PROGRAMMER'S ADDENDUM

This addendum describes the software changes available in

- version 6.0 of the Monarch® 9855® and 9860™ printers.
- version 3.0 of the Monarch® 9825® printer.

This addendum contains information about

- defining a GS1 DataBar™ (RSS) bar code symbology.
- defining the RFID Setup Packet.
- using the Unicode UTF-8 symbol set.
- viewing the printer's serial number.

Note: Information in this document supercedes information in previous versions. Check our Web site (**www.monarch.com**) for the latest documentation and release information.

Audience

This addendum is for the System Administrator, who designs and prints Monarch® Printer Control Language II (MPCLII) formats.

Defining a GS1 DataBar™ (RSS) Symbology

The GS1 DataBar is a family of linear symbologies. Depending on the bar code data entered, the bar code may appear as a 2D bar code stacked on top of the linear bar code. For more information about the GS1 DataBar bar code, refer to the *GS1 General Specification*.

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

B1. *B*   Bar Code Field.

B2. *field#*   Unique number from **1-999** to identify this field.

B3. *# of char* Maximum number of characters. The actual maximum number of characters is limited by the size of the label and bar code density. Range: **0-2710**. The default is 30.

B13. Bar Code Type	B3. Number of Characters (Max.)
1 - GS1 DataBar 14	13 - no check digit input
2 - GS1 DataBar 14 Truncated	13 - no check digit input
3 - GS1 DataBar 14 Stacked	13 - no check digit input
4 - GS1 DataBar 14 Stacked Omni directional	13 - no check digit input
5 - GS1 DataBar Limited	13 - no check digit input
6 - GS1 DataBar Expanded	*
7 - UPCA	11 - no check digit input
8 - UPCE	10 - no check digit input
9 - EAN13	12 - no check digit input
10 - EAN8	7 - no check digit input
11 - UCC/EAN128 and CC A/B	*
12 - UCC/EAN128 and CC C	*

*   For more information, refer to the *GS1 General Specification*.

Note: If not enough characters are entered, the bar code pads to the left with zeros. If too many characters are entered, unpredictable results may occur.

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

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.

To easily identify the pivot points (marked with a circle), a linear bar code is shown:

Left-Justified Fields

Printer	Unit of Measure	Row or End Row	Column or End Column
9855/ 9860	English (1/100 inch) Metric (1/10 mm) 203 dpi Dots	0-1599 0-4061 0-3246	0-399 0-1013 0-810
9855/ 9860	English (1/100 inch) Metric (1/10 mm) 300 dpi Dots	0-1199 0-3045 0-3597	0-399 0-1013 0-1197

B6. *column*   Distance from the lower left edge of the print area to the pivot point. Use the previous table for values.
Allow a minimum of 1/10 inch between the scan edge of bar code and label edges or other data.

B7. *font*   Bar code type. Use **38**.

3

B8. *density*   Bar code density. The range is 2-8. The default is **2**.
Select the density from the following table.

Bar Code Type	Density Selector	203 dpi Narrow Element Size (dots/mils)	300 dpi Narrow Element Size (dots/mils)	Data Length	Char Set
GS1 DataBar	**2**	2/9.9	3/9.8	0-2710	00H to FFH
	3	3/14.8	4/13.1		
	4	4/19.7	5/16.4		
	5	5/24.6	7/23		
	6	6/29.6	8/26.2		
	7	7/34.5	10/32.8		
	8	8/39.4	11/36.1		

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

English 19
Metric 48
203 Dots 38
300 Dots 57

Note: Only for use with UCC/EAN family *types* listed below.

B10. *text*   Appearance of text with bar code. Options:
  0   Default
  8   No text, bar code only

B11. *alignment*   Alignment of bar code data in the field. Use **L** (left).

B12. *field rot*   Field rotation. Field rotation rotates the whole field. Rotation is affected by the pivot point, which varies depending on how text is justified. The lower left corner of the field is the pivot point. The default is 0. 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

B13. *type*	Select from the bar code family. Options:	

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

B14. *sep_height*	Height of the separator between the linear bar code and 2D bar code. The value is **1** or **2**. The default is 1.
B15. *segment*	Width of the segment – only for use with GS1 DataBar family types listed above. The range is even numbers from **2** to **22**. The default is 22.

Example `B,1,30,V,5,5,38,4,0,0,L,0,1,2,22¦`

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

```
{F,1,A,R,E,400,400,""¦
B,1,30,V,5,5,38,4,0,0,L,0,1,2,22¦}
{B,1,N,1¦
1,"123456|Monarch Brand Printers"¦}
```

```
{F,1,A,R,E,400,400,""¦
B,1,30,V,5,5,38,4,35,0,L,0,11,2,22¦}
{B,1,N,1¦
1,"10ABC|Monarch"¦}
```

This GS1 DataBar uses UCC/EAN128 and CC A/B as the bar code type and specifies the linear bar code height at 0.35 inches.

Defining the RFID Setup Packet for UHF (9855 only)

Use the RFID setup packet (X) to set the protocol, write attempts, read power, write power, and signal adjust.

Note: Refer to the *RFID Setup Guide and Supply Chart* for the read and write power settings and signal adjustment based on your RFID supplies.
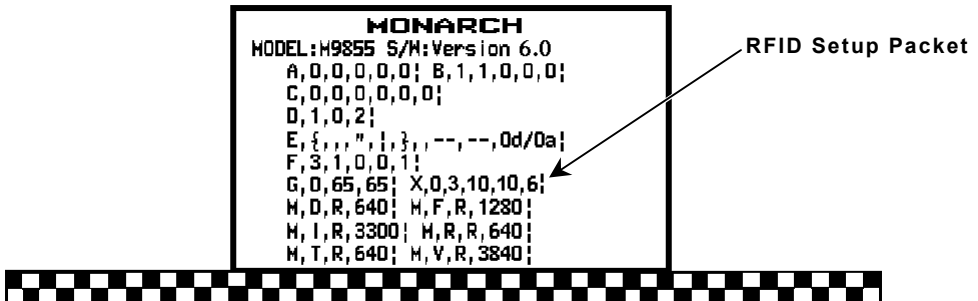
Syntax `{I,X,protocol,write_attem,read_power,`
`write_power,signal_adjust|}`

X1.	X	RFID Setup Packet
X2.	*protocol*	Select the UHF protocol. The default is **0**. Options:

0	C1Gen2 (Class 1 Gen 2)
1	C1Gen1 96 (Class 1 Gen 1 96-bit)
2	C1Gen1 EPC64/96 (Class 1 Gen 1 EPC64/96)
3	EM4122

X3.	*write_attem*	The number of times the interrogator tries to program the RFID tag in the RF Field. The range is **1 – 5**. The default is **3**.
X4.	*read_power*	The amount of power to read an RFID tag. The range is **1 – 25**. For the Japanese frequency, the range is **1 – 10**. The default is **18**.
X5.	*write_power*	The amount of power to write (program) an RFID tag. The range is **1 – 25**. For the Japanese frequency, the range is **1 – 10**. The default is **18**.
X6.	*signal_adjust*	The strength of the RF Field emitted by the printer's antenna. The higher the value, the greater the power of the RF Field. The signal adjustment varies depending on the selected protocol. The range is **2 – 10**. The default is **2**.

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

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

The test label has been updated to show the settings for the RFID Setup Packet.


```
              MONARCH
MODEL:H9855 S/N:Version 6.0
   A,0,0,0,0,0¦ B,1,1,0,0,0¦
   C,0,0,0,0,0,0¦
   D,1,0,2¦
   E,{,,,",¦,},,--,--,0d/0a¦
   F,3,1,0,0,1¦
   G,0,65,65¦ X,0,3,10,10,6¦
   H,D,R,640¦ H,F,R,1280¦
   H,I,R,3300¦ H,R,R,640¦
   H,T,R,640¦ H,V,R,3840¦
```
RFID Setup Packet

Defining the RFID Setup Packet for HF (9855 only)

Use the RFID setup packet (X) to set the protocol, write attempts and attenuation.

Note: Refer to the *HF Setup Guide and Supply Chart* for the protocol and attenuation settings based on your RFID supplies.

Syntax   `{I,X,protocol,write_attem,attenuation¦}`

X1. X		RFID Setup Packet
X2. *protocol*		Select the HF protocol. The default is **0**. Options:
	0	AUTO-Select
	1	TI ISO15693
	2	NXP ISO15693
	3	I-CODE UID
X3. *write_attem*		The number of times the interrogator tries to program the RFID tag in the RF Field. The range is **1 – 4**. The default is **3**.
X4. *attenuation*		The amount of power to read an RFID tag. The range is **1 – 4**. The default is **2**.

Example   `{I,X,0,3,2¦}`

Uses the default protocol (AUTO-Select), sets the number of write attempts to 3 and the attenuation to 2.

The test label has been updated to show the settings for the RFID Setup Packet.

Using International Fonts

Version 6.0 or greater (9855/9860) and version 3.0 or greater (9825) have a new font rasterizer, which allows for an additional symbol set (110 – Unicode UTF-8). To use this symbol set, you must download an International TrueType font. An International TrueType font containing Chinese or Japanese characters *requires* the high memory option (purchased separately). The high memory option is only available with the 9855/9860 printers. An International TrueType font containing Arabic characters may *not* require the high memory option.

Note: Because the 9825 printer's memory is limited, only Latin fonts (smaller than 256K) may fit in the printer's *flash* memory. There is not enough memory to store an Asian font. For more information about downloading a font to flash memory, refer to the *Packet Reference Manual* available on our Web site.

To use International fonts, consider the following information:

♦ All fonts contain an internal character mapping. The mapping is organized by one or more standards, such as BIG5. These mapping standards can provide over 65,000 characters, which are not represented in this manual. The printers support several mapping standards:

　♦ Unicode (UCS-2)

　♦ BIG5

　♦ GB2312

　♦ SJIS

♦ Specify a symbol set based on the characters to print and one that is compatible with the font's character mapping. For example, to print Japanese characters, select symbol set 932 (Japanese Shift JIS) and a font compatible with that symbol set. See "Selecting a Symbol Set" for more information.

♦ To enter batch data, use the method specified by the font's character mapping and a compatible symbol set.

Selecting a Symbol Set

Specify a symbol set based on the characters to print and one that is compatible with the font's character mapping. The symbol set parameter identifies the character mapping used in the text field or constant text field, for example, Unicode, BIG5, etc. If no symbol set is selected, the default symbol set (Internal Symbol Set) is used.

The printer automatically translates some character mappings to others. For example, if you need a BIG5 font, it is possible to use Unicode text data. Use Unicode in the symbol set parameter to indicate the text mapping and select the BIG5 font needed in the font parameter (T8 or C5). The printer automatically translates the Unicode character values into BIG5 values before printing the character.

The following table lists the compatible mappings and symbol sets.

Font Character Mapping		Symbol Set Parameter (T15, C13, or A6)
Batch Data*	TrueType Font Character Mapping	use in text or constant text fields
Unicode	BIG5	102 – Unicode If you are unsure which character mapping to select, use this symbol set, because the printer automatically translates the character mappings.
Unicode	SJIS	
Unicode	KSC5601	
Unicode	GB2312	
Unicode	Unicode	
BIG5	Unicode	103 - BIG5
GB2312	Unicode	104 - GB2312
SJIS	SJIS	105 - SJIS (Code Page 932 - Japanese Shift-JIS)
GB2312	GB2312	106 - GB2312 (Code Page 936 - Simplified Chinese)
BIG5	BIG5	107 - BIG5 (Code Page 950 - Traditional Chinese)
UTF-8	Unicode BIG5 SJIS KSC5601 GB2312	110 – Unicode UTF-8 If you are unsure which character mapping to select, use this symbol set, because the printer automatically translates the character mappings. **Note:** UTF-8 is very common. We recommend using it for compatibility with different host applications and data streams.

* Characters in batch data must be entered based on their mapping (Unicode, BIG5, etc.).

In text (T15) and constant text (C13) fields, symbol set 110 (Unicode UTF-8) is available.

T15. sym set	Symbol set. Options:	
	0	Internal Symbol Set
	1	ANSI Symbol Set
	100	Macintosh
	101	Wingdings
	102	Unicode (user input) for particular mapping
	103	BIG5 (user input) for Unicode mapping*
	104	GB2312 (user input) for Unicode mapping*
	105	SJIS (user input) for Unicode mapping* Code Page 932 (Japanese Shift-JIS)
	106	GB2312 (user input) for GB23212 mapping* Code Page 936 (Simplified Chinese)
	107	BIG5 (user input) for BIG5 mapping* Code Page 950 (Traditional Chinese)
	110	**Unicode UTF-8**
	437	DOS Code Page 437 (Domestic)
	850	DOS Code Page 850 (International)
	852	DOS Code Page 852 (Latin 2)
	855	DOS Code Page 855 (Russian)
	857	DOS Code Page 857 (IBM Turkish)
	860	DOS Code Page 860 (MS-DOS Portuguese)
	1250	Code Page 1250 (Latin 2)
	1251	Code Page 1251 (Cyrillic)
	1252	Code Page 1252 (Latin 1)
	1253	Code Page 1253 (Greek)
	1254	Code Page 1254 (Turkish)
	1255	Code Page 1255 (Hebrew)
	1256	Code Page 1256 (Arabic)
	1257	Code Page 1257 (Baltic)
	1258	Code Page 1258 (Vietnamese)

* Code pages 103 – 107 are only available using the 9855/9860 printers.

Note: Code pages 102 - 107 and 110 may require the high memory option and a downloaded International TrueType font. TrueType fonts are designed to be regionally specific; therefore, all code pages may not be supported in a given font.

When using symbol set 110 (Unicode UTF-8), make sure the MPCLII control characters (start of header, parameter separator, etc.) are set to decimal values **0** to **128**. Otherwise, errors may occur with the Unicode data you enter. For more information about setting the control characters, refer to the *Packet Reference Manual* available on our Web site.

Setting the Numeric Format

Use the new menu item in the Setup, Defaults menu to select how numeric values appear in your printed data. With symbol set 110 (Unicode UTF-8), data sent to the printer can be in mixed format (Latin and Arabic characters).

The choices include Default, Arabic-Indic, and Eastern Arabic.

Default   Latin numerals print in Latin; Arabic text prints in Arabic.

Arabic-Indic   Latin numerals print in Arabic; Arabic text prints in Arabic.

Eastern-Arabic   Latin numerals print in Arabic; Arabic text prints in Arabic.

Latin Characters Example

```
95% cotton
```

Latin Numerals with Arabic Characters Example

قطب 95%

This numeric format is the default.

Arabic Numerals with Arabic Characters Example

بوليستر ٦٨%

This example shows the Arabic-Indic option.

بوليستر ۶۸%

This example shows the Eastern-Arabic option.

To change the setting, from the Main Menu, select Setup, then Defaults. Then, follow these steps.

1. Press ← or → until you see

> DEFAULTS
> ← Numeric Format   →

2. Press **Enter/Pause**. The current setting is displayed, for example:

> NUMERIC FORMAT
> Default   →

3. Press ← or → until you see the option you want. Then press **Enter/Pause**. Press **Escape/Clear** until you see the Main menu.

Arabic Font Sample

```
{F,3,A,R,E,220,400,"SIMPLE"/                          ———— Font
T,1,250,V,40,380,0,1000,24,24,B,E,0,0,110¦
T,2,250,V,90,380,0,1000,24,24,B,E,0,0,110¦}
{B,3,N,1¦

1,"قطب 95% بوليستر 5%"¦                                ———— Symbol Set
2,"5% polyester 95% cotton"¦}
```

The following label prints with **Default** set for the Numeric Format:

5% polyester 95% cotton

قطب 95% بوليستر 5%

The following label prints with **Arabic-Indic** set for the Numeric Format:

5% polyester 95% cotton

قطب ٥%٩٥ بوليستر ٥%
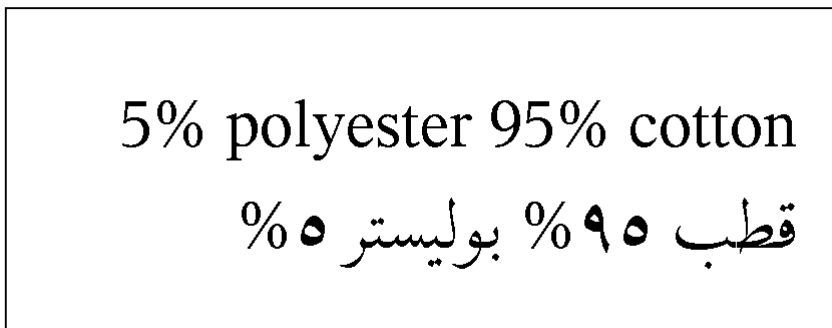
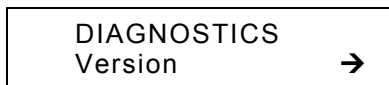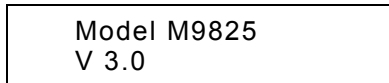## Viewing the Serial Number (9825 only)

The printer's serial number can be viewed by accessing the Diagnostics menu. Press **Feed/Cut** three times and then press **Enter/Pause**.
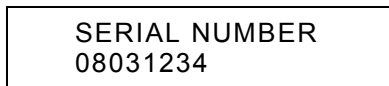
1. From the Diagnostics menu, press ← or → until you see

```
DIAGNOSTICS
Version           →
```

2. Press **Enter/Pause**. You see

```
Model M9825
V 3.0
```

3. Press **Enter/Pause**. You see

```
SERIAL NUMBER
08031234
```

4. Press **Escape/Clear** until you see the Main menu.

Updated Error Message

When using a Monarch 9825 or 9855 printer on the Mobile Work Station, you may receive error 762 - Low Voltage.

For DC-powered printers, recharge the external battery. For AC-powered printers, check the power inlet where the printer is connected. The acceptable voltage range is between 90-132 V_{RMS} and 180-264 V_{RMS}. If more or less power is received, unpredictable results may occur.