

Elfring Fonts

LaserJet Bar Codes & More

This package contains five separate types of bar code fonts, and two OCR fonts. These PCL bar code fonts can not be used unless you understand how each bar code type works and what their limitations are.

There are many different types of bar codes. Some bar codes, like UPC-A, are used to print product codes, while others, like bar code 3/9, 2/5, & 2/5 interleaved are used to encode data. Finally, the Postal Bar Code is only used to print encode zip code information. So before using a bar code, you must decide which bar code most closely matches your application.

If you want to print retail product data on labels you must chose the UPC-A bar code. Using this bar code is fairly involved, as it requires a checksum and the ability to switch between character areas in the font.

Postal Bar codes require a checksum, and the addition of start and stop characters, so using this font is somewhat difficult.

To print simple numerical data you can use the bar code 2/5 (non-interleaved). No checksum is needed, although you do need to add a special start and stop code to your data.

To print high density numerical data (Postal bag tags use this code) you can use the bar code 2/5 interleaved. While no checksum is needed, this bar code is quite complicated and requires the use of lookup table, plus special start and stop codes.

Finally, to print alpha-numeric data you need the bar code 3/9 font. This bar code format does not require a checksum and includes numbers, some punctuation, and upper case letters. The start and stop characters must be added to your data.

Finally, the OCR A and OCR B fonts are used to print data that must be read by optical character recognition programs. The following pages detail how to use each of these specific soft fonts.

How To Use These Fonts

We supply these bar code and OCR fonts in binary PCL font format. The fonts are simple binary data that resides on your computer's hard disk. To use a font to print a bar code, you first send the font to your printer (this process is called downloading). When your application needs to print a bar code it sends a special command to the printer to switch from the normal font to the bar code font. You then send your bar code data (with start, stop, checksums, etc added). 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 us the following PCL command:

```
<Esc>(3@
```

Downloading Fonts To Your Printer

Windows:

The Windows utility program Downloadwin.exe will send a font to any Windows printer. To use this utility, first enter in the name and path of the font you want to download, or use the *Browse* button to locate a font. Your default printer is automatically selected. If this is not the printer you want to send the font to, click on *Select Printer* to pick a different printer. You can enter an ID number for the font or default to the number shown on the screen. To download the font click on *Download Font* button. The program will tell you when the font download is complete.

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 turned 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 number 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

Bar Code 2/5

The bar code 2/5 fonts are easy to use. Like all soft fonts, they must be downloaded to your printer before they can be used. Once they are in your printer, switch to the bar code font, type a start character- (type the data you want bar coded, type an end character), then switch back to your normal font. That's all that is necessary. Bar Code 2/5 encodes only numbers.

All bar code 2/5 bars **MUST** start with the (and end with the). No checksum is required for this type of bar coding. These fonts are **not** interleaved. You can only encode numbers with these fonts. See the symbol map for this font for a better description of what characters are included.

This package includes both portrait and landscape bar code 2/5 fonts. These fonts come in two different pitches and two different heights. Heights include 12 & 24 points, (.166 or .333 inches). The pitch, or number of characters the font will print per inch is either 4.7 or 7.1.

- BC120R47.USP - 12 points tall, 4.7 characters per inch, portrait
- BC120R71.USP - 12 points tall, 7.1 characters per inch, portrait
- BC240R47.USP - 24 points tall, 4.7 characters per inch, portrait
- BC240R71.USP - 24 points tall, 7.1 characters per inch, portrait

Bar Code 2/5 Interleaved

Bar Code 2/5 is a high density, self-checking bar code format. It only encodes numbers and you must use an even number of digits in your bar code. If the code contains an odd number of digits you must add a leading 0 to the bar code. Maximum print density (not including start/stop codes) is 11.1 numbers/inch on 300 dpi printers, or 22.2 dpi on 600 dpi printers. Interleaved bar code 2/5 requires a start and a stop digit. The total interleaved bar code 2/5 format includes 102 characters, 100 data characters representing all the two digits pairs of numbers from 00 to 99, and the separate Start and Stop characters. The following chart shows what ASCII position to use for each pair of digits.

Number = ASCII	Number = ASCII	Number = ASCII	Number = ASCII	Number = ASCII
00 = !	21 = 6	42 = K	63 = `	84 = u
01 = "	22 = 7	43 = L	64 = a	85 = v
02 = #	23 = 8	44 = M	65 = b	86 = w
03 = \$	24 = 9	45 = N	66 = c	87 = x
04 = %	25 = :	46 = O	67 = d	88 = y
05 = &	26 = ;	47 = P	68 = e	89 = z
06 = '	27 = <	48 = Q	69 = f	
07 = (28 = =	49 = R	70 = g	90 = 161
08 =)	29 = >	50 = S	71 = h	91 = 162
09 = *	30 = ?	51 = T	72 = i	92 = 163
10 = +	31 = @	52 = U	73 = j	93 = 164
11 = ,	32 = A	53 = V	74 = k	94 = 165
12 = -	33 = B	54 = W	75 = l	95 = 166
13 = .	34 = C	55 = X	76 = m	96 = 167
14 = /	35 = D	56 = Y	77 = n	97 = 168
15 = 0	36 = E	57 = Z	78 = o	98 = 169

16 = 1	37 = F	58 = [79 = p	99 = 170
17 = 2	38 = G	59 = \	80 = q	
18 = 3	39 = H	60 =]	81 = r	Start = {
19 = 4	40 = I	61 = ^	82 = s	Stop = }
20 = 5	41 = J	62 = _	83 = t	

To print a bar code of the data 0123456796, you need to translate the numbers into pairs of digits. Break the number up into pairs first- 01, 23, 45, 67, 96. Translate each number pair into a single ASCII character- ", 8, N, d, \$. Then add a start character to the beginning of the string, and the stop character at the end of the string. So the actual string to print is {"8Nd\$}.

01234567 → {"8Nd\$} → 

To make a Bar Code 2/5 Interleaved code you switch to the font, type your converted string from above, then switch back to your normal font (<Esc>(3@).

- BI250F42.USP .25 inches tall, 4.2 characters per inch, portrait
- BI500F42.USP .50 inches tall, 4.2 characters per inch, portrait
- BI750F42.USP .75 inches tall, 4.2 characters per inch, portrait
- BI250F55.USP .25 inches tall, 5.5 characters per inch, portrait
- BI500F55.USP .50 inches tall, 5.5 characters per inch, portrait
- BI750F55.USP .75 inches tall, 5.5 characters per inch, portrait

Bar Code 3/9

Bar code 3/9 is easy to use. Like all PCL fonts, the bar code font must be downloaded to your printer before it can be used. Once it is in your printer, switch to the bar code font, type a start character, (the *), type the data you want bar coded, type the stop character, (the *), and then switch back to your normal font. That's all that is necessary. Bar code 3/9 can only encode the following characters: 0-9 A-B, space, \$%+-./

Bar code 3/9 MUST start and end with an *. No checksum is required for this type of bar coding. You can encode numbers, capitol letters, limited punctuation, and the space character. (Some bar code readers support an optional checksum for bar code 3/9 and may also support a special Full ASCII mode.) See the symbol map for this font for a better description of what characters are included.

To make a Bar Code 3/9 you, switch to the font, type the start character *, type your data, and the stop character *. Then switch back to your normal font (<Esc>(3@). For example, to bar code 123ABC you type:

123ABC → *123ABC* → 

This package includes both portrait and landscape bar code 3/9 fonts. These fonts come in two different pitches and two different heights. Both font sets come also include a human readable version (ASCII characters show below the bars). Heights include 18, 36, & 48 points, (.25, .5, & .75 inches). The pitch, or number of characters the font will print per inch is either 4.6 or 6.2.

BR180R46.USP - 18 points tall, 4.6 characters per inch, portrait
 BR180R62.USP - 18 points tall, 6.2 characters per inch, portrait
 BR360R46.USP - 36 points tall, 4.6 characters per inch, portrait
 BR360R62.USP - 36 points tall, 6.2 characters per inch, portrait
 BR480R46.USP - 48 points tall, 4.6 characters per inch, portrait
 BR480R62.USP - 48 points tall, 6.2 characters per inch, portrait
 BR180H62.USP - 18 points tall, human readable, 6.2 cpi, portrait
 BR360H62.USP - 36 points tall, human readable, 6.2 cpi, portrait
 BR480H62.USP - 48 points tall, human readable, 6.2 cpi, portrait
 BR180H46.USP - 18 points tall, human readable, 4.6 cpi, portrait
 BR360H46.USP - 36 points tall, human readable, 4.6 cpi, portrait
 BR480H46.USP - 48 points tall, human readable, 4.6 cpi, portrait

Postal Bar Codes

The Postal Bar Codes is easy to use. It does require a start and a stop code, and you must calculate a checksum character for each bar code you generate.

Each Postal Bar Code consists of 4 separate parts: a lead-in character, the zip code, a checksum, and a lead-out character. There are several ways to represent the lead in and lead out characters. You may use the (and) as the Lead in and out characters, or use the * as both a Lead in and Lead out character. Each PostNet bar code must contain either 5, 9, or 11 zip code digits, plus 1 checksum digit.

The Postal Bar Code font contains bar codes for the numbers 0 - 9, and the lead-in & out characters. You print the checksum using a digit from 0 - 9.

To print a Postal Bar Code (ignoring the checksum for the moment) you, switch to the font, type the lead-in character "(", type the zip code, the checksum, and the lead-out character ")". Then switch back to your normal font (<Esc>(3@). For example, to print the zip code 60605-1234 you type:


(606051234X)

Where "X" is the checksum.

Checksums

The checksum digit is easy to calculate. Basically, the sum of all the digits in the bar code PLUS the checksum digit must be an even multiple of 10. (The sum must be evenly divisible by 10.) The same rule holds true for 5 digit zip codes.

For example, take the zip code 12345-6789. The sum of the digits is 45 (1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9). So a checksum of 5 is need to make the total divisible by 10. (With the checksum the total sum is 50.) So, to print this bar code type:

12345-6789 → (1234567895) → 

Notes

Depending on your post office the following *may* be true. All Postal Bar Codes must be parallel to the bottom edge of the envelope you are printing on. (within +-5 degrees)

The Postal Bar Code MUST appear in the lower right hand corner of your mail. The base of the bar code should be 3/16" from the bottom of the envelope. The bar can start up to 4" from the right margin. The bar must end at least 5/8" from the right margin.

PB090RPN.USP / PostNet, portrait

UPC-A Fonts

This package contains two different sized UPC-A soft fonts. These include 48 and 72 point versions. The UPC-A font actually contains four separate bar code patterns and a special guard bar. There are four separate bar patterns because each UPC-A bar code includes four separate parts, each of which is represented by a different bar code pattern. These four parts are: product code, left 5 digits, right 5 digits, and checksum.

Product Code	Left 5 Digits	Right 5 Digits	Checksum
P = 0	0 = 0	@ = 0	` = 0
Q = 1	1 = 1	A = 1	a = 1
R = 2	2 = 2	B = 2	b = 2
S = 3	3 = 3	C = 3	c = 3
T = 4	4 = 4	D = 4	d = 4
U = 5	5 = 5	E = 5	e = 5
V = 6	6 = 6	F = 6	f = 6
W = 7	7 = 7	G = 7	g = 7
X = 8	8 = 8	H = 8	h = 8
Y = 9	9 = 9	I = 9	i = 9

To print a UPC-A bar code you need to calculate a checksum for it. For example, suppose you wanted to print the UPC-A code for: 7 35173 80495. To calculate the checksum take the entire string of 11 digits, (product code, 5 left digits, 5 right digits) and starting from the left add each of the odd position digits (add the first, third, fifth, etc.) Multiply the result of this addition by three (3). Now, starting from the left again, add all the even digits (second, fourth, etc.) Add this result to the previous result that was multiplied by three. Divide this number by 10 and take the remainder (not the result) and subtract it from 10. That is the checksum byte! For our number 73517380495 we calculate as follows:

odd digits: $7+5+7+8+4+5 = 36$, $36 * 3 = 108$


even digits: $3+1+3+0+9 = 16$

odd + even: $108 + 16 = 124$, remainder when you divide by 10 = 4

checksum: $10 - 4 = 6$, So the correct checksum is 6

Now that we have a checksum we can print a complete bar code. The data is: 7 35173 80495 6. Next we need to map this string according to the position of bar code data within the font. The product code (7) is remapped to the letter "W". The left five digits stay the same "35173". Next add a "|" for the guard bar between halves of the bar code. The right five digits, 80495, get remapped to H@DIE. Finally, the checksum, 6, is remapped to the letter f. So the string that will print a UPC-A bar code has become:

"W35173|H@DIEf" To print a UPC-A bar code, select the UPC-A font, send that string to your printer, then select the normal font (<Esc>(3@).

7 35173 80495 → W35173|H@DIEf →  7 35173 80495 6

UPCA36.USP - 36 point tall, portrait
UPCA48.USP - 48 point tall, portrait
UPCA72.USP - 72 point tall, portrait

Font Selection

BR180H46.USP Name: Bar 3/9 Human Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s0p4.72h18.2v0s0b83T"

BR360H46.USP Name: Bar 3/9 Human Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s0p4.72h36.2v0s0b83T"

BR480H46.USP Name: Bar 3/9 Human Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s0p4.72h48.2v0s0b83T"

BC120R47.USP Name: Bar Code 2/5 Symbol Set=1Y Resolution=300
Font Calling Sequence: <Esc>(1Y<Esc>(s1p12.1v0s0b170T"

BC240R47.USP Name: Bar Code 2/5 Symbol Set=1Y Resolution=300
Font Calling Sequence: <Esc>(1Y<Esc>(s1p24.2v0s0b170T"

BC240R71.USP Name: Bar Code 2/5 Symbol Set=1Y Resolution=300
Font Calling Sequence: <Esc>(1Y<Esc>(s1p24.2v0s0b170T"

BC120R71.USP Name: Bar Code 2/5 Symbol Set=1Y Resolution=300
Font Calling Sequence: <Esc>(1Y<Esc>(s1p12.1v0s0b170T"

BI250F55.USP Name: Bar Code 2/5 Int Symbol Set=10U Resolution=300
Font Calling Sequence: <Esc>(10U<Esc>(s1p18.2v0s0b173T"

BI250F42.USP Name: Bar Code 2/5 Int Symbol Set=10U Resolution=300
Font Calling Sequence: <Esc>(10U<Esc>(s1p18.2v0s0b172T"

BI500F42.USP Name: Bar Code 2/5 Int Symbol Set=10U Resolution=300
Font Calling Sequence: <Esc>(10U<Esc>(s1p36.2v0s0b172T"

BI750F42.USP Name: Bar Code 2/5 Int Symbol Set=10U Resolution=300
Font Calling Sequence: <Esc>(10U<Esc>(s1p54.2v0s0b172T"

BI500F55.USP Name: Bar Code 2/5 Int Symbol Set=10U Resolution=300
Font Calling Sequence: <Esc>(10U<Esc>(s1p36.2v0s0b173T"

BI750F55.USP Name: Bar Code 2/5 Int Symbol Set=10U Resolution=300
Font Calling Sequence: <Esc>(10U<Esc>(s1p54.2v0s0b173T"

BR360H62.USP Name: Bar 3/9 Human Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s0p6.49h36.2v0s0b81T"

BR180H62.USP Name: Bar 3/9 Human Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s0p6.49h18.2v0s0b81T"

BR480H62.USP Name: Bar 3/9 Human Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s0p6.49h48.2v0s0b81T"

BR180R62.USP Name: Bar Code 3/9 Symbol Set=0U Resolution=300

Font Calling Sequence: <Esc>(0U<Esc>(s0p6.49h18.2v0s0b80T"

BR360R62.USP Name: Bar Code 3/9 Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s0p6.49h36.2v0s0b80T"

BR480R62.USP Name: Bar Code 3/9 Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s0p6.49h48.2v0s0b80T"

BR180R46.USP Name: Bar Code 3/9 Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s0p4.72h18.2v0s0b82T"

BR360R46.USP Name: Bar Code 3/9 Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s0p4.72h36.2v0s0b82T"

BR480R46.USP Name: Bar Code 3/9 Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s0p4.72h48.2v0s0b82T"

OA120R10.USP Name: OCR A Symbol Set=0O Resolution=300
Font Calling Sequence: <Esc>(0O<Esc>(s0p10.0h12.1v0s0b252T"

OB120R10.USP Name: OCR B Symbol Set=1O Resolution=300
Font Calling Sequence: <Esc>(1O<Esc>(s0p10.0h12.1v0s0b252T"

PB090RPN.USP Name: Postal Bar Code Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s1p9.1v0s0b247T"

UPCA48.USP Name: UPC-A Symbol Set=9U Resolution=300
Font Calling Sequence: <Esc>(9U<Esc>(s1p48.48v0s0b201T"

UPCA72.USP Name: UPC-A Symbol Set=0U Resolution=300
Font Calling Sequence: <Esc>(0U<Esc>(s1p72.78v0s0b201T"

UPCA36.USP Name: UPC-A Symbol Set=9U Resolution=300
Font Calling Sequence: <Esc>(9U<Esc>(s1p36.2v0s0b201T"

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