch.
B4. quantity	Quantity to print (0 to 32000). **1** is the default. Using **0** pre-images the field to reduce the imaging time for labels. See "Batch Quantity Zero Method" for more information.

Example **{B,1,N,1 |**

Defines a batch header that uses format #1 and reimages all fields using the online data. One label is printed with this batch.

Defining the Batch Control Field

The batch header must precede this field. The batch control field defines the print job and applies only to the batch that immediately follows.

Syntax **`E,feed_mode,batch_sep,print_mult,multi_part,cut_type, cut_mult,ver_mode,cable_det |`**

E1. E Batch Control Field.

E2. feed_mode Feed Mode. **0** is the default. Options:

- **0** Continuous Feed
- **1** On-Demand

E3. batch_sep Batch Separator (striped label in between batches). **0** is the default. Options:

- **0** Does not print a separator
- **1** Prints a separator
- **2** Double-length separator – prints 2 tags (9855)

Note: Do not use batch separators with continuous (non-indexed) supply. If using a stacker, the batch separator is always 3.66 inches long.

E4. print_mult Number of tags (**1** to **999**) with the same image. **1** is the default.

E5. multi_part Number of identical parts on one tag (**1** to **5**). **1** is the default.

E6. cut_type Enables or disables the knife. Not all the printers support a knife. See the following chart for more information. **0** (does not cut) is the default. Options:

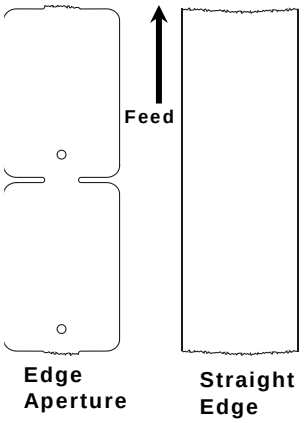
- **0** Does not cut (default)
- **1** Cuts before, during, and after last tag - printed tag(s) left between printhead & knife.
- **2** Cuts in strips, not each tag - printed tag(s) left between printhead & knife.
- **3** Cuts before, during, and after last tag - no printed tags left between printhead & knife.
- **4** Does not cut before first tag, cuts each tag and after the last tag - printed tag(s) left between printhead & knife.
- **5** Cuts in strips, not each tag - no printed tags left between printhead & knife.

				Recommended Settings for optimal performance with:			
Description of cut mode operation				Straight Edge Tags		Edge Aperture Tags	
Cut Mode	Cut Before first tag in Batch?	Cut Between Tags?	Cut After Batch?	Extended backfeed	Verifier Overstrike	Extended backfeed	Verifier Overstrike
0	No	No	No	Yes	Yes	No	No
1	Yes	Yes	Yes*	Yes	Yes	Yes	Yes
2	Yes	No (Feeds strips)	Yes*	Yes	Yes	No	No
3	Yes	Yes	Yes**	No	Yes	Yes	Yes
4	No	Yes	Yes*	Yes	Yes	No	Yes
5	Yes	No (Feeds strips)	Yes**	Yes	Yes	No	No

* The last tag in the batch is queued to be cut once it reaches the knife; however, there may be printed tags left between the printhead and the knife. The user must press **Feed/Cut** or send another batch to feed the last tag out far enough to be cut.

** The printer feeds the last tag in the batch out far enough to be cut. No user intervention is required to cut the last tag.

Note: Using "overstrike/continue" as the Error Action minimizes the number of RFID tags left between the printhead and the knife. To use the least amount of RFID tags, set overstrike to five.



E7. cut_mult Number of tags to print before cutting. A cut multiple of one cuts after each tag. The range is 0 to 32,000. **0** is the default. The cut multiple is a multiple of the print quantity. If the cut multiple is three and the print quantity is 16, then five sets of three tags and one set of one tag is produced.

Note: The last tag in the batch is always cut, regardless of the multiple.

E8. ver_mode Verifier Mode. Enables or disables the verifier. For more information about enabling the verifier, refer to the Verifiers Operating Instructions. Not all the printers support a verifier. **0** is the default. Options:

0 Disable verifier - not using a verifier
1 Enable verifier

E9. cable_det Verifier cable detect. The printer can be set to detect when a verifiers cable is disconnected. For more information about connecting the verifiers cables, refer to the Verifiers Operating Instructions. **0** is the default. Options:

0 The printer does not detect when a cable is disconnected (default)
1 I/O cable is disconnected
2 I/O and/or data cables are disconnected

Example **E,0,1,4,2,1,4,1,2 |**

Defines a batch control field. Continuous feed mode is used and a separator prints between batches. Four tags have the same image and there are two identical parts on one tag. The knife cuts after every four tags. A verifier is enabled and the printer detects when either the I/O or data cables are disconnected.

Defining Batch Data Fields

Batch data fields should be sent in field number order. Use continuation fields for large amounts of data. If you are using **N** (New) in the batch header, you must list all fields with your data in sequence. If you are using **U**, you need to list only those fields and data that changes from the last printed batch.

Syntax **field#,"data string" |**
C,"continuation" |

field# Identifies the text, bar code, or non-printable text field in which to insert the following data. Range: **1** to **999**.

"*data string*" Provides the actual information to appear in fields. Enclose in quotation marks. Length: **0** to **2710** characters. **“”** is the default.

C Identifies information to be appended to the data string. This parameter is optional.

"*continuation*" Provides the actual information to be added to the batch packet. Enclose in quotation marks. Use this option to break up longer fields. Length: **0** to **2710** characters. **“”** is the default. This parameter is optional.

Example **1,"Size 12" |**
2,"" |
3,"Blue" |
C,"and this would be appended." |

Defines a batch data field. “Size 12" prints in field #1, a blank line appears in field #2, ”Blue and this would be appended" prints in field #3.

Merged or Sub-Fields

If a field is completely filled by data copied from other fields, use quotation marks without spaces between them for the “*data string*” parameter.

Incrementing Fields

In incrementing fields, the first number in the sequence must contain the same number of digits as the highest number to be counted. For example, to increment the numbers in a field from **1** to **999**, enter the starting number in the batch as **001**.

Using Gen2 RFID Data (9855 RFMP Printer Only)

The 9855 RFMP printer supports C1Gen2 RFID data, which contains these fields:

- EPC Data — The printer accepts EPC data following the guidelines in the *EPCglobal™ Tag Data Standards* Specification, which conforms to the *EPC Radio-Frequency Identity Protocols Class 1 Generation 2 UHF RFID Protocol for Communications at 860-960MHz Standards* (RFID Air Interface protocol). Refer to the *EPC Specification* to create valid EPC data.
- User Memory — Many different RFID supplies (tags) are available and the amount of programmable user memory varies with the chip embedded in the tag. Depending on your tag type, all memory fields may not be available. Refer to the *Monarch® RFID Printer Setup Utility* (http://www.servisource1.com/prnutil/rfidsetup/) for details about the available user memory for each chip.
- TID Field Tag Identifier — A portion of the TID field contains a unique number that identifies the manufacturer of the tag. This field is readable and writable.
- Access Password — Controls when new data can be written to a field.
- Kill Password — Sets a tag up to be inoperable.
- Lock Code — Contains the locking method for each field. There are four locking methods:

Value	EPC Lock	Description
0	No lock (unsecure)	The selected memory fields (EPC, user memory, access password and kill password) are readable and writable. The tag can be programmed multiple times.
1	Permalock (permanently unsecure)	Permanently locked in a writable state. The tag can be programmed multiple times. User memory and kill password are also readable in this state.
2	Password lock (secure)	Requires the access password to rewrite the selected memory fields. The tag can be programmed multiple times *with the password*. EPC and user memory are writable with password and readable. Access password is never readable. Kill password is only writable with password.
3	Permalock and Password lock (permanently locked)	Never rewritable, but always readable. The tag can never be rewritten, once locked. EPC and user memory are never rewritable, but are readable. Access password and kill password are never readable or rewritable.

Note: The EPC field is always readable, no matter what locking method is assigned.

To use Gen2 data, modify the RFID Field's batch data.

Syntax **field#,"EPC_data~028" |**
C,"User_Mem~028" |
C,"TID_Mem~028" |
C,"Acs_Pwd~028" |
C,"Kill_Pwd~028" |
C,"Lock_Code" |

field# Identifies the RFID Data Field number for the following data. Range: **1** to **999**. **1** is the default.

"EPC_data~028" EPC data. Enclose in quotation marks. To create EPC data, follow the guidelines in the *EPC Global Generation 1 Tag Data Standards Specification*. The data **must** be in ASCII Hex format specified in the RFID Data Field (*data_type*). The data must end with the ASCII field separator (decimal 028).

Note: Do not enter more characters than the available EPC data.

Using version 7.1 or greater firmware, the printer increments EPC data.

C,"User_Mem~028" User Memory. Enclose in quotation marks. The amount of programmable user memory varies with the tag types. Refer to the Monarch® RFID Printer Setup Utility for details about the available user memory for each chip. The printer programs up to 512-bits of data (128 ASCII Hex characters). The data must be ASCII Hex characters and end with the ASCII field separator (decimal 028).

C,"TID_Mem~028" TID Memory. Reserved for future use. Only include the field separator (decimal 028) in this field.

C,"Acs_Pwd~028" Access Password. This must be 8 ASCII Hex characters. No password is assigned if this field is left blank. The data must end with the ASCII field separator (decimal 028).

C,"Kill_Pwd~028" Kill Password. This must be 8 ASCII Hex characters. No password is assigned if this field is left blank. The data must end with the ASCII field separator (decimal 028).

C,"Lock_Code" Five-digit locking method for each field in this order:
EPC Data, User Memory, TID, Access password, and Kill password.
Use 0 for the reserved field. Locking options:

0 No Lock (unsecure)
1 Permalock (permanently unsecure)
2 Password lock (secure)
3 Permalock & password lock (permanently locked)

Notes: Use only one locking method per field.
The printer is not capable of unlocking a field. Depending on the locking method used for each field, the EPC data *may* be programmable by sending the access password with the batch data. See "Sample RFID Data Fields" in Appendix A for more information.

Do not use the ASCII file separator character (1C) in RFID batch data.

Example
```
F,2,A,R,E,400,400,"PERMLOCK" |
X,1,100,0 |
B,2,N,1 |
1,"313233343536373831323334~028" |
C,"ABCDEF~028" |
C,"~028" |
C,"73737373~028" |
C,"CAD01234~028" |
C,"11001" | }
```

The EPC data is 313233343536373831323334, the user memory data is ABCDEF, the access password is 73737373, and the kill password is CAD01234. Selects permalock (1) as the locking method for the EPC, user memory, and kill field. Selects no lock (0) for the access password field. The EPC, user memory, and kill fields are **permanently** readable/writable.

Entering Batch Data for QR Code

QR Code requires certain parameters at the beginning of all batch data.

Syntax **"error_cor mask# data_input,char"**

error_cor Level of error correction. Some damaged or dirty bar codes may still be scannable if the error correction is high enough. Options:

H Ultra high reliability level
Q High reliability level
M Standard level
L High density level (more data in the bar code)

Note: As you increase the error correction level, the maximum number of characters (in the field) decreases.

mask# Mask number. Undefined. Use **0**.

data_input Type of data input. Options:

A Automatic
M Manual

Note: When using **A**utomatic, do not end with a comma or specify the next parameter for *char* (type of characters).

char Type of characters. This parameter is only required when *data_input* is **M**anual. Options:

A Alphanumeric
B Binary
K Kanji
N Numeric

Note: In binary mode, the number of characters must be represented by the 4-digit number in decimal.

Example

```
{F,1,A,R,E,200,200,"QRURL" |
B,2,200,V,75,50,36,0,100,2,B,0 |  }
{B,1,N,1 |
2,"LA testdatainAutomode0987654321" | }
```

Defines the following batch data for the QR Code: the error correction level is L, which provides high density (more data in bar code). Leave the mask number blank. The data input mode is Automatic and the data is testdatainAutomode0987654321.

Example **1,"HM,N0123456789012345" |**

Defines the following batch data for the QR Code: The error correction level is H, which provides very high reliability. Leave the mask number blank. The data input mode is Manual. The type of characters are Numeric and the data is 0123456789012345.

Structured Append Mode

QR Code offers a mode called structured append (or concatenated) that allows you to collect data from multiple QR Code symbols and use that data elsewhere. For example, the components of a sub-assembly can have individual QR Codes and the QR Code for the entire assembly contains all the data from the individual codes. This mode also requires certain parameters at the beginning of all batch data.

Syntax **"mode_id code# #of_div parity, error_cor mask# data_input char"**

mode_id — Mode identifier. Use **D** to indicate the structured append (or concatenated) mode.

code# — Code number of the individual symbol in the concatenated set. You must use a two-digit number in decimal.

#of_div — Total number of symbols in this concatenated set. You must use a two-digit number in decimal.

parity — Parity byte. You must use a two-digit number in hexadecimal. There is no standard parity byte.

error_cor — Level of error correction. Some damaged bar codes may still be scannable if the error correction is high enough. Options:

- **H** Ultra high reliability level
- **Q** High reliability level
- **M** Standard level
- **L** High density level

Note: As you increase the error correction level, the maximum number of characters (in the field) decreases.

mask# — Mask number. Undefined. Leave blank or use **0**.

data_input — Type of data input. When using **A**utomatic, do not specify the next parameter for *char* (type of characters). Options:

- **A** Automatic
- **M** Manual

char — Type of characters. This parameter is only required when *data_input* is **M**anual. Options:

- **A** Alphanumeric
- **B** Binary
- **K** Kanji
- **N** Numeric

Note: In binary mode, the number of characters must be represented by the 4-digit number in decimal.

Example **1,"D0205E9,Q0A," |**
C,"B006qrcode," | }

Defines the structured append mode (D) for QR Code. This is symbol (02) of a concatenated set containing (05) symbols. The parity byte is E9. The error correction level is Q, which provides a high reliability. Use 0 for the mask number. The data input mode is Automatic. The type of characters are binary (B) and there will be six (06) data characters (qrcode).

Structured Append QR Code Packet

```
{F,2,A,R,E,200,200,"QRCODE2" |
B,1,200,V,50,50,36,0,100,2,B,0 | }
{B,2,N,1 | 1,"D0202E9,Q0A" |
C,"0123456789ABCD+__âôû
~129~064~159~252~224~064" | }
```

Using Special Characters in Batch Data

There are two ways to specify special characters in batch data:

- Place a tilde (~) before each character
- Use a tilde with the decimal ASCII equivalent

For example, you can use “” or ~034 to print the “ character in your batch data; otherwise, the tilde characters are ignored. You can also use ~XXX where XXX is the decimal equivalent of an unprintable character.

Sample Batch Data with Special Characters

{B,1,N,1 |	Decimal Character	What Prints
1,"123~034456789" |	~034 is “	123"456789
2,"~094983~’126LG4451" |	~094 is ^~126 is ~	^983~’LG4451

Special 9855 Printing Considerations

Keep in mind the following special printing considerations when using a 9855 printer.

Print Speed	Printing	Printhead Density	Knife	Peel Mode	Verifier
2.5/4.0/6.0 ips	Direct Transfer	203/300 dpi	supported	supported	supported
8.0 ips	Direct Transfer	203/300 dpi	not supported	supported	supported
10.0 ips	Direct Transfer	203 dpi only	not supported	not supported	supported
12.0 ips	Direct Transfer	203 dpi only	not supported	not supported	supported

Notes: The minimum label feed length is 0.75 inches using 8, 10, or 12 ips printing.
94x5 emulation is not supported using 300 dpi.
The maximum supply and image length with the optional 300 dpi printhead is 12.0 inches (305 mm).
The recommended print speed using linerless supplies is 2.5 or 4.0 ips.
Contact your Sales Representative for supply requirements in high temperature and high humidity environments.

Serial Bar Code Printing Information

Keep in mind the following serial bar code printing information when using a 9855 printer.

Print Speed	Printhead Density	Minimum Bar Code Narrow Element
2.5 ips	203/300 dpi	Less than 3 dots
4.0 ips	203 dpi	3 dots
6.0/8.0/10.0 ips	203 dpi	4 dots or more

Downloading Methods

You can download the format and batch data using one of three methods: sequential, batch, and batch quantity zero.

Sequential Method

Using the sequential method, send all format and batch data at one time. Use this method when your application does not require operator intervention to input data. All data is sent down at one time, and the printer then images each field. As soon as the last field is imaged, your labels begin to print.

Example
```
{Format}
{Batch Packet}
```

Batch Method

This is similar to the sequential method, but it is used when you want to send multiple batches. All data for the first batch is sent at one time, and the printer then images each field. As soon as the last field for the first batch is imaged, labels begin to print. This process is repeated for each subsequent batch.

Example
```
{Format}
{Batch Packet}
{Batch Packet}
```

Batch Quantity Zero Method

You may use the batch quantity zero method when your application requires operator intervention to enter data. While the operator is entering data, the previous field is sent with a batch quantity of zero. The printer images the field, but does not print it. After the operator enters the data for the last field, the batch quantity can be specified. The last remaining field is imaged, and the label prints almost immediately.

To use the batch quantity zero method:

1. Send the format and a batch header in one file. The first time you send the batch header, use the parameter **N** (new batch), and the parameter **0** for (zero quantity). This ensures the label is properly positioned.

   The printer images constant text, line, and box fields, but does not print them.

2. Input data for each field, and send it with a batch header using the parameter **U** (batch update) and a quantity of zero. When the printer receives the data, it immediately images the field, but does not print it.

   At this time, the printer is imaging all associated fields, including fields that copy from other fields.

3. Repeat step 2 for each field except the last one.

4. For the last field, input data and send a batch header with the quantity of labels you want printed. When the printer receives input for the last field, it immediately prints the labels. See “Reducing Imaging Time” in Chapter 9 for an example using the batch quantity zero method.

Modifying Formats

The optional entry method is a quick way to modify your format fields, check digit fields and configuration packets.

Optional Entry Method

This method enables you to reset only the parameters you want to change. Commas act as placeholders for unchanged parameters. The optional entry method reduces file size and increases the speed at which files are sent to the printer.

Creating DOS Batch Files for Downloading

If you are downloading from an MS-DOS system, you can create batch files to set communication values and download formats. It is a good idea to create a subdirectory to hold your format files.

Here is a DOS batch file that sets a serial port, changes to a subdirectory, and downloads a check digit file, format file, and batch data file.

```
MODE COM1: 9600,N,8,1,|
CD\MONARCH
COPY LABEL1.CDS COM1
COPY LABEL1.FMT COM1
COPY LABEL1.BCH COM1
```

Refer to your DOS manual for more information on creating batch files.

STATUS POLLING

7

This chapter explains how to use status polling.

There are two types of Status Polling:

- Inquiry Request—information about the readiness of the printer.
- Job Request—information about the current (or last received) job downloaded to the printer.

Inquiry Request (ENQ)

An ENQ character acts as a request for printer status information. You can send an ENQ in front of, in the middle of, or immediately following any packet downloaded to the printer. An ENQ is a command that can be executed as part of a packet or sent on its own (using a communications program). An ENQ is processed immediately. The ENQ character is user defined.

The ENQ character does not appear as a visible character; however, we are representing the ENQ character as ENQ.

Inquiry Response

Printer status is returned to the host in a 3-byte (3-character) sequence. The first byte is the non-printable user-defined ENQ character, which is not visible on the response. The second and third bytes are printer status codes. See the ENQ Reference Tables for the meaning of bytes 2 and 3.

Example: ENQ**AB**

The status codes (A and B in this case) are ASCII equivalents to the hexadecimal bits that represent the various types of status responses. This response indicates that the printer is online (Character A) and that there is a stock fault (Character B).

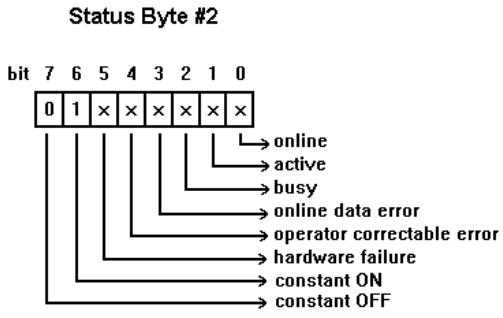
Example: ENQ**??**

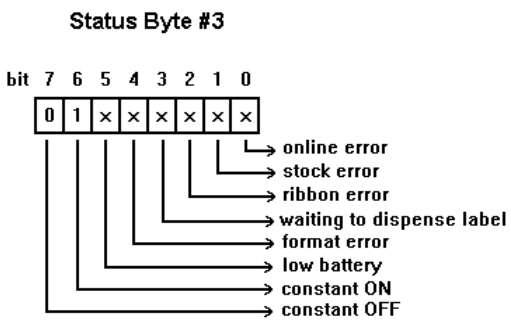
Indicates that this is the first ENQ response since the printer was turned on. Send another ENQ immediately to receive the printer's status.

Example: ENQ@@

Indicates the printer is offline.

The following graphics can be used as a quick reference for the Status of Byte #2 and Byte #3. Byte #1 is the non-printable user-defined ENQ character.





ENQ Reference Table - Byte #2

Char	Const. OFF	Const. ON	Comp. Failure	Corr. Error	Online Data Error	Busy	Active	Online
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
@	0	1	0	0	0	0	0	0
A	0	1	0	0	0	0	0	1
B	0	1	0	0	0	0	1	0
C	0	1	0	0	0	0	1	1
D	0	1	0	0	0	1	0	0
E	0	1	0	0	0	1	0	1
F	0	1	0	0	0	1	1	0
G	0	1	0	0	0	1	1	1
H	0	1	0	0	1	0	0	0
I	0	1	0	0	1	0	0	1
J	0	1	0	0	1	0	1	0
K	0	1	0	0	1	0	1	1
L	0	1	0	0	1	1	0	0
M	0	1	0	0	1	1	0	1
N	0	1	0	0	1	1	1	0
O	0	1	0	0	1	1	1	1
P	0	1	0	1	0	0	0	0
Q	0	1	0	1	0	0	0	1
R	0	1	0	1	0	0	1	0
S	0	1	0	1	0	0	1	1
T	0	1	0	1	0	1	0	0
U	0	1	0	1	0	1	0	1
V	0	1	0	1	0	1	1	0
W	0	1	0	1	0	1	1	1
X	0	1	0	1	1	0	0	0
Y	0	1	0	1	1	0	0	1
Z	0	1	0	1	1	0	1	0
[	0	1	0	1	1	0	1	1
\	0	1	0	1	1	1	0	0
]	0	1	0	1	1	1	0	1
^	0	1	0	1	1	1	1	0
_	0	1	0	1	1	1	1	1
`	0	1	1	0	0	0	0	0

Note: A “1" indicates the bit is turned on. A ”0" indicates the bit is off.

ENQ Reference Table - Byte #2 (continued)

Char	Const. OFF	Const. ON	Comp. Failure	Corr. Error	Online Data Error	Busy	Active	Online
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
a	0	1	1	0	0	0	0	1
b	0	1	1	0	0	0	1	0
c	0	1	1	0	0	0	1	1
d	0	1	1	0	0	1	0	0
e	0	1	1	0	0	1	0	1
f	0	1	1	0	0	1	1	0
g	0	1	1	0	0	1	1	1
h	0	1	1	0	1	0	0	0
i	0	1	1	0	1	0	0	1
j	0	1	1	0	1	0	1	0
k	0	1	1	0	1	0	1	1
l	0	1	1	0	1	1	0	0
m	0	1	1	0	1	1	0	1
n	0	1	1	0	1	1	1	0
o	0	1	1	0	1	1	1	1
p	0	1	1	1	0	0	0	0
q	0	1	1	1	0	0	0	1
r	0	1	1	1	0	0	1	0
s	0	1	1	1	0	0	1	1
t	0	1	1	1	0	1	0	0
u	0	1	1	1	0	1	0	1
v	0	1	1	1	0	1	1	0
w	0	1	1	1	0	1	1	1
x	0	1	1	1	1	0	0	0
y	0	1	1	1	1	0	0	1
z	0	1	1	1	1	0	1	0
{	0	1	1	1	1	0	1	1
|	0	1	1	1	1	1	0	0
}	0	1	1	1	1	1	0	1
~	0	1	1	1	1	1	1	0
Dec 127	0	1	1	1	1	1	1	1

Note: A “1" indicates the bit is turned on. A ”0" indicates the bit is off.

ENQ Reference Table - Byte #3

Char	Const. OFF	Const. ON	Low Battery	Format Error	Waiting to Dispense Label	Ribbon Fault	Stock Fault	Online Error
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
@	0	1	0	0	0	0	0	0
A	0	1	0	0	0	0	0	1
B	0	1	0	0	0	0	1	0
C	0	1	0	0	0	0	1	1
D	0	1	0	0	0	1	0	0
E	0	1	0	0	0	1	0	1
F	0	1	0	0	0	1	1	0
G	0	1	0	0	0	1	1	1
H	0	1	0	0	1	0	0	0
I	0	1	0	0	1	0	0	1
J	0	1	0	0	1	0	1	0
K	0	1	0	0	1	0	1	1
L	0	1	0	0	1	1	0	0
M	0	1	0	1	1	0	0	1
N	0	1	0	0	1	1	1	0
O	0	1	0	0	1	1	1	1
P	0	1	0	1	0	0	0	0
Q	0	1	0	1	0	0	0	1
R	0	1	0	1	0	0	1	0
S	0	1	0	1	0	0	1	1
T	0	1	0	1	0	1	0	0
U	0	1	0	1	0	1	0	1
V	0	1	0	1	0	1	1	0
W	0	1	0	1	0	1	1	1
X	0	1	0	1	1	0	0	0
Y	0	1	0	1	1	0	0	1
Z	0	1	0	1	1	0	1	0
[	0	1	0	1	1	0	1	1
\	0	1	0	1	1	1	0	0
]	0	1	0	1	1	1	0	1
^	0	1	0	1	1	1	1	0
_	0	1	0	1	1	1	1	1
`	0	1	1	0	0	0	0	0

Note: A “1" indicates the bit is turned on. A ”0" indicates the bit is off.

ENQ Reference Table - Byte #3 (continued)

Char	Const. OFF	Const. ON	Low Battery	Format Error	Waiting to Dispense Label	Ribbon Fault	Stock Fault	Online Error
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
a	0	1	1	0	0	0	0	1
b	0	1	1	0	0	0	1	0
c	0	1	1	0	0	0	1	1
d	0	1	1	0	0	1	0	0
e	0	1	1	0	0	1	0	1
f	0	1	1	0	0	1	1	0
g	0	1	1	0	0	1	1	1
h	0	1	1	0	1	0	0	0
i	0	1	1	0	1	0	0	1
j	0	1	1	0	1	0	1	0
k	0	1	1	0	1	0	1	1
l	0	1	1	0	1	1	0	0
m	0	1	1	0	1	1	0	1
n	0	1	1	0	1	1	1	0
o	0	1	1	0	1	1	1	1
p	0	1	1	1	0	0	0	0
q	0	1	1	1	0	0	0	1
r	0	1	1	1	0	0	1	0
s	0	1	1	1	0	0	1	1
t	0	1	1	1	0	1	0	0
u	0	1	1	1	0	1	0	1
v	0	1	1	1	0	1	1	0
w	0	1	1	1	0	1	1	1
x	0	1	1	1	1	0	0	0
y	0	1	1	1	1	0	0	1
z	0	1	1	1	1	0	1	0
{	0	1	1	1	1	0	1	1
|	0	1	1	1	1	1	0	0
}	0	1	1	1	1	1	0	1
~	0	1	1	1	1	1	1	0
Dec 127	0	1	1	1	1	1	1	1

Note: A “1" indicates the bit is turned on. A ”0" indicates the bit is off.

Job Request

A Job Request returns status information about the most recently processed print job. You can send a job request after an ENQ or batch. You can send two levels of Job Requests:

- Numeric Error Codes Only (0, 1, or 2)
- Verbose (3 or 4)

Syntax **{J,#}**

Field Type	Valid Options	Description
Identifier	J	Job Status Request
Request#	0 1 2	Returns ASCII coded strings or numeric error codes
	3	Returns error number
	4	Returns number of labels printed in batch

Example **{J,3}**

The job response may not be immediate. If the printer has an error (out of supplies, ribbon problem, etc.), is in pause mode, or has insufficient memory, correct the problem and then resend the job request. If the problem is not corrected, no response is returned. If a formatting error has occurred, the job request will return the status. The printer must first interpret the format and batch data before returning the response.

Note: You may need to press **FEED/CUT** before the job response is returned.

To clear an error, press **ESCAPE/CLEAR**. An ENQ can also clear errors numbered less than 500. Once the error is corrected, a job request can be sent. The printer cannot accept another job request until the error is resolved.

Job Response

The Job Response varies, depending on the type of request sent to the printer. The following syntax is the response for a Job 0, 1,or 2 request.

Syntax **{J,Status1,Status2,"FMT-1","BCH-2"}**

Status1 These errors stop the print job. Examples include out of stock, supply faults, or data formatting errors. These errors are numbered less than 24 on the "Job Status 0, 1, 2 Response Table," later in this chapter.

Status2 These are errors in the syntax of the MPCL data stream. Printing does not stop, but the information may not print properly. These errors are numbered greater than 24 on the "Job Status 0, 1, 2 Response Table," later in this chapter.

FMT-1/BCH-2 The format or batch number is returned.

Here is an example of a response returned to a J 0, 1, 2 request:

{J,8,0,"FMT-1","BCH-2"}

Indicates that a portion of the format extends off the tag in format 1, batch 2. Refer to the "Job Status 0, 1, 2 Response Table" later in this chapter for brief explanations for J, 0, 1, 2 requests. In the above example, refer to error 8 for an explanation.

The following syntax is the response for a Job 3 request. You may need to press **FEED** before the job response is returned.

Syntax **{J,"Status1 A,B","Status2 A,B,C,D,E","FMT-1","BCH-2"}**

"Status1 A,B" Status1 A contains the field number, in the format or batch, where an error was found. If the error is not in the format or batch, a "0" is returned.Status1 B contains an error number, which represents the actual printer error. The error numbers can be found in Chapter 8, "Diagnostics and Errors."

Example **{J,"2,612",}**

2 is the field number where an error was found. 612 is the error number, indicating that data is missing or does not match the format definition for that field.

Note: Error numbers found in Status1 B, always have a value equal to or greater than 500. These are considered very serious errors.

"Status2 A,B,C,D,E" Status2 A contains the packet type, field type, field number, parameter, and error number.

Status2A-Packet Type represents the MPCLII packet that the error occurred on. The packet could be Format (F), Batch (B), Check Digit (A), Graphic (G), or Font (W).

Status2B-Field Type represents the MPCLII field that the error occurred on. If the packet has no fields, Status2 A will be replicated. If the error occurs before the field is identified a question mark is sent. Since the batch data is variable, a D is sent to indicate data.

Status2C-Field Number represents the field number within each packet. The packet header is the first field and each subsequent field is indicated by the field separator.

Status2 D-Parameter represents the parameter within the field that the error occurred. The numbering begins after the field identifier.

Status2E-Error Number is the error that coincides with the error numbers presented in Chapter 8, "Diagnostics and Errors."

"FMT-1/BCH-2" The format or batch number is returned.

Note: If more than one error occurred, only the most serious error is acknowledged.

Example **{J,"","F,B,4,6,33","FMT-1","BCH-2"}**

Indicates that an error occurred on a bar code (**B**) field within a format (**F**) packet. The bar code field is the fourth (**4**) field in the packet. The error occurred in the sixth (**6**) parameter of the field. Error number **33** means the bar code density is invalid.

To clear an error, press **ESCAPE/CLEAR**. An ENQ can also clear errors numbered less than 500. Once the error is corrected, a job request can be sent. The printer cannot accept another job request until the error is resolved.

The following syntax is the response for a Job 4 request.

Syntax **{J,printed,total,"FMT-1","BCH-2"}**

Printed	the number of tags or labels *remaining* in the batch to print.
Total	the total number of tags or labels to be printed in the current batch.
"FMT-1/BCH-2"	The format or batch number is returned.

Example **{J,8,25,"FMT-3","Bch-2"}**

8 out of **25** tags or labels are left to print from format number 3.

Use a Job Request 4 when printing in the on-demand mode with a large number of tags or labels from a single batch. A Job Request 4 may not be accurate if tags or labels are printed in continuous mode, because of the response time involved. A Job Request 4 is not useful in single ticket batches (printing 1 of 1) or multiple single ticket batches.

Note: A batch has to be printing when you send the job request. You cannot use this job request on batches printing formats with incrementing fields.

Job Status 0, 1, 2 Response Table (Status 1 Codes)

Number	Meaning
0	No error
1	Stacker Fault
2	Supply problem
4	Hot printhead
5	Printhead open
6	Insufficient memory
7	Ribbon problem
8	Field number extends off tag
9	Field number has a bad font/bar code
10	Field number contains invalid data
11	Field number has a graphic missing
12	Invalid communication channel
13	Invalid file type
14	All communication channels are busy
15	Receive overrun error
16	Receive parity error
17	Receive framing error
18	Receive buffer full
19	Label waiting
21	Bad dots (verifier detected a failure)
23	Low battery
24	Memory configuration packet error

Numbers 25 through 50 are not currently in use.

Job Status 0, 1, 2 Response Table (Status 2 Codes)

Number	Meaning
51	Invalid command
52	Invalid separator value
53	Graphic not found
54	Format for batch not found
55	Quantity/Multiples out-of-range
56	Name descriptor too long
57	Invalid cut value
58	Invalid number-of-parts
59	Invalid orientation value
60	Invalid thickness value
61	Invalid text field
62	Invalid bar code file
63	Data string too long
64	Invalid data field
65	Row greater than stock length
66	Row greater than format length
67	Column greater than printhead width
68	Column greater than format width
69	Invalid label length
70	Invalid label width
71	Invalid increment/decrement value
72	Identifier out-of-range
73	No field to create format
74	Stop location of a line is out of range
75	Syntax error
80	Cannot use offline format for online batch
81	Cannot queue graphic batch
82	Cannot store online format
83	Cannot queue online batch
84	Cannot queue online clear command

Status Polling Considerations for Script Mode

The following table shows the effects of the **I** Packet and the printer's front panel (or keyboard) on status polling and immediate commands.

	I Packet Printer Configuration Packet (inside the script or sent online to the printer)	**While Running in Script Mode ONLY (set through printer's front panel)**	
		Disabled	Enabled
Status Polling	**OFF** (status polling not enabled by **I** packet)	**OFF** (status polling not enabled through printer's front panel)	**OFF** (status polling enabled through printer's front panel)
	ON (status polling enabled by **I** packet)	**OFF** (status polling not enabled through printer's front panel)	**ON** (status polling enabled through printer's front panel)
Immediate Commands	**OFF** (immediate commands not enabled by **I** packet)	**OFF** (immediate commands not enabled through printer's front panel)	**OFF** (immediate commands enabled through printer's front panel)
	ON (immediate commands enabled by **I** packet)	**OFF** (immediate commands not enabled through printer's front panel)	**ON** (immediate commands enabled through printer's front panel)

If status polling and immediate commands are NOT enabled through the **I** Packet, enabling status polling and immediate commands at the printer's front panel has NO effect.

DIAGNOSTICS AND ERRORS

8

This chapter explains how to

- print diagnostics labels
- reset the printer
- call Technical Support.

Before you call Service, print a test label. The label contains information to help diagnose mechanical and setup problems.

This chapter also provides explanations of your printer's errors. The errors are classified by type and are listed in order. If you have trouble loading supplies or performing maintenance, refer to the *Operator's Handbook*.

Some errors numbered 400-438 and 500-574 are internal software errors. Errors numbered 703-758 are supply errors. Follow the directions provided with the error description to correct the problem. Errors numbered 900-999 are Hard Printer Failures. If you cannot clear an error, turn off the printer, wait several seconds and then turn on the printer. Call Technical Support if you receive any error message not listed in this chapter.

To clear a data error, press **ESCAPE/CLEAR**. If a formatting error occurs, the label prints; but data may be missing. Correct the format or batch and resend them to the printer. If a data error occurs, press **FEED/CUT** to queue and print an error label.

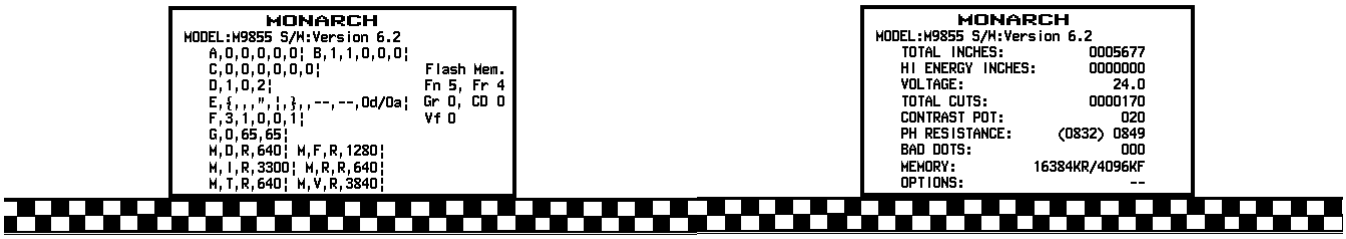
Printing a Test Label

1. From the User Diagnostics menu, press the right arrow until you see

USER DIAG Test Label

2. Press **ENTER/PAUSE**.

The test label shows the model number, software version, total number of inches printed, voltage, print contrast, printhead resistance, code page, MPCL control characters, ENQ and RS232 characters.



Note: You can also print a test label by pressing **the left arrow** and **the right arrow** at the same time. Hold for one second and release.

Reading a Test Label

The first label shows the printer's configuration by packet (**A-X**). See Chapter 2, "Configuring the Printer" for more information. The lines beginning with **M** show the printers memory allocation, which can be changed. The units for supply position, etc. are displayed in dots, even if you entered them in English or Metric units.

The second label shows the model number, software version, total number of inches printed, number of inches printed by current printhead, voltage, print contrast, printhead resistance, number of bad dots, and installed options (see the following table). The test label for the 9855 printer shows an inch count for the high energy ribbon. The one-dot rule line at the bottom of the test label indicates the vertical 0,0 point.

The third test label shows wireless and network settings if the printer has network capability.

Installed Options	Description
A	Network Control Language (NCL)
B	Battery
C	Cutter (Knife)
H	High Speed (12.0 ips)
L	Smart Relay
P	Peel mode
R	RS-232 option (Keypad)
S	Stacker
V	Verifier

If You Receive an Error Message

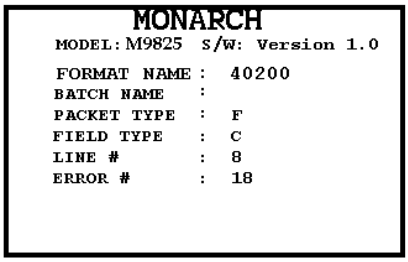
Any time you receive a message that is not described in this manual, or the recommended action does not solve the problem, call Technical Support. Some errors are the result of communication problems. In this case, reset your printer and reboot your computer. If you change any of the online configuration packets, resend the format packet to the printer, so the configuration changes take effect.

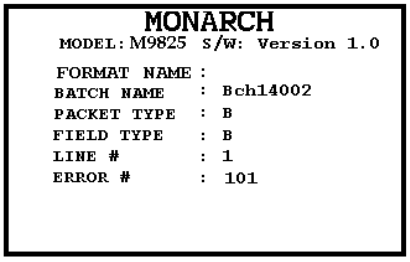
Reading an Error Label

An error label queues and prints when you press FEED/CUT after a data error (0-499) occurs. The error label contains the packet type, field type, line number, and error number. The packet and field type return the first letter after the or | . A "?" is returned if the letter cannot be determined. The line number refers to which line in the packet the error occurs. The error number is the three-digit error code. Use this information to correct the format, batch, font, check digit, graphic, or online configuration packet.

The first label shows an error in line 8, which is a constant text field within the format packet. The error number is 18.

The second label shows an error in line 1 of the batch packet. The error number is 101.





If the PC and Printer Are Not Communicating

If your PC is having trouble communicating with your printer, follow these steps:

- Check any messages that occur at the printer and at the computer. See the following error message listing in this chapter for more information.
- Make sure you are using the correct printer cable.
- Make sure the cable is plugged into the correct port on the computer.
- Compare your printer's communications settings (especially flow control) with the settings on your PC. Your printer and PC communications should match. Print a test label to identify the printer's communication settings.
- Make sure the printer is online (ready to receive data).

If all of the above are correct, reset your printer. Try the function again. If you still can not establish communications, call Technical Support.

Resetting the Printer

Sometimes, the printer receives mixed signals and loses its ability to communicate. If this happens, reset the printer and attempt communication again. To reset the printer, turn off the printer, wait 15 seconds, and turn it back on.

When you turn off the printer, all the information set through the online configuration packets (A-M) is saved. See the sections in Chapter 2, "Configuring the Printer," for more information about each packet.

Calling Technical Support

Technical support representatives are available Monday through Friday during regular business hours. Follow these steps before you call:

1. Make sure your PC and printer are properly connected.
2. Record any error messages that occurred.
3. Recreate the problem, if you can.
4. Check your port settings. Your problem may be corrected simply by changing the communication settings.
5. List any changes that have recently been made to the system. Try to record what you were doing when the problem occurred.
6. Reset your printer. For information on resetting your printer, see "Resetting the Printer."
7. Reboot your computer. Refer to your computer documentation for specific instructions.
8. Print a test label, see "Printing a Test Label" for more information.

Have the following information ready before you call: computer brand name and model, version of DOS, printer model, other peripheral devices on your system, support agreement, contract number, or invoice information, customer number, and printer serial number.

Additional Diagnostics Information

For detailed printer diagnostics information, refer to the *Operator's Handbook*. See Chapter 7, "Status Polling," for information on requesting printer and job status. See the following error message listing in this chapter for more information.

Data Errors

Call Technical Support if you receive any error message not listed below.

Errors 001 to 499 are data errors. These errors are returned in response to a J,3 request. See Chapter 7, “Status Polling,” for more information. A data error indicates that incorrect data was received from the host, causing the printer to ignore the entire print job. After checking the packet and correcting the problem, transmit the print job again.

The following is a list of data errors. These errors occur because data in the format, batch, check digit, font, or graphic packet is invalid.

Format Errors

Error Code	Description
001	Packet ID number must be 1 to 999.
002	Name must be 1 to 8 characters (excluding non-printable control characters) inside quotes. The range is 1 to 256 characters for the 9855 XML-enabled printer.
003	Action must be A (add) or C (clear).
004	Print length is invalid. See “Defining the Format Header” in Chapter 3 for valid lengths.
005	Print width is invalid. See “Defining the Format Header” in Chapter 3 for valid widths.
006	Storage device must be F (Flash), R (volatile RAM), or T (temporary for graphics).
007	Unit of measure must be E (English), M (Metric), or G (Dots). See “Defining the Format Header” in Chapter 3 for more information.
010	Field ID number is outside the range 0 to 999.
011	Field length exceeds 2710.
012	Row field position is greater than the maximum stock dimension. See “Defining Text Fields” in Chapter 3 for valid row lengths.
013	Column field position is greater than the maximum stock dimension. See “Defining Text Fields” in Chapter 3 for valid column widths.
014	Font style must be 1, 2, 3, 4, 5, 6, 10, 11, 15, 16, 17, 18, 50, 56; or a valid downloaded font selector. See “Defining Text Fields” in Chapter 3 or Appendix B, “Fonts,” for more information.
015	Character rotation must be 0 (0 degree), 1 (90 degree), 2 (180 degree), or 3 (270 degree). See “Defining Text Fields” in Chapter 3 for more information.
016	Field rotation must be 0 (0 degree), 1 (90 degree), 2 (180 degree), or 3 (270 degree). See “Defining Text Fields” in Chapter 3 for more information.
017	Field restriction must be V (variable) or F (fixed).
018	Code page/symbol set selection defined in the field must be 0 (Internal), 1 (ANSI), 100 (Macintosh), 101 (Wingdings), 102 (Unicode), 103 (BIG5 for Unicode), 104 (GB2312 for Unicode), 105 (SJIS for Unicode), 106 (GB2312), 107 (BIG5), 110 (Unicode UTF-8), 437 (DOS Page 437), 850 (DOS Page 850), 852 (Latin 2), 855 (Russian), 857 (Turkish), 860 (Portuguese), 1250 (Latin 2), 1251 (Cyrillic), 1252 (Latin 1), 1253 (Greek), 1254 (Turkish), 1255 (Hebrew), 1256 (Arabic), 1257 (Baltic), or 1258 (Vietnamese). See “Defining Text Fields” in Chapter 3 for more information.
020	Vertical magnification must be 1 to 7 or 4 to 255 (point size) for the scalable or downloaded TrueType fonts.

Error Code	Description
021	Horizontal magnification must be 1 to 7 or 4 to 255 (point size) for the scalable or downloaded TrueType fonts.
022	Color must be A, B, D, E, F, N, O, R, S, T, or W. See “Defining Text Fields” in Chapter 3 for more information.
023	Intercharacter gap must be 0 to 99 dots.
024	Field justification must be B (balanced), C (centered), E (end), L (left), or R (right). See “Defining Text Fields” in Chapter 3 for more information.
025	String length is outside the range 0 to 2710.
030	Bar code height must be at least 19 (English), 48 (Metric), 38 (203 dpi Dots), 57 (300 dpi Dots), or is not within the supply dimensions.
031	Human readable option must be 0 default 1 no CD or NS 5 NS at bottom, no CD 6 CD at bottom, no NS 7 CD and NS at bottom 8 no text
032	Bar code type is invalid. See “Defining Bar Code Fields” in Chapter 3 for valid options.
033	Bar code density is invalid. See “Defining Bar Code Fields” in Chapter 3 for the bar code density chart.
034	GS1 DataBar type is invalid. See “Defining Bar Code Fields” in Chapter 3 for more information.
035	GS1 DataBar separator height is invalid. See “Defining Bar Code Fields” in Chapter 3 for more information.
036	GS1 DataBar segment width is invalid. See “Defining Bar Code Fields” in Chapter 3 for more information.
040	Line thickness must be 0 to 99 dots.
041	Line direction must be 0, 90, 180, or 270.
042	End row is invalid. Line segment or box end row is defined outside of printable area.
043	End column is invalid. Line segment or box end column is defined outside of printable area.
044	Dot pattern for line or box must be “”.
045	Line length is defined beyond the maximum length. See “Defining Line Fields” in Chapter 3 for valid lengths.
046	Line type must be S (segment) or V (vector).
051	Imaging mode in the graphic header must be 0.
052	Data type in the RFID Data Field is invalid. See “Defining the RFID Data Field” in Chapter 3 for more information.

Batch Errors

Error Code	Description
101	The format referenced by batch is not in memory.
102	Print quantity is outside the range 0 to 32000.
104	Batch mode must be N (new) or U (update).
105	Batch separator in a batch control field must be 0 (Off) or 1 (On).
106	Print multiple is outside the range 1 to 999.
107	Cut multiple is outside the range 0 to 999. Only valid for printers with a knife.
108	Multiple part supply is outside the range 1 to 5.
109	Cut type is outside the range 0 to 5.
110	Image rotation must be 0 (no rotation) or 1 (180° rotation) in the batch control field.

Option Errors

Error Code	Description
200	Option number must be 1 - 7, 20, 21, 30, 31, 42, 50, 51, 52, 53, 60, 61, 62, or 64.
201	Copy length is outside the range 0 to 2710.
202	Copy start position must be 1 to 2710.
203	Destination start position must be 1 to 2710.
204	Source field must be 0 to 999.
205	Copy type must be 1 (copy after rules) or 2 (copy before rules).
206	Increment/Decrement selection must be I (increment) or D (decrement).
207	Incrementing start position must be 0 to 2710.
208	Incrementing end position must be 0 to 2710.
209	The incrementing amount must be 0 to 999.
210	Security value for a PDF-417 bar code must be 0 to 8. Correct the value and resend the format to the printer.
211	Narrow element value is less than 1 or greater than 99. Correct the value and resend the format to the printer.
212	Wide element value is less than 1 or greater than 99. Correct the value and resend the format to the printer.
213	Dimension must be 1 to 30 for a column or 3 to 90 for a row on a PDF417 bar code.
214	Truncation code must be S (standard) or T (truncated bar code).
215	Aspect code must be C (columns) or R (rows).
216	Option definition must be S (set) or T (template).
217	Input device must be D (Default), H (Host), K (Keyboard), N (None), or S (Scanner).
218	Pad direction must be L (from left) or R (from right).
219	Pad character is outside the range 0 to 255.
220	Check digit selection must be G to generate check digit.

Error Code	Description
221	Primary or secondary price format is outside the range 1 to 16.
222	Data type restriction is outside the range of 1 to 6.
223	Option is not valid for the field.
224	Bar code intercharacter gap must be 0 to 99 dots. (This is also known as the additional character gap when using Option 50, Defining Bar Code Densities.)
226	Rule (option) Record Line xx. The upload device must be H (host) for Option 6.

Online Configuration Errors

Error Code	Description
251	Power up mode must be 0 (online) or 1 (offline).
252	Language selection must be 0 (English), 1 (French), 2 (German), 3 (Spanish-ES), 4 (Japanese), 5 (Portuguese), 6 (Italian), 7 (Swedish), 8 (Spanish2-MX), 9 (Danish), 10 (Dutch), 11 (Finnish), or 12 (Norwegian).
253	Batch separator code in a system setup packet must be 0 (off), 1 (on) or 2 (double).
254	Slash zero selection must be 0 (standard zero) or 1 (slashed zero).
255	Supply type must be 0 (black mark), 1 (die cut), 2 (continuous), or 3 (aperture)
256	Ribbon selection must be 0 (direct), 1 (transfer), or 2 (high energy).
257	Feed mode must be 0 (continuous) or 1 (on-demand).
258	Supply position must be -300 to 300 dots.
259	Contrast adjustment must be -699 to 699 dots.
260	Print adjustment (position) must be -99 to 99 dots (9825) or -450 to 450 dots (9855).
261	Margin adjustment (position) must be -99 to 99 dots.
262	Speed adjustment must be 0 (default), 25 (2.5 ips), 40 (4.0 ips), 60 (6.0 ips), 80 (8.0 ips), 100 (10.0 ips), or 120 (12.0 ips). Speeds above 6.0 ips are available on the 9855 printer.
263	Primary monetary symbol must be 0 (None), 1 (Dollar), 2 (Pound), 3 (Yen), 4 (Deutsche Mark), 5 (Franc), 6 (Peseta), 7 (Lira), 8 (Krona), 9 (Markka), 10 (Schilling), 11 (Rupee), 12 (Ruble), 13 (Won), 14 (Baht), 15 (Yuan), or 16 (Euro).
264	Secondary symbol selection must be 0 (none) or 1 (print secondary sign).
265	Monetary decimal places must be 0 to 3.
266	Character string length in the control characters packet must be 5 (MPCL control characters) or 7 (ENQ/IMD command character).
267	Baud rate selection must be 0 (1200), 1 (2400), 2 (4800), 3 (9600), 4 (19200), 5 (38400), 6 (57600), or 7 (115200). Resend the communication settings packet.
268	Word length selection must be 0 (7 bits), or 1 (8 bits). Resend the communication settings packet.
269	Stop bits selection must be 0 (1 bit), or 1 (2 bits). Resend the communication settings packet.
270	Parity selection must be 0 (none), 1 (odd), or 2 (even). Resend the communication settings packet.

Error Code	Description
271	Flow control selection must be 0 (none), 1 (DTR), 2 (CTS/RTS), or 3 (XON/XOFF). Resend the communication settings packet.
272	Symbol set (code page) in the System Setup packet must be 0 (Internal), 1 (ANSI), 2 (DOS 437), 3 (DOS 850), 4 (1250- Latin 2), 5 (1251- Cyrillic), 6 (1252- Latin 1), 7 (1253- Greek), 8 (1254- Turkish), 9 (1255- Hebrew), 10 (1256- Arabic), 11 (1257- Baltic), 12 (1258- Vietnamese), 13 (852- Latin 2), 14 (855- Russian), 15 (857- IBM Turkish), 16 (860- DOS Portuguese), 17 (Wingdings), 18 (Macintosh), 19 (Unicode), 20 (BIG5), 21 (GB), 22 (SJIS to SJIS), 23 (GB to GB), 24 (BIG5 to BIG5), 25 (KSC to KSC) or 26 (UTF-8).
273	Cut adjustment must be -300 to 300 dots.
282	RS232 Trailer string is too long. Use a maximum of 3 characters.
283	ENQ Trailer string is too long. Use a maximum of 3 characters.
284	The buffer type must be D (Downloadable Fonts), F (Format), I (Image), R (Receive), T (Transmit), or V (Scalable Fonts).
285	The storage device type in the memory configuration packet must be F (flash) or R (volatile RAM).
286	The buffer size is invalid.
287	The printhead width must be 0.
288	The battery voltage must be 0 (15-volt battery) or 1 (12-volt battery).
289	The printer address specified in the communications settings packet must use exactly six characters.
290	Action must be 0 (disable), 1 (enable), or 2 (extended) for the backfeed control packet or the printer is active.
291	Dispense position must be 50 to 200 dots or the printer is active.
292	Backfeed distance must be 10 to 200 dots or the printer is active. The backfeed distance can not be greater than the dispense position.
293	The skip index selection defined in the field must be 0 (disabled) or 1 (enabled). Correct the packet and resend to the printer.
294	The verifier mode must be 0 (disable) or 1 (enable).
295	The verifier's cable detect mode must be 0 (no detect), 1 (I/O cable detect), or 2 (I/O and data cable detect).
296	Protocol must be 0 to 3. 0 is the only valid option for hardware version 00000003. See "Defining the RFID Setup Packet" for more information.
297	Write attempts must be 1 to 5. 3 is the only valid option for hardware version 00000003. See "Defining the RFID Setup Packet" for more information.
298	Read power must be -7 to 25 (-7 to 10 for Japan). Use 10 for hardware version 00000003. See "Defining the RFID Setup Packet" for more information.
299	Write power must be -7 to 27 (-7 to 10 for Japan) or -7 to 27 for hardware version 00000003. See "Defining the RFID Setup Packet" for more information.
300	Signal adjust must be 1 to 6. Use 2 for hardware version 00000003. See "Defining the RFID Setup Packet" for more information.
301	Image rotation must be 0 (no rotation) or 1 (180° rotation).

Error Code	Description
302	The hours in the time/date packet must be 0 to 23.
303	The minutes in the time/date packet must be 0 to 59.
304	The day in the time/date packet must be 1 to 31.
305	The month in the time/date packet must be 1 to 12.
306	The year in the time/date packet must be 0 to 99.
307	Read after write must be 0 (disable) or 1 (enable). See “Defining the RFID Setup Packet” for more information.
308	Retry Printing must be 0 (Disabled) or 1 (Enabled). See “Defining the RFID Setup Packet” for more information.
309	Singulate mode is invalid. Use **0**.

Check Digit Errors

Error Code	Description
310	Check digit scheme number must be 1 to 10.
311	Modulus must be 2 to11.
314	Check digit algorithm must be D (sum of digits) or P (sum of products).

Graphic Errors

Error Code	Description
325	Duplicating direction must be 0 (insert after) or 1 (insert before) in duplicate fields for graphics.
327	Amount of row adjustment must be 0 to 999 dots in duplicate fields for graphics.
328	Duplicate count must be 0 to 999.
340	Bitmap line encoding must be H (hex) or R (run length).
350	Font selector must be 1 to 9999.
351	Font data length must be 68 to 16384.
352	Insufficient font memory is available for the downloaded font.
380	Job request is outside the range 0 to 4.
400	The character immediately following { is invalid.
401	Internal software failure. Call Technical Support.
402	Field separator is not in the expected location.
403	Field separator was not found.
404	The number (greater than five digits/732,000), string (greater than 2710), or tilde sequence (greater than 255) currently being processed is out of range.
405	Too many fields exist in the format. You cannot have more than 1000 fields in the format. Lines, boxes, and constant text fields count as fields.
406	Parser error. Format or graphic is already in use. Make sure your packet is not missing **|** or **{}** characters.

Communication Errors

Error Code	Description
409	The printer memory is full. Delete unnecessary formats or graphics from memory. If you are using a graphic file that is very large, consider using another mapping method (such as run length encoding) to reduce the required memory. To use flash memory, you must format it first. See “Formatting Flash Memory” in Chapter 2 for more information.
410	Parity on the printer does not match the parity on the host. Check the parity setting under SETUP options.
411	Framing error. The printer cannot communicate with the host. Make sure the host is turned on, communication cables are connected correctly, port settings are correct, and communications are active. Check the baud rate, word length, and stop bits to make sure they match those at the host. Do not toggle between Microsoft® Windows® and MS-DOS while using the COPY command, or you will receive a framing error. Exit Windows before using the COPY command. Re-transmit the data.
412	There is a problem with flow control between the printer and the host. Make sure the printer and the host flow control settings match (both are DTR or both are XON/XOFF). If the error persists, call Technical Support.
413	Online receive buffer is full. Check your printer’s XON/XOFF or DTR SETUP values to be sure there is not a flow control problem.
414	The internal keyboard buffer is full or you need a new keypad. Call Technical Support.
415	The buffer size you defined exceeds the total available in your machine.
416	Flash/PC board error. Call Technical Support.
417	Flash memory is full. Clear flash. Resend the format, graphic, and check digit packets. If the error reappears, call Technical Support.
420	Internal software list error. Call Technical Support.
421	Internal software list error. Call Technical Support.
422	Duplicate internal name. Call Technical Support.
423	Internal software error. Call Technical Support.
424	Internal software list error. Call Technical Support.
425	Internal software list error. Call Technical Support.
426	Internal software list error. Call Technical Support.
427	Format name is invalid. Valid name is 1 to 8 characters inside quotes or “” for a printer-assigned name. Press **ESCAPE** and try to continue. If the error reappears, call Technical Support.
428	Batch name is invalid or graphic not found. Press **ESCAPE** and try to continue. If the error reappears, call Technical Support.
429	A field number appears more than once in a format.
430	The format uses a graphic or verifier configuration packet that cannot be found.
433	The batch references a field number that does not exist in the format.
497	An error occurred during the loop back test on the parallel port. Call Service.
499	An error occurred during the loop back test on the serial port. Call Service.

Data Formatting Failures

Formatting errors indicate that a field prints incorrectly. After you have checked the data stream and corrected the data, retransmit the format and batch.

Note: For errors 571-622, the batch still prints, but the field, font, bar code, or density may be incomplete, missing or contain incorrect data.

Error Code	Description
571	UPC or EAN bar code data length is invalid. The bar code data length in the batch does not fit the format.
572	A copy field, padded field, or incrementing field length is invalid. The field length in the batch does not fit the format or the field contains blanks. Or, the fixed length field does not contain the specified number of characters.
573	Price field length is invalid. The price field length in the batch does not fit the format or the field contains blanks.
574	No CD scheme or room for CD. The CD scheme in the batch does not fit the format or the field contains blanks.
575	The graphic included in your format could not be found. Resend the graphic packet. If the error persists, call Technical Support.
600	The printer could not image the batch, because the batch was refused. Call Technical Support.
601	An error occurred while the batch was imaging. Resend the format, batch, font, and/or any graphic packets. If the error persists, call Technical Support.
603	The batch was not found while imaging. Resend the batch packet. If the error persists, call Technical Support.
611	Font, bar code or density is invalid. The font, bar code or density in the batch does not fit the format.
612	The data in this line of the batch is either missing or does not match the format. This error also occurs if the EPC Gen2 RFID data length is invalid. See “Using Gen2 RFID Data” for more information.
613	Reference point off tag.
614	Portion of field off tag. There may be an invalid character in the packet. Make sure you did not enter O for 0 (zero).
615	Bar code width is greater than 16 inches or the number of keywords for your PDF 417 bar code exceeds 928. Decrease the density or shorten the amount of data to print the bar code.
616	A bad dot falls on a bar code and the dot cannot be shifted. A gray box is printed instead of the bar code. However, 2D bar codes still print on the 9825 printer when bad dots are present within the bar code field.
618	Magnification must be 1 to 7 or 4 to 255 (point size) for the scalable font.
619	The JIS (16-bit) code for Kanji is invalid.
620	Font and printhead dot density mismatch. A 300 dpi font is specified in the format, but a 203 dpi printhead is used in the printer or vice-versa. Check the font or change the printhead to correct the error.
621	An error occurred opening the TrueType font file. Select a different font to download. If the error message persists, call Technical Support.

Error Code	Description
622	Not enough memory to create the downloaded TrueType characters in the scalable fonts buffer. Save the font into the printer's flash memory instead. If the error message persists, call Technical Support.
623	There are more than 10 bar codes on one label for the verifier to scan. Redesign the format, disable scanning certain bar codes using Option 62, or disable the verifier.

Machine Faults

These errors occur when there is a problem with the printer.

Error Code	Description
703	The printer sensed a calibration of different-sized black marks. Make sure the correct supply is loaded.
704	Printer has not sensed a supply mark within the specified number of inches or out of supplies. Check the ♦ supply tracking ♦ black mark sensor position ♦ supply marks ♦ supply roll for binding. Press **ESCAPE**. If the error continues to appear, change the supply and/or clean the supply sensor.
710	Band out of data. Call Technical Support.
711	UART receiving communication error (framing, parity, etc.). Call Technical Support.
712	Receiving failure or command overrun error. Call Technical Support.
713	Receiving failure or illegal command. Call Technical Support.
714	Receiving failure or undefined command. Call Technical Support.
730	A memory allocation error occurred during initialization.

RFID Errors

These errors occur when there is an RFID problem.

Note: The printer does not recalibrate (feed a blank label) after any RFID error.

Error Code	Description
715	Invalid data length/data mismatch. The data in the RFID Data Field has an incorrect data length or there is a data type mismatch between selected data type and actual data entered. See "Defining the RFID Data Field" for more information on the data length and for selecting the appropriate data type for the data being entered. This error also occurs if any of the Gen2 fields are invalid. Check with your System Administrator about your format.
727	Duplicate TID fields. The printer detected two inlays within the programmable range with the same TID. One inlay is defective and another inlay may have the wrong data encoded – do not use the label that has an overstrike pattern. Check the Write power setting.
728	Multiple Tag Error. The printer detected multiple inlays within the programmable range. Re-check values from the *Monarch® RFID Printer Setup Utility*.

Error Code	Description
729	Invalid Tag Type. The chip (inlay) embedded in your RFID supply does not support serialized TID.
730	A memory allocation error occurred during initialization.
731	Backfeed error with a positive cut position defined for RFID. The tag is cut too short and cannot backfeed to the correct inlay encoding position. Check or modify the backfeed and cut position settings.
732	RFID Hardware Error. A non-RFID printer received a format containing an RFID Data Field. Resend the format to an RFID printer.
733	The RFID tag is not in the programmable field with short-feed length RFID supplies. Check supply loading. If you changed the supply, print or RFID position, make sure the RFID tag was not moved out of the programmable range. Refer to the *Monarch® RFID Printer Setup Utility* for more information.
734	The RFID tag is not programmed before the end of the label is reached. The program cycle fails. Resend the batch to the printer.
735	RFID module hardware error. The RFID module may need to be replaced or has become disconnected. Call Technical Support.
736	Invalid RFID command sent to the RFID module. The tag command is invalid.
737	Invalid RFID reader command sent to the RFID module. The reader setup command is invalid.
738	Insufficient RFID power to read the TID field or program the RFID tag. There is a reader or tag power level problem.
739	Missing specific tag. The printer cannot find the RFID tag identified by singulation. Check supply loading or the RFID tag may be lost or defective.
740	Command, hardware, inventory, or memory allocation error. There may be an RFID hardware or memory allocation error.
741	RFID tag missing. Tag not found in RF Field. The RFID tag was not found in the RF Field (area inside the printer where RFID tag is programmed.) Check supply loading. If you changed the supply or print position, make sure the RFID tag was not moved out of the programmable range. Re-check values from the *Monarch® RFID Printer Setup Utility*.
742	Tag erase failed. The RFID tag was found in the RF Field, but could not be erased. If this error occurs consecutively, increase or decrease the write power setting by one. If the write power is set too high, you may affect the data programmed in adjacent labels.
743	Program tag failed. The RFID tag was found in the RF Field, but could not be programmed. If this error occurs consecutively, increase or decrease the write power setting by one. If the write power is set too high, you may affect the data programmed in adjacent labels. Re-check values from the *Monarch® RFID Printer Setup Utility*.
744	Tag locked fail. The RFID tag is unable to be programmed, because it is already locked. This is considered a bad RFID tag.
746	Lock tag fail. The RFID tag has not been locked to prevent reprogramming. This is considered a bad RFID tag.
747	Time out failure. Any RFID command (read, program, etc.) has failed to complete in the maximum amount of allowed time.

Machine Faults (Continued)

Error Code	Description
748	Invalid data length/data mismatch from RFID interrogator module. The RFID interrogator module found a problem with the data received from the printer. You may need a new RFID printer or RFID module.
749	RFID verify fail. The RFID verification process failed after writing (programming) the tag. This is considered a bad RFID tag.
750	Printhead is overheated. Turn off the printer to let the printhead cool. If the error persists, call Technical Support.
751	Printer did not sense a black mark when expected. The supply may be jammed. For errors 751-753, check the supply tracking, supply marks, black mark sensor position, and supply roll for binding. Press **ESCAPE/CLEAR** and try to continue printing. If the error continues to appear, change the supply
752	Printer sensed a mark in the wrong place.
753	Printer sensed a mark that is too long.
754	Printer has a ribbon problem. Check the ribbon for a jam or remove any slack by turning the take-up reel clockwise. Load a new ribbon.
755	Printhead is open. Close the printhead before continuing. If the error persists, call Technical Support.
756	The printer is out of supplies. Load supplies and/or clean the supply sensor.
757	Load supplies. The calibrated supply length differs by plus or minus .25 inches from the format. Press **FEED/CUT** to print on the current supply or load new supply and press **ENTER/PAUSE**.
758	Check supply. Either the supply is not seen, or the on-demand sensor is broken (purchase optional). Check for a label jam. Clear the supply path or reload supplies. This error may occur if you remove a label too quickly in on-demand mode. The printer does not recalibrate after this error.
759	Knife is not moving. Call Technical Support.
760	Knife jam. Call Technical Support.
761	The stacker is full or jammed. Empty the stacker or clear the jam before continuing. The printer does not recalibrate after this error.
762	Low Voltage. For DC-powered printers, recharge the external battery. For AC-powered printers, check the power inlet where the printer is connected. The acceptable voltage range is between 90-132 V_{RMS} and 180-264 V_{RMS}. If more or less power is received, unpredictable results may occur.
763	Waiting to dispense label. Press **FEED/CUT**.
764	Verifier scan error (bad scan) on label when using normal (no overstrike) mode. Press **ESCAPE/CLEAR** to clear the error and continue printing. Make sure you did not apply Option 62 (do not scan a particular bar code) to all bar codes on a format.
765	The printhead has less than 8 bad dots. The printer can shift bar code fields to avoid bad dots. You may need to press **ESCAPE/CLEAR** to continue printing. Print a test label to confirm the number of bad dots.
766	Backfeed/overfeed error. There is a problem with the backfeed or overfeed distance.
767	Incorrect AD value. Call Technical Support.

Error Code	Description
768	Printhead has more than 8 bad dots within the format area or is not connected. Make sure the printhead is connected.
769	The printhead is not receiving enough volts. Call Technical Support.
770	The print motor is not ready. Call Technical Support.
771	The format specified by the application was not found. Reload your application and format, and try again. If the problem continues, call Technical Support.
772	Verifier scan error (bad scan) on label or multiple labels in a row when using overstrike and continue mode. Press **ESCAPE/CLEAR** to clear the error and continue printing.
773	Verifier Failure - the verifier is enabled, but not connected. The printer can detect if the I/O and/or serial cables are connected to the verifier. Refer to your verifier's *Operating Instructions* for more information.
781	The voltage is too low. Call Technical Support.
782	The voltage is too high. Call Technical Support.
783	The printer is printing too fast for the verifier to accurately scan the bar codes. Increase the bar code height in your formats or slow the print speed.
784	No power to stacker. Check connections between the stacker and the printer. Make sure the printer is connected to an AC outlet.
785	The internal liner take-up reel is full. Remove the liner take-up reel and dispose of the liner. Press **ESCAPE/CLEAR** to continue printing.
786	Internal liner take-up error. The liner has separated from the core or is not properly winding on the core. Remove the liner from the take-up core and reload the liner into the take-up core.
790	Wait until the printer is idle (no batch waiting to print or not receiving data) before you send any packets. This error may occur when you try to print a test label if the printer is busy.
791	The printer has an error pending. Turn off the printer. Wait 15 seconds and turn it back on. Resend the packets. If the problem continues, call Technical Support.
792	The printer is not initialized. Call Technical Support.
793	The printer job queue is full. Turn off the printer. Wait 15 seconds and turn it back on. Resend the packets. If the problem continues, call Technical Support.
794	The backfeed mode is not set.
795	Print engine lock-up. Call Technical Support.
796	No job quantity for the job setup. If this error message appears, call Technical Support.
797	No sub-job quantity for the job setup. If this error message appears, call Technical Support.
799	Job quantity mismatch. If this error message appears, call Technical Support.

Script Errors

These errors occur when there is a script (application) problem.

Error Code	Description
850	Invalid script packet or not enough flash memory for the script. The script download failed. Format flash memory and download the script using the COPY command from DOS or the ADK2 software.
851	Invalid lookup table or not enough flash memory for the script. The lookup table download failed. Check the data in the lookup table. Format flash memory and download the script using the COPY command from DOS or the ADK2 software.
852	Invalid buffer definition packet or not enough flash memory for the script. One or more of the following buffers were invalid: input buffer, temporary buffer, lookup buffer, printer, or array buffer. Check the buffer definitions. Format flash memory and download the script using the COPY command from DOS or the ADK2 software.
853	Invalid version string or not enough flash memory for the script. The version information in the APPVERSION command is missing or invalid. Make sure the information is enclosed in double quotation marks. Format flash memory and download the script using the COPY command from DOS or the ADK2 software.
854	Invalid table (string and numeric) data or not enough flash memory for the script. Check the data. Format flash memory and download the script using the COPY command from DOS or the ADK2 software.
855	Invalid start/clear command. The script is missing the start or clear command {S space}.
856	Invalid quit command. The script is missing the quit command {Q space}.
857	Illegal command in the script. Your script may include commands that have been removed from the ADK2 scripting language.
858	Check sum error. Each packet has a four-digit checksum at the beginning of the packet. Compile the script again using the ADK2 software.
859	Script download buffer overflow. The image buffer is used as the SCRATCH buffer. Increase the size of the image buffer.

Hard Printer Failure Errors

Errors numbered 930-940 are errors that may occur during the loading of flash memory. Errors numbered 950-999 may indicate a circuit board failure. These errors are hard printer failures. Call Technical Support if you receive these messages.

Error Code	Description
900	RAM test failure.
901	ROM/EPROM checksum failure.
902	Software timer failure.
903	Software interrupt failure.
905	Illegal interrupt.
906	Non-maskable interrupt. Check format packet for font clear or format clear packets.
907	Low RAM error.
908	Non Volatile RAM checksum failure.

Error Code	Description
909	NVRAM reset.
910	Warm restart.
911	Version string mismatch.
930	Flash erase error.
931	Flash write error.
932	RAM write error.
933	Parity error.
934	Framing error.
935	Buffer overrun.
936	Invalid record type.
937	Invalid hex data.
938	Invalid checksum.
939	Invalid record count.
940	Invalid flash address.

Errors numbered 900-911 occur when you turn on the printer. They may indicate a circuit board failure. Errors numbered 930-940 are errors that may occur during the loading of flash memory. Errors numbered 950-999 indicate a circuit board failure. Call Technical Support if you receive any of these messages.

When a HARD failure occurs on the printer, the printer displays WARNING or POWER DOWN on the top line of the keypad display. If this happens, record the displayed message and turn off the printer. If the problem reoccurs when you turn the printer on again, call Technical Support. If the problem does not reoccur after you turn your printer on again, reset your printer's SETUP options. Retransmit your packets.

Printer Display	**Description**
WARNING RAM Test Failure	RAM check failed on power up. Reset your SETUP options. Retransmit your packets.
POWER DOWN ROM Sum Failure	ROM checksum test failed.
POWER DOWN Timer Failure	Timer test failed.
POWER DOWN Intr Test Failure	Interrupt test failed.
POWER DOWN Low System RAM	Not enough RAM for system. Reset your SETUP options. Retransmit your packets.
POWER DOWN Illegal Intr#	Illegal interrupt occurred.
POWER DOWN NMI Received	Non-maskable interrupt occurred. Reset your SETUP options. Retransmit your packets.
POWER DOWN Low Appl RAM	Not enough RAM for application. Reset your SETUP options. Retransmit your packets.
POWER DOWN NVRAM Sum Fail	RAM checksum test failed. Reset your SETUP options. Retransmit your packets.
POWER DOWN RAM Corrupt	Item storage RAM failed. Reset your SETUP options. Retransmit your packets.

PRINTER OPTIMIZATION

9

This chapter provides information on how to improve your printer's performance by

- adjusting the print quality
- reducing the imaging time for printing
- providing general tips and hints for designing formats.

This printer uses "smart imaging" to image and print fields on supplies. Smart imaging remembers the exact boundaries and locations of each field and places a boundary box (white space) around each field. When a field changes that particular boundary box is cleared and the new field data is imaged. However, the new field data may require a larger boundary box than the previous field did. In some cases, neighboring fields that do not change may be covered with white space from the changing field's boundary box. To prevent existing fields from being covered by a changing field, see "Using Option 61 (Reimage Field)" in Chapter 4.

Note: Smart imaging is automatically disabled on formats with a Data Matrix bar code.

Adjusting the Print Quality

Many factors affect print quality: type of supplies, print speed, print contrast, and the type of printer's application. This printer supports both thermal transfer and thermal direct supplies. The type of supply should match the printer's application.

- If you want to print at high speeds, you should use premium supplies. Using premium supplies reduces smudged images, hard to read labels, and faded print. Supply type, print speed, and print contrast work together to improve the print quality of labels. Contact your Sales Representative for more information.
- Select the print speed based on desired throughput and print quality. If print quality is more important, reduce the print speed, because a lower print speed increases the print quality of labels. If throughput is more important, increase the print speed as high as it will go to give you the needed print performance. See "Increasing Throughput" for more information.
- If the print quality is too light or too dark, adjust the print contrast. The correct contrast setting is important because it effects how well your bar codes scan and how long the printhead lasts. Solid black print cannot exceed 30% of any given square inch of the supply.

  Be sure to check the print quality of bar codes with a bar code verifier or scanner. If you do not have a verifier or scanner, check the bar code visually. A bar code that is **IN SPEC** will have complete bars and clear spaces. Small alphanumeric characters will look complete. A bar code that is **IN SPEC** may not look as good as one that is too dark, but it will have the highest scan rate.

Note: For highest scan rates, make sure there is adequate white space before and after the bar code. Also, a darker bar code does not mean it will scan better.

The following non-print zones are recommended:

All Supplies .050 inches on either edge of the label.
All Supplies .020 inches at the top and bottom of the label.

If using the optional verifier, allow a minimum no-scan zone on the trailing edge of the label of 0.5 inches (13 mm).

Reducing Imaging Time

Imaging time is the time it takes the printer to image the data for the first label after the printer receives the format and batch packet. There are several ways to reduce the imaging time: send formats and configurations once, use a batch quantity of zero, or update batch fields.

- If the formats use the same check digit scheme, you only need to send the check digit scheme once.
- Send formats once and use the batch update field to change information on the label. Using a batch update field reduces the imaging time, because only the fields that change are imaged. All other fields remain the same as the last queued batch.
- Use the batch quantity zero method when your application requires operator intervention to enter data. While the operator is entering data, the previous field is sent with a batch quantity of zero. The printer images the field, but does not print it. After the operator enters the data for the last field, the batch quantity can be specified. The last remaining field is imaged, and the label prints almost immediately.

To pre-image a label:

1. Send the format and a batch header in one file. The first time you send the batch header, use the parameter N (new batch), and the parameter 0 for (zero quantity).

Example **{B,1,N,0 | }**

The printer images constant text, line, box, and graphic fields, but does not print them.

2. Input data for each field, and send it with a batch header using the parameter U (update) and a quantity of zero. When the printer receives the data, it immediately images the field, but does not print it.

Example
```
{B,1,U,0 |
1,"RODGER DIST CTR" | }
{B,1,U,0 |
2,"8292" | }
```

At this time, the printer is imaging all associated fields, including fields that copy from other fields.

3. Repeat step 2 for each field except the last one.

```
{B,1,U,0 |
3,"BROADWAY" | }
{B,1,U,0 |
4,"555 WEST OAK AVE." | }
```

4. For the last field, input data and send it with the quantity of labels you want printed. When the printer receives input for the last field, it immediately prints the labels.

Example
```
{B,1,U,10 |
5,"DAYTON, OHIO" | }
```

Increasing Throughput

Reducing the imaging time increases throughput. You can also increase the baud rate to increase the transmission time and increase throughput. Make sure the communication settings at the printer match those at the host. Using a baud rate of 19200 is almost twice as fast as 9600 baud. Using a baud rate of 38400 is almost twice as fast as 19200 baud.

General Format Tips and Hints

The following tips and hints are helpful to keep in mind when designing MPCLII formats.

With Packets

- Leave parameters blank that you do not need to change when sending online configuration packets. For example, {**I**,A,,,,1 | } prints a slashed zero and uses the last sent online system setup parameters.

You can group fields with similar parameters. For example

```
T,1,10,V,250,50,1,1,1,1,B,C,0,0 |
T,2,15,,,75 |
T,3,,,,100 |
```

The first text field sets all the parameters for that field. The second text field's number of characters and column location changes from what was defined in the first field. In the third text field, only the column location is changed. This method can be used on bar code and constant text fields as well.

Note: You should understand the basics of each field before using this method.

After you modify any fields or parameters with the optional entry method, resend the format, batch, or configuration packet to the printer.

With Bar Codes

- Be careful when rotating or placing a UPC/EAN bar code with human readable characters, because the bottom reference point is at the bottom of the bars, not at the bottom of the human readable characters.

With Fields

- Data that remains the same for each label should be in a constant text field. Data that varies for each label should be in a text field.
- Check for trailing spaces in text or constant text fields if you receive a "field off tag" error. An easy way to see trailing spaces is to print the field in the reverse font.
- Make sure if you magnify a field, it does not go off the label or cover another field. Magnifying a field increases the distance between the printed character and the edge of the cell.

SAMPLES

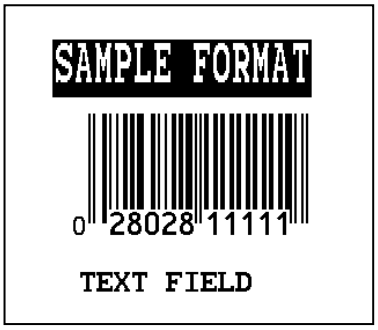
A

This appendix contains sample formats. You can customize any of these formats to meet your needs.

The field separator is the split vertical bar (|). The decimal value is 124. To enter this character, use the Shift key plus the Split Vertical Bar key on your computer's keyboard. Depending on your text editor, it may appear as a solid vertical bar or as a split vertical bar.

Sample UPCA Format Packet

```
{F,25,A,R,E,200,200,"Fmt 25" |
C,140,40,0,1,2,1,W,C,0,0,"SAMPLE FORMAT" |
B,1,12,F,85,40,1,2,40,5,L,0 |
T,2,18,V,50,50,1,3,1,1,B,L,0,0 | }
```



Sample Batch Packet

```
{B,25,N,1 |
1,"02802811111" |
2,"TEXT FIELD" | }
```

Sample MaxiCode Packets

MaxiCode is a two-dimensional bar code developed by UPS (United Parcel Service, Inc.). Data must be defined in a specific way for UPS. Refer to the *Guide to Bar Coding with UPS* or the *AIM MaxiCode Specification* for more details about data requirements.

The printer supports modes 0, 1, 2, and 3. Contact us for information about additional MaxiCode modes.

Mode	Description
0	Obsolete
1	Obsolete
2	Structured Message
3	Structured Message

You can select which mode to use in the bar code field or allow the printer to auto-select the mode (0, 2, or 3) based on your data. See "Defining a Bar Code Field" for more information. MaxiCode automatically pads data with the "!" character.

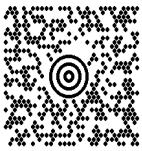
Note: MaxiCode does not support the NULL character.

Modes 2 and 3 are defined by the way the postal code, class of service, and country code fields are arranged. (The postal code, class of service, and country code are required fields.) Begin with the message header, then the primary data (15 characters), followed by the secondary message (up to 78 characters). Or, begin with the primary data, then the message header, followed by the secondary data. If the postal code data characters are all numeric then the MaxiCode symbol is set to Mode 2. If the characters are alphanumeric, or only contain ASCII characters 65 to 90, then the MaxiCode symbol is set to Mode 3.

If you receive an error 612, check your MaxiCode data. You may have not correctly structured or left out one of the three required fields (postal code, class of service, and country code) or the "~029" character.

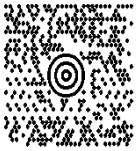
Mode 0 (Obsolete) Sample

`{F,1,A,R,E,0200,0200,"MAXICODE" |`	
`B,1,93,V,020,20,33,7,0,8,L,0 | }`	MaxiCode bar code (33)
`{B,1,N,1 |`	Batch header
`1,"450660000" |`	Postal code- zip code
	(This field determines Mode)
`C,"001" |`	Country code
`C,"840" |`	Class of service
`C,"[)~030" |`	Message header
`C,"01~02996" |`	Transportation header
`C,"1Z12345678~029" |`	Tracking number
`C,"UPSN~029" |`	Origin carrier SCAC
`C,"12345A~029" |`	UPS shipper number
`C,"070~029" |`	Julian day of pickup
`C,"~029" |`	Shipment ID (empty)
`C,"1/1~029" |`	Package count
`C,"15~029" |`	Weight (lb.)
`C,"Y~029" |`	Address validation
`C,"60 SADDLEBROOK CT.~029" |`	Street address (empty)
`C,"DAYTON~029" |`	City (empty)
`C,"OH~030" |`	State
`C,"~004" | }`	EOT



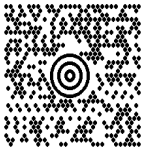
Mode 2 Sample

`{F,1,A,R,E,200,200,"MAXI_M2" |`	
`B,1,93,V,020,020,33,7,0,8,L,0 | }`	MaxiCode bar code (33)
`{B,1,N,1 |`	
`1,"[)~030" |`	Message header
`C,"01~02996" |`	Transportation header
`C,"068100000~029" |`	Postal Code
	(This field determines Mode)
`C,"840~029" |`	Country code
`C,"001~029" |`	Class of service
`C,"1Z12345675~029" |`	Tracking number
`C,"UPSN~029" |`	Origin carrier SCAC
`C,"12345E~029" |`	UPS shipper number
`C,"089~029" |`	Julian day of pickup
`C,"~029" |`	Shipment ID (empty)
`C,"1/1~029" |`	Package count
`C,"10~029" |`	Weight (lb.)
`C,"Y~029" |`	Address validation
`C,"~029" |`	Street address (empty)
`C,"~029" |`	City (empty)
`C,"CT~030" |`	State
`C,"~004" | }`	EOT



Mode 3 Sample

`{F,1,A,R,E,200,200,"MAXI_M3" |`	
`B,1,93,V,020,020,33,7,0,8,L,0 | }`	MaxiCode bar code (33)
`{B,1,N,1 |`	
`1,"[)~030" |`	Message header
`C,"01~02996" |`	Transportation header
`C,"M5E1G45~029" |`	Postal Code
	(This field determines Mode)
`C,"124~029" |`	Country code
`C,"066~029" |`	Class of service
`C,"1Z12345679~029" |`	Tracking number
`C,"UPSN~029" |`	Origin carrier SCAC
`C,"12345E~029" |`	UPS shipper number
`C,"089~029" |`	Julian day of pickup
`C,"~029" |`	Shipment ID (empty)
`C,"1/1~029" |`	Package count
`C,"10~029" |`	Weight (lb.)
`C,"Y~029" |`	Address validation
`C,"~029" |`	Street address (empty)
`C,"TORONTO~029" |`	City (empty)
`C,"ON~030" |`	State
`C,"~004" | }`	EOT



MaxiCode Compression Sample

Once the data is properly encoded per the compressed format, the UPS scanners and software do the translating of the compressed data when reading the symbol. Our printers take the input data as-is and encode it as a standard MaxiCode symbol. Standard scanners interpret the encoded data exactly as it appears in the symbology without decompressing its contents.

Note: Compressed data can not contain carriage return or line feed (CRLF) characters.

```
{F,1,A,R,E,600,400,"Compress"|
B,01,120,V,272,15,33,7,0,8,L,0|}      appearance (8) for compressed data
{B,1,N,1|
1,"[)>~030"|
C,"01~029"|
C,"96453420000~029"|
C,"840~029"|
C,"013~029"|
C,"1Z12121212~029"|
C,"UPSN~029"|
C,"564W65~030"|                       start of compressed data
C,"07'4N%KKL8X5~029"|
C,"9T#VO:Z+Z 0~029"|
C,"SFBH3R#&ZAT/~029"|
C,"87EPJ)~029"|                       end of compressed data
C,"S~013"|
C,"~030"|
C,"~004"|}
```

Batch data can also be included as one long string without carriage return or line feed (CRLF) characters.

```
{B,1,N,1|
1,"[)>~03001~02996142010000~029840~029003~0291Z00000014~029UPSN~029111111~03007#P
36 (AWO'$6,X3&W6HMJAL-7WK0 8YU,)92+'#I%~029#S~013~030~004"|}
```

Sample Data Matrix Packets

Data Matrix (ECC-200) is a two-dimensional bar code which is made up of square modules arranged within a perimeter finder pattern. There are 24 square symbol sizes available ranging from 10 rows by 10 columns to 144 rows by 144 columns. There are six rectangular symbol sizes available ranging from 8 rows by 8 columns to 16 rows by 48 columns. The symbol size is data dependent. Data Matrix automatically pads data.

Make sure you do not overlay other fields when designing your Data Matrix symbol. Smart imaging is automatically disabled on formats with a Data Matrix bar code. You should also allow a 3 or 4 dot “quiet zone” (blank space around the bar code’s perimeter) for scanning. See “Defining a Bar Code Field” for more information.

Sample Batch Data with Special Characters

To use this character in the bar code	enter these characters in the batch data
null character	~~@
~ (tilde)	~126~126
FNC1	~~1

Square Data Matrix Packet

```
{F,36,A,R,E,400,400,"DTMTRX1" |
B,1,50,V,50,100,35,0,100,8,L,0 | }
{B,36,N,1 |
1,"1234567890ABCDEFGHIJKLMNOPQRST" | }
```

This example prints a one-inch wide by one-inch tall (100) square Data Matrix symbol using the default density (0) without any field rotation (0).

Rectangular Data Matrix Packet

```
{F,36,A,R,E,400,400,"DTMTRX2" |
B,1,400,V,100,200,35,29,50,8,L,1 | }
{B,36,N,1 |
1,"1234567890ABCDEFGHIJKLMNOPQRST" | }
```

This example prints a one-inch by a half-inch tall (50) rectangular 16 rows by 36 columns (density 29) Data Matrix symbol rotated 90 (1).

Sample Data Matrix with Function 1

```
{F,36,A,R,E,400,400,"DTMTRX1" |
B,1,50,V,10,50,35,0,50,8,L,0 | }
{B,36,N,1 |
1,"~~110012345678902" | }
```

This example prints a 0.50-inch wide by 0.50-inch tall (50) square Data Matrix symbol using the default density (0) without any field rotation (0). FNC1 appears in the batch data as ~~1.

Sample Quick Response Packets

Quick Response (QR Code) is a two-dimensional bar code, which is made up of square modules arranged in an overall square pattern. A unique finder pattern is located at three corners of the symbol. Four levels of error correction are available, along with a wide range of symbol sizes.

- Model 1 is the original specification.
- Model 2 is an enhanced form that includes additional features.

The maximum number of characters depends on the type of characters entered for the batch data and differs for the two models of QR Code.

Data Type	Model1	Model2
Numeric Data	1167	2710
Alphanumeric Data	707	2710
8-Bit data	486	2710
Kanji data	299	1817

QR Code can accommodate Japanese *Kana* and *Kanji* characters and has a variety of applications, including marking spark plugs, radiators, printed circuit boards, and test tubes. Refer to the *AIM International Symbology Specification* for more details about data requirements.

Sample QR Code Packet

```
{F,1,A,R,E,200,200,"QRCODE" |
B,1,200,V,75,50,36,0,100,2,B,0 |  }
{B,1,N,1 |
1,"HM,N0123456789012345" |}
```

Sample QR Code with URL Packet

```
{F,1,A,R,E,200,200,"QRURL" |
B,2,200,V,75,50,36,0,100,2,B,0 |  }
{B,1,N,1 |
2,"MA,http://www.monarch.averydennison.com" | }
```

Structured Append QR Code Packet

```
{F,2,A,R,E,200,200,"QRCODE2" |
B,1,200,V,50,50,36,0,100,2,B,0 | }
{B,2,N,1 | 1,"D0202E9,Q0A" |
C,"0123456789ABCD+__âôû
~129~064~159~252~224~064" | }
```

Sample GS1 DataBar Packets

GS1 DataBar encodes brand identification and dynamic data. This family of bar codes can contain more information than current EAN/UPC bar codes. Seven symbologies encode a Global Trade Item Number (GTIN). GS1 DataBar codes can be stacked, truncated, or omni directional.

GS1 DataBar with Function 1

```
{F,1,A,R,E,400,400,"UCCAB" |
B,1,30,V,5,65,38,4,35,0,L,0,11,2,22 | }
{B,1,N,1 |
1,"#10ABC|#Monarch Brand Printers" | }
```

GS1 DataBar EAN13 with Composite

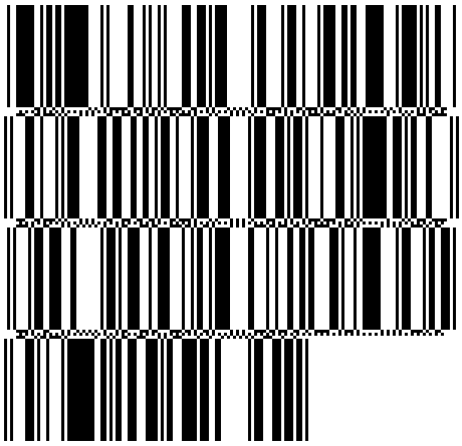
```
{F,1,A,R,E,600,400,"GS1EAN13" |
B,0,39,V,285,100,38,3,60,8,L,0,9,1,22 |
R,1,"123456789012|#910123456#011234567890123" | }
{B,1,N,1 | }
```

GS1 DataBar 14 Stacked Omni Directional

```
{F,17,A,R,E,400,400,"STACKOM" |
B,1,120,V,50,100,38,3,100,0,L,0,4,2 | }
{B,17,N,1 |
1,"1234567890123" | }
```

GS1 DataBar Expanded

```
{F,27,A,R,E,400,400,"EXPANDED" |
B,1,120,V,50,100,38,3,100,0,L,0,6,,6 | }
{B,27,N,1 |
1,"12345678901234567890123456789012345
67890123456789012345678901234567890" | }
```



GS1 DataBar Expanded (no composite)

```
{F,1,A,R,E,600,400,"GS1EXPD" |
B,0,16,V,425,25,38,3,50,8,L,0,6,1,22 |
R,1,"10123456#21ABCD" | }
{B,1,N,1 | }
```

Sample Aztec Packet

Aztec is a two-dimensional bar code symbology consisting of square modules arranged around a square bulls eye pattern. For more information about the Aztec bar code, refer to the *ANSI/AIM BC13 ISS - Aztec Code Specification* from AIM Global.

```
{F,1,A,R,E,200,200,"TEST" |
B,1,25,V,20,20,37,7,0,0,L,0 |
R,53,0,0,0,1,"" | }
{B,1,N,1 |
1,"Monarch Brand Printers" | }
```

Sample Intelligent Mail® Packet

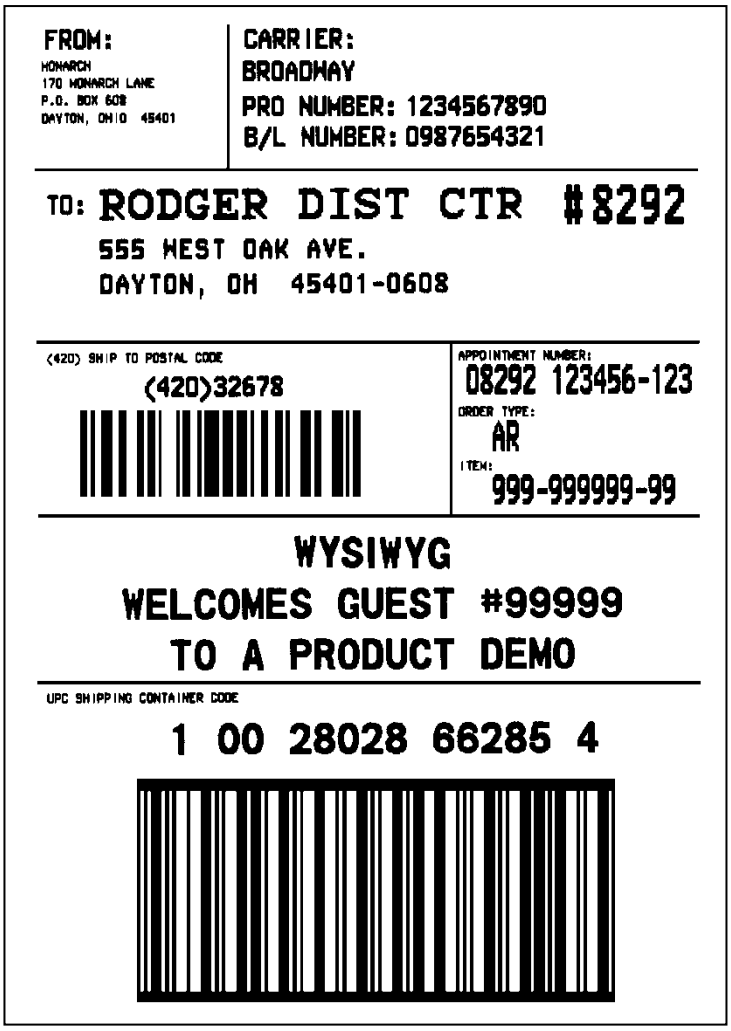
For the Intelligent Mail® bar code, the maximum number of characters is 31, including commas between the data. This bar code is only available on the 9855 printer using version 7.1 or greater firmware. For more information, refer to the *USPS® Intelligent Mail® Specification*.

```
{F,1,A,R,G,1218,812,"intmail"|
B,1,35,V,100,100,24,0,0,8,L,0|}
{B,1,N,1|
1,
"11,222,333333,444444444,55555555555"| }
```

In the above sample, the batch data indicates the following:

Batch Data	Description
11	**Bar code ID:** First digit = 0 to 9; Second digit = 0 to 4
222	**Special Services:** Range: 000 to 999
333333	**Mailer ID:** Range: 000000 to 999999
444444	**Serial Number:** Range: 000000000 to 999999999
555555555	**Delivery Point ZIP code:** 0, 5, 9, or 11-digit ZIP code

```
{F,1,A,R,E,600,400,"RDCI" |
L,V,500,115,90,85,3 |
L,V,298,245,90,102,3 |
L,V,500,2,0,390,3 |
L,V,400,2,0,390,3 |
L,V,298,2,0,390,3 |
L,V,200,2,0,390,5 |
C,568,8,0,2,2,2,B,L,0,0,"FROM:",0 |
C,568,125,0,2,2,2,B,L,0,0,"CARRIER:",0 |
C,529,124,0,2,2,2,B,L,0,0,"PRO NUMBER:",0 |
C,511,125,0,2,2,2,B,L,0,0,"B/L NUMBER:",0 |
C,472,8,0,2,2,2,B,L,0,0,"TO:",0 |
C,387,8,0,2,1,1,B,L,0,0,"(420) SHIP TO POSTAL CODE",0 |
C,391,250,0,2,1,1,B,L,0,0,"APPOINTMENT NUMBER:",0 |
C,358,250,0,2,1,1,B,L,0,0,"ORDER TYPE:",0 |
C,327,250,0,2,1,1,B,L,0,0,"ITEM:",0 |
C,190,8,0,2,1,1,B,L,0,0,"UPC SHIPPING CONTAINER CODE",0 |
C,557,6,0,2,1,1,B,L,0,0,"MONARCH",0 |
C,547,6,0,2,1,1,B,L,0,0,"170 MONARCH LANE",0 |
C,537,6,0,2,1,1,B,L,0,0,"P.O. BOX 608",0 |
C,527,6,0,2,1,1,B,L,0,0,"DAYTON, OHIO 45401",0 |
C,462,313,0,2,4,3,B,L,0,0,"#",0 |
T,1,15,V,529,220,0,2,2,2,B,L,0,0,0 |
T,2,15,V,511,220,0,2,2,2,B,L,0,0,0 |
B,3,13,V,311,28,8,4,50,8,L,0 |
B,4,14,V,17,60,50,5,130,8,L,0 |
T,5,30,V,161,080,0,3,1,1,B,L,0,0,0 |
T,6,15,V,467,40,4,1,2,2,B,L,0,0,0 |
T,7,10,V,462,330,6,2,4,3,B,L,0,0,0 |
T,8,20,V,549,124,0,2,2,2,B,L,0,0,0 |
T,9,30,V,446,40,4,2,2,2,B,L,0,0,0 |
T,10,30,V,426,40,4,2,2,2,B,L,0,0,0 |
T,11,30,V,406,40,4,2,2,2,B,L,0,0,0 |
T,12,20,V,368,255,0,2,3,2,B,L,0,0,0 |
T,13,5,V,335,270,0,2,3,2,B,L,0,0,0 |
T,14,15,V,304,270,0,2,3,2,B,L,0,0,0 |
T,15,15,V,366,65,0,2,2,2,B,L,0,0,0 |
  R,1,"(420)ÿ" |
T,16,27,V,270,10,0,3,1,1,B,C,0,0,0 |
T,17,27,V,240,10,0,3,1,1,B,C,0,0,0 |
  R,1,"WELCOMES GUEST # " |
T,18,27,V,210,10,0,3,1,1,B,C,0,0,0 | }
```



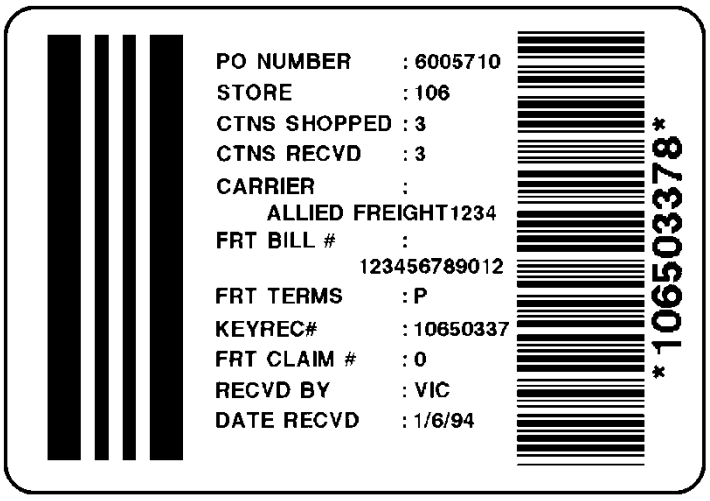
Sample Batch Packet

```
{B,1,N,1 |
1,"1234567890" |
2,"0987654321" |
3,"~20142032678" |
4,"10028028662854" |
5,"1 00 28028 66285 4" |
6,"RODGER DIST CTR" |
7,"8292" | 8,"BROADWAY" |
9,"555 WEST OAK AVE." |
10,"DAYTON, OH 45401-0608" |
11,"" |
12,"08292 123456-123" |
13,"AR" |
14,"999-999999-99" |
15,"32678" |
                        16,"WYSIWYG" |
                        17,"99999" |
                        18,"TO A PRODUCT DEMO" | }
```

```
{F,5,A,R,G,576,768,"1HDREC1" |
L,S,19,39,499,39,38,"" |
L,S,19,93,499,93,15,"" |
L,S,19,124,499,124,15,"" |
L,S,19,155,499,155,38,"" |
C,461,232,0,1,1,1,B,L,0,0,"PO NUMBER ",1 |
C,426,232,0,1,1,1,B,L,0,0,"STORE " |
C,391,232,0,1,1,1,B,L,0,0,"CTNS SHOPPED" |
C,357,232,0,1,1,1,B,L,0,0,"CTNS RECVD " |
C,320,232,0,1,1,1,B,L,0,0,"CARRIER " |
C,259,232,0,1,1,1,B,L,0,0,"FRT BILL # " |
C,196,232,0,1,1,1,B,L,0,0,"FRT TERMS " |
C,159,232,0,1,1,1,B,L,0,0,"KEYREC# " |
C,125,232,0,1,1,1,B,L,0,0,"FRT CLAIM # " |
C,090,232,0,1,1,1,B,L,0,0,"RECVD BY " |
C,056,232,0,1,1,1,B,L,0,0,"DATE RECVD " |
C,461,445,0,1,1,1,B,L,0,0,":" |
C,426,445,0,1,1,1,B,L,0,0,":" |
C,391,445,0,1,1,1,B,L,0,0,":" |
C,357,445,0,1,1,1,B,L,0,0,":" |
C,320,445,0,1,1,1,B,L,0,0,":" |
C,259,445,0,1,1,1,B,L,0,0,":" |
C,196,445,0,1,1,1,B,L,0,0,":" |
C,159,445,0,1,1,1,B,L,0,0,":" |
C,125,445,0,1,1,1,B,L,0,0,":" |
C,090,445,0,1,1,1,B,L,0,0,":" |
C,056,445,0,1,1,1,B,L,0,0,":" |
T,01,08,V,461,458,0,1,1,1,B,L,0,0 |
T,02,08,V,426,458,0,1,1,1,B,L,0,0 |
T,03,08,V,391,458,0,1,1,1,B,L,0,0 |
T,04,08,V,357,458,0,1,1,1,B,L,0,0 |
T,05,18,V,290,289,0,1,1,1,B,R,0,0 |
T,06,12,V,230,395,0,1,1,1,B,R,0,0 |
T,07,08,V,196,458,0,1,1,1,B,L,0,0 |
T,08,08,V,159,458,0,1,1,1,B,L,0,0 |
T,09,08,V,125,458,0,1,1,1,B,L,0,0 |
T,10,08,V,090,458,0,1,1,1,B,L,0,0 |
T,11,08,V,056,458,0,1,1,1,B,L,0,0 |
T,12,11,V,259,762,0,1,2,2,B,B,0,1 |
  R,1,"*_________*" |
B,13,09,V,259,720,4,4,145,8,B,1 |
  R,4,12,2,9,1,1 |
  R,50,3,8 | }
```

Sample Zero Batch Packet

```
{B,5,N,0 | }
{B,5,U,1 |
1,"6005710" |
2,"106" |
3,"3" |
4,"3" |
5,"ALLIED FREIGHT1234" |
6,"123456789012" |
7,"P" |
8,"10650337" |
9,"0" |
10,"VIC" |
11,"1/6/94" |
12,"106503378" | }
```

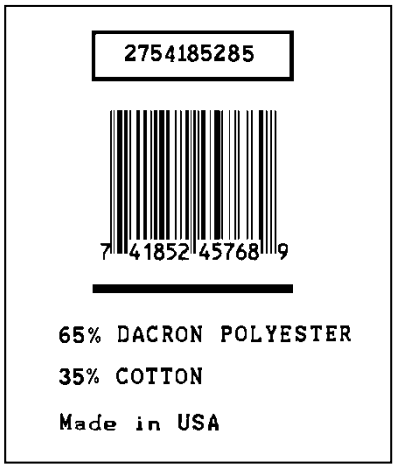


Sample Data Entry Format Packet

This packet uses Option 5 (Data Entry Sources) and Option 20 (Data Entry Prompts). After the printer receives the format packet, the operator can go into Batch Entry Mode at the printer and enter the batch data.

```
{F,1,A,R,E,300,200,"TEXTILES" |
T,1,10,V,250,50,0,1,1,1,B,C,0,0,0 |
  R,20,"PART NUMBER:" |
  R,5,K |
B,2,12,V,150,40,1,2,80,7,L,0 |
  R,20,"UPC NUMBER:" |
  R,5,K |
D,3,20 |
  R,20,"FIBER#1:" |
  R,5,K |
D,4,3 |
  R,20,"PERCENTAGE:" |
  R,5,K |
T,5,30,V,80,10,0,1,1,1,B,L,0,0,0 |
  R,1," % " |
  R,4,3,1,20,5,1 |
  R,4,4,1,3,1,1 |
  R,5,N | D,6,20 |
  R,20,"FIBER #2:" |
  R,5,K |
D,7,3 |
  R,20,"PERCENTAGE:" |
  R,5,K |
T,8,30,V,65,10,0,1,1,1,B,L,0,0,0 |
  R,1," % " |
  R,4,6,1,20,5,1 |
  R,4,7,1,3,1,1 |
  R,5,N |
C,30,10,0,1,1,1,B,L,0,0,"MADE IN USA",0 |
L,S,110,30,110,150,10," " |
Q,240,30,270,150,3," " | }
```

Depending on the operator-entered batch data, a label similar to this one prints.



```
{F,1,A,R,E,200,200,"EPCFONT" |
T,40,1,F,10,10,0,56,40,40,B,L,0,0|}
{B,1,N,1 |
40,"A"|}
```

RFID Data Field with a Copy Option

```
F,1,A,R,E,600,400,"RDCI" |
L,V,500,115,90,85,3 |
L,V,298,245,90,102,3 |
C,568,8,0,2,2,2,B,L,0,0,"FROM:",0 |
C,568,125,0,2,2,2,B,L,0,0,"CARRIER:",0 |
C,387,8,0,2,1,1,B,L,0,0,"(420) SHIP TO POSTAL CODE",0 |
C,391,250,0,2,1,1,B,L,0,0,"APPOINTMENT NUMBER:",0 |
C,327,250,0,2,1,1,B,L,0,0,"ITEM:",0 |
C,190,8,0,2,1,1,B,L,0,0,"UPC SHIPPING CONTAINER CODE",0 |
T,1,15,V,529,220,0,2,2,2,B,L,0,0,0 |
B,3,13,V,311,28,8,4,50,8,L,0 |
B,4,14,V,17,60,50,5,130,8,L,0 |
X,5,24,0 |
T,6,20,V,415,270,0,50,15,15,B,L,0,2 |
R,4,5,1,16,1,0 |
```

Sample Batch Packet

```
B,1,N,1 |
1,"RFID TEST" |
3,"1005678" |
4,"67-90-32" |
5,"3123456789ABCDEF12345678" |
6,"ABCDEFG" |
```

ASCII HEX

```
{F,2,A,R,E,400,400,"ASCIIHEX" |
T,1,50,V,10,10,0,1,1,1,B,L,0,0 |
X,2,24,0 |}
{B,2,N,1 |
1,"313233343536373839303132" |
2,"313233343536373839303132" |}
```

ASCII HEX Incrementing Field

```
{F,2,A,R,E,400,400,"ASCIIHEX" |
T,1,50,V,10,10,0,1,1,1,B,L,0,0 |
X,2,24,0 |
  R,60,I,1 |}
{B,2,N,5 |
1,"313233343536373839303132" |
2,"313233343536373839303132" | }
```

SSCC96

```
{F,45,A,R,E,600,400,"SSCC96" |
C,45,220,0,50,10,10,B,L,0,2,"®" |
C,75,385,0,50,40,30,B,L,0,2,"Monarch RFID" |
C,110,385,0,50,6,6,B,L,0,2,"SHIP TO RFID USER" |
C,110,150,0,50,6,6,B,L,0,2,"CARRIER" |
C,150,150,0,50,9,9,B,L,0,2,"PRO:" |
C,165,150,0,50,9,9,B,L,0,2,"B/L:" |
C,200,380,0,50,18,15,B,L,0,2,"AVERY DENNISON" |
C,235,380,0,50,14,12,B,L,0,2,"EMAIL: RFID@MONARCH.COM" |
C,255,380,0,50,14,12,B,L,0,2,"PHONE: 1 800 543-6650" |
C,275,345,0,50,6,6,B,L,0,2,"VENDOR STK NO:" |
C,275,110,0,50,6,6,B,L,0,2,"PACK/UNITS:" |
C,360,330,0,50,10,10,B,L,0,2,"EPC Pure Identity:" |
C,275,190,0,50,6,6,B,L,0,2,"COLOR:" |
C,315,110,0,50,6,6,B,L,0,2,"SIZE/STYLE:" |
C,415,390,0,50,12,12,B,L,0,2,"EPC#:" |
L,S,098,005,098,395,6,"" |
L,S,170,005,170,395,6,"" |
L,S,098,155,170,155,6,"" |
L,S,260,005,260,395,6,"" |
L,S,390,005,390,395,6,"" |
T,1,15,V,130,335,0,50,13,12,B,L,0,2 |
B,2,15,V,165,365,8,4,25,0,L,2 |
T,3,20,V,130,150,0,50,13,12,B,L,0,2 |
T,4,20,V,150,110,0,50,10,12,B,L,0,2 |
T,5,20,V,165,110,0,50,10,12,B,L,0,2 |
T,12,10,V,295,370,0,50,15,18,B,L,0,2 |
T,13,10,V,295,110,0,50,15,18,B,L,0,2 |
T,14,50,V,380,385,0,50,12,11,B,L,0,2 |
T,15,10,V,295,200,0,50,15,18,B,L,0,2 |
T,16,10,V,335,155,0,50,15,18,B,L,0,2 |
T,18,30,V,550,330,0,50,15,18,B,L,0,2 |
B,17,20,V,530,340,50,6,110,0,L,2 |
X,19,24 |
T,20,40,V,415,330,0,50,12,13,B,L,0,2 |
R,4,19,1,40,1,1 |}
```

```
{B,45,N,1 |
1,"VENDOR USA" |
2,"42060512" |
3,"AVERY DENNISON" |
4,"0987764356" |
5,"0020545640" |
12,"0075687332" |
13,"3600" |
14,"urn:epc:tag:sscc-96:1.0028028.0000001235" |
15,"RED" |
16,"48~"/TOUGH" |
17,"009280287586887" |
18,"0  09  28028  75688  7" |
19,"313401B5F0000004D3000000" |
20,"0" |}
```

SGTIN 96

```
{F,46,A,R,E,600,400,"SGTIN96" |
C,45,220,0,50,10,10,B,L,0,2,"®" |
C,75,385,0,50,40,30,B,L,0,2,"Monarch RFID" |
C,110,385,0,50,6,6,B,L,0,2,"SHIP TO RFID USER" |
C,110,150,0,50,6,6,B,L,0,2,"CARRIER" |
C,150,150,0,50,9,9,B,L,0,2,"PRO:" |
C,165,150,0,50,9,9,B,L,0,2,"B/L:" |
C,200,380,0,50,18,15,B,L,0,2,"AVERY DENNISON" |
C,235,380,0,50,14,12,B,L,0,2,"EMAIL: RFID@MONARCH.COM" |
C,255,380,0,50,14,12,B,L,0,2,"PHONE: 1 800 543-6650" |
C,275,345,0,50,6,6,B,L,0,2,"VENDOR STK NO:" |
C,275,110,0,50,6,6,B,L,0,2,"PACK/UNITS:" |
C,360,330,0,50,10,10,B,L,0,2,"EPC Pure Identity:" |
C,275,190,0,50,6,6,B,L,0,2,"COLOR:" |
C,315,110,0,50,6,6,B,L,0,2,"SIZE/STYLE:" |
C,415,390,0,50,12,12,B,L,0,2,"EPC#:" |
L,S,098,005,098,395,6,"" |
L,S,170,005,170,395,6,"" |
L,S,098,155,170,155,6,"" |
L,S,260,005,260,395,6,"" |
L,S,390,005,390,395,6,"" |
T,1,15,V,130,335,0,50,13,12,B,L,0,2 |
B,2,15,V,165,365,8,4,25,0,L,2 |
T,3,20,V,130,150,0,50,13,12,B,L,0,2 |
T,4,20,V,150,110,0,50,10,12,B,L,0,2 |
T,5,20,V,165,110,0,50,10,12,B,L,0,2 |
T,12,10,V,295,370,0,50,15,18,B,L,0,2 |
T,13,10,V,295,110,0,50,15,18,B,L,0,2 |
T,14,50,V,380,385,0,50,12,11,B,L,0,2 |
T,15,10,V,295,200,0,50,15,18,B,L,0,2 |
T,16,10,V,335,155,0,50,15,18,B,L,0,2 |
T,18,30,V,550,330,0,50,15,18,B,L,0,2 |
B,17,20,V,530,340,50,6,110,0,L,2 |
X,19,24 |
T,20,40,V,415,330,0,50,12,13,B,L,0,2 |
R,4,19,1,40,1,1 |}
```

```
{B,46,N,1 |
1,"VENDOR USA" |
2,"42060512" |
3,"AVERY DENNISON" |
4,"0987764356" |
5,"0020545640" |
12,"0075687332" |
13,"3600" |
14,"urn:epc:tag:sgtin-96:1.0028028.001234.2" |
15,"RED" |
16,"48~"/TOUGH" |
17,"009280287586887" |
18,"0  09  28028  75688  7" |
19,"303401B5F001348000000002" |
20,"0" |}
```

Password Lock

```
{F,1,A,R,E,400,400,"PWDLOCK" |
X,1,100,0 |}
{B,1,N,1 |
1,"313233343536373831323334~028" |
C,"ABCDEFGH01234567UserMemorySample~028" |
C,"~028" |
C,"73737373~028" |
C,"CAD01234~028" |
C,"22022" |}
```

Permalock and Password Lock

```
{F,1,A,R,E,400,400,"BOTHLOCK" |
X,1,100,0 |}
{B,1,N,1 |
1,"313233343536373831323334~028" |
C,"ABCDEF ~028" |
C,"~028" |
C,"73737373~028" |
C,"CAD01234~028" |
C,"33033" |}
```

FONTS

B

Our printers support two types of fonts: Bitmapped (traditional printer fonts such as Standard and Reduced) and Scalable/TrueType® (Font 50). This appendix gives a brief overview of each type of font and how your printer interprets fonts. It also shows examples of the fonts loaded in your printer.

Number	Font Size and Appearance	Type of Spacing	# of Dots Between Characters
1	Standard	Monospaced	3 (203 dpi) 5 (300 dpi)
2	Reduced	Monospaced	1 (203 dpi) 2 (300 dpi)
3	Bold	Monospaced	3 (203 dpi) 5 (300 dpi)
4	OCRA-like	Monospaced	3 (203 dpi) 5 (300 dpi)
5	HR1 – only for numeric data	Monospaced	2 (203 dpi) 3 (300 dpi)
6	HR2 – only for numeric data	Monospaced	1 (203 dpi) 2 (300 dpi)
10*	CG Triumvirate™ Typeface Bold (9pt. at 203 dpi or 8 pt. at 300 dpi)	Proportional	Varies with each letter
11*	6 pt. CG Triumvirate™ Typeface	Proportional	Varies with each letter
15*	7 pt. CG Triumvirate™ Typeface	Proportional	Varies with each letter
16*	9 pt. CG Triumvirate™ Typeface	Proportional	Varies with each letter
17*	11 pt. CG Triumvirate™ Typeface	Proportional	Varies with each letter
18*	15 pt. CG Triumvirate™ Typeface	Proportional	Varies with each letter
50	EFF Swiss Bold	Scalable	Varies with each letter
56	PaxarSymbols	Proportional	Varies with each letter
70	15 pt. Paxar	Proportional	Varies with each letter
71	18 pt. Paxar	Proportional	Varies with each letter
72	15 pt. NAFTA	Proportional	Varies with each letter
73	18 pt. NAFTA	Proportional	Varies with each letter

***** The CG Triumvirate™ typefaces support only ANSI and DOS Code Page 437 and 850 Symbol Sets. The scalable font does not support Code Page 1256 (Arabic). The Euro symbol(€) at position ~192 is only available in the Standard, Reduced, and Bold fonts.

These samples were printed using the Internal Symbol set.

Standard Font

Reduced Font

Bold Font

OCRA-like Font

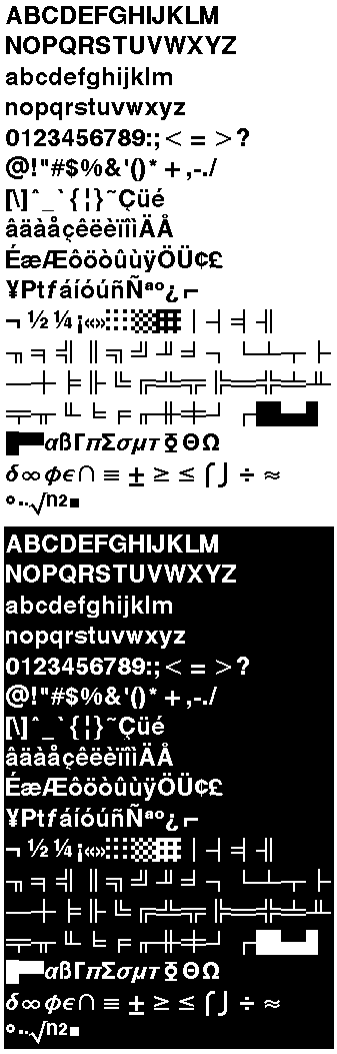
EFF Swiss Bold Font*

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklm
nopqrstuvwxyz
0123456789:;<=>?
@!"#$%&'()*+,-./
[\]^_`{|}~€ ,
ƒ„…†‡ˆ‰Š‹Œ Ž
‘’“”•—˜™š›œ
žŸ ¡¢£¤¥¦§¨©
ª«¬-®¯°±²³´µ¶
·¸¹º»¼½¾¿ÀÁÂÃ
ÄÅÆÇÈÉÊËÌÍÎÐ
ÑÒÓÔÕÖ×ØÙÚÛÜÝ
Þßàáâãäåæçèéê
ëìíîðñòóôõö÷
øùúûüýþÿ

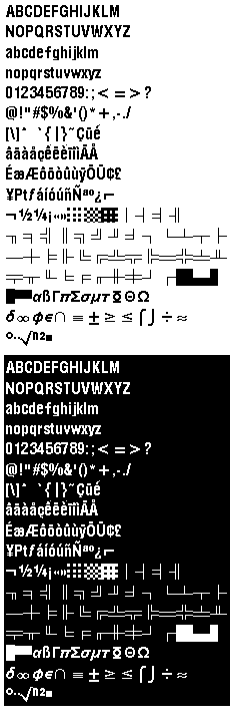
* Printed with ANSI Symbol Set

These samples were printed using Code Page 437.

CG Triumvirate™ Typeface Bold



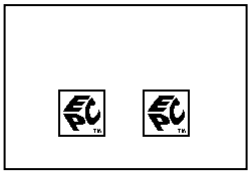
CG Triumvirate™ Typeface



PaxarSymbols Font 56 Characters

A (decimal 65) =

```
{F,1,A,R,E,200,200,"epc" |
T,1,10,V,30,35,0,56,20,20,B,L,0,0|}
{B,1,N,1|
1,"~065     A"|}
```

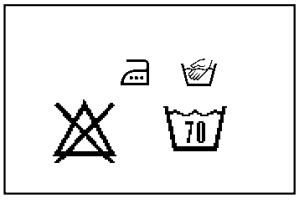


Paxar Font 70 and Font 71 Characters

32	33	34	35	36	37	38	39
				professional dry clean			
40	41	42	43	44	45	46	47
		No bleach	Tumble dry	No tumble dry	Tumble dry low heat	Tumble dry high heat	
48	49	50	51	52	53	54	55
		Cool iron	Warm iron	Hot iron	No iron	Hand Wash	Do Not Wash
56	57	58	59	60	61	62	63
Cotton Wash	Synthetics Wash	Cotton Wash	Synthetics Wash	Cotton Wash	Synthetics Wash	Cotton Wash	Synthetics Wash
64	65	66	67	68	69	70	71
Cotton Wash	Synthetics Wash	Cotton Wash	Synthetics Wash				
72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87
					Wool Wash		

Use the tilde sequences shown in this table to produce the desired character on your tags/labels.

```
{F,1,A,R,E,200,200,"Font70" |
T,1,10,V,25,25,0,70,2,2,B,L,0,0|
T,2,10,V,65,65,0,70,1,1,B,L,0,0|}
{B,1,N,1|
1,"~042  ~064"|
2,"~052   ~054"|}
```



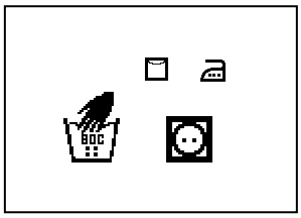
NAFTA Font 72 and Font 73 Characters

32	33	34	35	36	37	38	39
	Machine Wash	Machine Wash	Machine Wash	Machine Wash	Machine Wash	Machine Wash	Machine Wash
40	41	42	43	44	45	46	47
Hand Wash	Hand Wash	Hand Wash	Hand Wash	Hand Wash	Hand Wash	Machine Wash, Perm. Press	Machine Wash, Perm. Press
48	49	50	51	52	53	54	55
Machine Wash, Perm. Press	Machine Wash, Perm. Press	Machine Wash, Perm. Press	Machine Wash, Perm. Press	Machine Wash, Gentle	Machine Wash, Gentle	Machine Wash, Gentle	Machine Wash, Gentle
56	57	58	59	60	61	62	63
Machine Wash, Gentle	Machine Wash, Gentle	Do Not Wash	Do Not Bleach	Do Not Dry	No Iron	Bleach When Needed	Non-Chlorine Bleach When Needed
64	65	66	67	68	69	70	71
	Tumble Dry	Tumble Dry, High Heat	Tumble Dry, Medium Heat	Tumble Dry, Low Heat	Tumble Dry, No Heat	Tumble Dry, Perm. Press	Tumble Dry, Perm. Press, High Heat
72	73	74	75	76	77	78	79
Tumble Dry, Perm. Press, Medium Heat	Tumble Dry, Perm. Press, Low Heat	Tumble Dry, Perm. Press, No Heat	Tumble Dry, Gentle	Tumble Dry, Gentle, High Heat	Tumble Dry, Gentle, Medium Heat	Tumble Dry, Gentle, Low Heat	Tumble Dry, Gentle, No Heat
80	81	82	83	84	85	86	87
Line Dry	Drip Dry	Dry Flat	Do Not Wring	Do Not Tumble Dry	Dry In Shade	Iron	Iron, High Heat
88	89	90	91	92	93	94	95
Iron, Medium Heat	Iron, Low Heat	Iron, High Heat, No Steam	Iron, Medium Heat, No Steam	Iron, Low Heat, No Steam	Professional dry clean	Do Not Dry clean	Dry clean, Any Solvent

96 Dry clean, No Trichloro-ethylene	97 Dry clean, Petroleum Solvent Only	98 Dry clean, Any Solvent, Short Cycle	99 Dry clean, No Trichloro-ethylene, Short Cycle	100 Dry clean, Petroleum Solvent Only, Short Cycle	101 Dry clean, Any Solvent, Reduced Moisture	102 Dry clean, No Trichloro-ethylene, Reduced Moisture	103 Dry clean, Petroleum Solvent Only, Reduced Moisture
104 Dry clean, Any Solvent, Low Heat	105 Dry clean, No Trichloro ethylene, Low Heat	106 Dry clean, Petroleum Solvent Only, Low Heat	107 Dry clean, Any Solvent, No Steam	108 Dry clean, No Trichloro ethylene, No Steam	109 Dry clean, Petroleum Solvent Only, No Steam		

Use the tilde sequences shown in this table to produce the desired character on your tags/labels.

```
{F,1,A,R,E,200,200,"Font72" |
T,1,10,V,25,25,0,72,2,2,B,L,0,0|
T,2,10,V,65,65,0,72,1,1,B,L,0,0|}
{B,1,N,1|
1,"~042  ~067"|
2,"~080   ~087"|}
```



Bitmap Font Information

Our bitmap fonts are either monospaced (each character occupies the same amount of space) or proportional (each character is a different width). Use monospaced fonts for price fields and data you want to list in a column. With proportionally spaced fonts, you may be able to place more characters on a line. However, you may need to experiment with these fonts and adjust field measurements in your format. The bitmapped fonts (either monospaced or proportional) appear jagged when magnified. The magnification range is 1 to 7.

Use the MONARCH® MPCL™ Toolbox (Font Utility), available on our Web site, to convert a bitmap font to Hex or Run-Length encoding for the printer. Select the point size and characters to print. Bitmap fonts may image faster than a TrueType font, but you are limited to the point size and characters you downloaded.

Monospaced Font Magnification

Monospaced characters occupy the same amount of space within a magnification. Use monospaced fonts for price fields and data you want to list in a column. Decide how wide and tall you want the characters to appear on the labels.

Only the 1x width can be scanned with the OCRA-like font. Using a printhead with 203 dpi, the character widths are as follows: 7.9 (English), 20.1 (Metric), and 16 (Dots).

To calculate other font widths, multiply the font dots (14 dots for Standard, 7 dots for Reduced, 24 dots for Bold) by the magnification and add the default spacing (3 dots for Standard, 1 dot for Reduced, 3 dots for Bold) between characters.

Example

14 (Standard font dots) x 5 (magnification) = 70 + 3 (default spacing between characters). There are 73 dots in the Standard font at 5x.

Proportional Font Magnification

Each character in a proportionally spaced font is a different height and width. You may be able to place more characters on a line using proportionally spaced fonts. You may want to experiment with these fonts and adjust field measurements in your format as needed. The bitmapped fonts (either monospaced or proportional) appear jagged when magnified. The magnification range is 1 to 7.

To calculate other font widths, multiply the font dots (3 dots for Minimum, 13 dots for Average, 22 dots for Maximum) by the magnification.

Example

13 (Average font dots) x 5 (magnification) = 65 dots in an average letter of the CG Triumvirate™ Typeface Bold at 5x.

Scalable Font Information

The scalable font is smooth at any point size. There are no jagged edges because the font is created from an equation every time it is used. The field width varies with each letter.

When you define formats using scalable fonts, remember to set the character rotation to 0, because it is not supported. However, field rotation is supported for text or constant text fields using the scalable font. **The scalable font does not print a slashed zero**.

Scalable fonts perform better in constant text fields, because those fields are imaged only once per batch, not once per label as in text fields. The transparent overlay allows closer field placement when using scalable fonts.

The height and width magnification are defined in point size. 72 points = one inch.
One inch = cell size. The cell size is the built-in space around the individual characters of the scalable font. The point size range is **4** to **255**. If the height and width are not set to the same point size, the printed characters look tall and thin or short and thick, which allows for greater flexibility in the appearance of the font.

The 72 point EFF Swiss Bold sample shows the one inch cell size.

6pt Sample

10pt Sample

24pt Sample

48pt Sample

72pt Sample

TrueType Font Information

TrueType fonts follow the TrueType outline font standard. These fonts are smooth at any point size. There are no jagged edges, because the font is created from an equation every time it is used. The height and width magnification are defined in point size.
72 points = one inch. One inch = cell size. The cell size is the built-in space around the individual characters of the scalable font. The point size range is 4 to 255. The field width varies with each letter. The printer accepts downloaded TrueType fonts.

Downloading TrueType Fonts

The MONARCH® MPCL™ Toolbox (Font Utility) is available on our Web site and converts TrueType fonts to Hex or Run-Length encoding for the printer.

When downloading a TrueType font, you download the entire font, not particular characters or one point size. You can print a variety of symbol sets with International (Turkish, Latin, Spanish, etc.) characters. TrueType fonts are designed to be regionally specific; therefore, all symbol sets may not be supported in a given font.

Save the fonts to flash memory for optimal performance with downloaded fonts. No memory configuration packets are necessary since flash memory cannot be reallocated.

Using International Fonts

International fonts are available as bitmap or TrueType fonts. See "Bitmap Font Information" or "TrueType Font Information" for more details. Save the font into the printer's flash memory.

An additional symbol set (110 - Unicode UTF-8) is available depending on your printer's firmware version. To use this symbol set, download an International TrueType font. An International TrueType font containing Chinese or Japanese characters *requires* the high memory option (purchased separately). An International TrueType font containing Arabic characters may not. The high memory option is only available with the 9855 printer.

Note Because the 9825 printer's memory is limited, only Latin fonts (smaller than 256K) may fit in the printer's *flash* memory. There is not enough memory to store an Asian font.

To use International fonts, consider the following information:

- All fonts contain an internal character mapping. The mapping is organized by one or more standards, such as BIG5. These mapping standards can provide over 65,000 characters, which are not represented in this manual. The printer supports several mapping standards:
  - Unicode (UCS-2)
  - BIG5
  - GB2312
  - SJIS
- Specify a symbol set based on the characters to print and one that is compatible with the font's character mapping. For example, to print Japanese characters, select symbol set 932 (Japanese Shift JIS) and a font compatible with that symbol set. See "Selecting a Symbol Set" for more information.
- To enter batch data, use the method specified by the font's character mapping and a compatible symbol set.

Selecting a Symbol Set

Specify a symbol set based on the characters to print and one that is compatible with the font's character mapping. The symbol set parameter identifies the character mapping used in the text field or constant text field, for example, Unicode, BIG5, etc. If no symbol set is selected, the default symbol set (Internal Symbol Set) is used.

The printer automatically translates some character mappings to others. For example, if you need a BIG5 font, it is possible to use Unicode text data. Use Unicode in the symbol set parameter to indicate the text mapping and select the BIG5 font needed in the font parameter (T8 or C5). The printer automatically translates the Unicode character values into BIG5 values before printing the character.

The following table lists the compatible mappings and symbol sets.

Font Character Mapping		**Symbol Set Parameter (T15, C13, or A6)**
Batch Data*	True Type Font Character Mapping	Use in text or constant text fields
Unicode	BIG5	102 – Unicode If you are unsure which character mapping to select, use this symbol set, because the printer automatically translates the character mappings.
Unicode	SJIS	
Unicode	KSC5601	
Unicode	GB2312	
Unicode	Unicode	
BIG5	Unicode	103 – BIG5
GB2312	Unicode	104 – GB2312
SJIS	SJIS	105 – SJIS (Code Page 932 – Japanese Shift JIS)
GB2312	GB2312	106 – GB2312 (Code Page 936 – Simplified Chinese)
BIG5	BIG5	107 – BIG5 (Code Page 950 – Traditional Chinese)
UTF-8	Unicode BIG5 SJIS KSC5601 GB2312	110 – Unicode UTF-8 If you are unsure which character mapping to select, use this symbol set, because the printer automatically translates the character mappings. **Note:** UTF-8 is very common. We recommend using it for compatibility with different host applications and data streams.

* Characters in batch data must be entered based on their mapping (Unicode, BIG5, etc.).

Note: Symbol sets 102-110 require the memory expansion option and a downloaded International TrueType font.

International Font Sample

```
{F,3,A,R,E,150,200,"SIMPLE" |
T,1,5,V,10,10,0,100,30,30,B,L,0,0,102 | }
{B,3,U,1 |
1,"~125~000~125~002~125~004~125~005" | }
```

Symbol Set Parameter

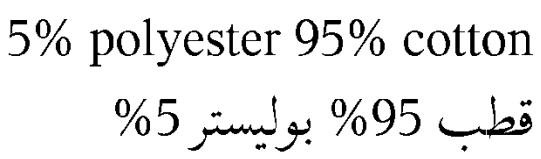
Font Number

This example prints these four characters with Unicode batch data of ~125~000, ~125~002, ~125~004 and ~125~005.

Arabic Font Sample

```
{F,3,A,R,E,220,400,"SIMPLE" |
T,1,250,V,40,380,0,1000,24,24,B,E,0,0,110 |
T,2,250,V,90,380,0,1000,24,24,B,E,0,0,110 | }
{B,3,N,1 |
1,"%5 بوليستر 95% قطب |
2,"5% polyester 95% cotton" | }
```

This example prints on the printer with a downloaded Arabic font and the printer's Numeric Format set as Default.



Refer to the Internet for a listing of the characters in each code page. Search on a particular code page, such as “codepage 936" to view the characters in that code page.

Licensing Your Fonts

We provide you with tools to create and download TrueType fonts. However, it is your responsibility to purchase and license any fonts you download to your printer. Contact your font supplier for licensing information. Additional fonts that are compatible with the printer can be purchased from:

The Electronic Font Foundry
thefonts.com

Korean, Chinese, and Japanese fonts can be purchased from:

DynaComware
www.dynalab.com

Locating the Font Number in a Font Packet

If you are creating font packets, the font number is the second parameter in the packet. Software is available to create the font data and packet. Call Technical Support for more information.

Example

```
{W,200,A,M,68 |
font data |
font data | }
```

Font Number

Use this number in T8 (**font**) or in C5 (**font**). See “Defining Text Fields” or “Defining Constant Text Fields” in Chapter 2 for more information.

Example

```
T,1,10,V,30,10,0,200,1,1,B,L,0,0,0 |
C,50,30,0,200,1,1,B,L,0,0,"MONARCH",0 |
```

Font Number

Font Number

Defines a text and constant text field using the downloaded (#200) font.

SYMBOL SETS/CODE PAGES

C

This appendix contains a listing of the symbol sets, code pages, and extended character sets the printer supports.

Use the charts in this appendix to convert dot sequences from the image dot pattern to codes you can use in the fields. Use the Binary to Hex Conversion Chart to convert Binary dot sequences to Hexadecimal numbers for bitmap files. Use the Dot to Run Length Encoding Chart to convert dot sequences to alphabetic characters for bitmap files.

Supported Symbol Sets and Code Pages

The printers support these symbol sets and code pages: Internal, ANSI, Bold, OCRA Character Set, DOS Code Page 437 and 850. Additional Code Pages are supported with downloaded TrueType or Unicode (International) fonts.

The printer defaults to the internal symbol set. See “Defining the System Setup Packet” in Chapter 2 to change the symbol set.

Selecting a Symbol Set or Code Page

The CG Triumvirate™ typefaces support only the ANSI and DOS Code Page 437 and 850 Symbol Sets. These fonts print a slashed zero when using the ANSI symbol set.

Internal Use this symbol set to print international monetary symbols, the trademark (™) symbol, and for formats that may be used on other MPCLII printers.

ANSI Use this symbol set with proportionally spaced fonts.

DOS CP 437/850 Use this symbol set for extended and international characters with proportionally spaced fonts.

Using Code 128 Function Codes

This table lists the characters for Bar Code 128 function codes. These functions are used with scanners.

Code	Function Code
~201	F1
~202	F2
~203	F3
~204	F4

When using extended characters in your batch data file, type a tilde in front of the three-digit code. For example, if you want to include the character Ä in a text field using the Internal Symbol Set, type:

```
1,"~142" |
```

Using International Character Sets/Code Pages

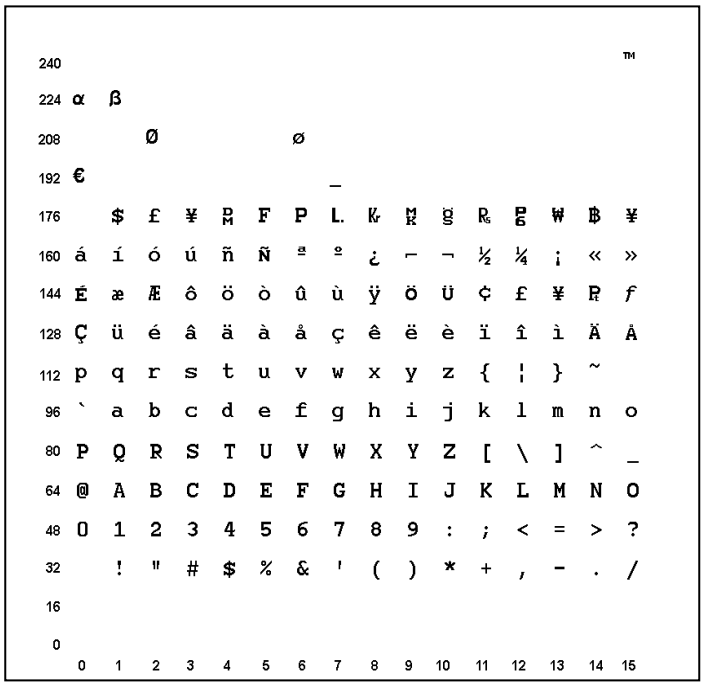
Symbol sets 100, 101, 852-860, and 1250-1258 may only be used with the scalable font (font#50) or downloaded TrueType fonts. TrueType fonts are designed to be regionally specific; therefore, all symbol sets may not be supported in a given font. For example, to print Hebrew characters, you need to find a font (such as Arial) that supports Hebrew characters; convert, and then download the font to your printer. Make sure the correct symbol set for Hebrew characters is selected.

Font 50 does not print the slashed zero or support Code Pages 101 (Wingdings) and 1256 (Arabic). The Euro symbol at position **~192** is only available in the Standard, Reduced, and Bold fonts.

Code pages 102-107, 932, 936, and 950 contain thousands of characters, which are not represented in this manual. These code pages require the memory expansion option and a downloaded International TrueType font.

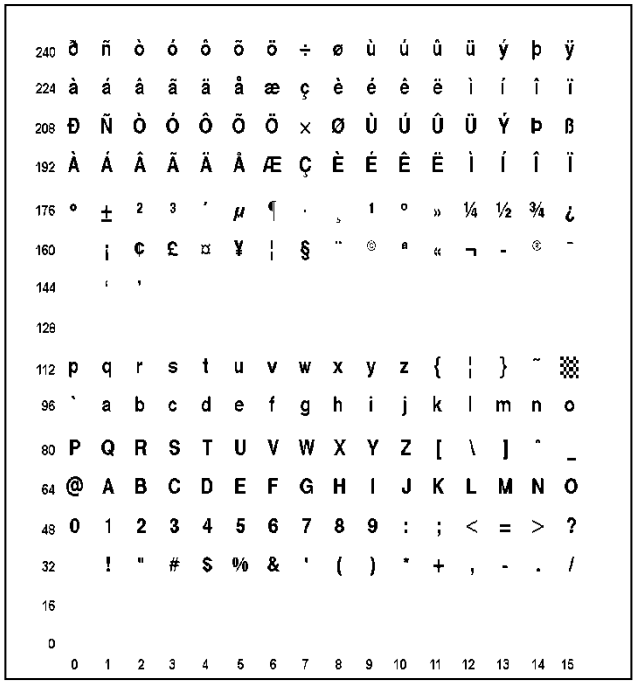
The Code Pages (100 and greater) on the following pages were printed using Arial or a similar downloaded TrueType font.

Internal Symbol Set



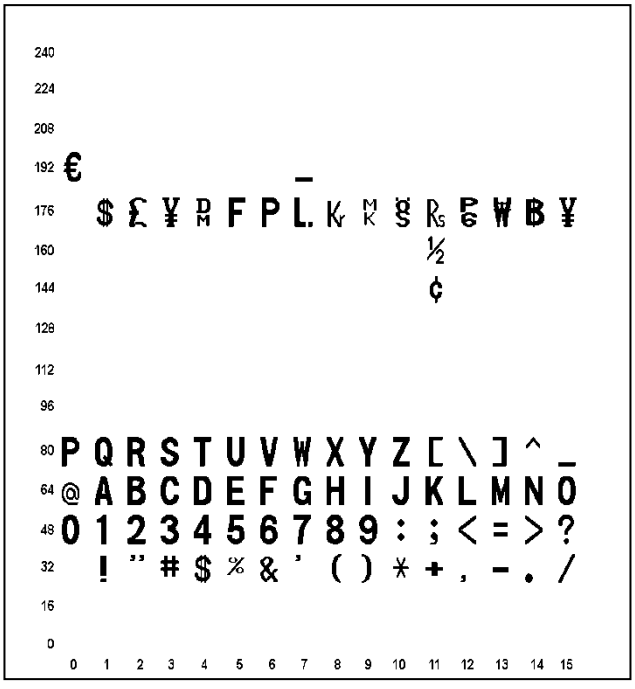
Note: To determine the character code, add the column number and row number for the character. For example, to produce the ™ character with the Internal character set, you would press Alt 255 (column 15 + row 240) or use ~255 in your data stream.

ANSI Symbol Set

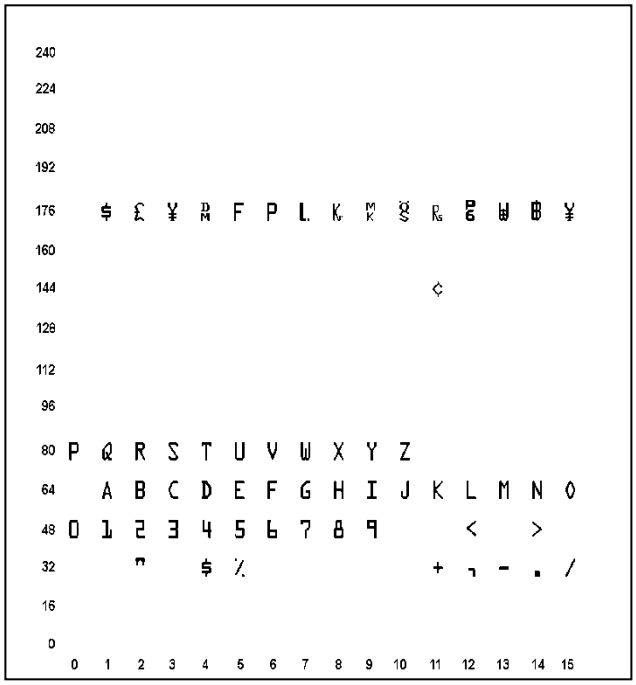


Note: To determine the character code, add the column number and row number for the character. For example, to produce the ÿ character with the ANSI character set, you would press Alt 255 (column 15 + row 240) or use ~255 in your data stream.

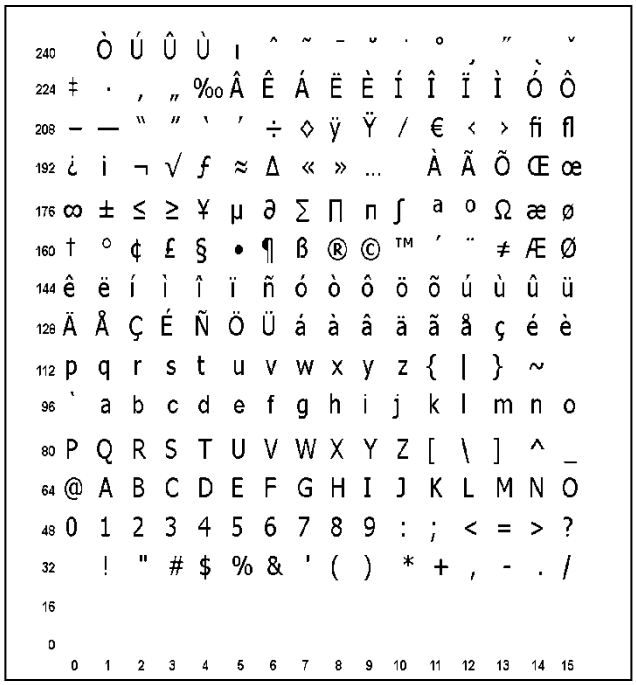
Bold Character Set



OCRA Character Set



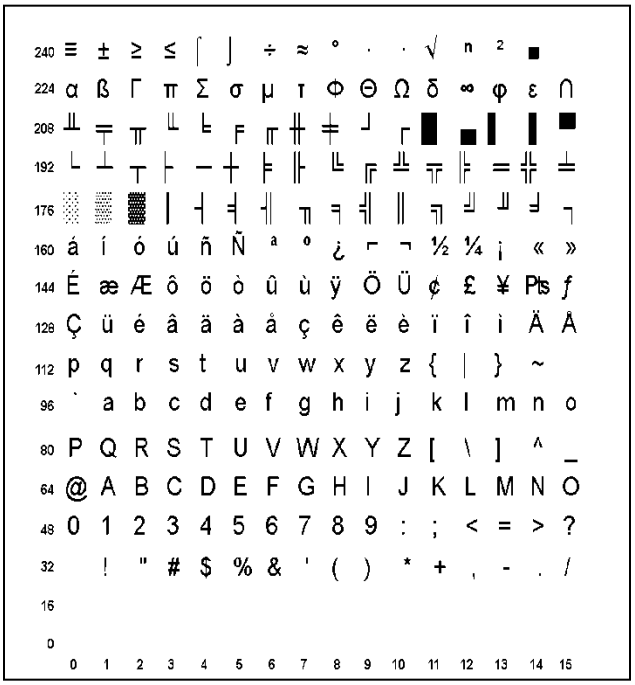
Code Page 100 (Macintosh)



Note: To determine the character code, add the column number and row number for the character. For example, to produce the ñ character with the Code Page 100 character set, you would press Alt 150 (column 6 + row 144) or use ~150 in your data stream.

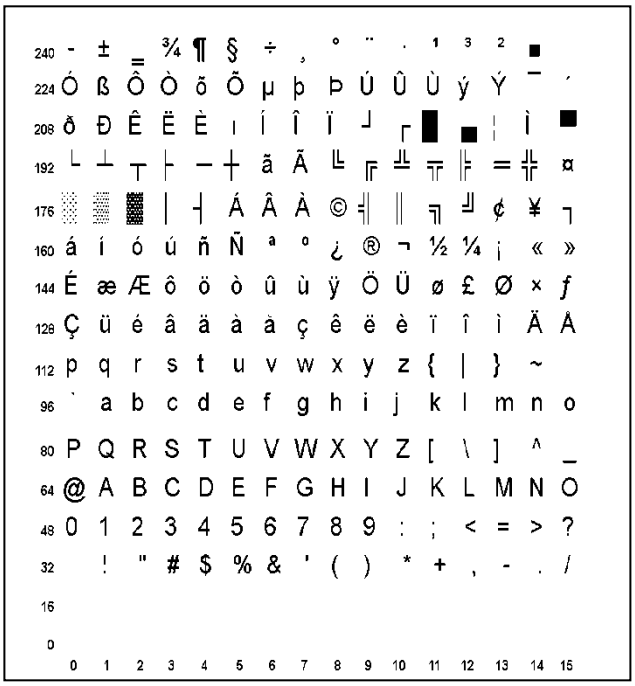
Code Page 101 (Wingdings)

Code Page 437 (Latin U.S.)

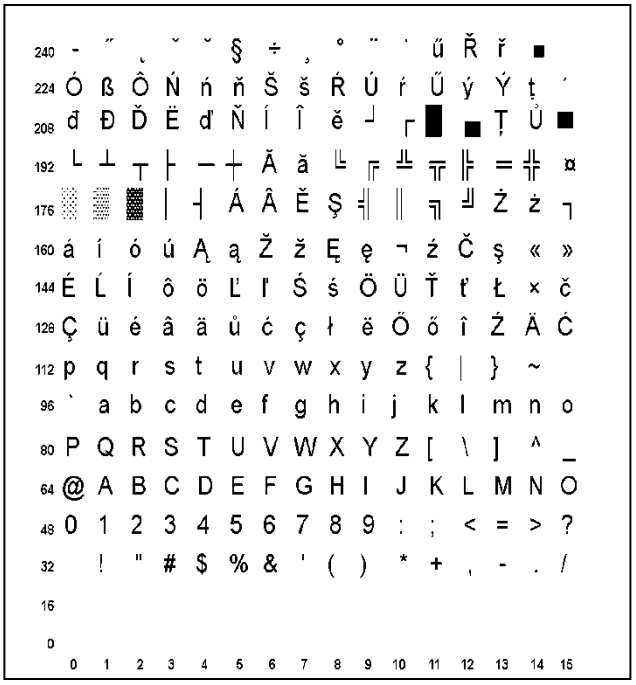


Note: To determine the character code, add the column number and row number for the character. For example, to produce the û character with the Code Page 437 character set, you would press Alt 150 (column 6 + row 144) or use ~150 in your data stream.

Code Page 850 (Latin 1)

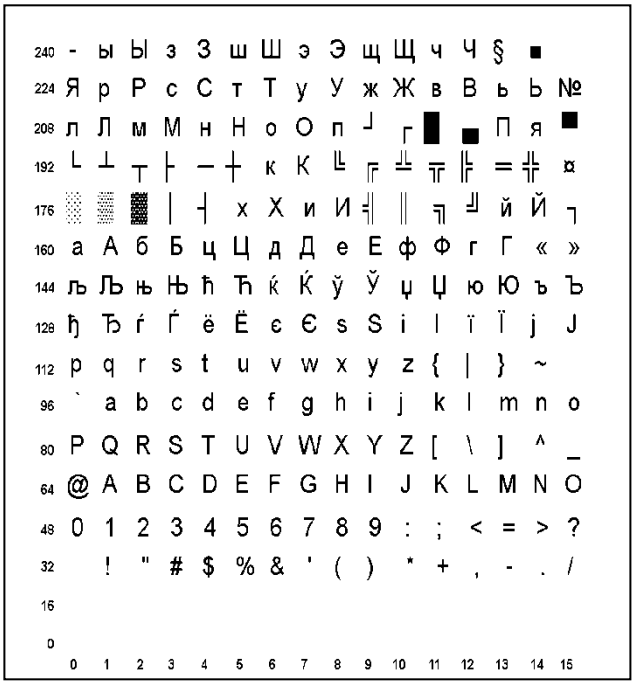


Code Page 852 (Latin 2)

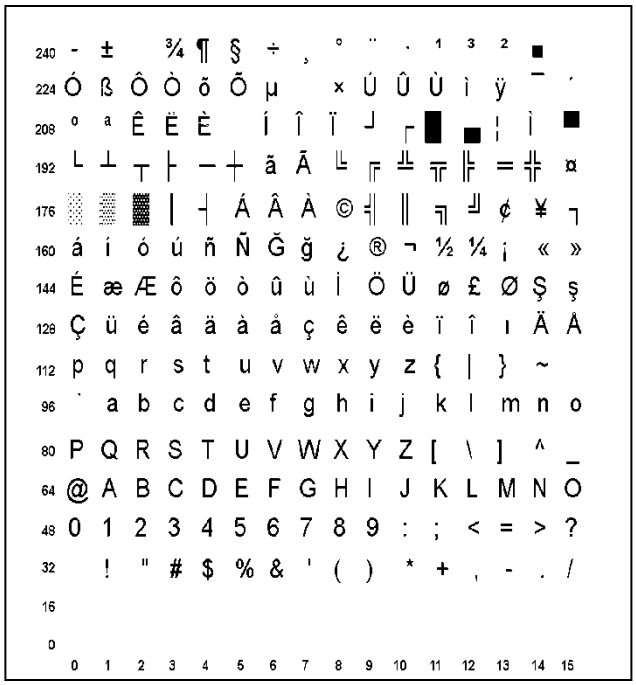


Note: To determine the character code, add the column number and row number for the character. For example, to produce the ľ character with the Code Page 852 character set, you would press Alt 150 (column 6 + row 144) or use ~150 in your data stream.

Code Page 855 (Russian)

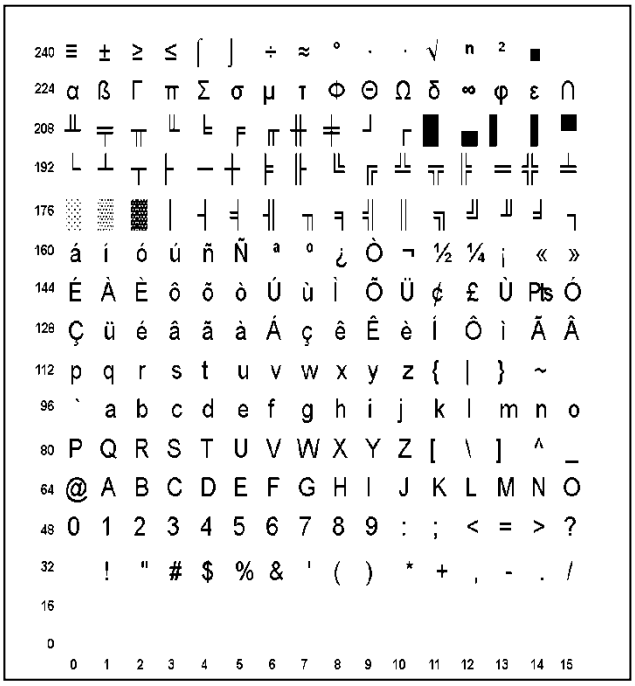


Code Page 857 (IBM Turkish)

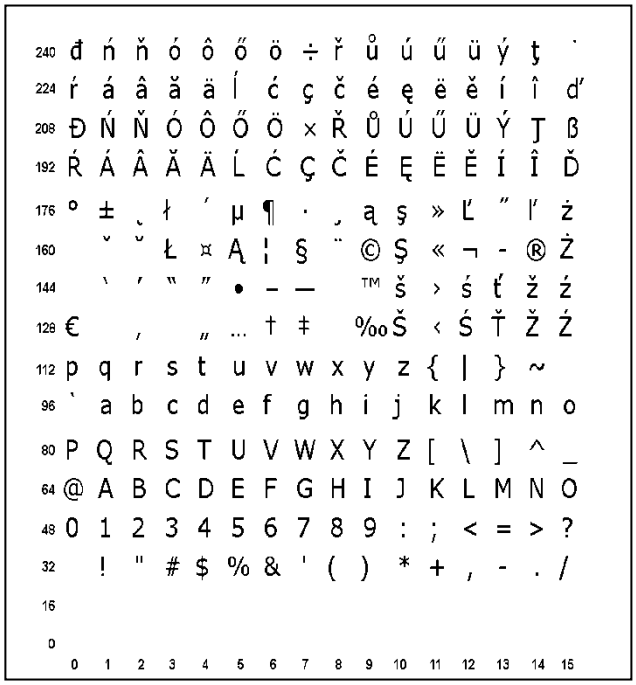


Note: To determine the character code, add the column number and row number for the character. For example, to produce the û character with the Code Page 857 character set, you would press Alt 150 (column 6 + row 144) or use ~150 in your data stream.

Code Page 860 (MS-DOS Portuguese)

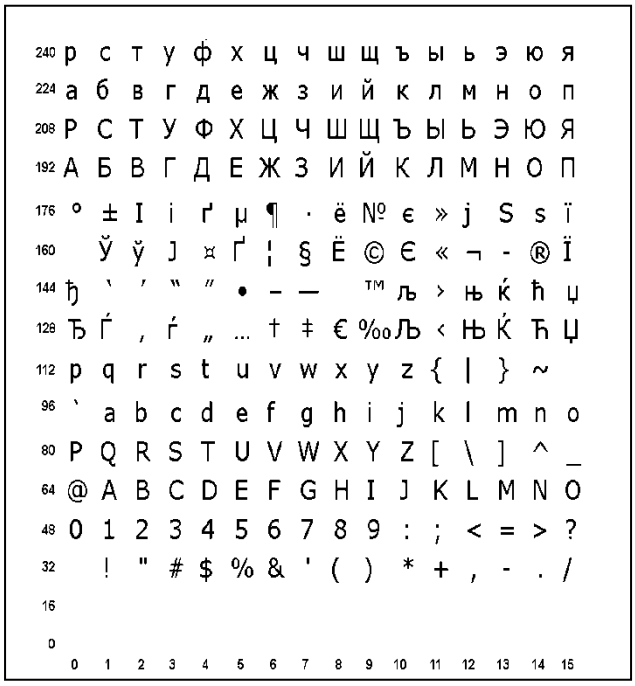


Code Page 1250 (Latin 2)

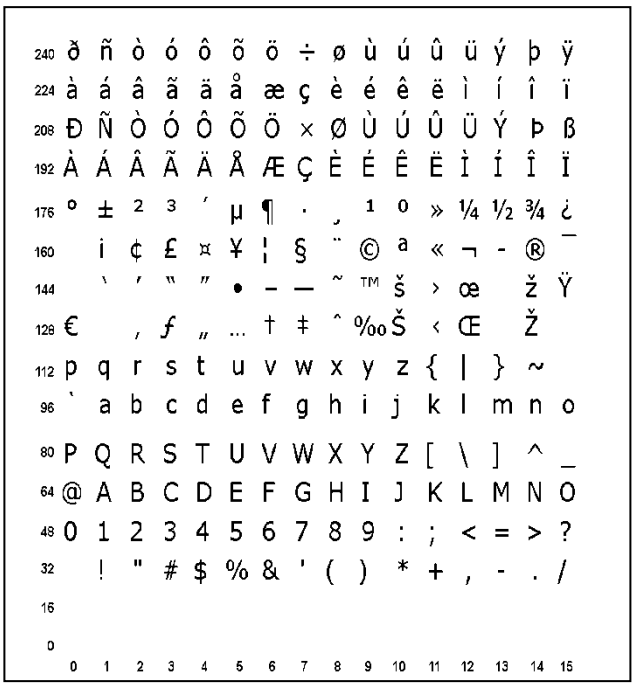


Note: To determine the character code, add the column number and row number for the character. For example, to produce the ü character with the Code Page 1250 character set, you would press Alt 252 (column 12 + row 240) or use ~252 in your data stream.

Code Page 1251 (Cyrillic)

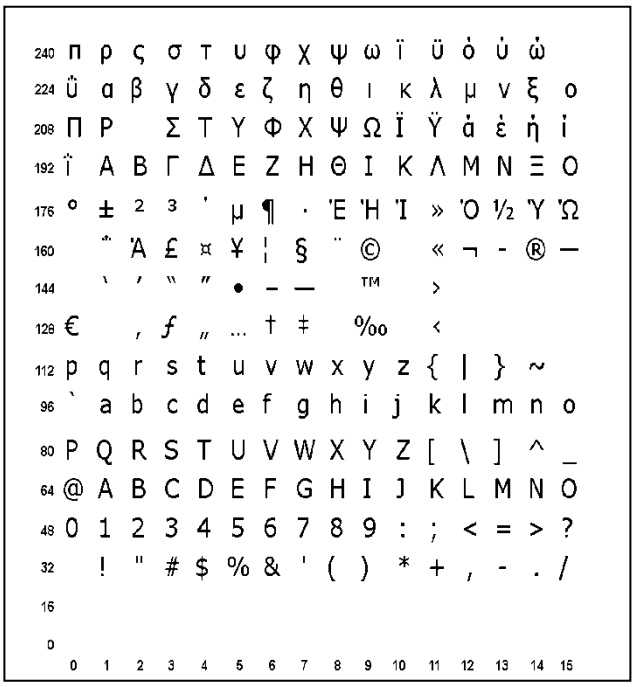


Code Page 1252 (Latin 1)

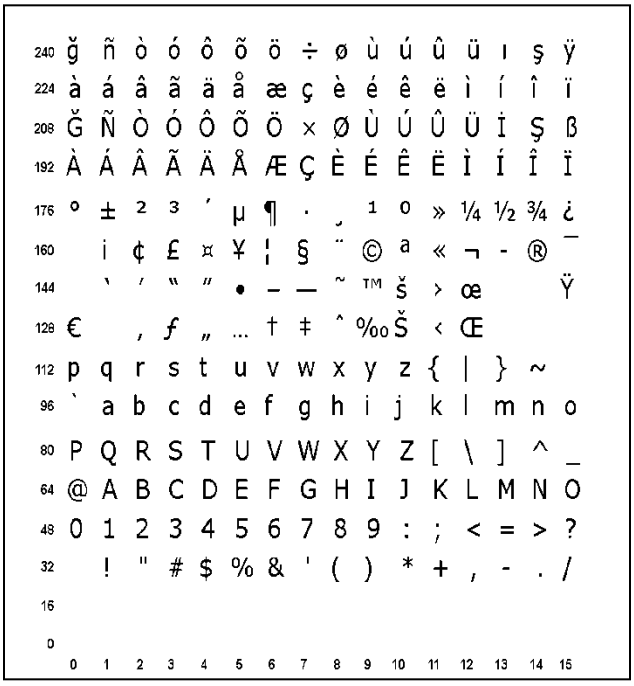


Note: To determine the character code, add the column number and row number for the character. For example, to produce the ü character with the Code Page 1252 character set, you would press Alt 252 (column 12 + row 240) or use ~252 in your data stream.

Code Page 1253 (Greek)

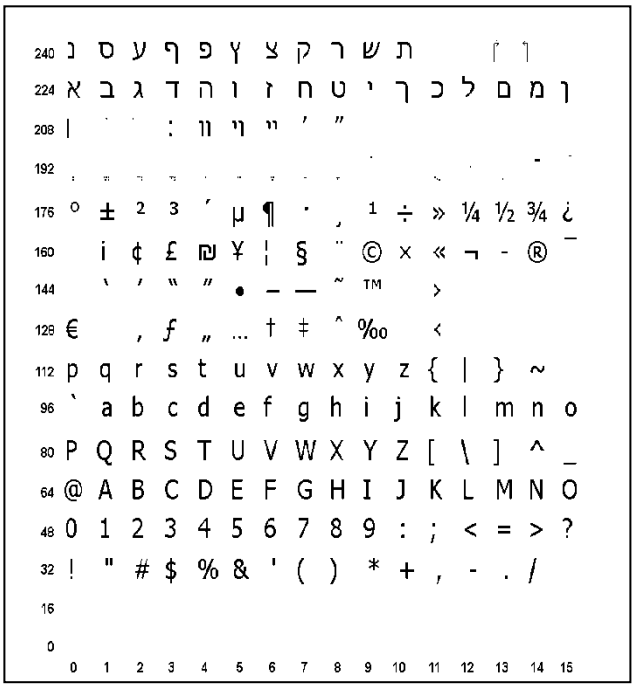


Code Page 1254 (Turkish)

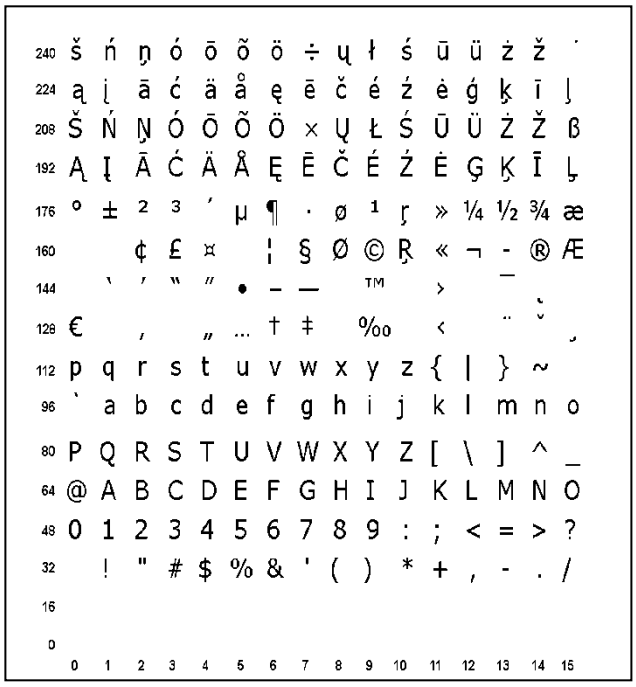


Note: To determine the character code, add the column number and row number for the character. For example, to produce the ü character with the Code Page 1254 character set, you would press Alt 252 (column 12 + row 240) or use ~252 in your data stream.

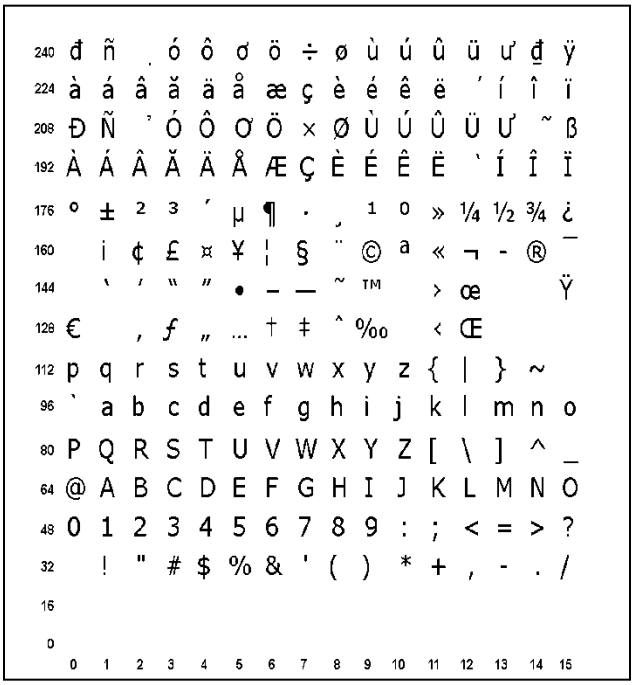
Code Page 1255 (Hebrew)


240 נ ס ע ף פ ץ צ ק ר ש ת ‎ ‏ ‎
224 א ב ג ד ה ו ז ח ט י ך כ ל ם מ ן
208 | ‎ ‎ ‎ : ‎ ‎ ‎

Code Page 1257 (Baltic)



Code Page 1258 (Vietnamese)



Note: To determine the character code, add the column number and row number for the character. For example, to produce the ü character with the Code Page 1258 character set, you would press Alt 252 (column 12 + row 240) or use ~252 in your data stream.

ASCII to Hexadecimal Conversion Chart

Use the chart below to translate the characters printed on your test label. The chart lists ASCII characters and their hexadecimal and decimal equivalents.

Char.	Hex	Decimal	Char.	Hex	Decimal
NUL	00	0	DC2	12	18
SOH	01	1	DC3	13	19
STX	02	2	DC4	14	20
ETX	03	3	NAK	15	21
EOT	04	4	SYN	16	22
ENG	05	5	ETB	17	23
ACK	06	6	CAN	18	24
BEL	07	7	EM	19	25
Backspace	08	8	SUB	1A	26
Tab	09	9	Escape	1B	27
Linefeed	0A	10	File separator	1C	28
Vertical tab	0B	11	Group separator	1D	29
Form feed	0C	12	Record separator	1E	30
Carriage return	0D	13	Unit separator	1F	31
SO	0E	14	Space	20	32
SI	0F	15	!	21	33
DLE	10	16	„	22	34
DC1	11	17	#	23	35

ASCII to Hexadecimal Conversion Chart (continued)

Char.	Hex	Decimal	Char.	Hex	Decimal
$	24	36	;	3B	59
%	25	37	<	3C	60
&	26	38	=	3D	61
,	27	39	>	3E	62
(	28	40	?	3F	63
)	29	41	@	40	64
*	2A	42	A	41	65
+	2B	43	B	42	66
,	2C	44	C	43	67
-	2D	45	D	44	68
.	2E	46	E	45	69
/	2F	47	F	46	70
0	30	48	G	47	71
1	31	49	H	48	72
2	32	50	I	49	73
3	33	51	J	4A	74
4	34	52	K	4B	75
5	35	53	L	4C	76
6	36	54	M	4D	77
7	37	55	N	4E	78
8	38	56	O	4F	79
9	39	57	P	50	80
:	3A	58	Q	51	81

ASCII to Hexadecimal Conversion Chart (continued)

Char.	Hex	Decimal	Char.	Hex	Decimal
R	52	82	i	69	105
S	53	83	j	6A	106
T	54	84	k	6B	107
U	55	85	l	6C	108
V	56	86	m	6D	109
W	57	87	n	6E	110
X	58	88	o	6F	111
Y	59	89	p	70	112
Z	5A	90	q	71	113
[	5B	91	r	72	114
\	5C	92	s	73	115
]	5D	93	t	74	116
^	5E	94	u	75	117
_	5F	95	v	76	118
`	60	96	w	77	119
a	61	97	x	78	120
b	62	98	y	79	121
c	63	99	z	7A	122
d	64	100	{	7B	123
e	65	101	|	7C	124
f	66	102	}	7D	125
g	67	103	~	7E	126
h	68	104	Delete	7F	127

Binary to Hex Conversion Chart

Binary	Hex
00000000	0
00000001	1
00000010	2
00000011	3
00000100	4
00000101	5
00000110	6
00000111	7
00001000	8
00001001	9
00001010	a
00001011	b
00001100	c
00001101	d
00001110	e
00001111	f
00010000	10
00010001	11
00010010	12
00010011	13
00010100	14
00010101	15
00010110	16
00010111	17
00011000	18
00011001	19
00011010	1a
00011011	1b
00011100	1c
00011101	1d
00011110	1e
00011111	1f
00100000	20
00100001	21
00100010	22
00100011	23
00100100	24
00100101	25
00100110	26

Binary	Hex
01000000	40
01000001	41
01000010	42
01000011	43
01000100	44
01000101	45
01000110	46
01000111	47
01001000	48
01001001	49
01001010	4a
01001011	4b
01001100	4c
01001101	4d
01001110	4e
01001111	4f
01010000	50
01010001	51
01010010	52
01010011	53
01010100	54
01010101	55
01010110	56
01010111	57
01011000	58
01011001	59
01011010	5a
01011011	5b
01011100	5c
01011101	5d
01011110	5e
01011111	5f
01100000	60
01100001	61
01100010	62
01100011	63
01100100	64
01100101	65
01100110	66

Binary	Hex
10000000	80
10000001	81
10000010	82
10000011	83
10000100	84
10000101	85
10000110	86
10000111	87
10001000	88
10001001	89
10001010	8a
10001011	8b
10001100	8c
10001101	8d
10001110	8e
10001111	8f
10010000	90
10010001	91
10010010	92
10010011	93
10010100	94
10010101	95
10010110	96
10010111	97
10011000	98
10011001	99
10011010	9a
10011011	9b
10011100	9c
10011101	9d
10011110	9e
10011111	9f
10100000	a0
10100001	a1
10100010	a2
10100011	a3
10100100	a4
10100101	a5
10100110	a6

Binary	Hex
11000000	c0
11000001	c1
11000010	c2
11000011	c3
11000100	c4
11000101	c5
11000110	c6
11000111	c7
11001000	c8
11001001	c9
11001010	ca
11001011	cb
11001100	cc
11001101	cd
11001110	ce
11001111	cf
11010000	d0
11010001	d1
11010010	d2
11010011	d3
11010100	d4
11010101	d5
11010110	d6
11010111	d7
11011000	d8
11011001	d9
11011010	da
11011011	db
11011100	dc
11011101	dd
11011110	de
11011111	df
11100000	e0
11100001	e1
11100010	e2
11100011	e3
11100100	e4
11100101	e5
11100110	e6

Binary to Hex Conversion Chart (continued)

Binary	Hex
00100111	27
00101000	28
00101001	29
00101010	2a
00101011	2b
00101100	2c
00101101	2d
00101110	2e
00101111	2f
00110000	30
00110001	31
00110010	32
00110011	33
00110100	34
00110101	35
00110110	36
00110111	37
00111000	38
00111001	39
00111010	3a
00111011	3b
00111100	3c
00111101	3d
00111110	3e
00111111	3f

Binary	Hex
01100111	67
01101000	68
01101001	69
01101010	6a
01101011	6b
01101100	6c
01101101	6d
01101110	6e
01101111	6f
01110000	70
01110001	71
01110010	72
01110011	73
01110100	74
01110101	75
01110110	76
01110111	77
01111000	78
01111001	79
01111010	7a
01111011	7b
01111100	7c
01111101	7d
01111110	7e
01111111	7f

Binary	Hex
10100111	a7
10101000	a8
10101001	a9
10101010	aa
10101011	ab
10101100	ac
10101101	ad
10101110	ae
10101111	af
10110000	b0
10110001	b1
10110010	b2
10110011	b3
10110100	b4
10110101	b5
10110110	b6
10110111	b7
10111000	b8
10111001	b9
10111010	ba
10111011	bb
10111100	bc
10111101	bd
10111110	be
10111111	bf

Binary	Hex
11100111	e7
11101000	e8
11101001	e9
11101010	ea
11101011	eb
11101100	ec
11101101	ed
11101110	ee
11101111	ef
11110000	f0
11110001	f1
11110010	f2
11110011	f3
11110100	f4
11110101	f5
11110110	f6
11110111	f7
11111000	f8
11111001	f9
11111010	fa
11111011	fb
11111100	fc
11111101	fd
11111110	fe
11111111	ff

ON (Black) Dots

# of Dots	Code	# of Dots	Code
1	A	14	N
2	B	15	O
3	C	16	P
4	D	17	Q
5	E	18	R
6	F	19	S
7	G	20	T
8	H	21	U
9	I	22	V
10	J	23	W
11	K	24	X
12	L	25	Y
13	M	26	Z

Off (White Dots)

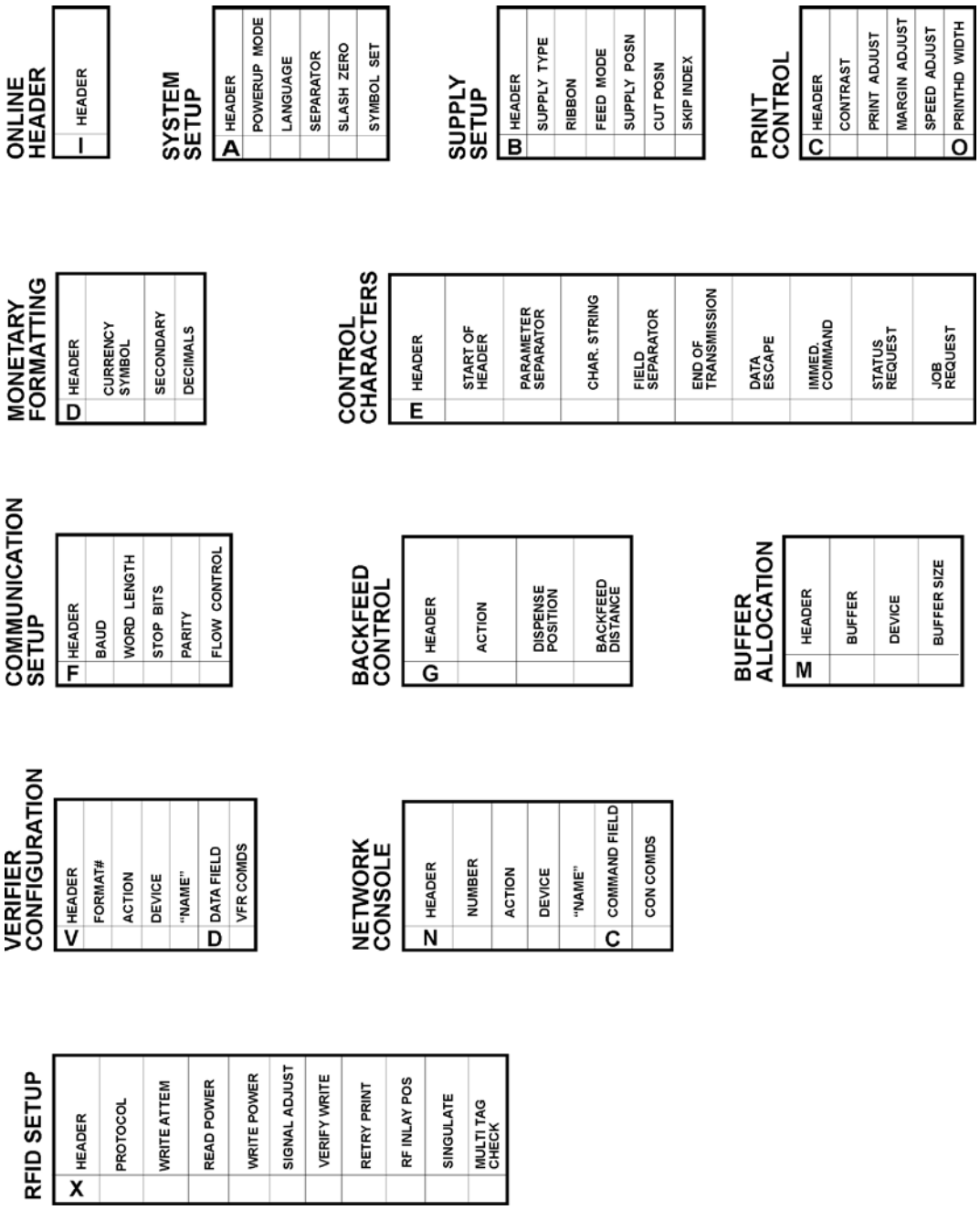
# of Dots	Code	# of Dots	Code
1	a	14	n
2	b	15	o
3	c	16	p
4	d	17	q
5	e	18	r
6	f	19	s
7	g	20	t
8	h	21	u
9	i	22	v
10	j	23	w
11	k	24	x
12	l	25	y
13	m	26	z

FORMAT DESIGN TOOLS

D

Use copies of these worksheets and grids to create formats, batch data, and check digit schemes. You may want to keep copies of the completed forms for your records:

- Online Configuration Worksheet
- Batch Worksheet
- Check Digit Worksheet
- Supply Layout Grids (English, Metric, Dots)
- Format Worksheet
- Sample Format Worksheet



Note: The Verifier Configuration and RFID Setup packets are only available on the 9855.

Batch Worksheet

BATCH HEADER

B1 HEADER	B2 FORMAT #	B3 NEW / UPDATE	B4 QUANTITY
B			

BATCH CONTROL

E1 HEADER	E2 FEED-MODE	E3 BATCH-SEP	E4 PRINT-MULT	E5 MULTI-PART	E6 CUT-TYPE	E7 CUT-MULT
E						

BATCH DATA

FIELD #	DATA
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	

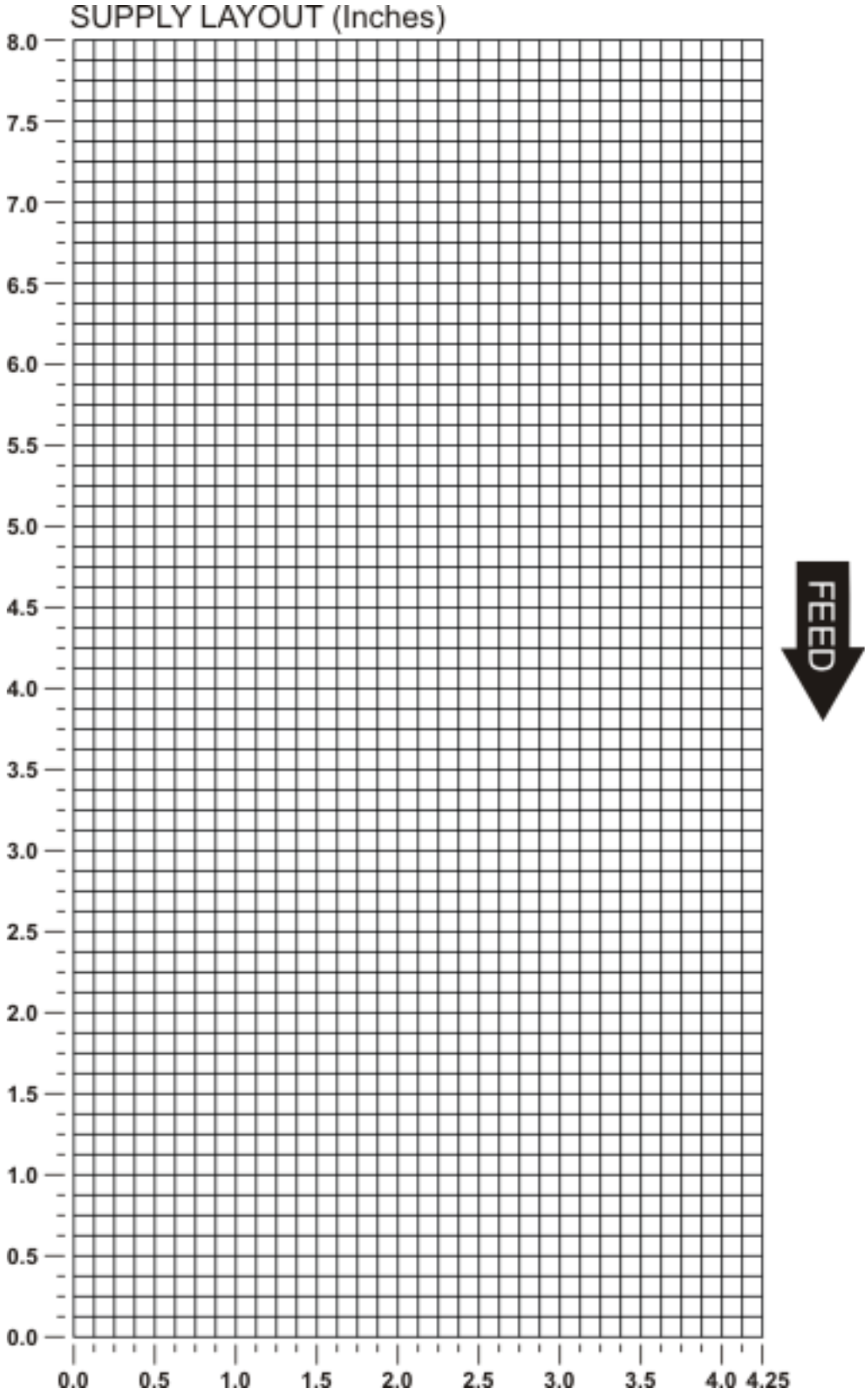
BATCH CONTINUATION

C	DATA
C	
C	
C	
C	
C	
C	
C	
C	
C	
C	
C	
C	
C	
C	

A1 HEADER	A2 SELECTOR #	A3 ACTION	A4 DEVICE	A5 MODULUS	A6 LENGTH	A7 ALGORITHM	A8 WEIGHTS
A			R				

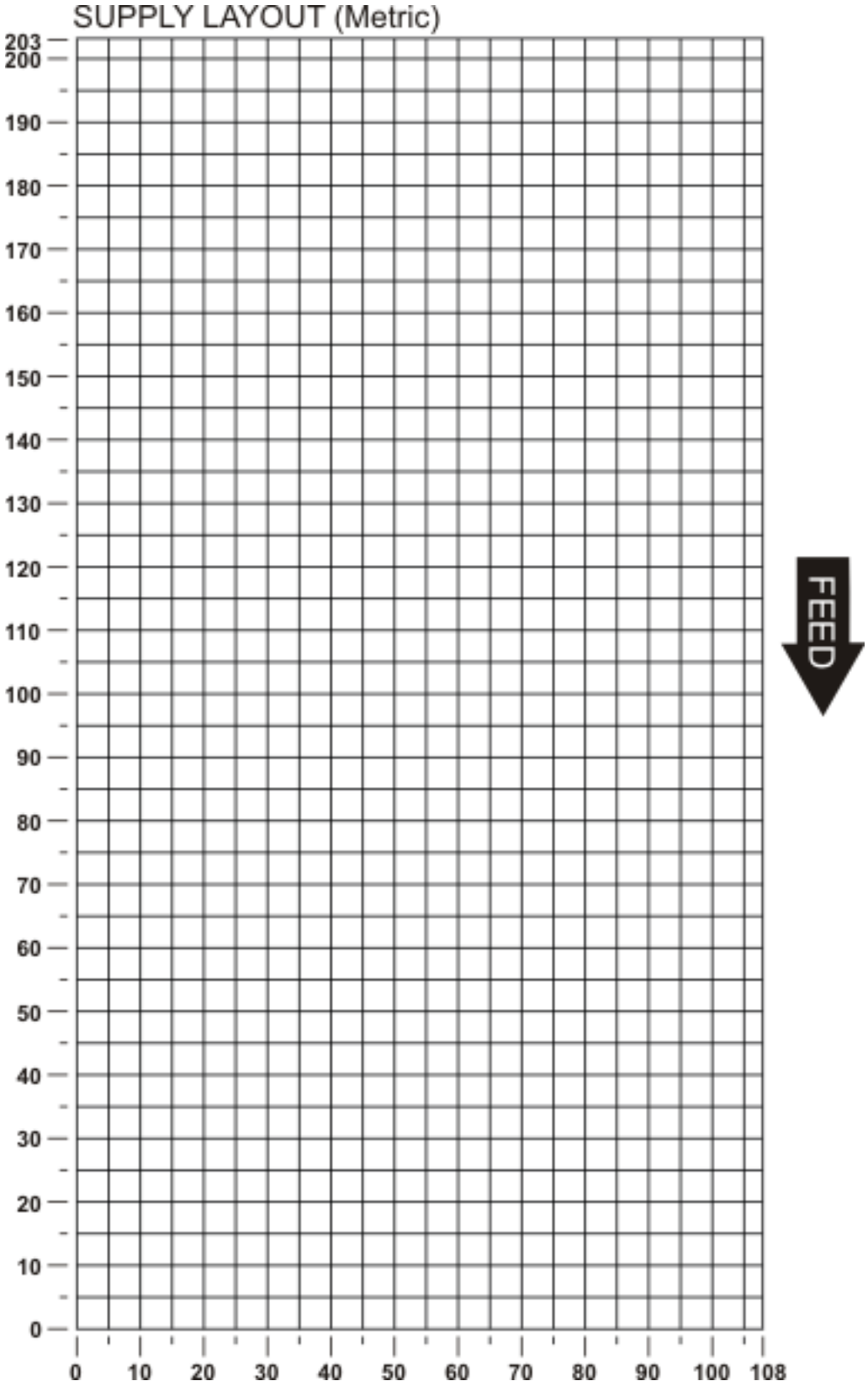
A1 HEADER	A2 SELECTOR #	A3 ACTION	A4 DEVICE	A5 MODULUS	A6 LENGTH	A7 ALGORITHM	A8 WEIGHTS
A			R				

A1 HEADER	A2 SELECTOR #	A3 ACTION	A4 DEVICE	A5 MODULUS	A6 LENGTH	A7 ALGORITHM	A8 WEIGHTS
A			R				



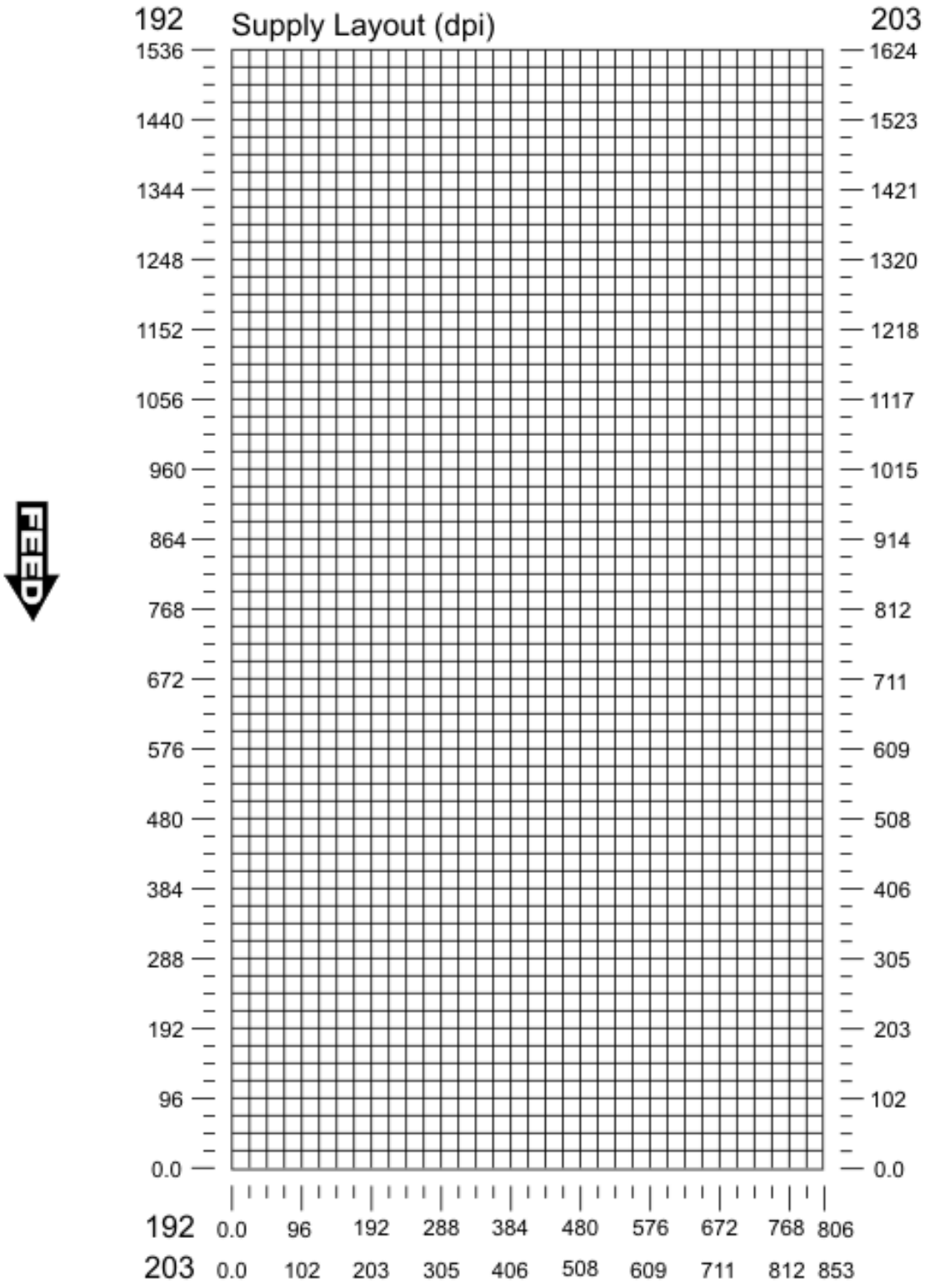
The following non-print zones are *recommended*:

All Supplies .050 inches on either edge of the label.
All Supplies .020 inches at the end of the label.



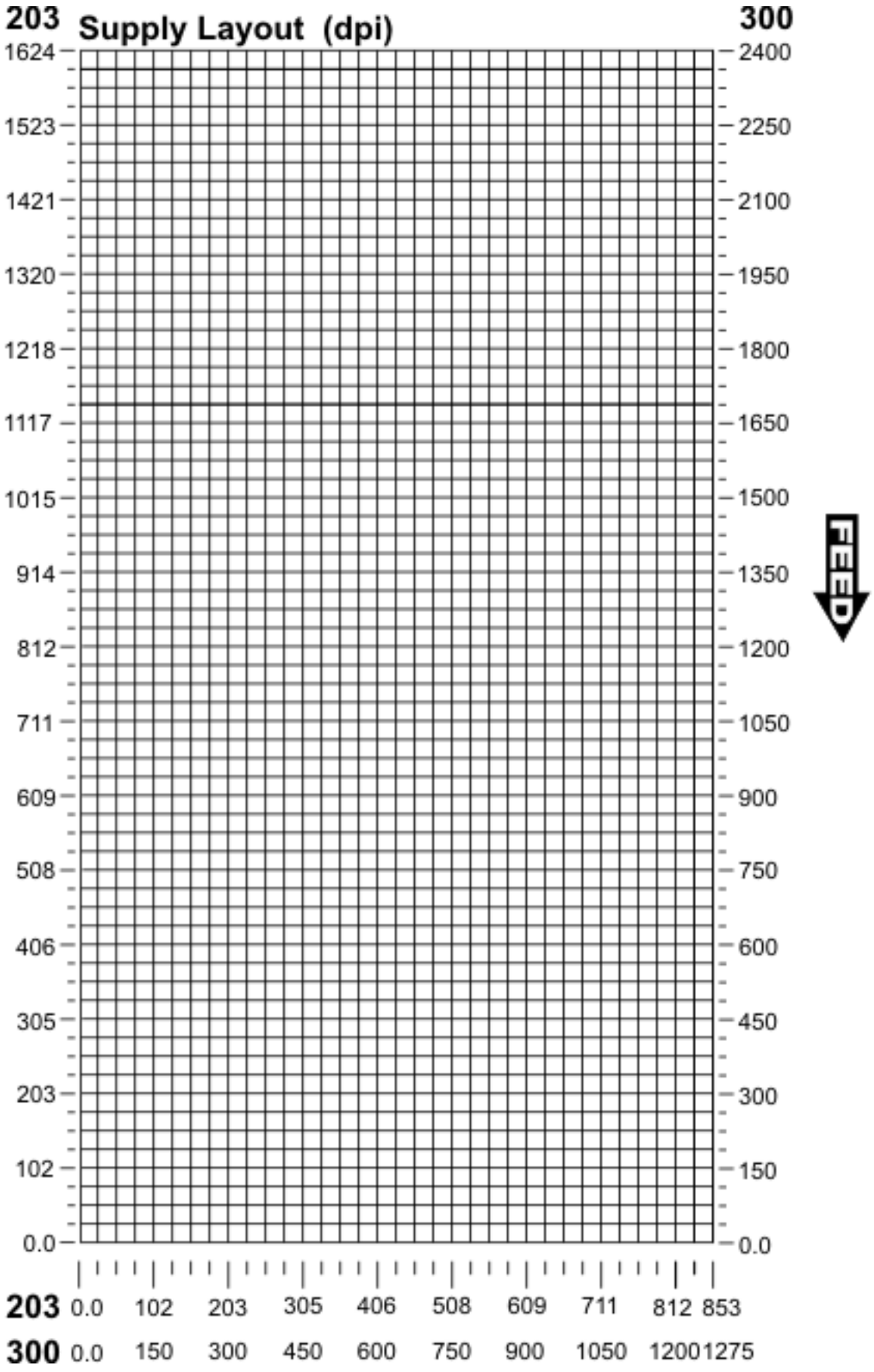
The following non-print zones are *recommended*:

All Supplies	1.3 mm on either edge of the label.
All Supplies	0.5 mm at the end of the label.



The following non-print zones are *recommended*:

All Supplies 10 dots on either edge of the label.
All Supplies 4 dots at the end of the label.



The following non-print zones are *recommended*:

All Supplies 15 dots on either edge of the label.
All Supplies 6 dots at the end of the label.

FORMAT HEADER

F1 HEADER	F2 FORMAT #	F3 ACTION	F4 DEVICE	F5 MEASURE	F6 LENGTH	F7 WIDTH	R8 NAME ("IN QUOTES")
F			R				

TEXT FIELDS

| T1 HEADER | T2 FIELD # | T3 # OF CHAR. | T4 FIX/VAR | T5 ROW | T6 COLUMN | T7 GAP | T8 FONT | T9 HGT. MAG. | T10 WID. MAG. | T11 COLOR | T12 ALIGNMENT | T13 CHAR. ROT. | T14 FIELD ROT. | T15 SYM. SET | OPTION #1 Fixed Characters: R1 HEADER | R2 CODE # | R3 FIXED CHAR. ("IN QUOTES") | OPTION #2 Data Type Restrictions: R1 HEADER | R2 CODE # | R3 CHAR CODE | OPTION #3 Data Entry Templates: R1 HEADER | R2 CODE # | R3 CODE | R4 "CHARACTER" ("IN QUOTES") | OPTION #4 Copy Data from Previous Field: R1 HEADER | R2 CODE # | R3 SRC FIELD | R4 SRC START | R5 # TO COPY | R6 DEST. START | R7 COPY CODE | OPTION #5 Data Entry Source: R1 HEADER | R2 CODE # | R3 CODE | OPTION #6 Upload Field Data: R1 HEADER | R2 CODE # | R3 DEVICE | OPTION #20 Data Entry Prompts: R1 HEADER | R2 CODE # | R3 PROMPT ("IN QUOTES") | OPTION #21 Define Extended Field Names: R1 HEADER | R2 CODE # | R3 "FIELD NAME" | OPTION #30 Pad Data: R1 HEADER | R2 CODE # | R3 L / R | R4 "CHARACTER" | OPTION #42 Price Field: R1 HEADER | R2 CODE # | R3 APP CODE | OPTION #61 Reimage Field: R1 HEADER | R2 CODE #
|---|---|---|---|---|---|---|---

FORMAT WORKSHEET (SAMPLE)

Format Name _____ **Supply Type** _____

Format # _____ **Customer Name** _____

Date _____ **Software Version** _____

Supply Size _____

FORMAT HEADER

F1 HEADER	F2 FORMAT #	F3 ACTION	F4 DEVICE	F5 MEASURE	F6 LENGTH	F7 WIDTH	R8 NAME ("IN QUOTES")
F	1	A	R	E	300	400	"TEXTILES"

TEXT FIELDS

| T1 HEADER | T2 FIELD # | T3 # OF CHAR. | T4 FIX/VAR | T5 ROW | T6 COLUMN | T7 GAP | T8 FONT | T9 HGT. MAG. | T10 WID. MAG. | T11 COLOR | T12 ALIGNMENT | T13 CHAR. ROT. | T14 FIELD ROT. | T15 SYM. SET | OPTION #1 Fixed Characters: R1 HEADER | R2 CODE # | R3 FIXED CHAR. ("IN QUOTES") | OPTION #2 Data Type Restrictions: R1 HEADER | R2 CODE # | R3 CHAR CODE | OPTION #3 Data Entry Templates: R1 HEADER | R2 CODE # | R3 CODE | R4 "CHARACTER" ("IN QUOTES") | OPTION #4 Copy Data from Previous Field: R1 HEADER | R2 CODE # | R3 SRC FIELD | R4 SRC START | R5 # TO COPY | R6 DEST. START | R7 COPY CODE | OPTION #5 Data Entry Source: R1 HEADER | R2 CODE # | R3 CODE | OPTION #6 Upload Field Data: R1 HEADER | R2 CODE # | R3 DEVICE | OPTION #20 Data Entry Prompts: R1 HEADER | R2 CODE # | R3 PROMPT ("IN QUOTES") | OPTION #21 Define Extended Field Names: R1 HEADER | R2 CODE # | R3 "FIELD NAME" | OPTION #30 Pad Data: R1 HEADER | R2 CODE # | R3 L / R | R4 "CHARACTER" | OPTION #42 Price Field: R1 HEADER | R2 CODE # | R3 APP CODE | OPTION #61 Reimage Field: R1 HEADER | R2 CODE # |
|---|---|---|---|---|---|---|---

PRINTER DIFFERENCES

E

Here are the major features and differences between each printer. Earlier printer versions may not support all features.

Printer Comparison

Feature	9825 Printer	9855 Printer
Printhead Density DPI	203 DPI	203 DPI / 300 DPI (optional)
Print speed IPS (inches per second)	2.5, 4.0, or 6.0 IPS	2.5, 4.0, 6.0, 8.0, 10.0, or 12.0 IPS (optional)
Maximum print area	4.0" x 16.0"	4.0" x 16.0"/ 4.0" x 13.0" (w/300 dpi)
Non-Print Zone	Recommended: all supplies - .05" on either edge and .02" at the end Butt cut supplies - .15" at the beginning	Recommended: all supplies - .05" on either edge and .02" at the end Butt cut supplies - .15" at the beginning
Location of Print Area	Center	Center
Supply Width	.75" x 4.25"	.75" x 4.25"
Supply Length	.50" x 17.5"	.32" x 17.5"
Power Up Mode	Online	Online/Offline
Feed Mode	On demand/Continuous/ Peel Mode (optional)	On demand/Continuous/ Peel Mode (optional)
Supplies	Labels or Perforated Tags	Labels or Tags
Supply Type	Edge Aperture/Black mark/ Die cut/ Continuous	Aperture/Black mark/Die cut/ Continuous
Keypad	Feed/Cut Enter/Pause Escape/Clear buttons	Feed/Cut Enter/Pause Escape/Clear buttons
Display	2-line 16 characters per line	2-line 16 characters per line
Serial Port Speed	1200/2400/4800/9600/ 19200/38400 Baud	1200/2400/4800/9600/ 19200/38400/57600/115200 Baud
Field Number Range	0-999	0-999
Batch Separator	Yes	Yes
High Energy Ribbon	Yes	Yes
Standard Fonts	Standard/Reduced/Bold OCRA/CG Triumvirate™ Typeface Bold 9 pt/ CG Triumvirate™ Typeface 6, 7, 9, 11, or 15 pt	Standard/Reduced/Bold OCRA/CG Triumvirate™ Typeface Bold 9 pt/CG Triumvirate™ Typeface 6, 7, 9, 11, or 15 pt
Scalable Font Standard	Yes (EFF Swiss Bold)	Yes (EFF Swiss Bold)
Downloadable Fonts	Yes	Yes
Memory Allocation	Yes	Yes
RAM	4 Meg / 2 Meg (Flash)	16 Meg / 4 Meg (Flash)
Storage on Power-down	512K (Flash)	In Flash

Feature	9825 Printer	9855 Printer
Extended Memory	No	Yes
2D bar codes	MaxiCode/PDF417 POSTNET/Data Matrix/QR	MaxiCode/PDF417 POSTNET/Data Matrix/QR
Parallel Port	IEEE-1284 or Centronics Mode	IEEE-1284 or Centronics Mode
94x5 Emulation	No	Yes
Backfeed	Yes	Yes
Offline Batch Entry	No	Yes, with keyboard
Status Polling	Yes	Yes
Immediate Commands	Yes	Yes
Test Label	Two labels	Two labels
Ethernet Print Server	Yes- supports IPX (NetWare), TCP/IP, NetBios/NetBEUI	Yes- supports IPX (NetWare), TCP/IP, NetBios/NetBEUI
RF Print Server	Yes	Yes
External Knife	No	Optional
Stacker	No	Yes
Verifier	No	Yes
External Rewind	Yes	Yes
Tear Bar	Optional	Optional
12 IPS	No	Optional
300 DPI	No	Optional
RFID support	No	Yes

Post-Print Options

Install the printer, knife, and stacker on sound-absorbing material in office, commercial, or industrial environments.

- The 9855 “knife ready” printer does not support on-demand/peel mode or the optional tear bar.
- The 926 knife must be installed before you can use the 928 stacker.
- A printer must be ordered “verifier ready” to receive the correct cut-out cover, which allows room for the verifier’s beam and for tearing supplies.

GLOSSARY

G

Batch Data
2,"Monarch" |
Defines the actual information (as fields within **{ }**) printed on the label.

Batch Control
E,0,0,4,2,1,0 |
Defines the print job (as a field).

Batch Header
{B,1,N,1 | }
First line of a batch, immediately following (**{**). Identifies the format and batch quantity.

Batch Packet
{B,1,N,1 |
2,"Monarch" | }
Contains a batch header and the batch data. Enclose within **{ }**.

Bitmapped Fonts
Reside in the printer's memory. If you change the point size, you have changed the font. Magnifying these fonts causes jaggedness to occur.

Buffer
Storage area in the printer's memory that holds specific data (images, formats, etc).

Field
Can be text, bar codes, lines, boxes, constant, or non-printable text. It is the result of a field definition.

Downloaded Fonts
Reside in the printers RAM and deleted when the printer is turned off.
.

Field Definition
Any string of parameters that pertain to one field. A field definition begins with a field identifier (such as T, B, D, C, etc.).

```
T,1,10,V,250,50,0,1,1,1,B,C,0 |
```

Field Parameters
Parameters that apply to a field and are separated by commas. (In the above example, **B** is a field element for black print on a white background.)

Flash Memory
Contains information that is SAVED when the printer is turned off. Flash memory needs to be formatted before it can be used.

Format
Layout or design for your printed label.

Format Header
First line of a format, immediately following the start of packet (**{**). A format header must begin with **F**, followed by various header elements.

```
F,1,A,R,E,600,400,"Fmt-1" |
```

Monospaced Fonts
All characters have the same width and are easy to center justify. (Standard, bold, and reduced are monospaced.)

Non-volatile RAM
Contains information that is SAVED when the printer is turned off.

Option
R,4,6,1,3,1 |
Any line within a format that applies special formatting to a field. This line begins with **R** and must immediately follow the field it applies to.

Packet
B,1,N,1 |
2,"Monarch" |
Any string of characters within (**{ }**).

Pre-image
A way to optimize the printer, because it images the fields while data is collected. After the last field is imaged, the label prints almost immediately.

Proportionally Spaced Fonts
All characters have different widths and are difficult to center justify (CG Triumvirate™ Typefaces).

Scalable Fonts	All characters are scalable and smooth at any point size. There are no jagged edges at any point size because the font is created from an equation every time it is used.
TrueType Fonts	All characters follow the TrueType outline font standard. All characters are scalable and smooth at any point size.
Volatile RAM	Contains information that is LOST when the printer is turned off.

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