Elfring Fonts, Inc.
PCL MICR Fonts

This package contains five MICR fonts *(also known as E-13B)*, to print magnetic encoding on checks, and six Secure Number fonts, to print check amounts. These fonts come in standard PCL bitmapped soft font format. All fonts come in 600 dpi format, with a file name extension of .L4P. **We do not include 300 dpi .USP font files** because they are not accurate enough to work on modern printers. MICR *(Magnetic Ink Character Recognition)* encoding is used by all banks in North America *(and many other countries)* to automate check processing. Federal banking laws *(Check 21 Act)* and the Canadian law *(CPA 006)* **require** that MICR lines be printed with magnetic ink. Since no magnetic ink exists for inkjet printers, you must use a laser printer with a magnetic toner cartridge to print checks.

These fonts are licensed for use on a **single printer**. To use these fonts on more than one printer, you need to purchase a multiple user/printer license. See the Multiple Printer License file, MultiplePrinters.pdf, for details and pricing.

These fonts are designed to be used on Unix, AS/400, or DOS computers. Windows does **not** directly support PCL bitmapped fonts. Some Windows check writing applications do use PCL bitmapped fonts. If you are using Windows software, check with your software supplier to make sure these are the correct format fonts before buying them. *(We do offer MICR in Windows TrueType format.)* Any computer program that uses these fonts must send the font to the printer before selecting it, and must send PCL (Printer Command Language) commands to select and deselect the font.

The MICR font contains 14 separate characters, plus several spacing and alignment characters. MICR includes the numbers 0 - 9, plus four special characters. The four special characters are each available in 2 different positions: the Xerox mapping and the People Soft mapping.

MICR Character	MICR Symbol	Xerox Position	PeopleSoft Position
Zero	0	0	0
One	1	1	1
Two	2	2	2
Three	3	3	3
Four	4	4	4
Five	5	5	5
Six	6	6	6
Seven	7	7	7
Eight	8	8	8
Nine	9	9	9
On-Us Symbol	⑈	<	C
Transit Symbol	⑆	:	A
Amount Symbol	⑇	;	B
Dash Symbol	⑉	=	D

‖▪ On-Us Symbol, < or C

The On-Us symbol tells the check reader that the next series of numbers identifies the account number, and other items. The issuing bank determines the content of the On-Us area, so the branch bank the check is drawn on may also be indicated.

▮▪ Transit Symbol, : or A

Each MICR line always includes two Transit Symbols. They open and close the transit field. Numbers between these fields tell the check reader the institution which the check is drawn on.

▮▪ Amount Symbol, ; or B

Two amount symbols tell the check reader that the numbers between them are the amount of the check. This field is usually blank and added later at the bank or under other special circumstances.

▮▮▮ Dash Symbol, = or D

The Dash Symbol is sometimes used to separate items in the On-Us field. Its use for this purpose is not recommended. Some check readers have problems detecting it.

How To Use These Fonts

We supply these MICR fonts in binary PCL soft font format. The fonts are simple binary data soft font files that resides on your computer's hard disk. To use a font to print MICR or Secure Numbers, you first send the font to your printer *(this process is called downloading).* When your application needs to print using one of these fonts, it sends a special command to the printer to switch from the normal font to the new font. You then send your data. Finally, you send a special printer command to tell the printer to return back to the normal font.

Printer commands always start with the Escape character (1B in hex, or 27 in decimal). The rest of the printer command is straight ASCII.

To return back to the default font your printer sets when it is turned on use the following PCL command:

<Esc>(3@

To summarize this process:

1) Send the font to your printer
2) Select the font
3) Print your MICR line or check amount
4) Return back to the default font

Downloading Fonts to Your Printer

The Windows utility program Downloadwin.exe is a Windows program that will send a font to any Windows printer. See the separate pdf manual for this product.

DOS:
The DOS utility program Download.exe will send a font from the command line or from a batch file to any parallel or serial printer. It will not work with networked printers or printers with USB connections. See the documentation file, download.txt for details on how to use this utility.

Other:
Each of these fonts must be sent to your printer (downloaded) before they can be selected and printed. If you are on a PC, you may be able to use our Download utility (see the documentation file download.txt for more information on this program) to send the fonts to your printer. If you are on a computer other than a PC, how you download a font to your printer depends on the computer you are using. Basically you need to:

1)   Assign the font an ID number by sending the following PCL command:
        <Esc>*c###D where <Esc> stands for the escape character (1B in Hex)
        and ### is the font ID number in ASCII, Say 10 for ID 10.

2)   Copy the font file to the printer

3)   Repeat step 1 above

4)   Send the following PCL command to make the font permanent (otherwise it gets erased when you reset the printer.) Note that "permanent" fonts are lost when the power to the printer is truned off.
        <Esc>*c5F

To download a font to your printer and assign it ID number 23 send:

<Esc>*c23D
copy the font file to the printer
<Esc>*c23D
<Esc>*c5F

Note that you can also select a font by the ID umber you assigned when you downloaded the font. To select a font by its ID number use:
<Esc>(###X
        where <Esc> is the escape character (1B hex) and ### is the ID number you assigned to the font when it was downloaded.

 To select the font in the download example above with ID 23 send: <Esc>(23X

Calibration

The MICR encoding on a check must be printed at as close as possible to 8 characters to the inch. In addition, character shapes must exactly match to their predicted size. Unfortunately, differences in paper, laser printing engines, toner cartridges, and settings can produce widely varying results. This can cause your checks to be rejected by banks. To solve these problems each MICR font from Elfring Fonts Inc has calibration characters built into it. You print sample sheets using three different MICR fonts on your laser printer, using your magnetic toner and

paper. The results will determine which of the MICR fonts we supply should be used in your application.

This package includes a DOS batch file (calibrat.bat) that will send the three base MICR fonts to your printer and then print a sample calibration page for you to measure. (MI100A08.L4P, MI100R08.L4P, and MI100C08.L4P) If you can not run the batch file, download the three fonts listed above giving assigning them ID numbers 1, 2, and 3. Then copy the calibrat.txt file to your printer. (MI100A08.L4P = ID 1, MI100R08.L4P = ID 2, and MI100C08.L4P = ID 3)

Many MICR printing problems are related to the paper you print on. When paper absorbs moisture from the air it expands. When heated in your laser printer, the paper shrinks. This can change the length of the MICR encoding line on the page. So to start, you need to ensure that your paper is stored in a dry environment. You can preheat some paper to drive the moisture out of it. Before you perform the tests described below, print a blank page, and then use that blank page for the printing tests. This will preshink the paper.

The next thing to do is to ensure you are printing at exactly 8 characters per inch. Download one of the three base MICR fonts to your printer. (MI100a08.L4P, MI100R08.L4P, or MI100c08.L4P) Select this font and then print two lines of text, *(on the preshrunk paper)*, as follows to check the horizontal spacing of your system. (The spacing check vertical line is produced using the "|" key.) Repeat this test with each of the three fonts mentioned above.

MI100a08.L4P

0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7

MI100r08.L4P

0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7

MI100c08.L4P

0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7

Wait few minutes after printing the test line before measuring it. Use an accurate ruler and measure the distance between the vertical bars over the entire length of the line. It should measure very close to 6 inches long. *(Plus or minus about 3/64's of an inch.)* Pick the font that generates a line closest to 6 inches in length. This font is the one you will use for all MICR printing. If no line measures 6 inches in length, check to see that your paper contains the proper level of humidity. (Run a page through your laser printer and then run the paper back through the laser to print the sample on it again. If the length of the line changes your paper has shrunk- it contains too much moisture.)

The MICR fonts in this set are defined as follows:

MI100A08.L4P	MI100R08.L4P	MI100C08.L4P (600 dpi, LaserJet 4, 5, & 6)
MICR Long	MICR Standard	MICR Short

MI100L08.L4P	MI100B08.L4P (600 dpi, LaserJet 4, 5, & 6)
MICR Light	MICR Dark

MICR Font Selection Commands

MI100A08.L4P Symbol Set=0U Resolution=600
Font Calling Sequence: <Esc>(0U<Esc>(s0p7.8h10v0s0b102T

MI100R08.L4P Symbol Set=0U Resolution=600
Font Calling Sequence: <Esc>(0U<Esc>(s0p8h10v0s0b104T

MI100C08.L4P Symbol Set=0U Resolution=600
Font Calling Sequence: <Esc>(0U<Esc>(s0p8.1h10v0s0b103T

MI100B08.L4P Symbol Set=0U Resolution=600
Font Calling Sequence: <Esc>(0U<Esc>(s1p10v0s3b104T

MI100L08.L4P Symbol Set=0U Resolution=600
Font Calling Sequence: <Esc>(0U<Esc>(s1p10v0s-3b104T

Secure Number Fonts

This font set includes two different fonts for printing check amounts. These Secure Number fonts are designed to be difficult to alter or forge.

Secure 1

Secure 2

Each Secure number font includes the following characters:

$ ' ( ) * , - . / > + [ ] 0 1 2 3 4 5 6 7 8 9

Secure Number Font Selection Commands

REV26SEC.L4P Symbol Set=0U Resolution=600
Font Calling Sequence: <Esc>(0U<Esc>(s1p26v0s0b181T

REV26SE2.L4P Symbol Set=0U Resolution=600
Font Calling Sequence: <Esc>(0U<Esc>(s1p26v0s0b182T

REV20SEC.L4P Symbol Set=0U Resolution=600
Font Calling Sequence: <Esc>(0U<Esc>(s1p20v0s0b181T

REV20SE2.L4P Symbol Set=0U Resolution=600
Font Calling Sequence: <Esc>(0U<Esc>(s1p20v0s0b182T

REV13SEC.L4P Symbol Set=0U Resolution=600
Font Calling Sequence: <Esc>(0U<Esc>(s1p13v0s0b181T

REV13SE2.L4P Symbol Set=0U Resolution=600
Font Calling Sequence: <Esc>(0U<Esc>(s1p13v0s0b182T

# MICR <u>Mounted</u> Check Position Gauge Instructions
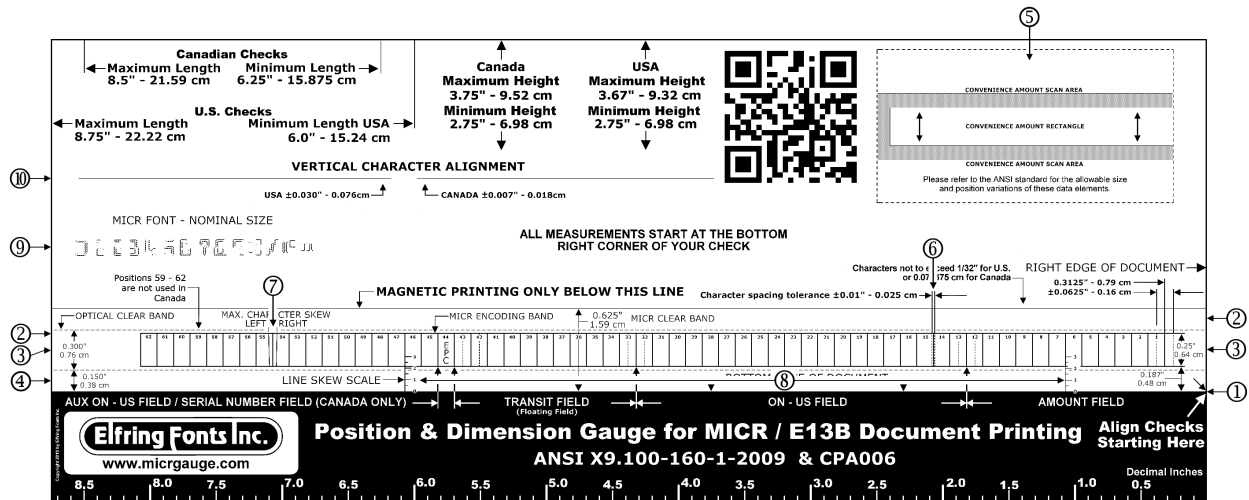
A MICR gauge verifies that **all** the data printed on your check is accurate and in the proper positions. A MICR gauge is a clear plastic template with a cardboard backer that you position over your check. It will indicate whether or not your MICR encoding line follows the correct spacing, is not skewed, and has the right number of characters. The MICR gauge also shows you the magnetic clear zone, maximum and minimum check widths and heights, offers a decimal inch ruler, plus much more
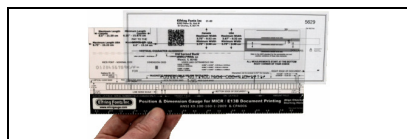
All U.S. specifications are measured in inches. All Canadian specifications are measured in centimeters (cm).
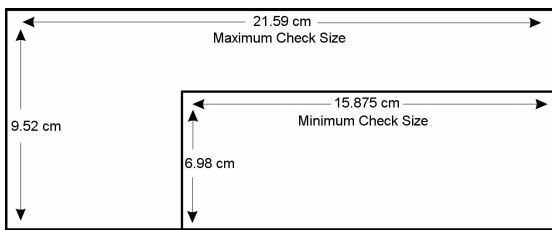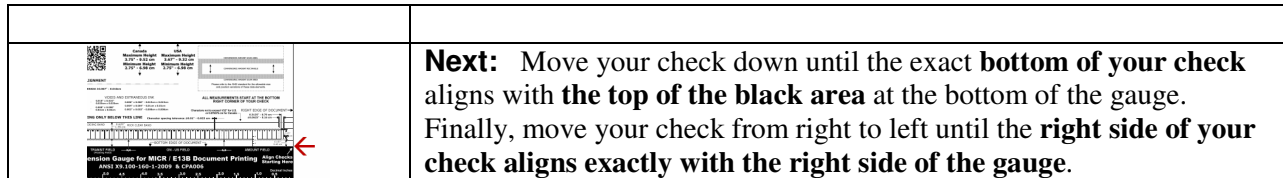

Canada Minimum & Maximum Check Size
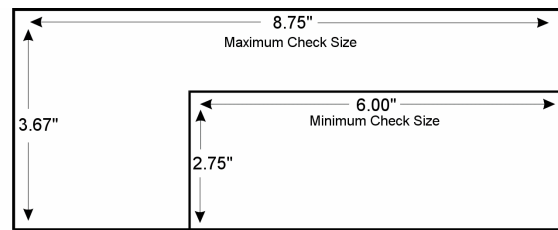
United States Minimum & Maximum Check Size

First: Slide your check between the transparent printed plastic gauge piece and the cardboard backing. You are now ready to position your check exactly inside the gauge.

	Next: Move your check down until the exact **bottom of your check** aligns with **the top of the black area** at the bottom of the gauge. Finally, move your check from right to left until the **right side of your check aligns exactly with the right side of the gauge**.

1. CHECK ALIGNMENT ALWAYS STARTS AT THE BOTTOM RIGHT CORNER.

All MICR measurements are made from the bottom **right** corner of your check. **Always base measurements with the gauge from the *right* side of your check!** Measurements for items 2 - 7 are made by positioning the check under the clear gauge so that the check's bottom and right edge align with the black bottom area and right edge of the MICR gauge.
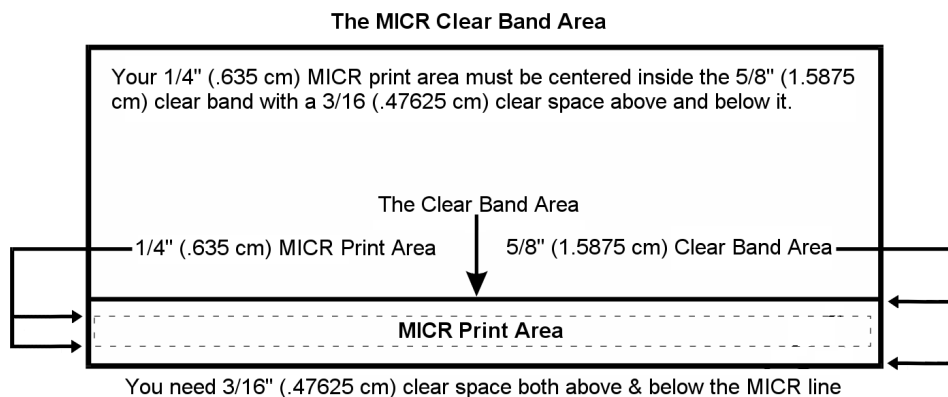
2. MICR CLEAR BAND:

This area extends the full length of the check and 0.625 inches or 1.59 cm up from the bottom edge of the check. It must be **free of *all* magnetic ink** other than that used for the MICR / E13-B encoding information

3. MICR ENCODING BAND:

All MICR characters must be printed inside the encoding band located within the clear band. There are 62 character positions broken up into 4 fields: Aux ON-US / Serial Number, Transit, ON-US, and Amount. The **Amount Field** occupies positions 12 - 1, and the **Transit Field** must occupy positions #43 and stop at position #33 unless a floating field is required, ±0.0625 inches (0.16cm). Both the **ON-US Field** and **Auxiliary ON-US Field** are floating fields and may begin and end anywhere within their respective boundaries. The **External Processing Code Field** (EPC), is located between the transit field and the auxiliary on us field. The field location and content are supplied by your financial institution must be followed exactly.

Canada Only: CPA 006 update June 30, 2006: The maximum number of characters in the serial number field is twelve (12) digits and two (2) On-Us symbols. This field must end at position 58. Positions 63, 64, & 65 must not be occupied. These positions are only used in the United States.

The MICR Clear Band Area

Your 1/4" (.635 cm) MICR print area must be centered inside the 5/8" (1.5875 cm) clear band with a 3/16 (.47625 cm) clear space above and below it.

The Clear Band Area

1/4" (.635 cm) MICR Print Area   5/8" (1.5875 cm) Clear Band Area

MICR Print Area

You need 3/16" (.47625 cm) clear space both above & below the MICR line

4. OPTICAL CLEAR BAND:

This area surrounds the MICR encoding band and extends the entire length of the check. It must be free of all background printing exceeding the optical specification of 0.30 Print Contrast Signal (PCS). Refer to the ANSI MICR specifications for related border information.

5. CONVENIENCE AMOUNT SCAN AREA (CASA):

This rectangle includes the convenience amount clear area (CACA) and the convenience amount rectangle (CAR). Refer to the ANSI specifications for acceptable position and size variations. It is located in the upper right hand side of the MICR gauge.

6. HORIZONTAL CHARACTER TO CHARACTER SPACING:
Each MICR character must have its **right edge touching the right edge** of the rectangular box it is located in. Each box is exactly 0.125 inches (0.317 cm) ±0.010" (0.025 cm), wide. The check may be shifted horizontally to positions 14 and 15 where possible spacing errors can be checked.

7. CHARACTER SKEW:
Position the check horizontally under the gauge so that the character in question is in position 54 or 55. If the character is tilted so that it falls outside of either slanted lines, the vertical character skew specification of 1.5 degrees has been exceeded.

8. LINE SKEW:
Position the check so that the top edges of the MICR characters, excluding the Dash and On-Us symbols, touch the solid horizontal line that marks the top of the clear band. The bottom edge of the check will then bisect the vertical scales, marked in 1/2 degree increments, viewed in positions 6 and 46. The difference between readings of the two scales is the degree of line skew. **Note the maximum line skew is 1.5 degrees.**

9. MICR FONT SIZE:
Position an outline character over a matching MICR symbol. The MICR character should fit inside the dashed.

10. VERTICAL CHARACTER TO CHARACTER ALIGNMENT:
Position the check under the gauge so that the field to be measured is located over the correct country area *(U.S. or Canada)*. The bottom edges of the characters must be within the dashed boundary lines above and below the solid base line.

MICR Line Requirements

ANSI standards require all checks to have a clear band at their bottom. The only thing allowed in this clear band is a single line of MICR encoding. This clear band has a minimum height of 5/8 of an inch, although 3/4 of an inch is recommended. This clear band must be totally free of any magnetic material, except for the MICR line.

All MICR characters fit on a single line in the clear band. This MICR line has 65 positions, numbered from right to left. (Everything in MICR works backwards {right to left} to what you would expect.) The MICR line must be positioned 3/16 +- 1/16 of an inch from the bottom of the check. The MICR line must start 5/16 +- 1/16 of an inch from the right side of the check. It can come no closer than 1/4 inch to the left side of the check.

Each MICR line of 65 possible positions is broken up into four fields: Amount, On-Us, Transit, and Auxiliary On-Us. A check must have at least three of these fields: Amount, On-Us, and Transit. (Note you normally don't print anything in the amount field.) Commercial checks may have an additional field on the left side, called the auxiliary On-Us field. Some checks may also have an external processing code digit positioned between the Transit and auxiliary On-Us fields.

Field	Position	Description
Amount	1	Amount Symbol
	2 through 3	Cents
	4 through 11	Dollars (zero fill to left)
	12	Amount Symbol
Blank	13	
On-Us	14 through 31	Determined by bank, generally contains the account number, serial number, or transaction Code
	32	May optionally expand to position 32
Transit	33	Transit Symbol
	34	Check digit
	35 through 38	Institutional identifier
	39 through 42	Check routing symbol
	43	Transit Symbol
External Processing	44 or 45	Optional External Processing Code
Auxiliary On-Us	45/46 through 65	Determined by bank, generally contains numbering, transaction codes, and internal controls. Checks with this field must be longer than 6 inches.