Morovia MICR/E-13B Fontware 4.0 Reference Manual

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Chapter 1. Package Contents

Morovia MICR/E-13B Fontware consists of true type, Postscript and PCL fonts to print MICR E-13B symbols on laser printers.

This package includes the following contents:

- True type font file of precise design - `MRV MICR`.
- Additional 11 fonts for printer calibration.
- The user manual, which you are reading on.
- The PCL and Postscript (PFA and PFB) version.

Note: this package provides the most critical part in a check printing system. However, it does not come up with a complete solution to print checks. Designing and printing your own checks take much more efforts.

All files are packaged in a single zip file. The root directory contains the installer for Windows operating system. Three sub-directories can be found under the root directory: `truetype`, `postscript`, and `pcl`. They contain True Type, Postscript and PCL fonts respectively.

Note

We recommend the use of true type version wherever applicable.

For use on Unix systems, you will likely to pick up either PFA or PFB version. Due to our resource constraints, we are unable to provide support for working with Unix systems. Some of our customers have successfully implemented check printing solutions on Unix with our fonts.

1.1. Font List

This package includes 10 typefaces. Among them, `MRV MICR` and `MICR` have the same characteristics, except typeface name. The glyphs in the two fonts are designed to produce precise results that meet the strictest testing requreiment when printed on a laser printer with at least 600 dpi in resolution. Therefore, they should be used by default in any distributed applications.

The following table lists all the true type font files. For other versions, see their own directory listing for details.

Table 1.1. Font List

Filename	Typeface	Usage
mrvmicr.ttf[a]	MRV MICR	normal MICR font that produces the most accurate MICR strip on most laser printers and check stocks
mrvmicrw.ttf	MRV MICRW	wider variant
mrvmicrn.ttf	MRV MICRN	narrower variant
mrvmicrb.ttf	MRV MICRB	bolder variant
mrvmicrbw.ttf	MRV MICRBW	bolder wider variant

Filename	Typeface	Usage
mrvmicrbn.ttf	MRV MICRBN	bolder narrower variant
mrvmicrl.ttf	MRV MICRL	lighter variant
mrvmicrlw.ttf	MRV MICRLW	lighter wider variant
mrvmicrln.ttf	MRV MICRLN	lighter narrower variant
micr.ttf[b]	MICR	Same as MRV MICR to be used in some accounting package such as Peachtree.

[a]In previous releases, the file is named as `mrvMICRWithMRV.ttf`.
[b]In previous releases, the file is named as `mrvMICRNoMRV.ttf`.

1.2. Installing Morovia MICR/E-13B Fontware On Windows

1.2.1. To Install from a CD

1. Insert the program CD into your CD drive. The setup starts automatically. Or if the auto-run feature isn't enabled on your system, click the Windows *Start* button and choose the *Run* command. Type `D:\Setup.exe` in the dialog box and click the *OK* button (Note that `D` represents the letter assigned to your CD-ROM drive. If your drive is assigned to a different letter, use it instead of `D`).

2. Follow the on-screen instructions.

3. Your will be prompted to enter the `License To/ Registration Code`. The `License to/` and `Registration Code` information are found on the back of the CD case.

1.2.2. To Install from direct download

1. Click the Download link to start the download.

2. When the browser prompts, do one of the following: A. To run setup immediately, click Open or Run This Program from Its Current Location. B. If you decide to run the setup at a later time, click `Save` or `Save This Program to Disk`.

3. If you choosed `Save This Program to Disk` in Step 2, locate the file where you saved it, and double click the .zip file to unzip the file.

4. Locate the .exe file under the root directory of the zip file, double click it to launch setup.

5. Follow the setup instructions.

6. Your will be prompted to enter the `License To/ Registration Code`. The `License To/` and `Registration Code` information can be found in the email we send to you after order completes.

1.3. Installing True Type Fonts on Mac OS/X

Mac OS/X accepts Windows true type font files directly with no conversion needed. You still need a ZIP utility such as StuffIt expander™, because most of our fonts are packaged in ZIP files.

Follow the steps below:

1. Download and install *StuffIt Expander* if you do not have a ZIP utility installed in your system. StuffIt Expander is free and can be downloaded from http://www.stuffit.com/mac/. When

download is complete, double click the icon in the desktop to install StuffIt Expander.

2. Download the Fontware from Morovia web site. Unpack the ZIP by dragging downloaded ZIP into the *StuffIt Expander* icon. StuffIt generates another folder under which you can find a directory named Macintosh. Double click to open the Macintosh subfolder.

3. Navigate to `truetype` directory.

4. Drag and drop the font file `mrvMicr.ttf` to the `Library/Fonts` folder.

5. The font is now ready to use. In some cases, a reboot is required to clear system cache.

Chapter 2. Basic Knowledge

2.1. MICR E-13B Charset

A MICR font consists of 14 characters. They include the numbers 0-9, and four special characters. Space is used to produce a blank space. Two additional mappings are added to assist programming.

Table 2.1. Character Mappings in MICR Fonts

Character	MICR Symbol	Mapping
One	1	1
Two	2	2
Three	3	3
Four	4	4
Five	5	5
Six	6	6
Seven	7	7
Eight	8	8
Nine	9	9
Zero	0	0
Transit Symbol	⑆	A or [or]
Amount Symbol	⑈	B or # or $
On-US Symbol	⑇	C or @
Dash Symbol	⑉	D or -

Note: some symbols have multiple mapping. In these cases, any character in the list produces the same symbol. For example, typing either "-" (dash) or "D" produces a dash symbol.

The meanings of the four special symbols are briefly explained here, as below:

Transit Symbol
The data between transit symbols indicates the institution which the check is drawn from. It is also called Routing Number in US.

Amount Symbol
The data between amount symbols represents the amount. This portion does not usually appear in the check; it is used internally in the bank.

On-US Symbol

This character indicates the following data represents the account number.

Dash

This character separates the account number.

In addition to standard 13B symbols, our fonts contain an extra glyph that looks like "X". This drawing is accessible by typing `X` or `S`. It is a useful feature at the check design stage. Because there are many spaces in a MICR line, it is not easy to tell if a character is placed in the specified positions by simply counting characters. To make character position evident, first substitute every space with character `X`. After you are satisfied with work, change them back to spaces.

2.2. MICR Printing Issues

MICR printing standard was designed thirty years ago. At that time, those symbols must be printed using special impact machines and read with magnetic readers. The reader recognizes symbols based on the waveforms of lengths. Today, the vast majority of banks employ optical recognition method (OCR) to read MICR strips, and reading is generally not an issue.

Because MICR printing and reading are so widespread across the whole industry, many banks require new check designs to pass strict measurement validation. Contrary to what some manufacturers claim, there is no "certified" MICR font in the market. The result varies by the printing technology, software and paper.

Based on past experience in assisting many big customers to pass strict validation tests, this release takes the rasterization process into account. The result is more predictable and accurate. It should pass strict validation test without any calibration, if all the conditions below are met:

- A 600 dpi and above laser printer.
- Toner is equipped with magnetic ink (MICR Toner).
- Paper is made of virgin pulp. Do not use recycled paper.
- Symbols are arranged according to MICR line guidelines. The next chapter provides an overview on MICR line requirement.

If for any reason you still have issues with the printing results, forward a copy of bank report to us at `<support@morovia.com>`. We can determine the possible cause of the issue, and advise steps to work around them.

2.3. Calibration Wizard

Generally speaking you should always use typeface `MRV MICR` or `MICR`. These two fonts are designed to meet strict testing requirement when printed on a 600-dpi printer.

The other font variants are designed to overcome situations that' may affect printing quality. For example, paper could shrink when heated up in laser printer. Toner could be over-filled or close empty. To choose one that produce the best result, you will need *Calibration Wizard*.

To run the calibration program, click on *Start* → Programs → Morovia → MICR/E-13 Fontware → *Calibration Wizard*. Click *Print* to print a sample page. Wait until the paper is cool. Use an accurate ruler to measure the distance between the vertical bars in the MICR lines. Choose the one that is closest to 7 inches. Next, measure the stroke widths of three zeroes printed and choose the one that is closet to 0.13 inch. Combine the two results and you get the best typeface for your printing
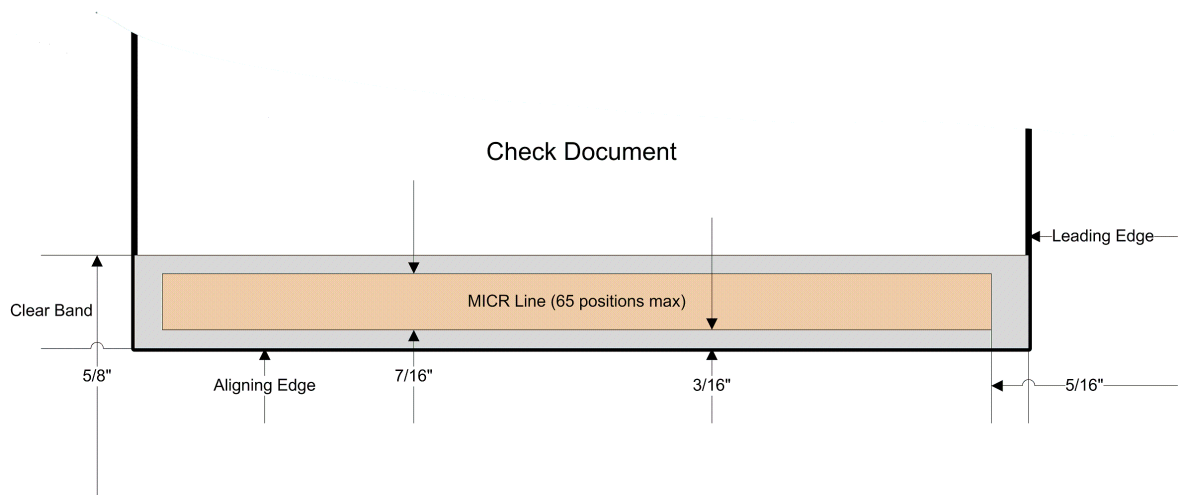
environment.

Chapter 3. MICR Line Placement Guide

This chapter briefly overview the placement requirement for MICR line. For detailed information, see ANSI X9.13 standard, or the publication from your country's standard organization or bank association.

3.1. Positioning MICR Line

MICR line is placed in an area called "clear band". This clear band has a minimum height of 5/8" from the bottom edge (called *aligning edge*) and runs across the check. The clear band should be free of any magnetic ink other than of the E-13B font.

Figure 3.1. MICR Line Positioning

Vertically, the MICR print band is a 1/4" high band, which begins at 3/16" from the aligning edge and ends at 7/16" inch from the aligning edge. Measured horizontally, the band should begin at 5/16" inch from the right side of the check document (referred as *leading edge* in the standard) and extend to 8 7/16" maximum from the leading edge. Because MICR symbols have a fixed width of 1/8" inch, the total line has 65 positions, numbered from 1 to 65 with position 1 the rightmost.

When layout MICR characters, the baseline is the bottom edge of the MICR print band.

Horizontally lengths are subject to 1/16" cutting tolerance. Therefore, the starting position can be between 1/4" ~ 7/16" inch from the leading edge.

The total 65 positions are further divided into four fields - Amount, On-Us, Transit and Auxiliary On-Us. Each field is separated with special MICR symbols (A, B, C and D). Note that although positions are counted from right to the left, numbers inside each field are meaning from left to right.

3.2. Fields in a MICR Line

This section explains the four fields in a MICR line.

3.2.1. Amount Field

The amount field is located from position 1 through 12. The field is enclosed with Amount symbols and have a fixed length.

- Position 1: Amount symbol.
- 2 through 3: Cents
- 4 through 11: Dollar Amount (filled with zeroes to the left)
- 12: Amount symbol (again).

> **Note**
>
> Amount field is printed by your bank. This area should be left blank when you design checks.

3.2.2. On-Us Field

The On-Us field is located in position 13 through 32. Although the format for this field may vary, this field commonly contains an account number, or an account number followed by a serial number. Position 13 and 32 are usually blank to make sure that reader clearly knows this field.

The data inside the field is usually left-aligned and filled with spaces to the right.

There are two common structures in this field: account number only or account number plus check number. In both cases, account number is followed by an On-Us symbol to indicate that it is an account number. A dash or space may appear inside the account number. They are treated as inter-exchangeable by the standard.

3.2.3. Routing Field

Routing field runs in position 33 through 43. Position 33 and 43 must be transit symbol which brackets a 9-digit routing number. Presence of the dash symbol in this field indicates checks drawn on financial institutions in Canada or Mexico.

3.2.4. EPC Field

EPC may appear in position 44 or 45. On 6-inch check it can only appear in position 44 due to length limit. This field is used by banks for special processing and should be left blank.
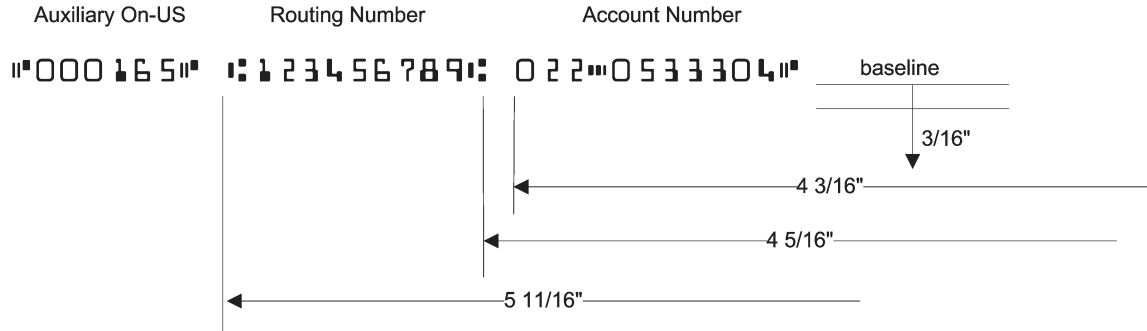
3.2.5. Auxiliary On-US Field

This field only appears on checks with lengths greater than six inches. This field usually encodes the check's serial number with a On-Us symbol at the beginning and at the end. It starts either from position 44 or 45.

3.3. Quick Reference Drawing

The drawing below shows the most common layout in business checks circulated in North America:

Figure 3.2. MICR Line Placement Quick Reference

Auxiliary On-US   Routing Number   Account Number

⑈000165⑈   ⑆123456789⑆   022⑈0533304⑈   baseline

3/16"

4 3/16"

4 5/16"

5 11/16"

Note that all horizontal lengths are measured from the right edge of the check (leading edge). Vertically, the base line of MICR characters should begin at 3/16" above the bottom edge of the check (aligning edge).

If you write programs to print MIcR symbols, it is not recommended to print all characters in one `DrawText` statement. Instead, print three fields separately, using the reference points listed in the drawing.

Chapter 4. Technical Support

Morovia offers a wide variety of support services. To help you save time and money when you encounter a problem, we suggest you try to resolve the problem by following the options below in the order shown.

- Consult the documentation. The quickest answer to many questions can be found in the Morovia product documentation.
- Review the tutorial and sample applications. The tutorial steps you through the development process for a typical barcode application. The sample applications provide working code examples in several programming languages. All sample applications are extensively commented.
- Access Morovia Online. Morovia Online provides a knowledge base which documents the frequently asked questions and a web forum.

  The web address for knowledge base is http://support.morovia.com. You can ask question at support forum at http://forum.morovia.com.
- Contact Morovia Technical Support Service. The Technical Support service is provided for free up to 180 days after the purchase. Email Morovia support engineers at `<support@morovia.com>`.

  ## Note

  If you purchased your software from our reseller, check to see if they provide support services before contacting Morovia.

Support services and policies are subject to change without notice.

Appendix A. Fontware License Agreement

By using or installing font software (referred as "Fontware" and "SOFTWARE" in this agreement, including fonts, components, source code, install program etc.) created by Morovia Corporation (referred as "Morovia" below), you (or you on behalf of your employer) are agreeing to be bound by the terms and conditions of this License Agreement. This License Agreement constitutes the complete agreement between you and Morovia. If you do not agree to the terms and condition of the agreement, discontinue use of the Fontware immediately.

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