
PAXAR

***MONARCH[®] PRINTER
CONTROL LANGUAGE II***

Packet Reference Manual

MPCLII
MPCLII
MPCLII

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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:

- ◆ 9494™ (V. 1.0 or greater)
- ◆ 9490™ (V. 3.0 or greater)
- ◆ 9446™ (V. 5.2 or greater)
- ◆ 1460™ (V. 3.0 or greater)

This chapter

- ◆ describes the significant differences between the four printers.
- ◆ creates a sample MPCLII packet.
- ◆ shows how to download a sample packet.
- ◆ gives a list of daily procedures for operators.

Audience

You do not have to be a programmer to use this manual, but you must be familiar with creating text files and executing basic MS-DOS® commands.

Overview of Printer Differences

While all four of these printers are very similar, some differences in operation and available options exist.

Feature	9494	9490	9446	1460
Maximum print speed	2.0 IPS	2.0 IPS	10.0 IPS	7.0 IPS
Maximum print area	4.0 in. x 6.0 in.	4.0 in. x 6.0 in.	4.0 in. x 8.0 in.	4.0 in. x 8.0 in.
Location of Print Area	Center	Center	Left	Left
Supply Width	2.0 in. x 4.0 in.	2.0 in. x 4.0 in.	1.2 in. x 4.2 in.	1.2 in. x 4.2 in.
Supply Length	1.0 in. x 6.0 in.	1.0 in. x 6.0 in.	.75 in. x 8.0 in.	.75 in. x 8.0 in.
Power Up Mode	Online/Offline	Online	Online/Offline	Online
On demand /Continuous	On demand /Continuous	On demand /Continuous	On demand /Continuous /Internal Rewind	On demand only
Supply Types	Black Mark /Non-indexed	Black Mark	Black Mark /Die Cut	Black Mark /Die cut
Print a Separator	Yes	Yes	Yes	No
Use High Energy Ribbon	No	No	Yes	No
Scalable Font Standard	Yes	Yes	No	No
Black to White Print Ratio	30%	20%	30%	30%

Before You Begin

1. Connect the printer to the host. Refer to your printer's documentation for more information.
2. Load supplies in the printer. Refer to your printer's documentation 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 3, "Configuring the Printer," for more information.
5. Design your format. See "Starting with a Design" in Chapter 2 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 MPCLII. 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 your printer's documentation for more information.

For detailed information about the format header, text, constant text, and bar code fields, see Chapter 4, "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,M,508,508,"FMT-25" |
```

2. Type the following constant text field:

```
C,250,80,0,1,1,1,W,C,0,0,"MONARCH MARKING:",0 |
```

3. Type the following bar code field:

```
B,1,12,F,110,115,1,2,120,5,L,0 |
```

4. Type the following text field:

```
T,2,18,V,30,30,1,1,1,1,B,C,0,0,0 | }
```

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, "12345678901" |
```

7. Type the following text field data:

```
2, "DAYTON, OHIO" | }
```

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 3 for more information.

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

```
{
F,25,A,R,M,508,508,"Fmt 25" |
C,250,80,0,1,2,1,W,C,0,0,"MONARCH MARKING" |
B,1,12,F,110,115,1,2,120,5,L,0 |
T,2,18,V,30,30,1,1,1,1,B,C,0,0 |
}
```

Sample Batch Packet

```
{
B,25,N,1 |
1,"12345678901" |
2,"DAYTON, OHIO" |
}
```



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, operator's 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.

Chapter 2.

Designing a Format

This chapter describes how to

- ◆ determine what kind of information to use in your format.
- ◆ use the Supply Layout Grid and Format Worksheet.
- ◆ categorize data into field types.
- ◆ select fonts to use in your format.

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. Supplies are available from Monarch 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 4, "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, you need to make a few decisions. For example:

- ◆ How large is your supply?
- ◆ Which fonts do you want to use?
- ◆ Do you want to include a bar code?
- ◆ Do you want to include graphics?

Determining the Print Area

The "bottom" is the edge that exits the printer first. *For the 9490 and 9494 printers*, the print area is in the center of the supply and it begins 0.16 inches from the bottom, and 0.05 inches from the left edge of the supply. *For the 9446 and 1460 printers*, the print area begins on the bottom edge and 0.06 inches from the left edge of the supply. The table below lists the maximum print area for a four-inch wide label.

Unit of Measure	Supply Size (Width x Length)	Maximum Print Area (Width x Length)	Printer
English (1/100 inch)	416 x 620 406 x 800	385 x 580 380 x 799	9494/9490 9446/1460
Metric (1/10 mm)	1055 x 1575 1031 x 2032	978 x 1473 965 x 2031	9494/9490 9446/1460
Dots (1/192 dots)	797 x 1190 779 x 1536	739 x 1114 730 x 1535	9494/9490 9446/1460

The following table lists the non-print zones for each printer.

Printer	Top	Bottom	Left	Right
9490/9494	.04 inches 1.01 mm 7.7 dots	.16 - .19 inches 4.1 - 4.8 mm 31 - 36.5 dots	.05 - .11 inches 1.3 - 2.8 mm 9.6 - 21.1 dots	.05 - .11 inches 1.3 - 2.8 mm 9.6 - 21.1 dots
9446/1460	none	none	.06 inches 1.5 mm 11.5 dots	.14 inches 3.6 mm 26.9 dots



The standard supply length for the 9490 and 9494 printers is six inches. The standard supply length for the 9446 and 1460 printers is eight inches.

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

$$\text{Dots} = \text{inches} \times 192$$

$$\text{Metric (1/10mm)} = \text{inches} \times 254$$

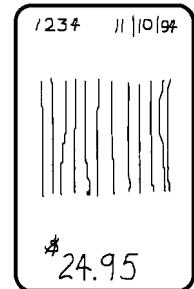
$$\text{English (1/100 inch)} = 100 \times (\text{dots}/192)$$

$$\text{Dots} = \text{Metric (1/10 mm)} \times 756/1000$$

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

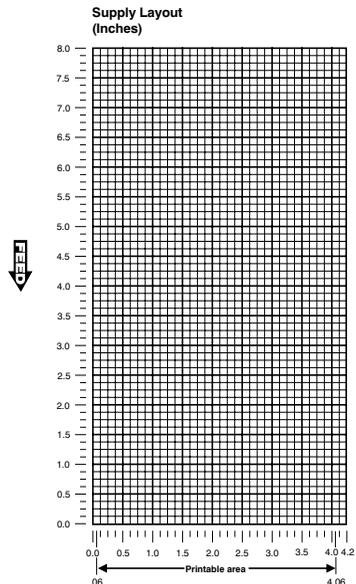
The English grid, shown to the right, is measured in 1/100 inches.

◆ 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 192 dots per inch (DPI).



If you want to use 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 batch 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 don't want to have visible to customers, product codes
Constant Text	Fixed characters that print without changing.	company name, company address
Line or Box	Highlight or separate items.	line marking out the regular price, border around the supply
Graphic	Contains a bitmap image or a compliance label overlay.	logos



All of the above field types except graphics are discussed in Chapter 4. Refer to the *MPCLII Graphics Manual*, for information on including graphic fields in your format.

Considering Fonts

Your printer has monospaced and proportionally spaced fonts, along with one scalable font, CG Triumvirate Bold™. The scalable font is smooth at any point size. See Appendix B, "Fonts," for a sample of CG Triumvirate Bold and more information about it.



The scalable font must be *purchased separately* for the 9446 and 1460 printers. The scalable font is standard on the 9490 printer.

When working with fonts, you have three considerations:

- ◆ font appearance
- ◆ font size (scalable or bitmapped)
- ◆ font spacing (monospaced or proportional)

Choosing the appropriate font appearance is up to the user. See Appendix B, "Fonts," for samples of each font. Choosing the appropriate font size and spacing depends on how much space is available on your supply. Monospaced characters occupy the same amount of space within a magnification, making it easy to predict the field size. Use monospaced fonts for price fields and data you want to list in a column. Proportionally spaced characters vary in height and width, making it difficult to predict the field size. However, you may be able to place more characters on a line.

Monarch offers software to convert TrueType™ fonts into printer fonts that can be interpreted by Monarch® MPCLII printers. Optional font ROMs are also available for these printers. Call your Monarch Representative for more information.

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." Keep the worksheet as a hard copy backup of your format.

Filling in the Format Worksheet

Decide what type of field to use for each piece of information on your label.

1. Make a copy of the Format Worksheet.
2. Define the Format Header.
3. Define all non-printable text fields before you define the ones you want to print. See "Defining Non-Printable Text Fields" in Chapter 4 for more information.
4. Define the rest of your fields. Apply options as you require them. See Chapter 5, "Defining Field Options," for more information.

Chapter 3. *Configuring the Printer*

This chapter discusses how to

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

Setting Communication Parameters

The communication parameters at the printer must match those at the host, or you will not be able to communicate. You can use the communication settings packet to set communication parameters for your printer. For the 9490 and 9494 printers, you can use autobaud to set communication parameters. For the 9446 or 1460 printers, you can set the communication parameters at the 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
```

Sets your host to a baud rate of 9600, no parity, an 8 bit word length, and 1 stop bit.



If you select 8 as the data bit setting, you must select NONE for the parity. If you select 7 as the data bit setting, you must select ODD or EVEN for the parity.

Using MPCLII Conventions

Here are some guidelines to follow when using MPCLII.

MPCLII Punctuation

Use the following symbols when creating MPCLII packets:

{	start of header
}	end of header
|	field separator
,	parameter separator
"ABC"	Quotation marks enclose character strings. Empty quotes ("") identify null strings or unused fields.
'comment'	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.



These MPCL characters are the default. See "Defining the Control Characters Packet" to change these characters.

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 **100** fields in a format. Each `|` indicates one field. The number of fields is limited by the available memory.

- ◆ The field number (**0 to 99**) must be unique. Monarch recommends starting at 1, instead of 0.
- ◆ Do not use a field number more than once per format.
- ◆ Define all fields in the order you want to image/print them.
- ◆ 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.
- ◆ 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 in a character string. 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 settings. You can send an individual packet or a packet that contains all seven online configuration packets. You can 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-F and 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 printer configurations, you must 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 an online configuration packet.



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 to 7 optional packets
A, parameter 1...parameter 5 | System Setup
B, parameter 1...parameter 5 | Supply Setup
C, parameter 1...parameter 5 | Print Control
D, parameter 1...parameter 3 | Monetary Formatting
E, parameter 1...parameter 9 | Control Characters
F, parameter 1...parameter 5 | Communication Settings
M, parameter 1...parameter 4 | Memory Configuration
}                               End of Header
    
```

Syntax for single packet

```

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

Configuration Syntax Guidelines

When creating a printer configuration packet:

- ◆ Follow the "Standard Syntax Guidelines" listed at the beginning of this chapter.
- ◆ Begin a packet with 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.
- ◆ Make sure the host settings match the settings contained in the communication settings packet.
- ◆ Record the new configuration for future reference.

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. Options:

- 0 online mode
- 1 offline mode (9494/9446/1460)

A3. *language* Display Language. Options:

- 0 English
- 1 French (9446/1460)
- 2 German (9446/1460)
- 3 Spanish (9446/1460)

A4. *sep_on* Batch Separators. Options:

- 0 Does not print a separator.
- 1 Prints a separator (9494/9490/9446)

A5. *slash_zero* Slash Zero. Options:

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

NOTE: The scalable font does not print a slashed zero.

A6. *symbol_set* Symbol Set. Options:

- 0 Internal/ Monarch
- 1 ANSI
- 2 Code Page 437
- 3 Code Page 850

NOTE: The CG Triumvirate fonts and Font #50 support only the ANSI and DOS Code 437 and 850 Page Symbol Sets. See Appendix C, "Symbol Sets/Code Pages" for more information.

See "Defaults" for the default values on each printer.

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_on, feed_mode, supply_posn, cut_posn }

B1. B Supply Setup Packet

B2. supply_type Supply Type. Options:
0 Black mark stock
1 Die Cut/aperature stock (9446/1460)
2 Non Indexed stock (9494)

B3. ribbon_on Options:
0 Ribbon not installed
1 Ribbon installed
2 High Energy Ribbon (9446)

B4. feed_mode Options:
0 Continuous operation (9494/9490/9446)
1 On demand mode
2 Internal Rewind (9446)

B5. supply_posn **-10 to 6** in 1/192 inch (9494/9490)
-99 to 99 in 1/192 inch (9446/1460). 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. Increase the supply position to move print up, decrease to move print down on the label. Print a test label to verify the 0,0 point. Changing the supply position affects the print position. Once the supply position is set, use the print control packet to adjust printing.

B6. cut_posn **-99 to 99** in 1/192 inch. Use **0** (no knife on these printers).

See "Defaults" for the default values on each printer.

Example {I, B, 0, 0, 1, 10 }

Indicates black mark and thermal direct stock has been loaded, causes the printer to operate in on-demand mode, and feeds the supply approximately .05 inches up before printing the format on each label (10/192 inches).

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, bat_voltage | }

C1. C Print Control Packet

C2. contrast **-390 to 156.** 0 is the default.

C3. print_adj **-99 to 99** in 1/192 inch. 0 is the default. Adjusts where data prints vertically on the supply. Adjust the print if it is too close to the top or bottom of the supply, or overtypes a pre-printed area. Increase the print position to move print up, decrease to move print down.

C4. margin_adj **-99 to 99** in 1/192 inch. 0 is the default. Adjusts where data prints horizontally on the supply. Adjust the print if it is too close to the left or right side of 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 affect the supply position.

C5. speed_adj Print speed in inches per second (IPS). Options:

0	uses default speed
15	1.5 IPS (9494)
20	2.0 IPS (9494/9490)
25	2.5 IPS (9494/9446/1460)
50	5.0 IPS (9446/1460)
70	7.0 IPS (9446/1460)
100	10.0 IPS (9446 High Speed model)

NOTE: Serial bar codes printed at speeds greater than 2.5 IPS may not scan properly.

C6. ph_width **230 to 768.** Width of the printhead in dots. 0 is the default (768 dots). Does not affect supply width defined in the format header. If this parameter is not defined, the default of 768 dots is used.

C7. bat_voltage Selects the battery voltage. Only valid on the 9490 printer used with the Mobile Printing Station. Options:

0	15-volt battery
1	12-volt battery

Example {I,C,0,-20,-10,0,768,1 | }

Uses the default contrast, moves print .1 inch closer to the bottom of the supply (20/192 inches) and .05 inch to the left on the supply (10/192 inches), prints at six inches per second, sets the printhead width to 4 inches, and uses a 12-volt battery (only for the 9490 printer).

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. Options:

- 0** No symbol
- 1** USA (\$, Dollar- default)
- 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 (S, Shilling)
- 11** India (R, Rupee)
- 12** Russia (R, Ruble)
- 13** Korean (, Won)
- 14** Thai (, Baht)
- 15** Chinese (¥, Yuan)

NOTE: Use the internal symbol set for these symbols.

D3. secondary Secondary Sign. Options:

- 0** No secondary sign (default)
- 1** Print secondary sign

NOTE: Secondary symbols only print if you designate at least one decimal place.

<i>D4. decimals</i>	Number of digits to the right of the decimal. Options:
	0 No digits
	1 One digit
	2 Two digits (default)
	3 Three digits

The defaults listed above are the defaults for all printers.

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 ENQ's.

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.



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

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

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

E1. E Control Characters Packet

<i>E2. "ANSI_cd"</i>	~123	Start of header	{	(left bracket)
	~044	Parameter separator	,	(comma)
	~034	Quoted strings	"	(quotes)
	~124	Field separator	|	(pipe sign)
	~125	End of header	}	(right bracket)
	~126	Data escape character (optional)	~~	(double tilde)
	def. ch.	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 (^) 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. The default is "013". 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. The default is none. Sending "" disables this sequence.

The defaults listed above are the defaults for all printers. After you change these parameters, all packets, including any future configuration packets, must use the new control characters. Monarch recommends 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.

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. Changing the communication settings takes approximately two seconds. Communications sent during this interval will be lost.

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

F1. F Communication Settings Packet

F2. baud Baud Rate. Options:

0	1200
1	2400 (default for 1460)
2	4800
3	9600 (default for 9494/9490/9446)
4	19.2K

F3. word_length Word Length. Options:

0	7-bit word length
1	8-bit word length (default for all printers)

F4. stop_bits Stop Bits. Options:

0	1-stop bit (default for all printers)
1	2-stop bits

F5. parity Parity. Options:
 0 None (default for all printers)
 1 ODD parity
 2 EVEN parity

F6. flow_control Flow Control. Options:
 0 None
 1 DTR (default for all printers)
 2 CTS
 3 XON/XOFF

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

F6. pr_address Printer's address. Only valid on the 9490 printer used with the Mobile Printing Station. Can be any six-byte string in the 0 to 255 decimal range enclosed by quotes. We recommend setting the printer's address to the printable alphanumeric ASCII values (0-9; A-Z; a-z). This avoids any conflict with the control characters (ENQ, parameter separators, etc.) and is easily interpreted.

Example {I,F,3,1,0,0,1,"ABC123" | }

Uses 9600 baud, an 8-bit word length, one stop bit, no parity, DTR mode, and sets one 9490 printer's address to ABC123.

Defining the Memory Configuration Packet

Use the memory configuration packet (M) to customize the size of your printer's buffers, which gives you 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
32	320
153	1530
229.5	2295

Each buffer's allocated memory remains in effect until that buffer is reallocated. For this reason, you may want to reallocate all the buffers when reallocating any buffer. If you reallocate more memory than you have available, you will receive an error.

Syntax {I,M,buffer,device,buffer_size ! }

M1. M Memory Configuration Packet

M2. buffer Buffer type:

D Downloadable Fonts
F Format
I Image
R Receive
T Transmit
V Scalable Fonts

M3. device Storage type:

N Non-volatile RAM
R Volatile RAM

M4. buffer size Buffer size in 1/10K ranges

5 - 40 Transmit
20 - 320 Receive
385 - 2295 Image
160 - 2295 Format
80 - 2295 Downloadable Fonts
0 - 1280 Scalable Fonts

Buffer size with Optional RAM
in 1/10K ranges

5 - 40 Transmit
20 - 320 Receive
385 - 2560 Image
160 - 5120 Format
80 - 5120 Downloadable Fonts
0 - 1280 Scalable Fonts

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

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

The following table lists the configured buffer sizes for your printer.

Buffer	Min - Max in K	9494	9490	9446	1460
Transmit	.5- 4K	1K	1K	1K	1K
Receive	2 - 32K	2K	2K	2K	2K
Image	38.5 - 229.5K	115K	124K	153K	153K
Downloadable Fonts	8 - 229.5K	20K	128K	20K	20K
Scalable Fonts	0 - 128K	36K	48K	0K	0K
Formats (Formats, Batches, and Graphics)	16 - 229.5K	32K	32K	32K	32K
Internal	cannot reallocate	50K	50K	48K	48K



- ◆ If you have purchased the scalable font for the 9446 and 1460 printers, the scalable fonts buffer is configured at 36K. The total actual memory available may be less than the total default sizes.

- ◆ Buffers must total 256K, or 512K if the Optional RAM is present.
- ◆ "Optional RAM Buffer Sizes" lists the minimum and maximum values for each buffer using the Optional RAM.

Checking Current Buffer Sizes

Send a configuration upload packet to check the sizes of your current buffers. See "Using Configuration Upload Packet" for more information. After you check your current buffer sizes you can begin reallocating memory.

If you want to increase your image buffer and you will not be using scalable fonts, add that memory into your image buffer.

<i>Example</i>	{I, M, R, R, 20 ↓	Receive buffer	2K
	M, T, R, 10 ↓	Transmit buffer	1K
	M, D, N, 80 ↓	Downloadable fonts	8K
	M, V, R, 0 ↓	Scalable fonts buffer	0K
	M, I, N, 1650 ↓	Image buffer	165K
	}		

Make sure memory is available before adding memory to a buffer. In the above example, if the image buffer (M,I,N,1650) was defined before the downloadable fonts and scalable fonts buffers (M,D,N,80 and M,V,R,0) were defined, an error would have occurred.

About Memory Buffers

<i>Transmit Buffer</i>	Used to send ENQ, job, and upload responses. A minimum of 5 is required. The maximum is 40. This buffer must be allocated as volatile (R) RAM.
<i>Receive Buffer</i>	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. A minimum of 20 is required. The maximum is 320. This buffer must be allocated as volatile (R) RAM.
<i>Image Buffer</i>	Used to image the current format. You can increase or decrease the default label length by manipulating this buffer. A minimum of 385 is required. The maximum is 2295. The Image Buffer is cleared after a printer reset, even if it is stored in non-volatile RAM. You must have the Optional RAM installed to create labels longer than the default. See Chapter 2, "Designing a Format," for the default label lengths. An image up to 11.75 inches can be created on the 9494/9490/9446 printers by increasing this buffer. However, the maximum image size for the 1460 printer/applicator is 7.5 inches. (The size of the tamp pad determines the maximum label size available for the 1460 printer/applicator.)



You may not be able to use scalable or downloadable fonts if you have increased the image buffer by reallocating memory from these buffers into your image buffer.

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

$$19.13K \times Length$$

Length is the length of your label in inches.

Example

$$19.13K \times 6 = 114.78K$$

(Multiply by 10 and round up.)

$$114.78K \times 10 = 1147.8$$

$$1147.8 = 1150$$

Enter 1150 for your Image buffer.

Format Buffer

Used to store formats, batch data, and graphics. A minimum of 160 is required. The maximum is 2295. Use the following formula to calculate the required format buffer size:

$$Linecount \times 50/1024$$

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

The result of the above calculation is in kilobytes.

*Downloadable
Fonts Buffer*

Used to store downloaded soft (bitmapped) fonts. A minimum of 80 is required. The maximum is 2295. To determine the size of your downloadable fonts, send a font packet. See "Using the Font Packet" for more information.

*Scalable (Vector)
Fonts Buffer*

Used to image the scalable 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 fonts. The maximum is 1280. This buffer must be allocated as volatile (**R**) RAM.

Buffer Worksheet

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



If you are using Optional RAM, refer to "Optional RAM Buffer Sizes" for the minimum and maximum buffer values.

	HEADER	BUFFER	DEVICE	BUFFER SIZE	
DOWN LOADABLE FONTS BUFFER	M	D			maximum of 2295
FORMAT BUFFER	M	F			maximum of 2295
IMAGE BUFFER	M	I			maximum of 2295
RECEIVE BUFFER	M	R	R		maximum of 320
TRANSMIT BUFFER	M	T	R		maximum of 40
SCALABLE FONTS BUFFER	M	V	R		maximum of 1280

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 you need to reallocate 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. For example, if you send

```
{ I, M, R, N, 20 |  
M, T, N, 60 |  
... }
```

the printer ignores the entire packet, because the second line allocates 6K for the transmit buffer, and 4K is the maximum for that buffer. If you define a buffer size that 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.
- ◆ If you remap your image buffer, make sure the length and width specified in your format header are not too large for the current image buffer. In other words, if you remap for a 4 x 4 inch label, you cannot print a 4 x 6 inch label without receiving an error, until you change your format header or increase your image buffer.

Optional RAM Buffer Sizes

If you have purchased the 256K Optional RAM for your printer, the following table lists the minimum and maximum values for each buffer.

Buffer	Min - Max (in K)
Transmit	.5 - 4
Receive	2 - 32
Image	38.5 - 256
Format	16 - 512
Downloadable Fonts	8 - 512
Scalable Fonts	0 - 128

Using Immediate Commands

Immediate commands affect 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 and therefore 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. This example assumes that the defined immediate command control character is the caret (^).

Command	Parameter
^ADxxxxxx	Selects the 9490 printer whose ASCII address is xxxxxx.
^CA	Cancels all the batches in the queue.
^CB	Cancels only the current batch being printed.
^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. May need to be sent multiple times. Use ^RB to reprint batch. CAUTION: 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 the trigger or pressing  to acknowledge an error. Normal operation will resume.
^FD	Feeds a label when printer is idle . Simulates the operation of pressing trigger or  and dispenses the next label if printer is in the on demand mode. NOTE: Printer ignores this command if printing.
^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.
^MC	Returns the customer ID or RPQ version to the host. (00 to 99)
^MI	Returns the customer ID or RPQ revision level to the host. (00 to 99)
^MM	Returns the model number to the host. 00 = M9446 01 = M1446/M1460 02= M9490 04= M9494
^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.
^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.
^TP	Prints a test label set. NOTE: Printer ignores this command if printing.

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.



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

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. For the 9490 and 9494 printers, turning off the printer clears the packets from memory. For all printers, send a format clear packet.

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

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

Example {F,1,C,R | }

Clears Format #1 from volatile RAM.

Using the Font Packet

You can use a font packet to add or clear downloaded fonts from memory, upload your font buffer, or upload the cell size information for a particular font. The font packet is useful when you are downloading fonts. If you are 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.

Syntax {W,font#,action,device ! }

W1. W Writable Font Header

W2. font# Font number from **0-9999**.
0 is for all fonts. 1 - 5 digits is the font number.
For example, 11 is the standard printer font,
CG Triumvirate.

W3. action Action. Options:

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

W4. device Storage device. Options:

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

If you are creating fonts, you need to have font data included with this packet. Software is available to create the font data and packet. Call Technical Support for more information.

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 printer returns the following to the host:

```

Font Style  {W,0,H,Z ! } Font Name
0,1,0,"Standard",0,0,0,14,22,14,22,3 !
Symbol Set 0,1,1,"CGTriBd9",1,0,7,25,31,10,15,0 !
Type       0,1,437,"CGTriBd9",1,0,7,25,31,10,15,0 ! Spacing
0,1,850,"CGTriBd9",1,0,7,25,31,10,15,0 !
Cell Width 0,2,0,"Reduced",0,0,0,7,14,7,14,1 ! Baseline
0,2,1,"CGTriumv6",1,0,5,17,21,5,10,0 ! Cell Height
0,2,437,"CGTriumv6",1,0,5,17,21,5,10,0 ! Nominal
0,2,850,"CGTriumv6",1,0,5,17,21,5,10,0 ! Nominal
0,3,0,"Bold",0,0,0,24,34,24,34,3 !
0,4,0,"OCRA",0,0,0,13,24,13,24,3 ! Inter-Character
0,5,0,"HR1",0,0,0,12,20,12,20,2 !
0,6,0,"HR2",0,0,0,10,16,10,16,1 !
0,10,1,"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 !
0,11,1,"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 !
0,50,0,"CGTriBd",1,1,92248 !
}
    
```



This example shows the fonts for the 9490 printer. Notice that the scalable font (font #50) is included in the list.

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.

Using Configuration Upload Packet

Use the configuration upload packet to upload your printer's configuration.

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

1. *header* Constant I.
2. *ID#* ID. Use **0**.
3. *action* Upload User Configuration (**U**).
4. *device* Storage Device. Options:
 - M** Memory
 - N** Nonvolatile RAM
 - R** Volatile RAM

Example {I, O, U, N | }

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

```
A,0,0,0,0,0 |
B,1,1,0,0,0 |
C,0,0,0,0,768 |
D,1,0,2 |
E,"~123~044~034~124~125~126",",", "~013~010" |
F,1,1,0,0,1 |
M,R,2110,200,N,2560,220 |
M,R,N,20 |
M,T,N,10 |
M,I,N,1530 |
M,D,N,20 |
M,F,N,320 |
M,V,N,0 | }
```

The parameters for each packet (A-F & M) are displayed. In the **first** line that begins with M, **2110** is the total volatile memory available, **200** is the memory used in volatile RAM in 1/10K. **2560** is the total non-volatile memory available, **220** is the memory left in non-volatile RAM in 1/10K.



The total volatile and non-volatile RAM varies with each printer.

In the **second** line that begins with M, **20** is the amount of memory in 1/10K allocated for the **R**ecieve buffer in **N**on-volatile RAM.

The remaining lines give the buffer sizes in 1/10K for the **T**ransmit, **I**mage, **D**ownloadable Fonts, **F**ormat, and **S**calable (**V**ector) Fonts Buffers.

Defaults

For the System Setup Packet (A), all the printers use these defaults:

Parameter	Default	Description
Identifier	A	System Setup Packet
online_mode	0	Online mode
language	0	English
sep_on	0	Do not print separator
slash_zero	0	Print a standard zero
symbol_set	0	Internal Symbol Set

For the 9494 printer

Parameter	Default	Description
Identifier	B	Supply Setup Packet
supply_type	0	Black Mark stock loaded
ribbon_on	1	Ribbon installed (transfer supply)
feed_mode	0	On demand operation
supply_posn	0	Supply position in 1/192 inches
cut_posn	0	Cut position in 1/192 inches

The defaults for the print control, monetary formatting, control characters, and communication settings packets are listed earlier in this chapter. The default print speed on the 9494 printer is 2 inches per second.

For the 9490 printer

Parameter	Default	Description
Identifier	B	Supply Setup Packet
supply_type	0	Black Mark stock loaded
ribbon_on	1	Ribbon installed (transfer supply)
feed_mode	0	On demand operation
supply_posn	0	Supply position in 1/192 inches
cut_posn	0	Cut position in 1/192 inches

The defaults for the print control, monetary formatting, control characters, and communication settings packets are listed earlier in this chapter. The default print speed on the 9490 printer is 2 inches per second.

For the 9446 printer

Parameter	Default	Description
Identifier	B	Supply Setup Packet
supply_type	1	Die Cut stock loaded
ribbon_on	1	Ribbon installed (transfer supply)
feed_mode	0	Continuous operation
supply_posn	0	Supply position in 1/192 inches
cut_posn	0	Cut position in 1/192 inches

The defaults for the print control, monetary formatting, control characters, and communication settings packets are listed earlier in this chapter. The default print speed on the 9446 printer is 5 inches per second.

For the 1460 printer

Parameter	Default	Description
Identifier	B	Supply Setup Packet
supply_type	1	Die Cut stock loaded
ribbon_on	1	Ribbon installed (transfer supply)
feed_mode	1	On-Demand operation
supply_posn	0	Supply position in 1/192 inches
cut_posn	0	Cut position in 1/192 inches

The defaults for the print control, monetary formatting, control characters, and communication settings packets are listed earlier in this chapter. The default print speed on the 1460 printer is 7 inches per second.

Chapter 4.

Defining Fields

This chapter provides a reference for defining

- ◆ the format header
- ◆ text, constant text, and non-printable text fields
- ◆ bar code fields
- ◆ line and box 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 **0-99** to identify the format.

F3. action Enter **A** to add a new format to the printer.

F4. device Format storage device. **R** is the only valid value.

F5. measure Unit of measure. Options:

E English, measured in 1/100 inches

M Metric, measured in 1/10 mm

G Graphic, measured in dots

F6. length Supply length, in units selected above. Measure supply top to bottom. The bottom is the edge that exits the printer first.

NOTE: For the 9490 and 9494 printers, you can use supply longer than 6 inches (up to 7.1 inches); however, the length in your format header cannot be greater than 6 inches.

9494/9490 ranges:

English **100 - 600**
 Metric **254 - 1524**
 Dots **192 - 1152**

9446/1460 ranges:

English **075 - 800**
 Metric **191 - 2033**
 Dots **144 - 1536**

NOTE: The ranges above are based on a standard memory configuration. You can create longer labels if you purchase the Optional RAM and reallocate memory to increase your image buffer size. See "Defining the Memory Configuration Packet" in Chapter 3 for more information.

F7. width

Supply width, from left to right, in selected units. Ranges:

English **120 - 400**
 Metric **305 - 1017**
 Dots **230 - 768**

F8. "name"

Format name (optional), **0-8** characters, enclose within quotation marks.

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.

Defining Text Fields

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.

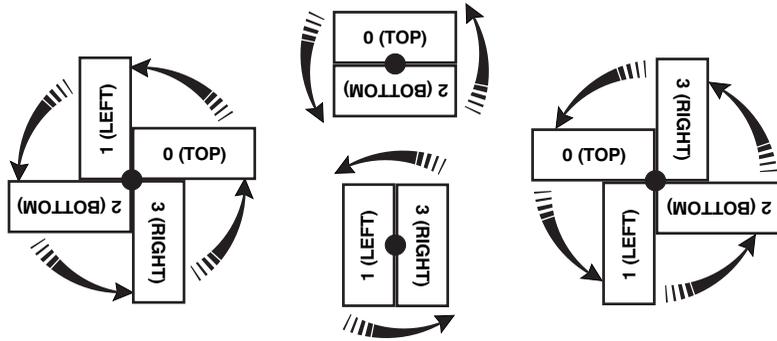
T2. field# Unique number from **0-99** to identify this field.

T3. # of char Maximum number of printed characters (**0-2710**) in the field.

T4. fix/var Fixed or variable length field. Options:
F Fixed length
V Variable length

T5. row

For monospaced fonts, distance from bottom of print area to the pivot point. The pivot point varies depending on how text is justified.



Left/Center/Right-Justified

Balanced

End-Justified

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



9494/9490 ranges:

English 0 - 599
 Metric 0 - 1523
 Dots 0 - 1151

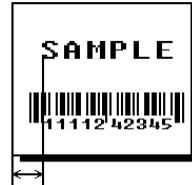
9446/1460 ranges:

English 0 - 799
 Metric 0 - 2031
 Dots 0 - 1535

NOTE: The ranges above are based on a standard memory configuration. You can create longer labels if you purchase the Optional RAM and reallocate memory to increase your image buffer size. See "Defining the Memory Configuration Packet" in Chapter 3 for more information.

T6. column Distance from the left edge of the print area to the pivot point is the column location. Ranges:

English **0 - 399**
 Metric **0 - 1015**
 Dots **0 - 767**



T7. gap Number of dots between characters (192 dots per inch). Range: **0-99**.

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 your field width. Default spacing:

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

T8. font Style of font. Options:

1 Standard **4** OCRA-like
2 Reduced **10** CG Triumvirate Bold
3 Bold **11** CG Triumvirate
50 CG Triumvirate Bold (scalable)

NOTE: If you have purchased optional fonts, refer to the *Optional Fonts Manual* for valid font selectors. The scalable font (Font #**50**) must be *purchased separately* for the 9446 and 1460 printers. The scalable font does not print a slashed zero. The CG Triumvirate fonts and Font #**50** support only the ANSI and DOS Code 437 and 850 Page Symbol Sets. See Appendix C, "Symbol Sets/Code Pages" for more information.

T9. hgt mag Height magnifier, **1-7** (times) or **4-90** points for the scalable font. If using the scalable font on the 9490 printer, the range is **4-200** points. Use a magnifier of **1** with proportionally spaced fonts, because characters lose smoothness at higher magnifications.

T10. wid mag Width magnifier, **1-7** (times) or **4-90** points for the scalable font. If using the scalable font on the 9490 printer, the range is **4-200** points.

Proportionally spaced fonts do not have a set width. To estimate the size of your field, use the letter "W" for the widest field or an "L" for an average width field. Find your selected font and the desired width in Appendix B, "Fonts."

NOTE: You may need to reconfigure the printer's memory to accommodate large point sizes. See "Defining the Memory Configuration Packet" in Chapter 3 for more information.

T11. color Options for standard printer fonts:

- B** Opaque, Normal, Black, Normal
- D** Opaque, Normal, White, Normal
- O** Transparent, Normal, Black, Normal
- R** Transparent, Normal, White, Normal
- W** Opaque, Normal, White, Normal

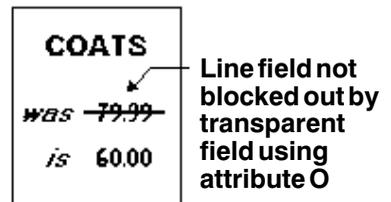
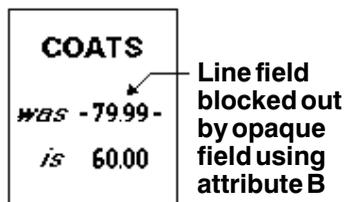
Options for the Scalable Font:

- 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 cannot exceed 20% (for the 9490 printer) or 30% (for the 9494/9446/1460 printers) on any given square inch of the label.

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.



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.

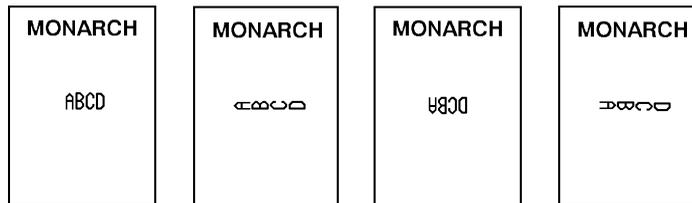
T12. alignment Options:

- 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.

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

- 0** Top of character points to top of field (Use for scalable font)
- 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. 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. Options:

0	Internal Symbol Set
1	ANSI Symbol Set
437	DOS Code Page 437 (Domestic)
850	DOS Code Page 850 (International)

NOTE: The CG Triumvirate fonts and Font #50 support only the ANSI and DOS Code 437 and 850 Page Symbol Sets. See Appendix C, "Symbol Sets/Code Pages" for more information.

Example T,2,10,V,250,50,0,1,1,1,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 50. 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.

Defining Bar Code Fields

Each bar code field requires a separate definition.

Syntax B,field#, # of char, fix/var, row, column,
font, density, height, text, alignment,
field rot †

B1. B Bar Code Field.

B2. field# Unique number from **0-99** to identify this field.

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: **0-2710**.

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

Bar Code	Number of Characters	Fixed or Variable
UPCA	12	F
UPCA+2	14	F
UPCA+5	17	F
UPCA+Price CD	12	F
UPCE	7	F
UPCE+2	9	F
UPCE+5	12	F
EAN8	8	F
EAN8+2	10	F
EAN8+5	13	F
EAN13	13	F
EAN13+2	15	F
EAN13+5	18	F
EAN13+Price CD	13	F
POSTNET	9 or 11	F
Interleaved 2 of 5 or Interleaved 1 2 of 5 with Barrier Bar	0 to 2710	V
Code 39 or MOD43	0 to 2710	V
Codabar (NW7)	depends on application	V
Code 128	0 to 2710	V
Code 93	0 to 2710	V
MSI	0 to 14	V
PDF417	0 to 2710	V
MaxiCode	15 to 99	V

B5. row

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. Pivot points:



Left/Center/Right-Justified Fields



Balanced Fields

End-Justified Fields

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



9494/9490 ranges:

9446/1460 ranges:

English **0 - 599**
 Metric **0 - 1523**
 Dots **0 - 1151**

English **0 - 799**
 Metric **0 - 2031**
 Dots **0 - 1535**

NOTE: The ranges above are based on a standard memory configuration. You can create longer labels if you purchase the Optional RAM and reallocate memory to increase your image buffer size. See "Defining the Memory Configuration Packet" in Chapter 3 for more information.

B6. column

Distance to the lower left corner of the field from the left edge of print area. Ranges:

English **0 - 399**
 Metric **0 - 1015**
 Dots **0 - 767**



NOTE: Allow a minimum of **1/10** inch between the scan edge of bar code and label edges or other data.

B7. font

Bar code. Options:

- 1** UPCA
- 2** UPCE
- 3** Interleaved 2 of 5
- 4** Code 39 (no check digit)
- 5** Codabar
- 6** EAN8
- 7** EAN13
- 8** Code 128
- 9** MSI
- 10** UPCA +2
- 11** UPCA +5
- 12** UPCE +2
- 13** UPCE +5
- 14** EAN8 +2
- 15** EAN8 +5
- 16** EAN13 +2
- 17** EAN13 +5
- 22** POSTNET
- 23** Code 93
- 31** Code 16K
- 32** PDF417
- 33** MaxiCode
- 40** Code 39 (MOD 43 check digit)
- 41** UPCA & Price CD
- 44** EAN13 & Price CD
- 50** Interleaved 2 of 5 with Barrier Bar

B8. density

Bar code density. Use the following table for the bar code density.

Barcode Type	Density Selector	Density (% or cpi)	Narrow Element (dots/mils)	Narrow to Wide Ratio	Data Length	Appearance Codes Available	Char Set
UPCA +2/+5 Price CD	2	80%	2/10.4	N/A	11 or 12	1,5,6	0 to 9
	4	120%	3/15.6		14/17	7 or 8	
UPCE +2/+5	2	80%	2/10.4	N/A	6 or 7	1,5,6	0 to 9
	4	120%	3/15.6		9/12	7 or 8	
EAN8 +2/+5	2	80%	2/10.4	N/A	7 or 8	1,5,6	0 to 9
	4	120%	3/15.6		10/13	7 or 8	
EAN13 +2/+5 Price CD	2	80%	2/10.4	N/A	12 or 13	1,5,6	0 to 9
	4	120%	3/15.6		15/18	7 or 8	
Interleaved 2 of 5 or 1 2 of 5 with Barrier Bar	1	1.0	21/109.4	1:3.0	0 to 2710	8	0 to 9
	2	2.0	12/62.5	1:2.5			
	3	3.0	7/36.5	1:3.0			
	4	4.0	6/31.3	1:2.5			
	5	5.3	4/20.8	1:3.0			
	6	6.0	4/20.8	1:2.5			
	7	7.1	3/15.6	1:3.0			
	8	8.3	3/15.6	1:2.3			
	9	9.1	3/15.6	1:2.0			
	10	10.6	2/10.4	1:3.0			
	11	10.6	2/10.4	1:3.0			
	12	12.0	2/10.4	1:2.5			
	13	13.7	2/10.4	1:2.0			
Code 39 or MOD 43 (Extended Code 39 supported)	1	1.3	10/52.1	1:2.5	0 to 2710	8	SPACE \$%*+-./ 0 to 9 A to Z
	2	1.7	8/41.7	1:2.5			
	3	3.3	4/20.8	1:2.5			
	4	4.0	3/15.6	1:3.0			
	6	6.0	2/10.4	1:3.0			
	7	6.6	2/10.4	1:2.5			
	11	3.7	4/20.8	1:2.0			
	12	12.0	1/5.2	1:3.0			
20	2.8	5/26.0	1:2.2				
Codabar (NW7)	2	2.0	8/41.7	1:3.0	0 to 2710	8	\$%*+-./ 0 to 9 : a to d
	3	2.9	6/31.3	1:2.5			
	4	4.3	4/20.8	1:2.5			
	5	4.7	4/20.8	1:2.0			
	7	7.7	2/10.4	1:3.0			
	8	8.4	2/10.4	1:2.5			
	9	9.6	2/10.4	1:2.0			
Code 93	3	3.6	6/31.2	N/A	0 to 2710	8	00H to FFH
	4	4.3	5/26.0				
	5	5.3	4/20.8				
	7	7.1	3/15.6				
	10	10.7	2/10.4				

Barcode Type	Density Selector	Density (% or cpi)	Narrow Element (dots/mils)	Narrow toWide Ratio	Data Length	Appearance Codes Available	Char Set
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	5/26.0 4/20.8 3/15.6 2/10.4	N/A	0 to 2710	8	00H to 7FH
MSI	4 5 7	4.0 5.3 6.9	4/20.8 3/15.6 2/10.4	1:2.0 1:2.0 1:2.5	0 to 2710	8	0 to 9

Barcode Type	Density Selector	Narrow Element (dots/mils)	Short Element (dots/mils)	Element Width (dots/mils)	Data Length	Appearance Codes Available	Char Set
POSTNET	0 (fixed at 4.3 cpi)	24/125.0	10/52.1	4/20.8 (5 dot gap)	0,5,6,9 or 11	8	0 to 9

Barcode Type	Density Selector	Element Width (dots/mils)	Row Height (dots/mils)	Aspect Ratio	Data Length	Appearance Codes Available	Char Set
PDF417 (security levels 0-8)	1 2 3 4 5 6 7 8 9	2/10.4 2/10.4 2/10.4 3/15.6 3/15.6 3/15.6 4/20.8 4/20.8 4/20.8	2/10.4 4/20.8 6/31.3 3/15.6 6/31.3 9/46.9 4/20.8 8/41.7 12/62.5	1:1 1:2 1:3 1:1 1:2 1:3 1:1 1:2 1:3	0 to 2710	8	00H to FFH
MaxiCode	7	N/A	N/A	N/A	15-99	8	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 **20**
 Metric **51**
 Dots **38**

NOTE: POSTNET, PDF417, and MaxiCode bar codes have a fixed height. Always enter **0** for these bar code types.

- B10. text** Appearance of text with bar code. For UPC and EAN only use **0-7**. For all others, use **8**. Options:
- 0** Default
 - 1** No check digit or number system
 - 5** Number system at bottom, no check digit
 - 6** Check digit at bottom, no number system
 - 7** Check digit and number system at bottom
 - 8** No text, bar code only
- B11. alignment** Choose **L**, **R**, **C**, **B** or **E** to align the bar code data correctly in the field. **B** centers variable width bar codes, which may not allow pad-character centering (Code 128, Code 39, etc.) **E** right justifies variable width bar codes. Maxicode must use **L**.
- B12. field rot** Field rotation. 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 printed at speeds greater than 2.5 IPS may not scan properly.

Example B,3,12,V,150,40,1,2,80,7,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.

Defining Non-Printable Text Fields

Non-printable text fields allow you to enter 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 you define the field where the information prints.

When you copy this field into another field, the maximum number of characters for the final field is **2710**. Allow only as many characters as you need, because extra characters use up space. Also, if you are 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.). You need to apply field options to manipulate the text entered in this field. For example, you may want to copy data from this field into another field. See "Option 4 Copy Data" in Chapter 5 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 5 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 **0-99** assigned to this field.

D3. # of char Maximum number of characters in this field (**0-2710**).

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 **100** fields per format). The characters in this field cannot be changed by batch data. Field options do not apply to constant text fields.

Determine the height and the maximum width of the characters, using the tables in Appendix B, "Fonts." If you're using proportionally spaced fonts, use the average size of the characters. Mark the pivot point of your field. This will vary, depending on how your field is justified.

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 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.)

9494/9490 ranges:

English	0 - 599
Metric	0 - 1523
Dots	0 - 1151

9446/1460 ranges:

English	0 - 799
Metric	0 - 2031
Dots	0 - 1535

NOTE: The ranges above are based on a standard memory configuration. You can create longer labels if you purchase the Optional RAM and reallocate memory to increase your image buffer size. See "Defining the Memory Configuration Packet" in Chapter 3 for more information.

C3. column Distance to lower left corner of field, from left edge of print area. Ranges:

English **0 - 399**
Metric **0 - 1015**
Dots **0 - 767**

C4. gap Number of dots between characters. Range: **0-99**.

C5. font Style of font. Options:

1	Standard	4	OCRA-like
2	Reduced	10	CG Triumvirate Bold
3	Bold	11	CG Triumvirate
50	CG Triumvirate Bold (scalable)		

NOTE: If you have purchased optional fonts, refer to the *Optional Fonts* manual for valid selectors. The scalable font (Font #**50**) must be *purchased separately* for the 9446 and 1460 printers. The CG Triumvirate fonts and Font #**50** support only the ANSI and DOS Code 437 and 850 Page Symbol Sets. See Appendix C, "Symbol Sets/Code Pages" for more information.

C6. hgt mag Height magnifier, **1-7** (times) or **4-90** points for the scalable font. If using the scalable font on the 9490 printer, the range is **4-200** points. Use a magnifier of **1** with proportionally spaced fonts, because characters lose smoothness at higher magnifications for all fonts.

C7. wid mag Width magnifier, **1-7** (times) or **4-90** points for the scalable font. If using the scalable font on the 9490 printer, the range is **4-200** points.

NOTE: You may need to reconfigure the printer's memory to accommodate large point sizes. See "Defining the Memory Configuration Packet" in Chapter 3 for more information.

C8. color Options for Standard Printer Fonts:

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

Options for the Scalable Font:

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 cannot exceed 20% (*for the 9490 printer*) or 30% (*for the 9494/9446/1460 printers*) on any given square inch of the label.

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.

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. Options:

L	Align on left side of field.
C	Center text within field (for monospaced fonts only)
R	Align on right side of field (for monospaced fonts only)
B	Align at midpoint of field
E	Align at end of field.

Use **L**, **B**, or **E** for any font.

C10. char rot Character rotation. Options:

0	Top of character points to top of field (Use for scalable font)
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. Lower left corner of field is the pivot point. Options:

- 0** Top of overlay points to top of supply
- 1** Top of overlay points to left of supply
- 2** Top of overlay points to bottom of supply
- 3** Top of overlay points to right of supply

NOTE: Rotation is affected by the pivot point, which varies depending on how text is justified.

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

C13. sym set Symbol set. Options:

- 0** Internal Symbol Set
- 1** ANSI Symbol Set
- 437** DOS Code Page 437 (Domestic)
- 850** DOS Code Page 850 (Multilingual)

NOTE: The CG Triumvirate fonts and Font #50 support only the ANSI and DOS Code 437 and 850 Page Symbol Sets. See Appendix C, "Symbol Sets/Code Pages" for more information.

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.

Defining Line Fields

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 **100** fields per format). You can define any line length and a thickness up to 99 dots, as long as the solid black print does not exceed 20 percent (for the 9490 printer) or 30 percent (for the 9494/9446/1460 printers) of any given square inch of the label.

Line Types

You can create horizontal and vertical lines. There are two ways to define lines.

Segments You choose the starting point and ending point.

Vectors You choose 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. Options:

S Segment. You choose the starting point and ending point.

V Vector. You choose the starting point, angle, and length.

L3. row Distance from bottom of print area to the starting point.



9490/9494 ranges:

English **0 - 599**
Metric **0 - 1523**
Dots **0 - 1151**

9446/1460 ranges:

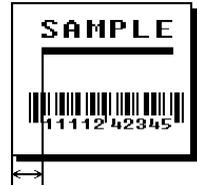
English **0 - 799**
Metric **0 - 2031**
Dots **0 - 1535**

NOTE: The ranges above are based on a standard memory configuration. You can create longer labels if you purchase the Optional RAM and reallocate memory to increase your image buffer size. See "Defining the Memory Configuration Packet" in Chapter 3 for more information.

L4. *column*

Distance from left edge of the print area to line origin.
 Ranges:

English **0 - 399**
 Metric **0 - 1015**
 Dots **0 - 767**



L5. *angle/
 end row*

If Using Segments

Row location of ending point. Measure from bottom of print area. Ranges same as *row* above. On horizontal lines, this value must match item L3.

If Using Vectors

Angle of line. Options: **0, 90, 180, or 270.**



L6. *length/
 end col*

If Using Segments

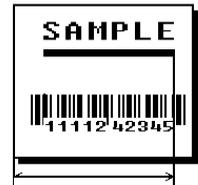
Column location of end point. Measure from left edge of print area. Ranges same as *column* above. On vertical lines, this value must match parameter L4.

If Using Vectors

Length of the line in selected units.

Ranges for horizontal lines:

English **0 - 400**
 Metric **0 - 1016**
 Dots **0 - 768**



9494/9490

vertical line ranges:

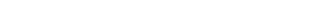
English **0 - 600**
 Metric **0 - 1524**
 Dots **0 - 1152**

9446/1460

vertical line ranges:

English **0 - 800**
 Metric **0 - 2033**
 Dots **0 - 1536**

L7. thickness Using the chart below for reference, write the desired line thickness (1 to 99) in box L7. Measured in dots.

Dots	Thickness
1	
10	
24	
48	
96	

NOTE: Line thickness fills upward on horizontal lines, or to the right on vertical lines.

L8. "pattern" Line pattern. Only one pattern is supported on these printers. 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 **100** fields per format). You can define any line length and a thickness up to 99 dots, as long as the solid black print does not exceed 20 percent (for the 9490 printer) or 30 percent (for the 9494/9446/1460 printers) of any given square inch of the label.

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

- Q1. Q** Box (**Q**uadrilateral) Field.
- Q2. row** Distance from bottom of print area to lower left corner of box.



9490/9494 ranges:

English **0 - 599**
Metric **0 - 1523**
Dots **0 - 1151**

9446/1460 ranges:

English **0 - 799**
Metric **0 - 2031**
Dots **0 - 1535**

NOTE: The ranges above are based on a standard memory configuration. You can create longer labels if you purchase the Optional RAM and reallocate memory to increase your image buffer size. See "Defining the Memory Configuration Packet" in Chapter 3 for more information.

- Q3. column** Distance from left edge of print area to lower left corner of box.

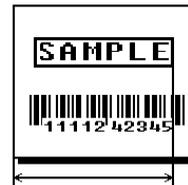
English **0 - 399**
Metric **0 - 1015**
Dots **0 - 767**



- Q4. end row** Distance from bottom of print area to upper right corner of box.
Ranges same as row.



Q5. end col Distance from left edge of print area to upper right corner of box. Ranges same as *column*.



Q6. thickness Using the chart below for reference, write the desired line thickness (1 to 99) in box **Q6**. Measure in dots.

Dots	Thickness
1	
10	
24	
48	
96	

NOTE: Line thickness fills upward on horizontal lines, or to the right on vertical lines.

Q7. "pattern" Line pattern. Only one pattern is supported on these printers. 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.

Chapter 5. Defining Field Options

This chapter provides a reference for defining

- ◆ field options in formats
- ◆ check digit packets.

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* you can apply any field option to it. Define options immediately after the field to which they apply.

Combining Field Options

You can use more than one option with most fields. For example, you can use Option 4 to copy data from another field, and then use Option 30 to pad the field. When you use multiple options for the same field, you must place the options in the order you want to apply them to your 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 the following sections addressing individual options for specific combinations to avoid.

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

Example R,1,3,1,3,1,1 |

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

R1. R Indicates field option header.

R2. option# Option number:

- 1** Define fixed characters
- 4** Copy data from previous field
- 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
- 60** Define incrementing or decrementing field
- 61** Reimage fields

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

Option 1 (Fixed Data)

Fixed data is information (a company name or store number) you want to print on all labels. You can 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 you are defining fixed characters for part of a field, place underscores (`_`) in non-fixed positions. Any spaces in the phrase are fixed characters. Range: **0 - 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 four and five. 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, you can apply Option 4 to copy data into the non-fixed character positions.

Option 4 (Copy Data)

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

The maximum number of characters defined in box **T3** or **B3** must allow for the number of characters you place 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**.



When copying from more than one field, copy into the destination field from left to right.

Syntax

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

R1. R Field Option Header.

R2. 4 Option **4**.

R3. src fld Field number from which data is copied. Range: **0 - 999**.

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.

R5. # to copy Number of characters to copy. Range: **1 - 2710**.

R6. dest start Position number where copied characters are to begin printing in the destination field. Range: **1 - 2710**.

R7. copy code Copy Method.

- 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

You can 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.

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

You can 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.

Option 30 (Padding Data)

You can add characters to one side of a field to "pad" the field. Padding allows you to fill 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.

Syntax `R, 30, L/R, "character" ;`

R1. R Field Option Header.

R2. 30 Option **30**.

R3. L/R Indicates type of padding

L Pad field on left side

R Pad field on right side

R4. "character" Pad character must be within the **0 - 255** decimal range and enclosed inside quotation marks.

NOTE: Do not use on fixed length fields.

Example `R, 30, L, "X" ;`

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

Sample Use for Padding

If you have a variable length bar code that you want to occupy a fixed amount of space on the supply, use pad characters. If the maximum number of characters in the bar code is 15, but the batch record only has 10 characters, the padding option fills the remainder of the field with pad characters.

Option 31 (Calculate Check Digit)

The printer generates a check digit if you apply Option 31 to the field. You cannot use this option if the field contains a UPC, EAN, Code 39 (with the MOD43 check digit), Maxicode, or POSTNET bar code.

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

R1. R Field 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 - 10**.

Example `R,31,G,5 |`

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

Option 42 (Price Field)

You can apply options that will insert monetary symbols automatically. 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, appearance code |

R1. R Field Option Header.

R2. 42 Option **42**.

R3. appearance code Enter **1** to print price field in standard notation, as defined by country setting.

Use the monetary formatting packet to select monetary notations and symbols by country setting. See "Defining the Monetary Formatting Packet" in Chapter 3 for more information.

See Appendix C, "[Symbol Sets/Code Pages](#)," to make sure the monetary symbol you want to use 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.

Option 50 (Bar Code Density)

You can apply this option to bar code fields when you want to create custom densities. When you apply this option, it overrides the density value in the bar code field.

When using this option, set the density parameter in your bar code field to the default value. You can only use this option once for each bar code field. This option overrides the density selected in the bar code field.

Bar codes produced using Option 50 may not be scannable. The additional character gap, narrow space, and wide space parameters are valid **only** with Code 39, Codabar or PDF417. 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 such as Maxicode or POSTNET.

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

- | | |
|-----------------------|---|
| <i>R1. R</i> | Field Option Header. |
| <i>R2. 50</i> | Option 50 . |
| <i>R3. narrow</i> | Dot width of the narrow element. Range: 1-99 . |
| <i>R4. wide</i> | Dot width of the wide element. Height of each element for PDF417). Range: 1-99 . |
| <i>R5. gap</i> | Additional dot space between characters. Enter a value of 1 to 99 . (Code 39 and Codabar only.) |
| <i>R6. nar_space</i> | Additional dot width of the narrow bar code space. (Code 39 and Codabar only). Range: 1- 99 . |
| <i>R7. wide_space</i> | Additional dot width of the wide bar code space. (Code 39 and Codabar only). Range: 1- 99 . |

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).

Option 51 (PDF417 Security/Truncation)

You can 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 your PDF417 bar code. For each level increased, the bar code will double in size.

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

R1. R Indicates option header.

R2. 51 Indicates Option **51**.

R3. security Security level ranges from **0-8** (**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. 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.

Option 52 (PDF417 Width/Length)

This option defines the image width or length of a PDF417 bar code. If you define a fixed number of columns (width), the bar code expands in length. If you define 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 Indicates option header.

R2. 52 Indicates Option **52**.

R3. row/column Indicates if you are defining the number of rows or columns.

R Row
C Column

If you specify rows, the bar code expands in columns, or vice versa.

R4. dimension The number of rows or columns defined for the bar code. The default is **4**. Valid values:

3-90 for rows
1-30 for columns

Example `R,52,C,10 |`

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

Option 60 (Incrementing/Decrementing Fields)

You may have an application, such as serial numbers, in which you need a numeric field to increment (increase in value) or decrement (decrease in value) on successive tickets within a single batch. Incrementing or decrementing can be applied to **numeric** data only. If you have a field that 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).

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

R1. R Field Option Header.

R2. 60 Option **60**.

R3. I/D **I** incrementing field
 D decrementing field

R4. amount Amount to increase or decrease. Range: **0- 99**.

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 - 2710**.

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 - 2710**.

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.

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**.

Option 61 (Reimage 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.



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

Syntax

R, 61 |

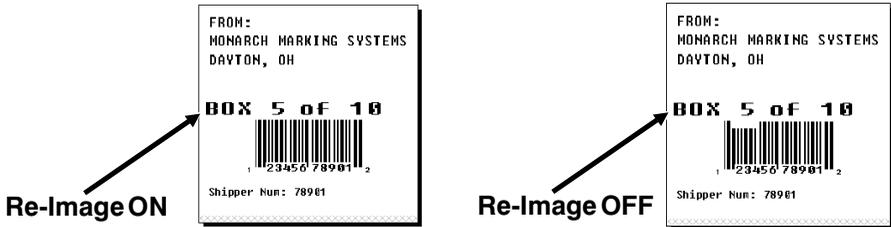
R1. R Option Header.

R2. 61 Option 61.

Example

R, 61 |

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



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

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 box **R4** 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 these bar codes, because they have predefined check digits: UPC, EAN, Code 39 (with the MOD43 check digit), Code 93, PDF417, Maxicode, or POSTNET.

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

- A1. *A* Check Digit Header.
- A2. *selector* Assign a number from **1-10** to this check digit formula.
- A3. *action* Adds a check digit scheme. Enter **A**.
- A4. *device* Device. Use **R**.
- A5. *modulus* Number from **2-11**. 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 - 2710**.
- 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 - 2710**.

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.

$$\begin{array}{r} 9 \\ 10 \overline{)98} \\ \underline{90} \\ 8 \end{array}$$

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.

$$\begin{array}{r} 4 \\ 10 \overline{)44} \\ \underline{40} \\ 4 \end{array}$$

5. Subtract the remainder from the modulus.

The result becomes the check digit. In this case, the check digit is **6**.

$$10 - 4 = 6$$

This chapter describes how to

- ◆ download files to the printer
- ◆ define the batch header, batch control, and batch data files
- ◆ modify formats
- ◆ create DOS batch files.

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 packets (M)
2. Configuration packets (A-F)
3. Any of the following:
 - ◆ Check digit packets (see Chapter 5)
 - ◆ Format packets (see Chapter 4)
 - ◆ Graphic packets (Refer to the *MPCLII Graphics Manual*)
4. Batch data (see "Defining the Batch Header")

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 3 for more information. Make sure the settings 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.

Defining the Batch Header

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 contains three parts:

batch header	identifies the format and how many labels to print.
batch control	defines the print job.
batch data (optional)	defines the actual information printed on the label.

A batch header begins the file. It tells which format the batch uses and how many labels to print. To record batch data, make a copy of the worksheet in Appendix D, "Format Design Tools."

Syntax {B, format#, N/U, quantity }

B1. B Batch Header.

B2. format# Format number (**0-99**) to use.

B3. N/U Controls how image is generated.

N New. Erase image and re-image all fields using online data. Any missing fields will be blank.

U Update last image with 1 or more fields. All other fields remain the same as the last queued batch.

B4. quantity Quantity to print (**0-32000**).

NOTE: 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 |`

E1. E Batch Control Field.

E2. feed_mode Feed Mode. Options:

- 0** Continuous Feed (9494/9490/9446)
- 1** On-demand
- 2** Internal rewind (9446)

E3. batch_sep Batch Separator (striped label in between batches).
Options:

- 0** Does not print a separator
- 1** Prints a separator (9494/9490/9446)

E4. print_mult Number of tags with the same image.
1 to 999

E5. multi_part Number of identical parts on one tag.
1 to 5

E6. cut_type **0** is the only valid option.

E7. cut_mult **0** is the only valid option.

Example `E, 0, 1, 4, 2, 0, 0 |`

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 last two parameters are 0, because a knife is not available on these printers.

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" |

<i>field#</i>	Identifies the text, bar code, or non-printable text field in which to insert the following data. Range: 0 - 99 .
<i>"data string"</i>	Provides the actual information to appear in fields. Enclose in quotation marks. Range: 0 - 2710 .
<i>C</i>	Identifies information to be appended to the data string. (This parameter is optional.)
<i>"continuation"</i>	Provides the actual information to be added to the batch packet. Enclose in quotation marks. Use this option to break up longer fields. (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.

Using Special Characters in Batch Data

There are two ways to specify special characters in batch data:

- ◆ Place a tilde (~) before the character
- ◆ Use a tilde with the decimal ASCII equivalent

For example, you can use "" or ~034 to print the " character in your batch data. Use ~~ to print the ~ character in your batch data; otherwise, the tilde characters is ignored. You can also use ~XXX where XXX is the decimal equivalent or 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

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.

Downloading Methods

Depending on your application, you can download the format and batch data using one of three methods: sequential method, batch method, batch quantity zero method.

Sequential Method

Using the sequential method, you send all your 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 10 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,P
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.

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:  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:  ??

Indicates that this is the first ENQ response since the printer was turned on. Send another ENQ immediately to receive the printer's status.

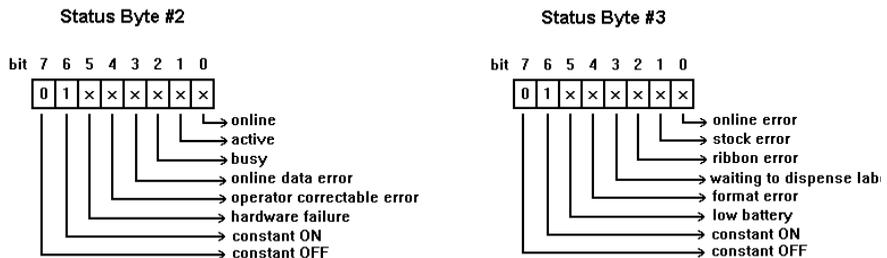
Example:  @@

Indicates the printer is offline.



On the 1460 printers (Version 3.0 and higher), status byte #3, bit 3 is "on" as soon as a label is printed and is placed on the Tamp Pad. The bit is "off" as soon as the Tamp Arm applies the label. This bit is "on" when the Tamp Arm returns to the home position and another label is placed onto the Tamp Pad. The bit is "off" if no label is placed onto the Tamp Pad.

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



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	0	1	0	0	0	1
c	0	1	1	1	0	0	0	1
d	0	1	0	0	1	0	0	1
e	0	1	1	0	1	0	0	1
f	0	1	0	1	1	0	0	1
g	0	1	1	1	1	0	0	1
h	0	1	0	0	0	1	0	1
i	0	1	1	0	0	1	0	1
j	0	1	0	1	0	1	0	1
k	0	1	1	1	0	1	0	1
l	0	1	0	0	1	1	0	1
m	0	1	1	0	0	1	0	1
n	0	1	0	1	1	1	0	1
o	0	1	1	1	1	1	0	1
p	0	1	0	0	0	0	1	1
q	0	1	1	0	0	0	1	1
r	0	1	0	1	0	0	1	1
s	0	1	1	1	0	0	1	1
t	0	1	0	0	1	0	1	1
u	0	1	1	0	1	0	1	1
v	0	1	0	1	1	0	1	1
w	0	1	1	1	1	0	1	1
x	0	1	0	0	0	1	1	1
y	0	1	1	0	0	1	1	1
z	0	1	0	1	0	1	1	1
{	0	1	1	1	0	1	1	1
|	0	1	0	0	1	1	1	1
}	0	1	1	0	1	1	1	1
~	0	1	0	1	1	1	1	1
Dec 127	0	1	1	1	1	1	1	1



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



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	0	1	0	1	1	0
m	0	1	1	1	1	0	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



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 3 4	Returns ASCII coded strings or numeric error codes Returns error number 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.

To clear an error, press the trigger (or  depending on your printer). 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, see error 8 for an explanation.

The following syntax is the response for a Job 3 request.

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 9, "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.



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" contains the packet type, field type, field number, parameter, and error number.

**Status2
A- 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**).

**Status2
B- 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.

Status2
C- 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.

Status2
E- Error Number is the error that coincides with the error numbers presented in Chapter 9, "Errors."

"FMT-1/BCH-2" The format or batch number is returned.



If more than one error occurred then only the most serious error will be acknowledged.

{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 the trigger (or  depending on your printer). 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 already
 printed in the batch.

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 have been printed 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.



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 ## extends off tag
9	Field ## has a bad font/bar code
10	Field ## contains invalid data
11	Field ## 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 (continued)

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 value
59	Invalid orientation value
60	Invalid thickness value
61	Invalid text field
62	Invalid bar code field
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	Can't use offline format for online batch
81	Can't queue graphic batch
82	Can't store online format
83	Can't queue online batch
84	Can't queue online clear command

Chapter 8.

Diagnostics

This chapter explains how to

- ◆ print a test label
- ◆ reset the printer
- ◆ call Technical Support.

Before you call Service, print a test label. The label contains information to help Service diagnose mechanical and setup problems.

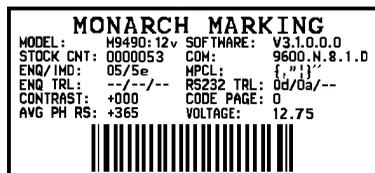
Printing a Test Label



Before printing a test label, disconnect your printer from the host.

Using the 9494 or 9490 printer

To print a test label, hold the trigger down and turn the printer on. The LED remains off for one second, turns amber for two seconds, and then turns off again. Release the trigger as soon as the amber LED turns off. The printer enters diagnostics mode. If the printer is in on demand mode, the LED rapidly blinks green. Press the trigger to dispense the test label. If the printer is in continuous mode, a test label prints automatically. The ENQ and RS232 characters are displayed in Hexadecimal. See Appendix C, "Symbol Sets/ Code Pages" for an ASCII to Hexadecimal Conversion Chart.

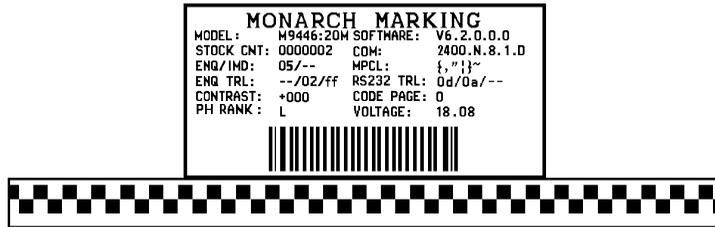




You can also use an immediate command to print a test label, see Chapter 3, "Configuring the Printer," for more information.

Using a 9446 or 1460 printer

Use your arrow keys to scroll through the main menu until you see Diagnostics. Press . Enter the password: . Press until you see Test Label. Press twice. The test label looks like this:



The ENQ and RS232 characters are displayed in Hexadecimal. See Appendix C, "Symbol Sets/ Code Pages" for an ASCII to Hexadecimal Conversion Chart.

The test labels display the following information:

- ◆ Model number
- ◆ Battery voltage selection (9490 only)
- ◆ Printer address in hex (9490 only)
- ◆ Board processing speed (9446 only)
- ◆ Software version (expanded version numbering to include customer ID and RPQ version and revision level)
- ◆ Stock count
- ◆ COM port settings
- ◆ ENQ/IMD Characters
- ◆ MPCL control characters

- ◆ ENQ trailer characters
- ◆ RS232 trailer characters (these are the trailers for all communications, except an ENQ.)



The ENQ/IMD, MPCL, and RS232 trailer characters can be user defined through the control characters packet. See "Defining the Control Characters Packet," in Chapter 3 for more information.

- ◆ Code page (symbol set)
- ◆ Print contrast
- ◆ Printhead information (printhead rank or resistance in ohms.)
- ◆ A Code 128 bar code filled with ASCII zeros for the 1460/9446/9494 printers or the printer's address for the 9490 printer.
- ◆ Test pattern

After you print a test label, the 9494 and 9490 printers are in "Data Dump" mode. If you do not want to perform a data dump, press the trigger two times to resume normal printing. See "Using Data Dump" for more information.

Using Data Dump

After printing a test label, the 9494 and 9490 printers are in "data dump mode."



To print a test label, you need to disconnect your cable from the host.

The printer's LED will flash, alternating amber and green. To download a data stream to the printer and print it on a label:

1. Press the trigger one time.
2. Reconnect your cable to the host.
3. Download the data stream you wish to "dump" (print out on a label).

4. The data stream prints out automatically when there is enough data to fill one label. Press the trigger to print any remaining data on another label.

```

, "06/11/94" | }0      10
  D      AD
1111" | o2, "G1111111" | 03, "Smith" | 04, "12345678" | 05
3, "CHECKER ID:      " | }0{B,1,N,1 | 01, "G111111
  D
200,100,0,1,2,1,B,L,0,3 | OC,330,20,0,1,1,1,B,L,0,
  D
0,100,0,1,1,1,B,L,0,3, "DATE RECEIVED:" | OT,5,8,V,
  D
"VIN #:" | OT,4,17,V,260,130,0,1,2,B,L,0,3 | OC,33
  D      D
,160,0,1,2,1,B,L,0,3 | OC,330,130,0,1,1,1,B,L,0,3,
  D
C,330,160,0,1,1,1,B,L,0,3, "OWNER:" | OT,3,15,F,260
  D
,3,3,2,B,L,0,3 | 08,2,9,V,330,220,4,11,080,8,L,3 | 0
  D      D
{F,1,A,R,E,400,400, "WINDSHIE" | OT,1,9,V,310,340,0
  D

```

The printer resets as it exits data dump mode. The LED displays the mode (continuous/amber or on demand/green) the printer was in before the data dump occurred. The printer is ready to accept formats and print labels.

Troubleshooting Information

If you experience problems using your printer, refer to this section.

If You Receive an Error Message

If an error message appears on the screen, see Chapter 9, "Errors," for more details. Any time you receive a message that is not described in this manual, or the recommended action doesn't solve the problem, call Technical Support. Some errors are the result of communication problems. In this case, reset your printer and reboot your computer. For more information, see "If the PC and Printer Aren't Communicating."

If you change ANY of the online configuration packets, resend the format packet to the printer, so the configuration changes take effect.

If the PC and Printer Aren't 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 Chapter 9, "Errors," for information about the specific error messages you may receive.
- ◆ 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 communication 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).
- ◆ Make sure the battery is fully charged, if your printer uses a battery.

If all of the above are correct, reset your printer. Try the function again. If you still can't establish communication, call Technical Support.

Resetting Printers

Sometimes, the printer receives mixed signals and loses its ability to communicate. If this happens, reset the printer and attempt communication again. Printers vary in reset procedures. Below are the procedures for resetting each of the supported printers.

Printers	Reset Actions
1460	Turn the printer off and back on.
9446	Turn the printer off and back on.
9490	Remove the battery and then re-attach it.
9494	Turn the printer off and back on.



When you turn off the printer, wait two seconds before turning it back on.

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. Try to recreate the problem, if you can.
4. Check your port settings. Your problem may be as simple as changing the communication settings.
5. List any changes that have recently been made to the system.
6. Reset your printer. For information on resetting your printer, see "Resetting Printers."
7. Reboot your computer. Refer to your computer documentation for specific instructions.
8. Print a test label. See "Printing a Test Label" earlier in this chapter for instructions on how to print a test label.

If these steps do not solve the problem, call Technical Support. Have the following information ready before you call: computer brand name and model, version of DOS, Monarch printer model, other peripheral devices on your system, support agreement, contract number, or invoice information.

Additional Diagnostics Information

For detailed printer diagnostics information, see your printer's documentation. See Chapter 7, "Status Polling," for information on requesting printer and job status. See Chapter 9, "Errors," for detailed information on error conditions and how to resolve them.

This chapter provides explanations of your printer's errors. The errors are classified by type and are listed in order from 001 to 765, followed by the unnumbered errors. Some errors numbered 400-438 and 500-574 are internal software errors.

If you have trouble loading supplies or performing maintenance, refer to your printer's documentation. If you have a problem you cannot solve, contact Technical Support.



To clear an error, press the trigger or press .

Data Errors

Errors 001 to 499 are Data Errors. These errors are returned in response to a **J,3** request. See Chapter 8, "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. Some of these errors display different elements (batch, format, graphic, etc.), depending on the type of data processed.

Error Code	Description
001	Field ID number must be 1 to 999 .
002	Name must be 1 to 8 characters inside quotes or a printer-assigned name ("").
003	Action must be A (add) or C (clear).

Error Code	Description
004	Supply length is invalid. See "Defining the Format Header" in Chapter 4 for valid lengths.
005	Supply width is invalid. See "Defining the Format Header" in Chapter 4 for valid widths.
006	Storage device is defined as something other than R .
007	Unit of measure must be E , M , or G . See "Defining the Format Header" in Chapter 4 for information about valid measurements.
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 4 for valid row lengths.
013	Column field position is greater than the maximum stock dimension. See "Defining Text Fields" in Chapter 4 for valid column widths.
014	Font style is defined as something other than: 1 , 2 , 3 , 4 , 10 , 11 , 50 , or a valid soft font selector. See "Defining Text Fields" in Chapter 4 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 4 for 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 4 for information.
017	Field restriction must be V (variable) or F (fixed).

Error Code	Description
018	Code page selection must be 0 (Internal), 1 (ANSI), 2 (DOS 437), or 3 (DOS 850).
020	Vertical magnification must be 1 to 7 or 4 to 90 (point size) for the scalable font.
021	Horizontal magnification must be 1 to 7 or 4 to 90 (point size) for the scalable font.
022	Color is defined as something other than A , B , D , E , F , N , O , R , S , T or W . See "Defining Text Fields" in Chapter 4 for more information about the valid color choices.
023	Intercharacter gap is outside the range 0 to 99 .
024	Field justification must be B (balanced), C (centered), E (end), L (left), or R (right). See "Defining Text Fields" in Chapter 4 for more information.
025	String length is outside the range 0 to 2710 .
030	Bar code height is defined as less than the minimum: English 20 Metric 51 Dots 38 or is not within the length and width dimensions of the supply.

Error Code	Description
031	Human readable option must be 0 not UPCA or EAN 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 See "Defining Bar Code Fields" in Chapter 4 for the bar code density chart.
032	Bar code type is invalid. See "Defining Bar Code Fields" in Chapter 4 for valid options.
033	Bar code density is invalid. See "Defining Bar Code Fields" in Chapter 4 for the bar code density chart.
040	Line thickness is outside the range 0 to 99 .
041	Line origin 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 4 for valid lengths.
046	Line type must be S (segment) or V (vector). See "Defining Line Fields" in Chapter 4 for valid line types.
051	Imaging mode in the graphic header must be 0 .
101	No format corresponding to format number in batch header.

Error Code	Description
102	Print quantity is outside the range 1 to 32000 .
104	Batch mode must be N (new) or U (update). See "Defining the Batch Header" in Chapter 6 for more information.
105	Batch separator 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	Reserved for knife usage. Only valid for printers with a knife.
200	Option number must be 1 , 4 , 30 , 31 , 42 , 43 , 50 , 51 , 52 , 60 , or 61 .
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 99 .
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 .

Error Code	Description
210	Security value for a PDF417 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 is not within the correct range for the row/column value: 1 to 30 for a column 3 to 90 for a row
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 code 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.
221	Primary or secondary price format is outside the range 1 to 15 .

Error Code	Description
222	Data type restriction is outside the range of 1 to 6 .
223	Option is not valid for the field.
224	Bar code Inter-Character Gap must be 1 to 99 in printer dots. (This is also known as the Additional Character Gap when using Option 50 , Defining Bar Code Densities.)
251	Online/offline power up mode must be 0 (online) or 1 (offline). (0 is the only valid option for the 9490 printer.) See "Defining the System Setup Packet" in Chapter 3 for more information.
252	Language selection must be 0 (English), 1 (French), 2 (German), or 3 (Spanish). (0 is the only valid option for the 9494 and 9490 printers.) See "Defining the System Setup Packet" in Chapter 3 for more information.
253	Batch separator code must be 0 (off) or 1 (on). (0 is the only valid option for the 1460 printer.) See "Defining the System Setup Packet" in Chapter 3 for more information.
254	Slash zero selection must be 0 (standard zero) or 1 (slash zero). See "Defining the System Setup Packet" in Chapter 3 for more information.
255	Supply type must be 0 (black mark), 1 (die cut), or 2 (non-indexed, only valid option for the 9494 printer). See "Defining the System Setup Packet" in Chapter 3 for more information.
256	Ribbon selection must be 0 (direct), 1 (transfer), or 2 (high energy, only valid option for the 9446 printer). See "Defining the System Setup Packet" in Chapter 3 for more information.

Error Code	Description
257	Feed mode must be 0 (continuous), 1 (on-demand), or 2 (rewind). (1 is the only valid option for the 1460 printer.) See "Defining the System Setup Packet" in Chapter 3 for more information.
258	Supply position is outside the range. See Chapter 5, "Configuring the Printer," for more information.
259	Contrast adjustment must be -390 to 156 .
260	Print adjustment must be -99 to 99 .
261	Margin adjustment must be -99 to 99 .
262	Speed adjustment is invalid. See "Defining the Print Control Packet" in Chapter 3 for more information.
263	Primary monetary symbol is invalid. See "Defining the Monetary Formatting Packet" in Chapter 3 for more information.
264	Secondary symbol selection must be 0 (none) or 1 (print secondary sign). See "Defining the Monetary Formatting Packet" in Chapter 3 for more information.
265	Monetary decimal places must be 0 to 3 . See "Defining the Monetary Formatting Packet" in Chapter 3 for more information.
266	Character string length in the control characters packet must be 5 (MPCL control characters) or 7 (ENQ/IMD command character). See "Defining the Control Characters Packet" in Chapter 3 for more information.

Error Code	Description
267	Baud rate selection must be 0 (1200), 1 (2400), 2 (4800), 3 (9600) or 4 (19200). 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.
271	Flow control selection must be 0 (none), 1 (DTR), 2 (CTS/RTS), or 3 (XON/XOFF). Resend the communication settings packet.
272	Internal code page selection must be 0 (Internal), 1 (ANSI), 2 (DOS 437), or 3 (DOS 850).
273	Cut adjustment must be -99 to 99 dots.
282	RS232 Trailer string is too long. Use a maximum of 3 characters. See "Defining the Control Characters Packet" in Chapter 3 for more information.
283	ENQ Trailer string is too long. Use a maximum of 3 characters. See "Defining the Control Characters Packet" in Chapter 3 for more information.
284	The buffer type must be T (transmit), R (receive), I (image), F (format, batch data, and graphics), D (downloadable fonts), V (vector/scalable fonts). See "Defining the Memory Configuration Packet" in Chapter 3 for more information.

Error Code	Description
285	The storage device type must be N (non-volatile RAM) or R (volatile RAM). See "Defining the Memory Configuration Packet" in Chapter 3 for more information.
286	The buffer size is invalid. See "Defining the Memory Configuration Packet" in Chapter 3 for more information.
287	The printhead width must be 230 to 768 dots.
288	Battery voltage must be 0 (15-volt battery) or 1 (12-volt battery).
289	The printer's address must be exactly six characters.
310	Check digit scheme number must be 1 to 10 only.
311	Modulus must be 2 to 11 only.
314	Check digit algorithm must be D (sum of digits) or P (sum of products).
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 .
328	Duplicate count must be 0 to 999 .
340	Bitmap line encoding must be H (hex) or R (run length).
350	Font number must be 1 to 9999 .
351	Font data length must be 68 to 16384 .
352	Insufficient font memory is available for the downloaded font.

Error Code	Description/Action
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.
405	Too many fields exist in the format. You cannot have more than 100 fields in the format. Lines, boxes, and constant text fields count as fields.
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.

Communication Failures

Errors 410 to 413 are usually caused by a hardware failure, by an incorrect SETUP option or by the host ignoring flow control (XON/OFF, CTS/RTS or DTR).



The valid communication settings are shown below.

Baud rate	1200, 2400, 4800, 9600, 19200
Word length	7 or 8
Stop bits	1 or 2
Parity	Odd, Even, None
Flow control	None, XON/XOFF, DTR, CTS
Reset	Yes or No

Error Code	Description/Action
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, communication 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 MS-Windows and MS-DOS, while using the COPY command, or you will receive a framing error. (Exit MS-Windows before using the COPY command.) Re-transmit the data.

Error Code	Description
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 queue is full. Check your printer's XON/XOFF or DTR SETUP values to be sure there isn't 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. See "Defining the Memory Configuration Packet" in Chapter 3 for valid options.
416	An error occurred during the flash writing process. Call Technical Support.
417	Flash memory is full. Call Technical Support.
418	An error occurred during the flash clearing process. Call Technical Support.
420	Internal software error relating to uploading. Call Technical Support.
421	Internal software error relating to location name. Call Technical Support.
422	Internal software error relating to duplicate name. Call Technical Support.
423	Internal software error. Call Technical Support.

Error Code	Description
424	Item in use. Record the error, then press the feed button and try to continue. If the error reappears, call Technical Support.
425	Item already checked out. Record the error, then press the feed button and try to continue. If the error reappears, call Technical Support.
426	Item not checked out. Record the error, then press the feed button and try to continue. If the error reappears, call Technical Support.
427	Format name is invalid. Valid name is 1 - 8 characters inside quotes or "" for a printer-assigned name. Press the feed button and try to continue. If the error reappears, call Technical Support.
428	Batch name is invalid or graphic not found. Press the feed button 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 file that cannot be found.
431	Internal software failure. The format name the task checked in does not match the name the task added.
432	Internal software failure. The graphic name the task checked in doesn't match the name the task added.
433	The batch references a field number that doesn't exist in the format.
434	Internal software error caused by a downloaded task that is not executable. Turn off the printer. Wait two seconds and turn it back on. If the error persists, call Technical Support.

Error Code	Description
435	Internal software error caused by a downloaded task that already exists. Turn off the printer. Wait two seconds and turn it back on. If the error persists, call Technical Support.
499	An error occurred during the loop back test on the serial port. Call Technical Support.

Data Formatting Failures

Formatting errors indicate that a field will print incorrectly. After you have checked the data stream and corrected the data, retransmit the batch.



For errors 571-614, the batch will still print, 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.

Error Code	Description
575	The graphic included in your format could not be found.
600	Imaging error because the batch was refused. Resend the batch. If the error persists, call Technical Support.
601	An error occurred while the batch was imaging. Resend the batch. If the error persists, call Technical Support.
602	The batch was not found during imaging. Resend the batch. 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.
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 .
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. Call Technical Support.
618	Magnification must be 1 to 7 or 4 to 90 (point size) for the scalable font. The range with the scalable font on the 9490 printer is 4 to 200 points.

619 The JIS (16-bit) code for Kanji is invalid.

Machine Faults

Errors 700 to 765 occur when there is a problem with the printer.

Error Code	Description
700	An error is pending and the printer cannot continue with the batch. Press the trigger or  and try to continue printing. If the error continues to appear, call Technical Support.
701	Printer received a command that it cannot execute while it is running. Press the trigger or  and try to continue printing. If the error reappears, call Technical Support.
702	SETUP setting is invalid. Check your printer's SETUP settings. Press the trigger or  and try to continue printing. If the error reappears, call Technical Support.
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. Check the <ul style="list-style-type: none"> ◆ supply tracking ◆ supply marks ◆ black mark sensor position ◆ supply roll for binding. Press the trigger or  . If the error continues to appear, change the supply.

Error Code	Description
705	Invalid batch received. Press the trigger or  to clear the error. Check the batch data. Resend the batch. If the error persists, call Technical Support.
750	Printhead is overheated. Turn the printer off to let the printhead cool. If the error persists, call Technical Support.
751	Printer did not sense a black mark when expected.



For errors 751-753, Check the

- ◆ supply tracking
- ◆ supply marks
- ◆ black mark sensor position
- ◆ supply roll for binding.

Press the trigger or  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. The printer is either out of ribbon or the ribbon is jammed.
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.

Error Code	Description
757	<p>Load Supplies. The calibrated supply length differs by plus or minus .25 inches from the format. Press  to display the format name.</p> <p>Press  to print on the current supply or load new supply and press .</p>
758	<p>Check Supply. Either the on demand sensor is broken, the supply is not seen, or you have a continuous unit set to on demand mode. Adjust the on demand sensor so it is over a white area on the supply, or set the unit to continuous mode. This message may also appear on printer models that do not have the rewind capability.</p>
759	<p>Knife is not moving. Call Technical Support.</p>
760	<p>Knife jam. Call Technical Support.</p>
761	<p>Stacker is full. Empty the stacker before continuing.</p>
762	<p>Low battery. Recharge the battery.</p>
763	<p>Waiting to dispense label. Press the trigger or . If the error persists, call Technical Support.</p>
764	<p>Verifier failed. Check the verifier by referring to your verifier's manual. Call Technical Support.</p>
765	<p>The printhead has less than 4 bad dots. The printer can shift bar code fields to avoid bad dots. Press  to continue printing.</p>
768	<p>Printhead has more than 10 bad dots or is not connected. Make sure the printhead is connected. You may need a new printhead. Call Technical Support.</p>

Error Code	Description
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.
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.

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.

900	RAM test failure.
901	ROM/EPROM checksum failure.
902	Software timer failure.
903	Software interrupt failure.

Error Code	Description
905	Illegal interrupt.
906	Non-maskable interrupt.
907	Low RAM error.
908	Non Volatile RAM checksum failure.
909	RAM corrupted.
910	Warm restart.
911	Version string mismatch.
931	An error occurred writing to flash memory. Repeat the flashing procedure.
932	An error occurred writing to RAM. A problem occurred when the resident loader loaded the transient loader into RAM. Repeat the flashing procedure.
933	Communication parity error. The parity values set do not match. Correct the problem and flash the printer again.
934	Communication framing error. Verify the cable connection and that you are using the correct communication settings.
935	Communication overrun error. One of the buffers is full and cannot handle more data. Repeat the flashing procedure.
936	Invalid record type. A communications error occurred during the flashing procedure. Verify the cable connection and the communications parameters being used and repeat the flashing procedure.

Error Code	Description
937	Invalid ASCII hex data in record. The file you downloaded is invalid. Verify the file's integrity and reflash the printer.
938	Invalid checksum. The checksum for the message's data was incorrect. Verify the cable connection and the communication settings and repeat the flashing procedure.
939	Invalid record count. A communications error occurred during the flashing procedure. Verify the cable connection and the communication settings and repeat the flashing procedure.
940	Flash address is illegal. The file contains an illegal address for the data type. Validate the file and repeat the flashing procedure.

Hard Printer Failures

When a HARD failure occurs, 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. Refer to your printer's documentation to reset the printer's SETUP options. Transmit your packets again.



These error messages will only appear on the printers with an LCD display (9446 and 1460).

Printer Display	Description
WARNING RAM Test Failure	RAM check failed on power up. All formats, batches, graphics, and SETUP data are lost. Reset your SETUP options. Transmit your packets again.
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. All formats, batches, graphics, and SETUP data are lost. Reset your SETUP options. Transmit your packets again.
POWER DOWN Illegal Intr#	Illegal interrupt occurred.
POWER DOWN NMI Received	Non-maskable interrupt occurred. All formats, batches, graphics, and SETUP data are lost. Reset your SETUP options. Transmit your packets again.
POWER DOWN Low Appl RAM	Not enough RAM for application. All formats, batches, graphics, and SETUP data are lost. Reset your SETUP options. Transmit your packets again.

**Printer
Display**

Description

POWER DOWN
NVRAM Sum Fail

RAM checksum test failed. All formats, batches, graphics, and SETUP data are lost. Reset your SETUP options. Transmit your packets again.

POWER DOWN
RAM Corrupt

Item storage RAM failed. All formats, batches, graphics, and SETUP data are lost. Reset your SETUP options. Transmit your packets again.

Chapter 10.

Printer Optimization

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.

These printers use "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 "Option 61 (Reimage Field)" in Chapter 5.

Adjusting the Print Quality

Many factors affect print quality: type of supplies, print speed, print contrast, and the type of printer's application. These printers support 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 Monarch 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.

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.



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.

- ◆ When designing formats, keep in mind the non-print zones. See "Determining the Print Area" in Chapter 2 for more information.

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.

General Format Tips and Hints

The following tips and hints are helpful to keep in mind when designing MPCLII formats.

With Formats

- ◆ If you want to modify your format fields, check digit fields, and configuration commands, use the 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.

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.



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.
- ◆ 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.
- ◆ 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.

Advanced Use of the Optional Entry Method

You can optimize format packets by using the optional entry method. With this method, you use commas for parameters that do not change from their previous setting.

Two sample formats are shown: the first is a standard format, the second shows the optional entry method used on the standard format.



Using this method on format packets can be confusing, so be sure you thoroughly understand the parameters of each field first. The fields do not need to be in numerical order, but that helps in troubleshooting your format.

To use the optional entry method on a format packet:

1. Create the format.
2. Group the fields with the same parameters.
3. Send the format packet to the printer.

Standard Format

```
{F,1,A,R,E,600,400,"ACGI" |
L,V,500,115,90,85,3,"" |
L,V,400,2,0,390,3,""|
L,V,298,2,0,390,3,"" |
C,568,8,0,2,2,2,B,L,0,0,"FROM:"|
C,568,125,0,2,2,2,B,L,0,0,"CARRIER:"|
C,387,8,0,2,1,1,B,L,0,0,"(420) SHIP TO POSTAL CODE"|
C,190,8,0,2,1,1,B,L,0,0,"UPC SHIPPING CONTAINER CODE"|
T,1,15,V,529,220,0,2,2,2,B,L,0,0|
T,2,15,V,511,220,0,2,2,2,B,L,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|
T,8,20,V,549,124,0,2,2,2,B,L,0,0|
T,15,15,V,366,65,0,2,2,2,B,L,0,0|
R,1,"(420)" | }
```

Optimized Format

```
{F,1,A,R,E,600,400,"ACGI" |
L,V,500,115,90,85,3 |
L,,400,2,0,390|
L,,298 |
C,568,125,0,2,2,2,B,L,0,0,"CARRIER:"|
C,,8,,,,,,,,,"FROM:"|
C,387,,,,,1,1,,,,,"(420) SHIP TO POSTAL CODE"|
C,190,,,,,,,,,"UPC SHIPPING CONTAINER CODE"|
T,1,15,V,529,220,0,2,2,2,B,L,0,0|
T,2,,,,,511,220|
T,15,,,,,366,65|
  R,1,"(420)" |
T,8,20,,549,124|
T,5,30,,161,080,,3,1,1| }
B,3,13,V,311,28,8,4,50,8,L,0|
B,4,14,,17,60,50,5,130|
```


Appendix A.

Samples

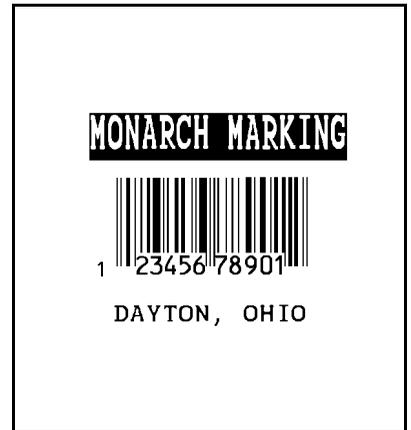
This appendix contains sample formats and labels. You can customize any of these formats and labels to meet your needs.

Sample UPCA Format Packet

```
{  
F,25,A,R,M,508,508,"Fmt 25" ¦  
C,250,80,0,1,2,1,W,C,0,0,"MONARCH MARKING" ¦  
B,1,12,F,110,115,1,2,120,5,L,0 ¦  
T,2,18,V,30,30,1,1,1,1,B,C,0,0 ¦  
}
```

Sample Batch Packet

```
{  
B,25,N,1 ¦  
1,"12345678901" ¦  
2,"DAYTON, OHIO" ¦  
}
```



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 printers support Modes 0, 2, and 3:

Mode	Description	Printer
0	Obsolete	9446 printer version 5.5 or greater (high speed 9446 printer version 6.2 or greater), 9490 printer version 3.1 or greater, and 9494 printer version 2.2 or greater
2	Structured Message	9490 printer version 3.1 or greater
3	Structured Message	9490 printer version 3.1 or greater



MaxiCode automatically pads data with the "!" character. MaxiCode does not support the NULL character.

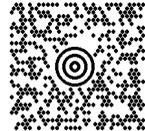
Modes 2 and 3 are defined by the way the postal code, class of service, and country code fields are arranged. (The postal code, class of service, and country code are required fields.) Begin with the message header, then the primary data (15 characters), followed by the secondary message (up to 78 characters). 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,0600,0400,"MAXICODE" |
B,1,99,V,050,150,33,7,0,8,L,0 | }
{B,1,N,1 |
1,"450660000" |
C,"001" |
C,"840" |
C,"[]~030" |
C,"01~02996" |
C,"1Z12345678~029" |
C,"UPSN~029" |
C,"12345A~029" |
C,"070~029" |
C,"~029" |
C,"1/1~029" |
C,"15~029" |
C,"Y~029" |
C,"60 SADDLEBROOK CT.~029" |
C,"DAYTON~029" |
C,"OH~030" |
C,"~004" | }
```

MaxiCode bar code (33)
Batch header
Postal code- zip code
(This field determines Mode)
Country code
Class of service
Message header
Transportation header
Tracking number
Origin carrier SCAC
UPS shipper number
Julian day of pickup
Shipment ID
Package count
Weight (lb.)
Address validation
Street address
City
State
EOT



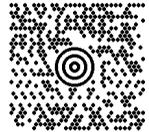
Mode 2 Sample

```
{F,1,A,R,E,400,400,"MAXI_M2" |
B,1,99,V,040,140,33,7,0,8,L,0 | }
{B,1,N,1 |
1,"[]>~030" |
C,"01~02996" |
C,"068100000~029" |

C,"840~029" |
C,"001~029" |
C,"1Z12345675~029" |
C,"UPSN~029" |
C,"12345E~029" |
C,"089~029" |
C,"~029" |
C,"1/1~029" |
C,"10~029" |
C,"Y~029" |
C,"~029" |
C,"~029" |
C,"CT~030" |
C,"~004" | }
```

MaxiCode bar-code (33)

Message header
Transportation header
Postal Code
(This field determines Mode)
Country code
Class of service
Tracking number
Origin carrier SCAC
UPS shipper number
Julian day of pickup
Shipment ID
Package count
Weight (lb.)
Address validation
Street address
City
State
EOT



Mode 3 Sample

```

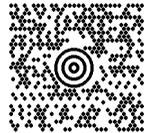
{F,1,A,R,E,400,400,"MAXI_M3" |
B,1,99,V,040,140,33,7,0,8,L,0 | }
{B,1,N,1 |
1,"[]>~030" |
C,"01~02996" |
C,"M5E1G45~029" |

C,"124~029" |
C,"066~029" |
C,"1Z12345679~029" |
C,"UPSN~029" |
C,"12345E~029" |
C,"089~029" |
C,"~029" |
C,"1/1~029" |
C,"10~029" |
C,"Y~029" |
C,"~029" |
C,"TORONTO~029" |
C,"ON~030" |
C,"~004" | }

```

MaxiCode bar-code (33)

Message header
Transportation header
Postal Code
(This field determines Mode)
Country code
Class of service
Tracking number
Origin carrier SCAC
UPS shipper number
Julian day of pickup
Shipment ID
Package count
Weight (lb.)
Address validation
Street address
City
State
EOT



Sample Compliance Packet

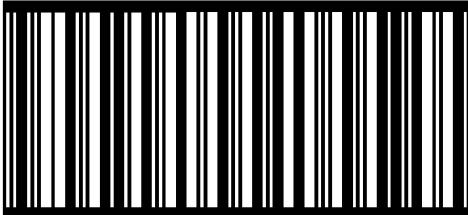
```

{
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) " |
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,"~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,"08292 123456-123" |  
13,"AR" |  
14,"999-999999-99" |  
15,"32678" |  
16,"WYSIWYG" |  
17,"99999" |  
18,"TO A PRODUCT DEMO" |  
}
```

FROM: MONARCH 170 MONARCH LANE P.O. BOX 608 DAYTON, OHIO 45401	CARRIER: BROADWAY PRO NUMBER: 1234567890 B/L NUMBER: 0987654321
TO: RODGER DIST CTR #8292 555 WEST OAK AVE. DAYTON, OH 45401-0608	
<420> SHIP TO POSTAL CODE <420>32678 	APPOINTMENT NUMBER: 08292 123456-123 ORDER TYPE: AR ITEM: 999-999999-99
WYSIWYG WELCOMES GUEST #99999 TO A PRODUCT DEMO	
UPC SHIPPING CONTAINER CODE 1 00 28028 66285 4 	

Sample Zero Batch Packet

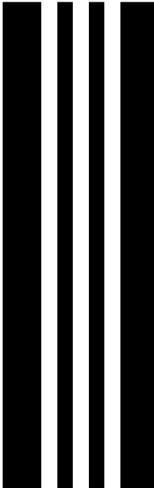
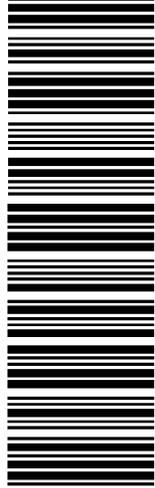
```

{I,E,"~123~044~039~124~125~126" | }
{F,5,A,R,G,576,768,"1HDREC1" | }
L,S,19,39,499,39,38,"11111111" | }
L,S,19,93,499,93,15,"11111111" | }
L,S,19,124,499,124,15,"11111111" | }
L,S,19,155,499,155,38,"11111111" | }
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 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" |  
}  
  
{I,E,"~123~044~034~124~125~126" | }
```

	PO NUMBER	: 6005710	 *106503378*
	STORE	: 106	
	CTNS SHOPPED	: 3	
	CTNS RECVD	: 3	
	CARRIER	:	
		ALLIED FREIGHT1234	
	FRT BILL #	:	
		123456789012	
	FRT TERMS	: P	
	KEYREC#	: 10650337	
	FRT CLAIM #	: 0	
	RECVD BY	: VIC	
DATE RECVD	: 1/6/94		

Sample Fixed Character Format Packet

```

{
F,1,A,R,E,300,200,"TEXTILES" |
T,1,10,V,250,50,0,1,1,1,B,C,0,0,0 |
B,2,12,V,150,40,1,2,80,7,L,0 |
D,3,3 |
D,4,20 |
T,5,25,V,80,10,0,1,1,1,B,L,0,0,0 |
R,1,"   %           " |
R,4,3,1,3,1,1 |
R,4,4,1,20,6,1 |
D,6,3 |
D,7,20 |
T,8,25,V,65,10,0,1,1,1,B,L,0,0,0 |
R,1,"   %           " |
R,4,6,1,3,1,1 |
R,4,7,1,20,6,1 |
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," " |
}

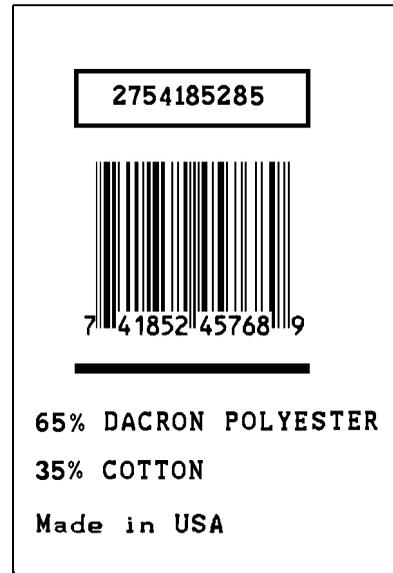
```

Sample Batch Packet

```

{
B,1,N,1 |
1,"2754185285" |
2,"74185245768" |
3,"65" |
4,"DACRON POLYESTER" |
6,"35" |
7,"COTTON" |
}

```



Appendix B.

Fonts

This appendix contains information you need to work with fonts.

Standard Fonts

The 9490 printer comes with these fonts loaded in ROM:

Number	Font Size and Appearance	Type of Spacing
1	Standard	Monospaced
2	Reduced	Monospaced
3	Bold	Monospaced
4	OCRA-like	Monospaced
10	CG Triumvirate Bold (9 pt.)	Proportional
11	CG Triumvirate (6 pt.)	Proportional
50	CG Triumvirate (4-200 pt.)	Scalable



- ◆ The scalable font (Font #50) must be *purchased separately* for the 9446 and 1460 printers. The point size range is **4-90 pt.**
- ◆ The CG Triumvirate fonts support only the ANSI and DOS Code Pages symbol sets. The CG Triumvirate fonts print a slashed zero when using the ANSI symbol set. However, the scalable font does not print a slashed zero.

Refer to the following pages for illustrations of these fonts.

Standard Font

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789:;<=>?
!"#\$%&'()*+,-./
[\]^_`{|}~Cüéääåä
çèéëìíîïËËäöóô
ùÿÖÜÇRfáíóúñÑ°º;
--¼½;«»Øøαβ@TM__
\$£¥RPFPL.KRGRBWB¥

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789:;<=>?
!"#\$%&'()*+,-./
[\]^_`{|}~Cüéääåä
çèéëìíîïËËäöóô
ùÿÖÜÇRfáíóúñÑ°º;
--¼½;«»Øøαβ@TM__
\$£¥RPFPL.KRGRBWB¥

Reduced Font

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklmnop
nopqrstuvwxy
0123456789:;<=>?
!"#\$%&'()*+,-./
[\]^_`{|}~Cüéääåä
çèéëìíîïËËäöóô
ùÿÖÜÇRfáíóúñÑ°º;
--¼½;«»Øøαβ_
\$£¥RPFPL.KRGRBWB¥

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
abcdefghijklmnop
nopqrstuvwxy
0123456789:;<=>?
!"#\$%&'()*+,-./
[\]^_`{|}~Cüéääåä
çèéëìíîïËËäöóô
ùÿÖÜÇRfáíóúñÑ°º;
--¼½;«»Øøαβ_
\$£¥RPFPL.KRGRBWB¥

Bold Font

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
0123456789@½
!"#\$%&'()*+,-
[\]^_`{|}~. / : ; < = > ?
\$£¥RPFPL.KRGRBWB¥

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
0123456789@½
!"#\$%&'()*+,-
[\]^_`{|}~. / : ; < = > ?
\$£¥RPFPL.KRGRBWB¥

OCRA-like Font

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
0123456789@
"/+,-./<>RFB¥
\$£¥RPFPL.KRGRBWB¥

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
0123456789@
"/+,-./<>RFB¥
\$£¥RPFPL.KRGRBWB¥

Monospaced Font Magnification

Decide how wide and tall you want the characters to appear on the labels. The following two tables show the width and height of each of the monospaced fonts after magnification.

Width Mag.		Standard	Reduced	Bold
	Units	Character Width Sample	Character Width Sample	Character Width Sample
1x	1/100 in.	8.85	4.17	14.06
	1/10 mm	22.49	10.58	33.72
	Dots	17 A	8 A	27 A
2x	1/100 in.	16.15	7.81	26.56
	1/10 mm	41.01	19.84	67.47
	Dots	31 A	15 A	51 A
3x	1/100 in.	23.44	11.46	39.06
	1/10 mm	59.53	29.10	99.22
	Dots	45 A	22 A	75 A
4x	1/100 in.	30.73	15.10	55.56
	1/10 mm	78.05	38.36	130.97
	Dots	59 A	29 A	99 A
5x	1/100 in.	38.02	18.75	64.06
	1/10 mm	96.57	47.63	162.72
	Dots	73 A	36 A	123 A
6x	1/100 in.	45.31	22.40	76.56
	1/10 mm	115.09	56.89	194.47
	Dots	87 A	43 A	147 A
7x	1/100 in.	52.60	26.04	89.06
	1/10 mm	133.61	66.15	226.22
	Dots	101 A	50 A	171 A

Only the 1x width can be scanned with the OCRA-like font. Character widths are as follows: 8.33 (English), 21.17 (Metric), and 16 (Dots).

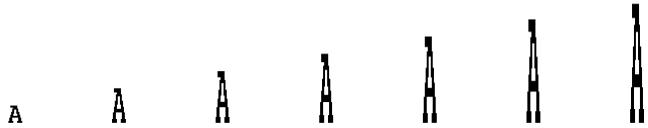


This table uses default character spacing.

Font Magnification

1x	2x	3x	4x	5x	6x	7x
----	----	----	----	----	----	----

Standard



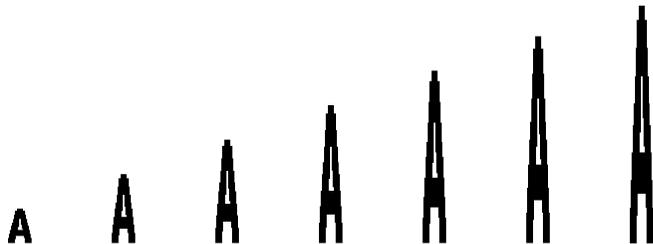
1/100 in.	11.4	22.8	34.2	45.6	57.0	68.4	79.8
1/10 mm	29.1	58.2	87.3	116.4	145.5	174.6	203.7
dots	22	44	66	88	110	132	154

Reduced



1/100 in.	7.3	14.6	21.9	29.2	36.5	43.8	51.1
1/10 mm	18.5	37.0	55.5	74.0	92.5	110.0	129.5
dots	14	28	42	56	70	84	98

Bold



1/100 in.	17.7	35.4	53.1	70.8	88.5	106.2	124
1/10 mm	44.9	89.8	134.7	179.6	224.5	269.4	314
dots	34	68	102	136	170	204	238

OCRA-like (1x only)

1/100 in.	12.5
1/10 mm	31.7
dots	24

A

Proportional Font Magnification

Each character in a proportionally spaced font is a different height and width. Therefore, field height and width vary depending on the characters used. For optimal field placement, you may want to experiment by printing your label and then adjusting field measurements in your format as needed. The following tables provide height and width magnification of sample characters.

CG Triumvirate Bold (9 pt.)

	Width Mag.	Minimum	Average	Maximum
1x	1/100 in.	1.56	6.77	11.46
	1/10 mm	3.97	17.2	29.10
	Dots	3 i	13 L	22 W
2x	1/100 in.	3.13	13.54	22.92
	1/10 mm	7.94	34.4	58.21
	Dots	6 i	26 L	44 W
3x	1/100 in.	4.69	20.31	34.38
	1/10 mm	11.91	51.59	87.31
	Dots	9 i	39 L	66 W
4x	1/100 in.	6.25	27.08	45.83
	1/10 mm	15.88	68.79	116.42
	Dots	12 i	52 L	88 W
5x	1/100 in.	7.81	33.85	57.30
	1/10 mm	19.84	85.99	145.52
	Dots	15 i	65 L	110 W
6x	1/100 in.	9.38	40.63	68.75
	1/10 mm	23.81	103.19	174.63
	Dots	18 i	78 L	132 W
7x	1/100 in.	10.94	47.40	80.21
	1/10 mm	27.78	120.39	203.73
	Dots	21 i	91 L	154 W

CG Triumvirate (6 pt.)

Width Mag.		Minimum	Average	Maximum
1x	1/100 in.	1.04	3.13	6.25
	1/10 mm	2.65	7.94	15.88
	Dots	2 i	6 L	12 W
2x	1/100 in.	2.08	6.25	12.50
	1/10 mm	5.29	15.88	31.75
	Dots	4 i	12 L	24 W
3x	1/100 in.	3.13	9.38	18.75
	1/10 mm	7.94	23.81	47.63
	Dots	6 i	18 L	36 W
4x	1/100 in.	4.17	12.5	25.00
	1/10 mm	10.58	31.75	63.50
	Dots	8 i	24 L	48 W
5x	1/100 in.	5.21	15.63	31.25
	1/10 mm	13.23	39.69	79.38
	Dots	10 i	30 L	60 W
6x	1/100 in.	6.25	18.75	37.50
	1/10 mm	15.88	47.63	95.25
	Dots	12 i	36 L	72 W
7x	1/100 in.	7.29	21.88	43.75
	1/10 mm	18.52	55.56	111.13
	Dots	14 i	42 L	84 W

Font Magnification

1x	2x	3x	4x	5x	6x	7x
----	----	----	----	----	----	----

CG Triumvirate Bold (9 pt.)

	w	a						
1/100 in.	9.38	18.75	30.21	37.50	46.88	62.50	71.88	
1/10 mm	23.81	47.63	76.73	95.25	119.06	158.75	182.56	
dots	18	36	58	72	90	120	138	

CG Triumvirate (6 pt.)

	w	h						
1/100 in.	6.25	12.50	18.75	25.00	31.25	37.50	43.75	
1/10 mm	15.88	31.75	47.63	63.50	79.38	95.25	111.13	
dots	12	24	36	48	60	72	84	

Scalable Font Information

The scalable font (CG Triumvirate Bold) is smooth at any point size or magnification. There are no jagged edges as in the standard printer bitmapped fonts. CG Triumvirate Bold is a proportionally spaced font. Therefore, the field height and 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 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 minimum point size is 4 and the maximum point size is 90. The maximum point size for the scalable font using the 9490 printer is 200 point. If height and width magnification 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.



- ◆ 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 scalable font does not print a slashed zero.
- ◆ The scalable font must be *purchased separately* for the 9446 and 1460 printers.
- ◆ The scalable font is standard on the 9490 printer.
- ◆ The transparent overlay allows closer field placement when using scalable or optional ROM fonts.

The 72 point CG Triumvirate Bold sample shows the one inch cell size.

6pt
10pt

24pt

48pt

72pt

Sample
Sample

Sample

Sample

Sample

1"

Additional Fonts

Optional and downloadable fonts are available for these printers. For more information, contact your Sales Representative.

Using Font Numbers in Formats

Use the following font numbers in your format when designating new fonts. If you use a font number that is not a standard font for your printer, make sure the font has been installed in the printer.

1 - 49	Resident fonts (bitmapped only)
50 - 99	Resident fonts (scalable only)
100 - 499	Customer-generated RAM fonts (bitmapped)
500 - 999	Monarch's optional ROM fonts (bitmapped and scalable)
1000 - 8999	Monarch's optional RAM fonts (bitmapped)
9000 - 9999	Monarch's optional RAM fonts (scalable only)

Locating the Font Number in a Font Packet

If you are creating font packets, the font number is the second parameter in the packet.

Example {W, 200, A, N, 68 | **Font Number**
font data |
font data | }

Example T, 1, 10, V, 30, 10, 0, 200, 1, 1, B, L, 0, 0, 0 | **Font Number**
C, 50, 30, 0, 200, 1, 1, B, L, 0, 0, "MONARCH", 0 | **Font Number**

Defines a text and constant text field using the downloaded (#200) font. See Chapter 4, "Defining Fields," for more information.

Appendix C. Symbol Sets/Code Pages

This appendix contains a listing of the symbol sets and code pages the printer supports. The extended characters available within these symbol sets and code pages are also listed.

Supported Symbol Sets and Code Pages _____

The printers support these symbol sets and code pages:

- ◆ Internal Symbol Set
- ◆ ANSI Symbol Set
- ◆ Bold Character Set
- ◆ OCRA Character Set
- ◆ DOS Code Page 437
- ◆ DOS Code Page 850

Selecting a Symbol Set or Code Page

These printers default to the Internal symbol set. You can select a different symbol set. See "Defining the System Setup Packet" in Chapter 3 for more information.

Selecting the Internal Symbol Set

Use this symbol set when you want to: use the international monetary symbols, create formats that may be used on other MPCLII- based printers, print the trademark symbol (Standard font only).

Selecting the ANSI Symbol Set

Use this symbol set when you want to use proportionally spaced fonts.

Selecting the 437 or 850 Code Page

These code pages provide extended and international characters and use proportionally spaced fonts. The CG Triumvirate fonts and the scalable font (Font #50) support only the ANSI and DOS Code Page symbol sets. These fonts print a slashed zero when using the ANSI symbol set. The scalable font does not print a slashed zero.

Entering Extended Characters

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 Å in a text field using the Internal Symbol Set, type:

1, "~142" |

Internal Symbol Set

Code	Char.	Code	Char.	Code	Char.
128	Ç	151	ù	174	«
129	ü	152	ÿ	175	»
130	é	153	Ö	176	<i>n</i>
131	â	154	Ü	177	\$
132	ä	155	ø	178	£
133	à	156	£	179	¥
134	å	157	¥	180	Ⓜ
135	ç	158	℞	181	F
136	ê	159	f	182	P
137	ë	160	á	183	L.
138	è	161	í	184	K _r
139	ï	162	ó	185	℞
140	î	163	ú	186	Ⓢ
141	ì	164	ñ	187	R _s
142	Ä	165	Ñ	188	Ⓟ
143	Å	166	ª	189	Ⓦ
144	É	167	º	190	Ⓝ
145	æ	168	¿	191	¥
146	Æ	169	┌	199	—
147	ô	170	└	210	∅
148	ö	171	½	214	ø
149	ò	172	¼	224	α
150	û	173	ı	225	β
				255	™

ANSI Symbol Set

To determine the character code, add the column number and row number for the character. For example, to produce the ÿ character, you would press **Alt 255** (column 15 + row 240).

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
16	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
32		!	"	#	\$	%	&	'	()	*	+	,	-	.	/
48	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
64	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
80	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
96	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
112	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	⌘
128	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
144	■	'	'	■	■	■	■	■	■	■	■	■	■	■	■	■
160		ı	ç	£	¤	¥	¦	§	¨	©	ª	«	¬	®	¯	°
176	°	±	²	³	´	µ	¶	·	,	'	º	»	¼	½	¾	¿
192	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
208	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
224	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
240	ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ

■ designates non-printing characters.



Bold Character Set

These are the printable characters using the Bold font.

Code	Char.	Code	Char.	Code	Char.
33	!	60	<	87	W
34	"	61	=	88	X
35	#	62	>	89	Y
36	\$	63	?	90	Z
37	%	64	@	91	[
38	&	65	A	92	\
39	'	66	B	93]
40	(	67	C	94	^
41	)	68	D	95	_
42	*	69	E	112	p
43	+	70	F	155	¢
44	,	71	G	171	1/2
45	-	72	H	177	\$
46	.	73	I	178	£
47	/	74	J	179	¥
48	0	75	K	180	DM
49	1	76	L	181	F
50	2	77	M	182	P
51	3	78	N	183	L.
52	4	79	O	184	Kr
53	5	80	P	185	₡
54	6	81	Q	186	₧
55	7	82	R	187	Rs
56	8	83	S	188	₪
57	9	84	T	189	₹
58	:	85	U	190	₴
59	;	86	V	191	₵
				199	-

OCRA Character Set

These are the printable characters using the OCRA font.

Code	Char.	Code	Char.	Code	Char.
34	"	67	C	90	Z
36	\$	68	D	91	[
37	%	69	E	92	\
43	+	70	F	93]
44	¬	71	G	94	^
45	-	72	H	95	_
46	.	73	I	112	p
47	/	74	J	155	¢
48	0	75	K	177	\$
49	1	76	L	178	£
50	2	77	M	179	¥
51	3	78	N	180	DM
52	4	79	O	181	F
53	5	80	P	182	P
54	6	81	Q	183	L.
55	7	82	R	184	Kr
56	8	83	S	185	₹
57	9	84	T	186	₹
60	<	85	U	187	Rs
62	>	86	V	188	₹
64	@	87	W	189	₹
65	A	88	X	190	₹
66	B	89	Y	191	₹

Code Page 850

0		32		64	Ⓔ	96	`	128	Ç	160	á	192	Ł	224	Ó
1	Ⓔ	33	!	65	À	97	a	129	ü	161	í	193	ł	225	ß
2	Ⓕ	34	"	66	B	98	b	130	é	162	ó	194	Ť	226	Ô
3	♥	35	#	67	C	99	c	131	â	163	ú	195	†	227	Ò
4	♦	36	§	68	D	100	d	132	ä	164	ñ	196	—	228	õ
5	♣	37	‰	69	E	101	e	133	à	165	Ñ	197	†	229	Õ
6	♠	38	&	70	F	102	f	134	ã	166	±	198	—	230	µ
7	•	39	'	71	G	103	g	135	ç	167	º	199	—	231	þ
8	◼	40	(	72	H	104	h	136	ê	168	¿	200	—	232	ƒ
9	◇	41	)	73	I	105	i	137	ë	169	Ⓞ	201	—	233	ú
10	◼	42	*	74	J	106	j	138	è	170	¬	202	—	234	Û
11	♂	43	+	75	K	107	k	139	ÿ	171	½	203	—	235	Ü
12	♀	44	,	76	L	108	l	140	î	172	¾	204	—	236	Ý
13	♯	45	_	77	M	109	m	141	ì	173	¡	205	—	237	Ÿ
14	♪	46	.	78	N	110	n	142	ñ	174	«	206	—	238	˘
15	*	47	/	79	O	111	o	143	Å	175	»	207	⊗	239	˙
16	▶	48	0	80	P	112	p	144	É	176	⋮	208	δ	240	-
17	◀	49	1	81	Q	113	q	145	æ	177	⋮	209	Ⓓ	241	±
18	‡	50	2	82	R	114	r	146	ŕ	178	⋮	210	Ê	242	=
19	!!	51	3	83	S	115	s	147	ô	179	|	211	Ë	243	¾
20	¶	52	4	84	T	116	t	148	ö	180	†	212	È	244	¶
21	§	53	5	85	U	117	u	149	ò	181	Á	213	Ì	245	§
22	—	54	6	86	V	118	v	150	û	182	À	214	Í	246	÷
23	±	55	7	87	W	119	w	151	ù	183	À	215	Î	247	˘
24	↑	56	8	88	X	120	x	152	ÿ	184	Ⓞ	216	Ï	248	°
25	↓	57	9	89	Y	121	y	153	ÿ	185	¶	217	J	249	˙
26	→	58	:	90	Z	122	z	154	Û	186	¶	218	Γ	250	˙
27	←	59	;	91	[	123	{	155	ø	187	¶	219	■	251	ı
28	└	60	<	92	\	124	|	156	£	188	—	220	■	252	ƒ
29	┐	61	=	93	]	125	}	157	Ⓓ	189	Ç	221	ı	253	z
30	▲	62	>	94	^	126	~	158	×	190	¥	222	Ï	254	■
31	▼	63	?	95	_	127	△	159	f	191	Γ	223	■	255	

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
ENQ	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	cursor right	1C	28
home	0B	11	cursor left	1D	29
form feed	0C	12	cursor up	1E	30
carriage return	0D	13	cursor down	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

Appendix D. Format Design Tools

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 (Inches, Metric, Dots)
- ◆ Format Worksheet
- ◆ Format Sample Worksheet

Online Configuration Worksheet

COMMUNICATION SETUP

T	HEADER
	BAUD
	WORD LENGTH
	STOP BITS
	PARITY
	FLOW CONTROL

MONETARY FORMATTING

D	HEADER
	DOLLAR
	SECONDARY
	DECIMALS

ONLINE HEADER

-	HEADER
----------	--------

SYSTEM SETUP

A	HEADER
	ONLINE MODE
	LANGUAGE
	SEPARATOR
	SLASH ZERO
	SYMBOL SET

SUPPLY SETUP

W	HEADER
	SUPPLY TYPE
	RIBBON ON
	FEED MODE
	SUPPLY POSN
O	CUT POSN

PRINT CONTROL

C	HEADER
	CONTRAST
	PRINT ADJUST
	MARGIN ADJUST
	SPEED ADJUST
	SUPPLY WIDTH

CONTROL CHARACTERS

!	HEADER
	START OF HEADER
	PARAMETER SEPARATOR
	CHAR. STRING
	FIELD SEPARATOR
	END OF TRANSMISSION
	DATA ESCAPE
	IMMED. COMMAND
	STATUS REQUEST
	JOB REQUEST

BUFFER ALLOCATION

S	HEADER
	BUFFER
	DEVICE
	BUFFER SIZE

Check Digit Worksheet

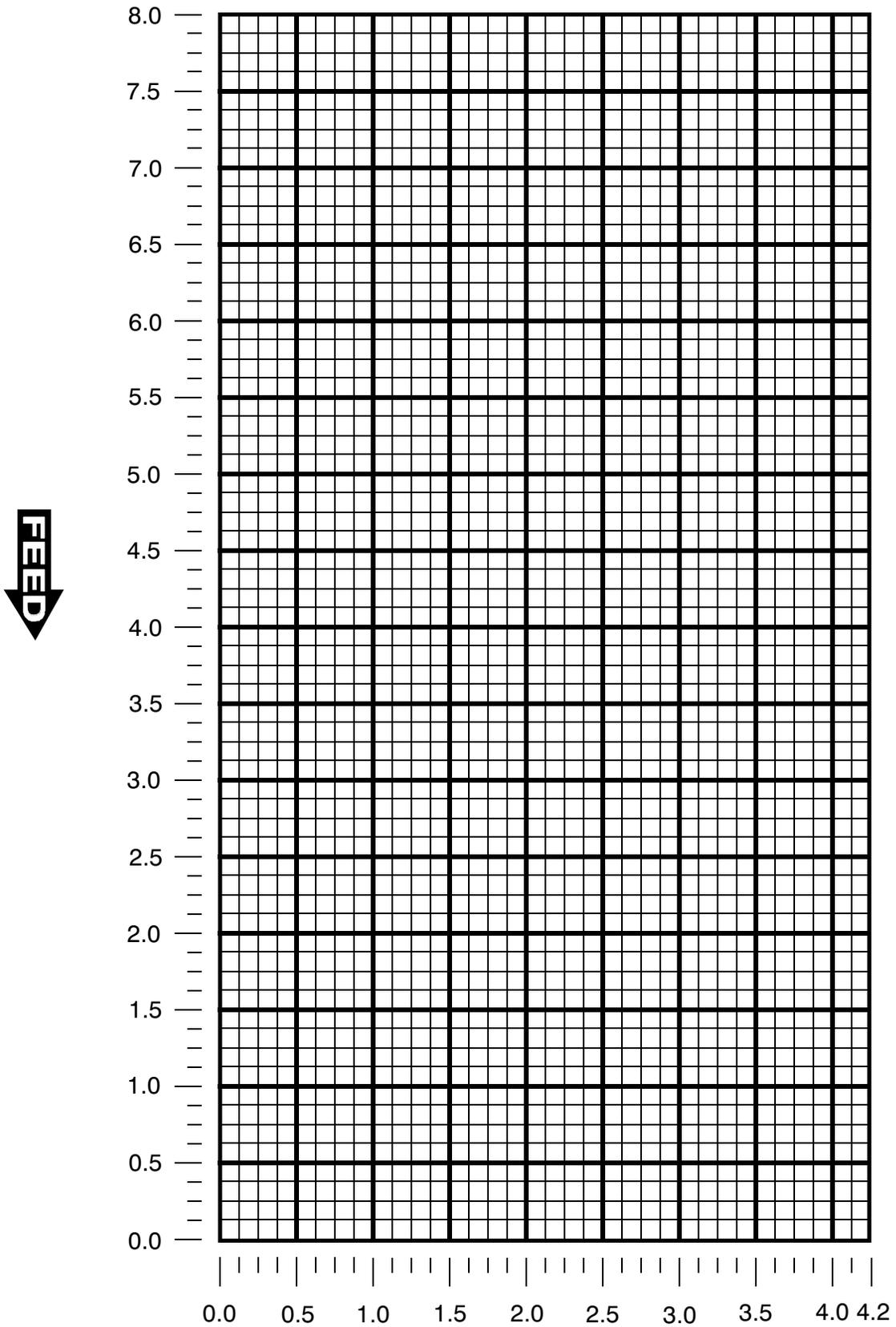
A1 HEADER	A2 SELECTOR #	A3 ACTION	A4 DEVICE	A5 MODULUS	A6 LENGTH	A7 ALGORITHM	WEIGHTS A8
A			R				

A1 HEADER	A2 SELECTOR #	A3 ACTION	A4 DEVICE	A5 MODULUS	A6 LENGTH	A7 ALGORITHM	WEIGHTS A8
A			R				

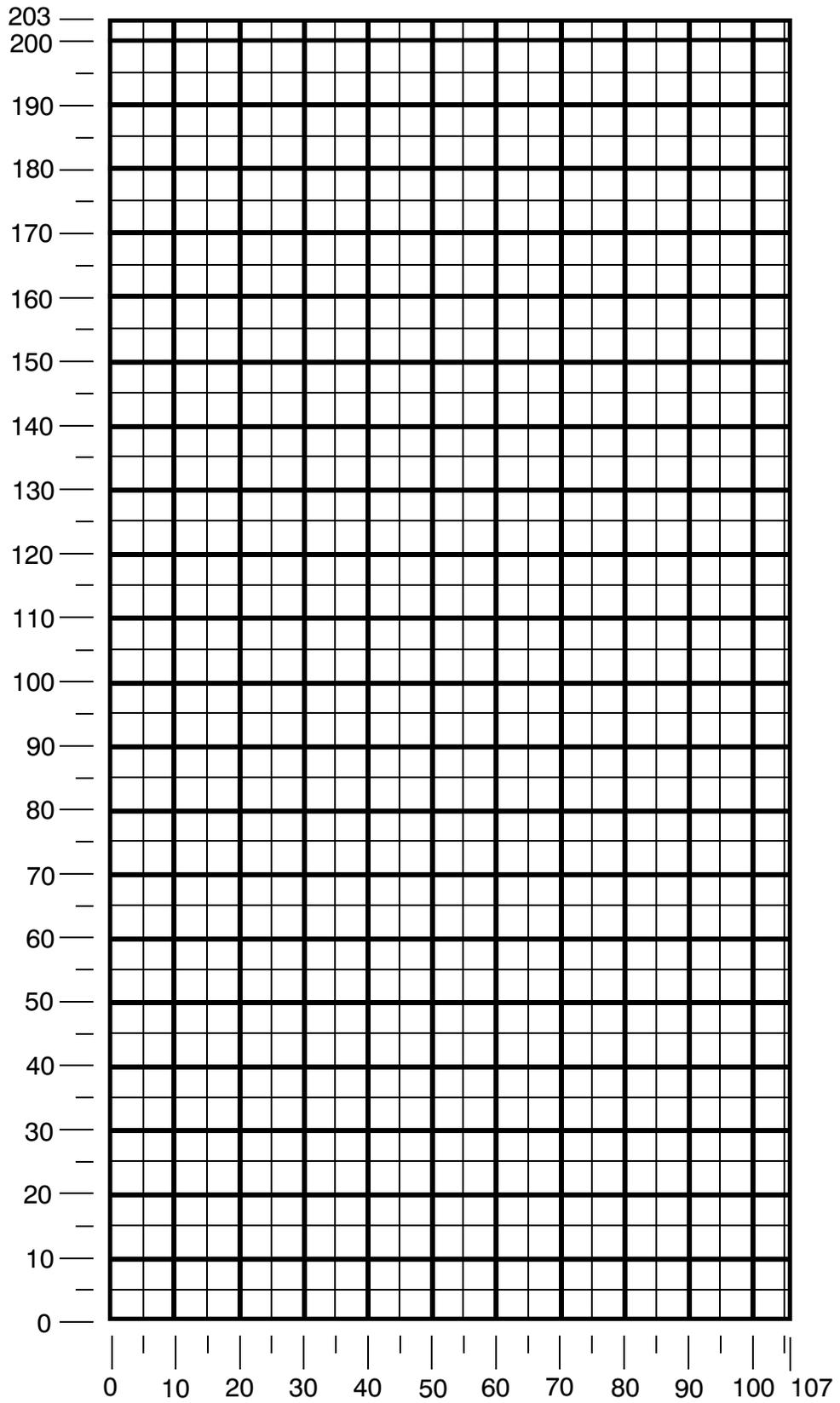
A1 HEADER	A2 SELECTOR #	A3 ACTION	A4 DEVICE	A5 MODULUS	A6 LENGTH	A7 ALGORITHM	WEIGHTS A8
A			R				

A1 HEADER	A2 SELECTOR #	A3 ACTION	A4 DEVICE	A5 MODULUS	A6 LENGTH	A7 ALGORITHM	WEIGHTS A8
A			R				

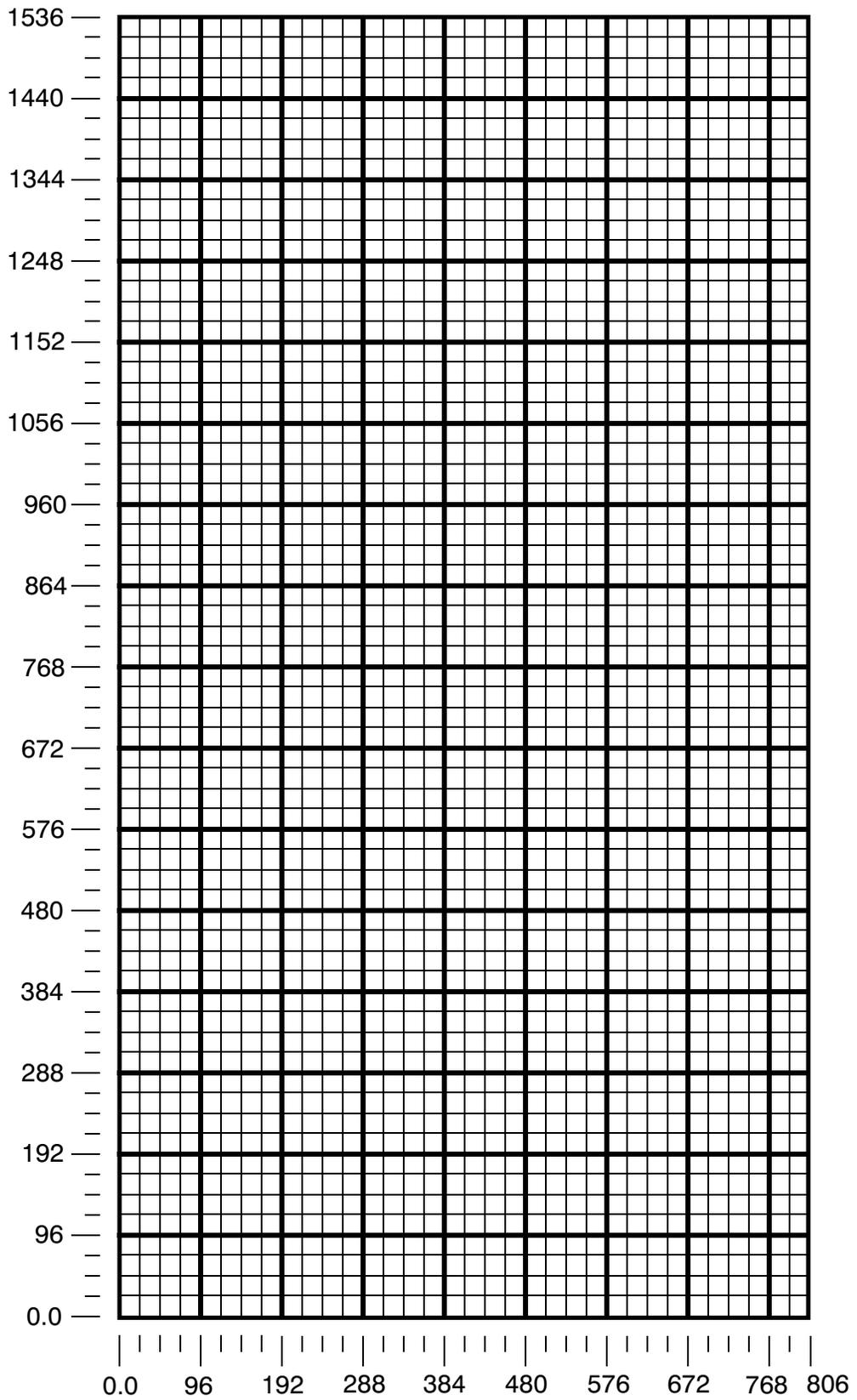
Supply Layout (Inches)



Supply Layout (Metric)



Supply Layout (Dots)



CONSTANT TEXT FIELDS

L1 HEADER	L2 TYPE	L3 ROW	L4 COLUMN	L5 ANGLE/END ROW	L6 LENGTH/END COL	L7 THICKNESS	L8 PATTERN
F	S	110	030	110	150	10	" "

C1 HEADER	C2 ROW	C3 COLUMN	C4 GAP	C5 FONT	C6 HGT. MAG.	C7 WID. MAG.	C8 COLOR	C9 ALIGNMENT	C10 CHAR. ROT.	C11 FIELD ROT.	C12 FIXED CHAR. ("IN QUOTES")	C13 SYM. SET
C	030	010	01	11	0	20					"MADE IN USA"	0

BAR CODE FIELDS

B1 HEADER	B2 FIELD #	B3 # OF CHAR.	B4 FIX/VAR	B5 ROW	B6 COLUMN	B7 FONT	B8 DENSITY	B9 HEIGHT	B10 TEXT	B11 ALIGNMENT	B12 FIELD ROT.	R1 HEADER	R2 CODE #	R3 FIXED CHAR. ("IN QUOTES")	R1 HEADER	R2 CODE #	R3 SRC FIELD	R4 SRC START	R5 # TO COPY	R6 DEST. START	R7 COPY CODE	R1 HEADER	R2 CODE #	R3 L/R	R4 CHARACTER	R1 HEADER	R2 CODE #	R3 GEN/VER	R4 CHECK DIGIT #	R1 HEADER	R2 CODE #	R3 DOT WIDTH NAR. ELEMENT	R4 DOT WIDTH WIDE ELEMENT	R5 ADDITIONAL CHAR. GAP	R6 ADDITIONAL NAR. SPACE	R7 ADDITIONAL WIDE SPACE	R1 HEADER	R2 CODE #	R3 SECURITY LEVEL	R4 STANDARD /DEFAULT	R1 HEADER	R2 CODE #	R3 ROW /COLUMN	R4 DIMENSION NUMBER	R1 HEADER	R2 CODE #	R3 I/D	R4 AMOUNT	R5 L POS	R6 R POS	R1 HEADER	R2 CODE #	R3 INPUT (✓)
B	3	12	Y	150	040	12	80	7	2	0		R	1		R	4						R	30		R	4		R	31		R	50						R	51			R	52			R	60			R	61		
B												R	1		R	4						R	30		R	4		R	31		R	50						R	51			R	52			R	60			R	61		
B												R	1		R	4						R	30		R	4		R	31		R	50						R	51			R	52			R	60			R	61		
B												R	1		R	4						R	30		R	4		R	31		R	50						R	51			R	52			R	60			R	61		

FORMAT HEADER

F1 HEADER	F2 FORMAT #	F3 ACTION	F4 DEVICE	F5 MEASURE	F6 LENGTH	F7 WIDTH	F8 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	R1 HEADER	R2 CODE #	R3 FIXED CHAR. ("IN QUOTES")	R1 HEADER	R2 CODE #	R3 SRC FIELD	R4 SRC START	R5 # TO COPY	R6 DEST. START	R7 COPY CODE	R1 HEADER	R2 CODE #	R3 L/R	R4 CHARACTER	R1 HEADER	R2 CODE #	R3 APP CODE	R1 HEADER	R2 CODE #	R3 INPUT (✓)		
T	2	10	Y	250	050	0	1	1	1	0	2	0	0	0	R	1	"	R	4	3	1	3	1	1	R	30		R	42		R	42		R	61	
T	5	25	Y	080	010	0	1	1	1	8	2	0	0	0	R	1	-----	R	4	4	1	20	6	1	R	30		R	42		R	42		R	61	
T															R	1		R	4						R	30		R	42		R	42		R	61	
T															R	1		R	4						R	30		R	42		R	42		R	61	
T															R	1		R	4						R	30		R	42		R	42		R	61	
T															R	1		R	4						R	30		R	42		R	42		R	61	
T															R	1		R	4						R	30		R	42		R	42		R	61	
T															R	1		R	4						R	30		R	42		R	42		R	61	
T															R	1		R	4						R	30		R	42		R	42		R	61	
T															R	1		R	4						R	30		R	42		R	42		R	61	
T															R	1		R	4						R	30		R	42		R	42		R	61	
T															R	1		R	4						R	30		R	42		R	42		R	61	

NON-PRINTABLE TEXT FIELDS

D1 HEADER	D2 FIELD #	D3 # OF CHAR.	R1 HEADER	R2 CODE #	R3 FIXED CHAR. ("IN QUOTES")	R1 HEADER	R2 CODE #	R3 SRC FIELD	R4 SRC START	R5 # TO COPY	R6 DEST. START	R7 COPY CODE
D	4	3	R	1		R	4					
D			R	1		R	4					
D			R	1		R	4					
D			R	1		R	4					

BOXES

Q1 HEADER	Q2 ROW	Q3 COLUMN	Q4 END ROW	Q5 END COLUMN	Q6 THICKNESS	Q7 PATTERN
Q	240	030	270	150	3	" "

GRAPHICS FIELDS

G1 HEADER	G2 GRAPH ID	G3 ROW	G4 COLUMN	G5 MODE	G6 ROTATION
G	5	010	200	0	0

(SAMPLE) FORMAT WORKSHEET

Format Name TEXTILES
 Format # 1
 Date 11/08/94
 Supply Size 4" x 3"
 Supply Type THERMAL DIRECT
 Customer Name ACE INDUSTRIES
 Software Version V2.0

Appendix E. Addressing a 9490 Printer

This appendix describes how to print supplies from a 9490 printer used with the Monarch® 9476™ Mobile Printing Station. The Station allows multiple printers to share a common communication cable.

To use an individual printer on the Station, you must

- ◆ Define a unique address for each printer.
- ◆ Select a printer.
- ◆ Send format and batch packets to the selected printer.

Addressing the Printer

These steps describe how to address printers that share a common communication cable.

Step 1. Define the Printer Address

You can define or change a printer address by sending the communication settings packet. Make sure you assign a unique address to each printer.



- ◆ Turn off all the printers except the one you want to address.
- ◆ Do not assign 000000 as a printer address.

Syntax

```
{I, F, baud, word_length, stop_bits, parity,  
flow_control, pr_address }
```

See "Defining the Communication Settings Packet" in Chapter 3 for more information.

F7. pr_address Printer's address. Can be any six-byte string in the 0 to 255 decimal range enclosed by quotes. We recommend setting the printer's address to the printable alphanumeric ASCII values (0-9; A-Z; a-z). This avoids any conflict with the control characters (ENQ, parameter separators, etc.) and is easily interpreted.

Example {I,F,3,1,0,0,1,"ABC123" | }

Uses a baud rate of 9600, an 8-bit word length, one stop bit, no parity, the DTR mode, and sets one printer's address to ABC123.

If the only parameter you need to change is the printer's address, make sure the printer is selected and ready to receive data. Then, send this packet:

Example {I,F,,,,,"ABC123" | }

Keeps your previously defined communication settings and sets one printer's address to ABC123.

Turn on the next printer you want to address and set the address by sending the communication settings packet. Repeat the addressing procedure for any remaining printers. After a printer has been addressed, immediate commands are enabled and the caret (^) is the defined immediate command character. If you need to change the immediate command character, see "Defining the Control Characters Packet" in Chapter 3 for more information.

Addresses remain in the printer after you turn off the printer. You can readdress any printer at any time by sending the communication settings packet. If a printer has been selected by the immediate command, it remains active until a different printer is selected or you turn the printer off. Only one printer may be active at a time. The defined printer address is displayed on the test label above the bar code. See "Printing a Test Label" in Chapter 8 for more information.

Step 2. Select a Printer

Select a specific printer by sending this immediate command: **^ADxxxxxx**, where **^** is the defined immediate command character, and **xxxxxx** is the printer's address in ASCII. See "Using Immediate Commands," in Chapter 3 for more information. To read the hexadecimal address found on the test label, convert it to the ASCII equivalent.

After you send this immediate command, the selected printer remains active until a different printer is selected or you turn the printer off. You must send this immediate command *before* the printer can process status polling, job request, format, batch, or any other MPCLII packets.

Example ^ADABC123

Selects the ABC123 printer. The ABC123 printer is ready to receive status polling/job requests, or any MPCLII packets.

Step 3. Select the Battery Voltage

Selecting the battery voltage is required only for the 9490 printers used with the Station, because a 12-volt battery powers all the printers on the Station. Print a test label to verify which voltage is selected. The battery voltage selection is printed after the model number on the test label. See "Printing a Test Label" in Chapter 8 for more information. You can change the battery voltage by sending the print control packet.

Selecting the proper voltage detects low-battery conditions, so you know when to recharge the battery. If you remove the 9490 printer from the Station, select the 15-volt battery.

Syntax {I,C,contrast,print_adjust,margin_adjust,speed_adjust, supply_width,bat_voltage }

See "Defining the Print Control Packet" in Chapter 3 for more information.

C7. *bat_voltage* Selects the battery voltage. Options:
0 15-volt battery
1 12-volt battery



The printer's LED does not flash after receiving this packet. To check if the battery voltage changed, print a test label. The selected printer remains active until a different printer is selected or you turn the printer off.

Example {I,C,0,0,0,0,768,1 | }

Uses the default print contrast, does not adjust the print or margin positions, prints at 2 inches per second, sets the supply width to 4 inches, and specifies a 12-volt battery.

If the only parameter you need to change is the battery voltage, make sure the printer is selected and ready to receive data. Then, send this packet:

Example {I,C,,,,,1 | }

Keeps your previously defined print control settings and specifies a 12-volt battery.

Using Non-Addressed Mode

In non-addressed mode, the printer uses a single communication cable and does not need to be addressed or selected before sending format and batch packets. To use a printer in non-addressed mode, you must clear the printer's address. Make sure the printer is selected and ready to receive data. Clear the printer's address by sending this packet:

Example {I,F,,,,, " " | }

Keeps your previously defined communication settings and clears the printer's address. The address becomes 000000.

Your printer is ready to operate in non-addressed mode. You can send format, batch, or any other MPCLII packets to the printer.

Returning to Addressed Mode

To change the printer from non-addressed mode to addressed mode:

1. Define the printer's address by sending the communication settings packet. After a printer has been addressed, immediate commands are automatically enabled with the caret (^) as the immediate command character.
2. Select the printer by sending the immediate command, **^ADxxxxxx**.
3. Send format and batch packets to the printer.

Switching Between Addressed Printers

Depending on the supply loaded in each 9490 printer, you may need to alternate printing between several printers.

The following example shows how to select one printer, send a format, select a different printer, send a format, and then switch to the first printer. Remember to print a test label to determine each printer's address.

<i>Example</i>	^AD111AAA Copy TEST.fmt com1	Selects the 111AAA printer. Sends TEST.fmt to the 111AAA printer.
	^AD222BBB Copy LABEL.fmt com1	Selects the 222BBB printer. Sends LABEL.fmt to the 222BBB printer.
	^AD111AAA Copy SAMPLE.fmt com1	Selects the 111AAA printer. Sends SAMPLE.fmt to the 111AAA printer.

You can change either printer's address to 333CCC by sending:

```
{I,F,,,,,"333CCC" |}
```

Make sure the printer you want to readdress is selected.

Troubleshooting

If you have a problem with the printer that you cannot correct, call Service. See your printer's documentation for more troubleshooting information.

Problem	Action
Printer indicates a low battery when fully charged.	Make sure the battery voltage is set to the correct level. Change the voltage from 15 volts to 12 volts.
Printer in addressed mode does not accept packets.	Make sure the printer you are trying to use has been selected by an immediate command containing that printer's address.
Printer in non-addressed mode does not accept packets.	Make sure you have cleared the printer's address by sending this packet: {I,F,,,,,"" ;}
The Station printer does not print.	There are three possible problems: The Station's battery is low. One of the printers is set to an incorrect voltage. One of the printers has a full data buffer. Turn the printers off to clear the buffers. If the printers still do not print, check each printer's voltage selection. If the voltage selection is correct (12 volts), charge the Station's battery.

Glossary

Batch Data 2,"Monarch" |	Defines the actual information (as fields within { }) printed on the label.
Batch Control E,0,1,4,2 |	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. Enclosed within { }.
Bitmapped Fonts	Reside in the printer's RAM or in a ROM chip. If you change the point size, you have changed the font. Magnifying these fonts causes some 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.
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.)
Format	Layout or design for your printed label.

Format Header First line of a format, immediately following the start of packet (f). A format header must begin with **F**.

```
{F,1,A,R,E,600,400,"Fmt-1" }
```

Monospaced Fonts Characters have the same width and are easy to center justify. (Standard, Bold, and Reduced fonts.)

Non-volatile RAM (NVRAM) Contains information that is **SAVED** on power-down.

Option Any line within a format that applies special formatting to a field. This line always begins with **R** and must immediately follow the field it applies to.
R,4,6,1,3,1 |

Packet Any string of characters within (f).
{**B,1,N,1** |
2,"Monarch" | }

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 Characters have different widths and are difficult to center justify.

Scalable Fonts Reside in the printer's RAM or in a ROM chip. Changing the point size and magnification prints a smooth font. There is no jaggedness at any point size, because the font is created from an equation every time it is used.

Soft (Downloaded) Fonts Reside in the printer's RAM. They can be erased or overwritten.

Volatile RAM Contains information that is **LOST** on power-down.

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