



# ELFRING FONTS, INC.

## BAR CODE 93

This package includes 12 bar code 93 fonts, in the TrueType and PostScript formats plus a Windows utility, BAR93, that helps you make bar codes. There are two basic versions of bar code 93 font in this set: standard 93 and a human readable 93. Each of these two versions comes in six different aspect ratios. The different aspect ratios let you print bar codes with the same height, but at different horizontal character densities.

Bar code 93 was introduced in 1982 as a high density replacement for bar code 3/9. Code 93 allows variable length encoding of alpha-numeric data and requires a checksum. Bar code 93 lets you directly encode 0-9, A-Z, \$, %, +, -, ., / and the space character. It also includes four special non-ASCII characters: \$, %, /, and ⊕, which let you encode the full ASCII character set.

	Standard Bar Code 93	Human Readable Bar Code 93
Bar Code 93 Samples		

### INSTALLATION

Our Barcod93.exe program will install this package and font set in your copy of Windows. The fonts will be installed into the proper Windows font folder automatically. Our bar code utility program, Bar93.exe, this documentation, and matching files will also be installed. The bar code fonts will appear in all Windows font menus. You can select any one of the bar code just as you normally select any other font in your application. For help in building bar codes, run the Bar93.exe utility program. To access the utility program or the documentation, click on Start, Programs, Bar Code 93, and select the program or documentation item you want to view.

### USER ACCESSIBLE FILES

In Windows 11 - 7 users are not allowed to access any files stored in the Programs folder. The Visual Basic macros, label templates, and sample Excel spread sheet are placed into a folder named "Bar93" in each user's Documents area. You can find these files as follows:

Windows XP: My Documents\Bar93

Windows 7: Libraries\Documents\ Bar93

Windows 8: Libraries\Documents\ Bar93

Windows 10: Libraries\Documents\ Bar93

Windows 11: Libraries\Documents\ Bar93

## BAR CODE BASICS

A bar code is made up of a series of parallel vertical bars and spaces. Bar codes are designed to convey information in a machine-readable format. In addition, some bar codes include a human readable portion so that a person can easily understand the bar code. Bar codes always start with a special character, or symbol, that tells the machine scanning that bar code to start the reading process. *(This Start character will also tell the reader what bar code symbology is being used.)* A bar code always ends with a special character, or symbol, that tells the reader that this is the end of the bar code *(the Stop character)*.

Some bar codes also require a checksum. A checksum is a special character that is added to your bar code. The checksum tells the bar code reader that the bar code is correct. The checksum character is read by the bar code scanner, but it is not passed along as part of the data. The checksum must be printed after the data, and before the Stop code.

The bar codes in this package are implemented as TrueType fonts. Each character in the font corresponds to its matching bar code pattern. To use a bar code font, you switch to the bar code font, enter the bar code Start character, the data that you want to encode, a checksum, and then the Stop character. Windows will display this data as a bar code on screen and will print a bar code on virtually any printer connected to Windows. For examples of how to do this, run the Bar93 program.

TrueType fonts are scaled by changing their height. The character's width is altered proportionate to the change in height. You can pick virtually any font height by changing the point size. *(There are 72 points to the inch.)* Unfortunately, when printing bar codes you frequently want to control both the bar height and its width, independent of each other. *(Printers and scanners can only handle a fixed range of print densities.)*

This package gives you six different variations of bar code 93 in both standard and human readable formats. If you need thicker bars, which print at the same height, you use a shorter bar code 93 font at a bigger point size. If you need thinner bars, which print at the same height, you use a taller bar code 93 font at a smaller height. By switching between the six different versions of the same bar code font, you should be able to print these bar codes at both the height and the width you need.

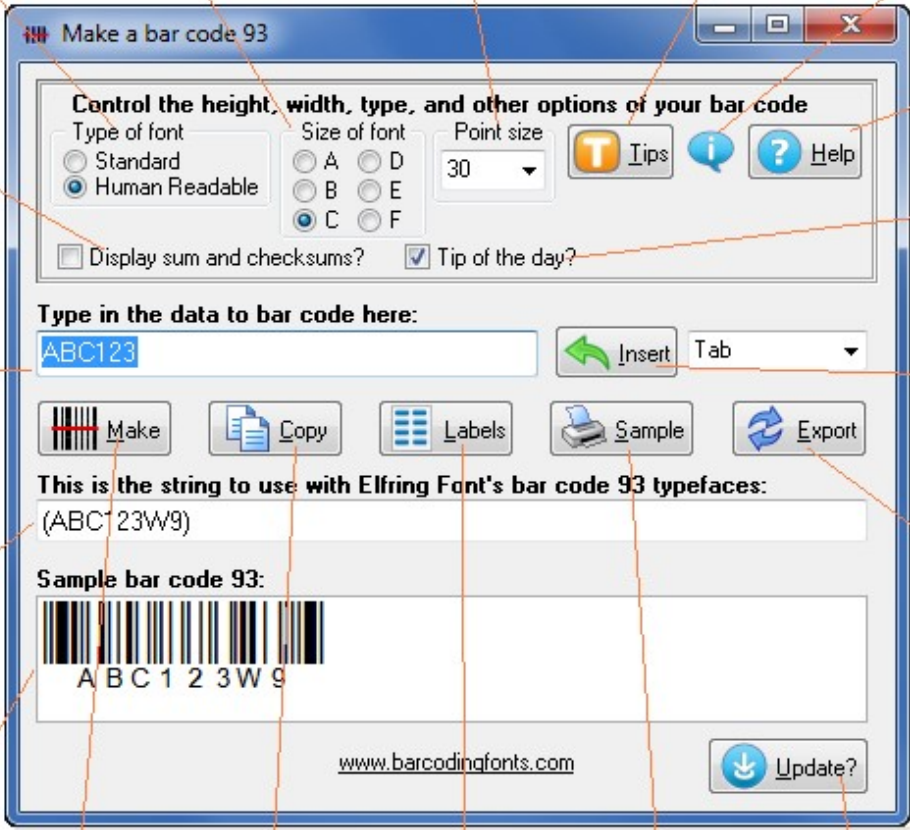
## BAR CODE FONTS

This package contains two different versions of the Bar Code 93 font. They include a standard Bar Code 93 and a human readable Bar Code 93 with text below the bar code. Each version has six separate variations, so you can control bar code height and width *(or the aspect ratio)* independent of each other. This bar code set thus contains a total of 12 TrueType fonts.

Typeface Name	Bar Code 93 a	Bar Code 93 b	Bar Code 93 c	Bar Code 93 d	Bar Code 93 e	Bar Code 93 f
Standard Bar Code 93						

Typeface Name	Bar Code 93 a HR	Bar Code 93 b HR	Bar Code 93 c HR	Bar Code 93 d HR	Bar Code 93 e HR	Bar Code 93 f HR
Human Readable Bar Code 93	 A 1 2 B	 A 1 2 B	 A 1 2 B	 A 1 2 B	 A 1 2 B	 A 1 2 B

## BAR93 UTILITY PROGRAM



The screenshot shows the 'Make a bar code 93' utility program interface. The window title is 'Make a bar code 93'. The main area is titled 'Control the height, width, type, and other options of your bar code'. It includes a 'Type of font' section with radio buttons for 'Standard' and 'Human Readable' (selected). There is a 'Size of font' section with radio buttons for A, B, C, D, E, and F (C is selected). A 'Point size' dropdown is set to 30. There are buttons for 'Tips', 'Help', and 'Info'. A checkbox for 'Display sum and checksums?' is unchecked, and a checkbox for 'Tip of the day?' is checked. Below this is a text input field containing 'ABC123' and an 'Insert' button with a dropdown menu showing 'Tab'. A row of buttons includes 'Make', 'Copy', 'Labels', 'Sample', and 'Export'. Below that is a text field for 'This is the string to use with Elfring Font's bar code 93 typefaces:' containing '(ABC?23W9)'. A 'Sample bar code 93:' section shows a barcode with the text 'A B C 1 2 3 W 9' below it. At the bottom, there is a website URL 'www.barcodingfonts.com' and an 'Update?' button with a download icon.

1 Type of bar code

2 Display sum and checksum

3 Change bar code height

4 Change bar code width

5 Enter data to bar code

6 Make a bar code

7 Copy to clip board

8 Display converted bar code data

9 This is your 93 bar code

10 Show a Tip of the Day

11 Program information

12 Help

13 Tip of the Day

14 Print a sample

15 Check for updates

16 Insert a special character

17 Print labels

18 Export a bar code

This utility converts your bar code 93 data into actual bar codes. Use this utility to build bar codes and then to copy and paste them into other Windows programs for printing. Click on any orange circle below to view a description of exactly what that control does. Bar codes can be copied into Word for label printing, or into a desktop publishing program to display a bar code on your packaging. These bar code fonts are compatible with virtually any Windows program. For programs like Excel and Access see the package documentation for details on using our Visual Basic macros directly inside of those programs.

- 1) Select the type of bar code 93 to create. Standard bar codes just display bar code patterns. You can also choose human readable bar codes that display the text the bar code represents either above or below it.
- 2) Display sum and checksum calculations to help you debug your own routines.
- 3) Modify the height of a bar code without changing the width. Bar codes can range from .25 to 1 or more inches in height.
- 4) Scale the bar code width up or down by increasing or decreasing the point size.
- 5) Type in the data you want to bar code here. Your data can contains numbers (0-9), upper case letters (A-Z) and the special characters: space, \$ % + - . / . Our program will add the Start and Stop character for you. It will also calculate the two checksums and add them to your bar code.
- 6) Click this button to **Make** a bar code from your data. The bar code will then be displayed in the bottom window of this program.
- 7) **Copy** your completed bar code to the Windows clip board. (*The Windows clip board is invisible- don't worry about where it is or how it works.*) You can then paste this bar code directly into virtually any Windows program by pressing Ctrl-V or using the Edit, Paste menu in that program.
- 8) This is the string of characters to use with our bar code fonts. This string includes the Start and Stop codes plus any optional checksum. Note that you can not just type in the bar code 93 font, you must always add a Start and Stop character plus two checksums.
- 9) This is a sample of what your bar code will look like. Note that Windows screen resolution is fairly low, so the bar code displayed may not exactly match what will be printed.
- 10) Display the next program Tip of the Day. From here you can page forwards or backwards through the entire list of available tips.
- 11) Display program and contact information including the version number of this software.
- 12) Launch the Windows Help application. The Help form will give you detailed answers to most questions about the program.
- 13) Display the next *Tip of the Day* on each start up when this is checked. Uncheck the box to stop this start up behavior.
- 14) Print a **Sample** page of your bar code 93 to see just what it will look like. This sample page shows you your bar code in a number of different sizes. Use this printout to check bar codes you are printing yourself.
- 15) Check the web for a program update. You must have an active internet connection running. A web page will be displayed with information about the current version of this program and whether or not you need to update.
- 16) Insert a special character into your bar code that you can not normally type in Windows.
- 17) To print a sheet of labels, click the **Labels** button. The program will prompt you for the label size, then launch a label template in your word processor.

18) **Export** a bar code as a gif, jpg, or png file.

## BAR CODE 93

Bar code 93 is similar to bar code 3 of 9 in format. Each bar code requires a **two** character checksum. Our bar code 93 fonts use the “(” character as a Start code and the “)” character as a Stop code. The bar code 93 format lets you encode numbers, capitol letters, some punctuation, and the space character in your bar code data. It also supports a Full ASCII mode, as detailed later. These fonts let you access the following characters as bar codes:

**Table 1**

ASCII		Code	ASCII		Code	ASCII		Code
Pos	Char	93	Pos	Char	93	Pos	Char	93
32	space	~	66	B	B	84	T	T
36	\$	\$	67	C	C	85	U	U
37	%	%	68	D	D	86	V	V
43	+	+	69	E	E	87	W	W
45	-	-	70	F	F	88	X	X
46	.	.	71	G	G	89	Y	Y
47	/	/	72	H	H	90	Z	Z
48	0	0	73	I	I			
49	1	1	74	J	J	40	(	Start
50	2	2	75	K	K	41	)	Stop
51	3	3	76	L	L			
52	4	4	77	M	M	60	<	Ⓢ
53	5	5	78	N	N	61	=	Ⓣ
54	6	6	79	O	O	62	>	Ⓛ
55	7	7	80	P	P	63	?	Ⓟ
56	8	8	81	Q	Q			
57	9	9	82	R	R			
65	A	A	83	S	S			

Note that since TrueType fonts do not allow a printable character to be defined for the space position, we have mapped the actual bar code 93 space character to the tilde “~” character.

To print a bar code of the data 456ABC, you need to add the Start code “(” to the beginning of the string, calculate the two checksums (*see the next section*) “Ⓢ/” and append the checksum characters to the end of the string, and then add a Stop code at the very end of the string, “)”.

“(“ + “456ABC” + “Ⓢ/” + “)”

So the actual string to print is (456ABC</). This becomes the bar code:

(456ABC</) =>  => standard bar code 93

(456ABC</) =>  => human readable bar code 93

## BAR CODE 93 CHECKSUM

Bar code 93 requires a two character checksum. The checksum characters follow your data and are positioned before the Stop code. Each checksum is calculated with a weighted modulo 47 routine. If you want to use Access, Excel, or Word to print bar codes, see our Visual Basic function documentation near the end of this manual. To calculate a checksum, each bar code 93 character is assigned a numerical value, from 0 to 46, shown in the table below. This value is multiplied by a weighting factor and the result is summed. A modulo 47 division is then performed. The table below shows the numerical value assignment for bar code 93.

**Table 2**

Code 93	Value	Code 93	Value	Code 93	Value	Code 93	Value
0	0	C	12	O	24	-	36
1	1	D	13	P	25	.	37
2	2	E	14	Q	26	space	38
3	3	F	15	R	27	\$	39
4	4	G	16	S	28	/	40
5	5	H	17	T	29	+	41
6	6	I	18	U	30	%	42
7	7	J	19	V	31	Ⓓ	<
8	8	K	20	W	32	Ⓔ	=
9	9	L	21	X	33	Ⓕ	>
A	10	M	22	Y	34	Ⓖ	?
B	11	N	23	Z	35		

To generate the checksum digits “C” and “K” for the string “456ABC” you first need to translate the characters to their values, using Table 2. Then assign a weighting factor for the C checksum from right to left, starting at 1. (*The C weighting factor ranges from 1 to 20, then resets to 1, ranges up to 20 again, etc. The K weighting factor ranges from 1 to 15, and then resets to 1, ranges up to 15 again, etc.*) Now multiply each weighting factor times the data value and add all these numbers up. Finally, divide the sum by 47. The remainder of this division (not the result, the remainder) is the value of the C checksum. Remember that the C weight only ranges from 1 to 20.

Data	4	5	6	A	B	C	C	K
Data Value	4	5	6	10	11	12		
C Weight	6	5	4	3	2	1		
Product	24	25	24	30	22	12		

To calculate the C checksum, multiply each weight factor times the data value and sum them, as follows:

$$(4 * 6) + (5 * 5) + (6 * 4) + (10 * 3) + (11 * 2) + (12 * 1) = 137$$

Then divide 137 by 47, which equals 2 remainder 43, so the checksum is the character with the value of the remainder, 43 = “Ⓓ” (which is the “<” character- see Table 2).

The K checksum is done in a similar fashion. Remember that the K weight only ranges from 1 to 15.

Data	4	5	6	A	B	C	<	K
Data Value	4	5	6	10	11	12	43	
K Weight	7	6	5	4	3	2	1	
Product	28	30	30	40	33	24	43	

$$(4 * 7) + (5 * 6) + (6 * 5) + (10 * 4) + (11 * 3) + (12 * 2) + (43 * 1) = 228$$

Divide the 228 by 47 and you get 4 remainder 40, so the K checksum value is 40, which is the “/” character. So the string to use with our bar code 93 fonts is:

$$(456ABC\textcircled{S}/) = (456ABC</>)$$

**Note** that the *C Weight* value cycles from 1 to 20, and the *K Weight* value cycles from 1 to 15. When a weight value reaches its maximum, it automatically resets to 1 for the next item in line. This only matters on bar codes that are 14 digits or longer. So *C Weight* looks like: 1, 2, 3, ... 19, 20, 1, 2, 3, ... and the *K Weight* looks like: 1, 2, 3, ... 14, 15, 1, 2, 3, ....

To calculate the checksum for the bar code data “BAR 5577” we follow the same process:

Data	B	A	R		5	5	7	7	C	K
Data Value	11	10	27	38	5	5	7	7	2	0
C Weight	8	7	6	5	4	3	2	1		
K Weight	9	8	7	6	5	4	3	2	1	

$$C = (11*8) + (10*7) + (27*6) + (38*5) + (5*4) + (5*3) + (7*2) + (7*1) = 566/47 = 12 \text{ remainder } 2, \text{ So } C = 2, \text{ which is the “2”}.$$

$$K = (11*9) + (10*8) + (27*7) + (38*6) + (5*5) + (5*4) + (7*3) + (7*2) + (2*1) = 678/47 = 14 \text{ remainder } 20, \text{ So } K = 20, \text{ which is the “K”}.$$

Note that the space character must be replaced by the “~”, so the string to use with our bar code 93 fonts is:



## BAR CODE 93 FULL ASCII

Bar code 93 has only 47 characters defined for it. Four of those characters are reserved for encoding all 128 ASCII characters using the Full ASCII feature of bar code 93. Since these are reserved characters that are not part of the normal alphabet, code 93 provides non-ambiguous full ASCII, unlike bar code 3 of 9. (*You don't have to tell your bar code reader you want to read full ASCII.*)

Special symbols:  $\textcircled{S}$ ,  $\textcircled{R}$ ,  $\textcircled{O}$ , and  $\textcircled{+}$ , modify the meaning of all the other characters in bar code 93. Thus it takes two characters to create each new ASCII character. You get a lower print density, but can print





## ASPECT RATIOS

This complete bar code 93 font set includes 6 different aspect ratios of each bar code: .25 (*a*), .5 (*b*), .75 (*c*), 1.0 (*d*), 1.25 (*e*), and 1.5 (*f*). When you are building a bar code, start with the *d* version of the bar code font. Once you have the bar code length set to what you want, you can vary the bar code height, without changing the bar code length, by changing the font to one of the *a*, *b*, *c*, *e*, or *f* versions. The *b* version will print a bar code of exactly the same length as the *d*, but at .5 times the bar height. The *e* version will print a bar code of exactly the same length as the *d*, but at 1.25 times the bar height. Maximum print density (*not including Start/Stop codes*) is 11.11 characters/inch on 300 dpi printers, or 22.22 CPI on 600 dpi printers. If you exceed this print density, your bar code scanner may not be able to read the bar codes you print.

## PRINTING SHEETS OF LABELS

This bar code font set adds the ability to print bar codes to other, existing Windows programs. It does not print bar code labels all by itself. It uses label templates to lay out label sheets in your existing word processor. A template tells your word processor how to arrange information to fit specific sheets of labels. Once you have a template you can use any word processor to build your own labels with bar codes. The bar codes do not have to be identical and you can also include other text or graphics on each label. Our utility will let you create a bar code and then automatically open up the label template of your choice in your word processor.

Just click on *Labels*, select a label size, and click *Print*. Your word processor will open and display the label template. Put the cursor in the first label and paste your bar code there. Adjust the size of the bar code to fit the label by changing the font name and point size.

This package includes label templates in RTF format (*compatible with virtually all word processors*) for most popular label styles. You can open any of these templates in your word processor to lay out a label. To locate these files using your word processor click on *Open* and then select the “Libraries\Documents” folder. Look for a new subfolder with the name: \Bar93.

Template	Label Size	Labels/Sheet
ef167.rtf	1.75 x 0.50	80
ef570.rtf	1.75 x 1.25	32
ef060.rtf	2.625 x 1.00	30
ef161.rtf	4.00 x 1.00	20
ef162.rtf	4.00 x 1.33	14
ef163.rtf	4.00 x 2.00	10
ef197.rtf	4.00 x 1.50	12
ef164.rtf	4.00 x 3.33	6

Our Bar93 utility also lets you create your own custom label template. See your word processor manual for details on how to create a template, or download one from your label supplier. Once you have your own custom template, save the template file (*in rich text format*) in the My

Documents/Bar93 folder with the file name “custom.rtf”. Our Bar93 utility can directly access that template to let you easily print labels.

### EMBEDDING BAR CODE FONTS IN PDF FILES

**The fonts in this bar code set are not embeddable.** When you embed a font in a PDF document, you are actually distributing a copy of that font with every single PDF file you generate. Your PDF generator glues a copy of the bar code font to the end of each PDF file it builds. This font is then installed on every computer that views the PDF document.

**Embeddable versions of these fonts are available, at additional cost.** Pricing for this add-on font set is based on how many computers the embeddable fonts will be installed on and how many people will view the PDF files. When you purchase an embeddable add-on font set you receive a new version of these fonts, and the new fonts will embed in PDF files. You must contact Elfring Fonts to order an embeddable add-on font set.

### Visual Basic FUNCTIONS FOR ACCESS, EXCEL, AND WORD

This package contains macros / functions that let you automatically build bar code 93 strings in Excel, Access, and indirectly in Word. This set includes the following functions:

**Table 4**

<b>Function</b>	<b>Details</b>
Bar93(Text)	Converts the input text string into bar code 93 format. The function adds the Start code, appends the data, calculates and adds the two checksums, and puts the Stop code at the end. This result must be formatted with one of the following typefaces: Code 93 a, Code 93 a HR, Code 93 b, Code 93 b HR, Code 93 c, Code 93 c HR, Code 93 d, Code 93 d HR, Code 93 e, Code 93 e HR, Code 93 f, Code 93 f HR. Non-legal characters are ignored.
Bar93fa(Text)	Converts the input text string into bar code 93 format, using Full ASCII mode. The function adds the Start code, appends the data, calculates and adds the two checksums, and puts the Stop code at the end. Characters not part of the base 47 character set are converted into character pairs. This result must be formatted with one of the following typefaces: Code 93 a, Code 93 a HR, Code 93 b, Code 93 b HR, Code 93 c, Code 93 c HR, Code 93 d, Code 93 d HR, Code 93 e, Code 93 e HR, Code 93 f, Code 93 f HR.

#### **Warning!**

Unlike our utility program, *Bar93*, these Visual Basic functions do **very** limited error checking. You must make sure that the data you send to the function is correct! If you send bad data, your bar codes may be unreadable or they may not encode the data you think they have. Please use the *Bar93* utility program to verify that your data is correct before using these Visual Basic functions to mass produce bar codes.

### Using Visual Basic Functions in Excel

Open the spread sheet you want to add bar code 93 functions to (*or create a new spread sheet*). Click on Tools, Macros, then Visual Basic Editor. In the Visual Basic Editor tool, click on File, Import File, and select the drive and folder where you installed our Bar Code 93 package (*probably Bar93*). The Visual Basic file **VBbar93.bas** should appear there. Select this file and open it. This will add a new module, EFBAR93, to your spread sheet. This module adds the two functions (*see Table 4*) to your spread sheet and is saved along with it.

These bar code functions can be used in any formula or cell to build working bar codes. For example, if cell H9 is defined as a text cell (*Format, Cell, Number, Text*) and cell I9 has the formula, =Bar93(H9), then any text entered in cell H9 will be converted into a bar code string in cell I9. Note that you also need to select the proper typeface for that bar code type, using Format, Cell, Font. See Chart 1 for applicable font names.

### Using Visual Basic functions in Access

Open the database you want to add bar code 93 functions to (*or create a new database*). Under your database Objects, click on Modules, then click on the New icon at the top of the box. This will bring up the Visual Basic Editor tool. Click on File, Import File, and select the drive and folder where you installed our Bar Code 93 package (*probably Bar93*). The Visual Basic file **VBbar93.bas** should appear there. Select this file and open it. This will add a new module, EFBAR93, to your database. This module adds the six functions to your database and is saved along with it. Table 4 lists these functions.

These bar code functions can be used in a report to build working bar codes. To use these functions, pass data to them from your table fields and return the result in a report. You do this by entering a formula =Bar93([table.field]) in the control source field of the report. Note that you need to select the proper typeface for that bar code subset. See Chart 1 for a complete listing of font names.

### Using Visual Basic functions in Word

Word does not have the ability to directly use Visual Basic functions. You can, however, combine Word and Excel to print bar code 93! The basic idea is to keep your data in Excel, and to have Excel format the data for bar code printing. You then do a mail merge in Word, selecting the formatted string from Excel as the data source.

Place your data in Excel in a specific column. You then apply one of our bar code functions to the data in that column, producing a second column that contains the formatted string. This second column is passed to Word in the mail merge. You must make sure to select the proper subset typeface for your mail merge field. See Chart 1 for a complete list of font names. Also note that the on-screen display of the bar code will not look correct. Only the data printed by the mail merge will be in the correct bar code 93 format.

## Glossary

**Application Program:** a computer program that performs useful work not related to the computer itself. Examples are word processors, spreadsheets, accounting systems, and engineering programs.

**ASCII:** American Standard Code for Information Interchange – a standard code for representing characters as numbers that is used on most microcomputers, computer terminals, and printers.

**Aspect ratio:** the ratio of height to width.

**Character string:** a sequence of characters stored in a computer and treated as a single data item.

**Checksum:** a number that accompanies data transferred from one place to another and helps to ensure that the data was transferred correctly.

**Clipboard:** a holding area to which information can be copied in order to transfer it from one application to another.

**CPI:** characters per inch.

**DPI:** dots per inch: the number of pixels or printer dots per linear inch.

**Font:** a complete collection of characters, in a consistent style and size. This includes upper and lower case letters, numerals, punctuation, ligatures, and reference marks.

**Modulo:** a mathematical operation that gives the remainder when one number is divided by another.

**Pixels:** one of the individual dots that make up a graphical image.

**Radio button:** small circles in a dialog box, only one of which can be chosen at a time. Choosing any button with the mouse causes all the other buttons in the set to be cleared.

**Scalable:** able to be used on a large or small scale without major changes.

**Scalable font:** a font that can be used to print characters of any size. Many newer laser printers include scalable fonts.

**Symbology:** a method of representing information by printed characters.

**TrueType Font:** an outline typeface that can be scaled or sized to practically any size.

**Scanner:** a device that enables a computer to read printed or handwritten page.

**Start Code:** the leading character of a bar code that identifies what kind of bar code it is.

**Stop Code:** the last character of a bar code that tells the bar code reader when it has reached the end of the code.

**Utility:** a program that assists in the operation of a computer but does not do the main work for which the computer was bought.

**Visual Basic Macros:** a small program written in Visual Basic and used in Microsoft products like Excel, Access, or Word to help create bar codes.

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