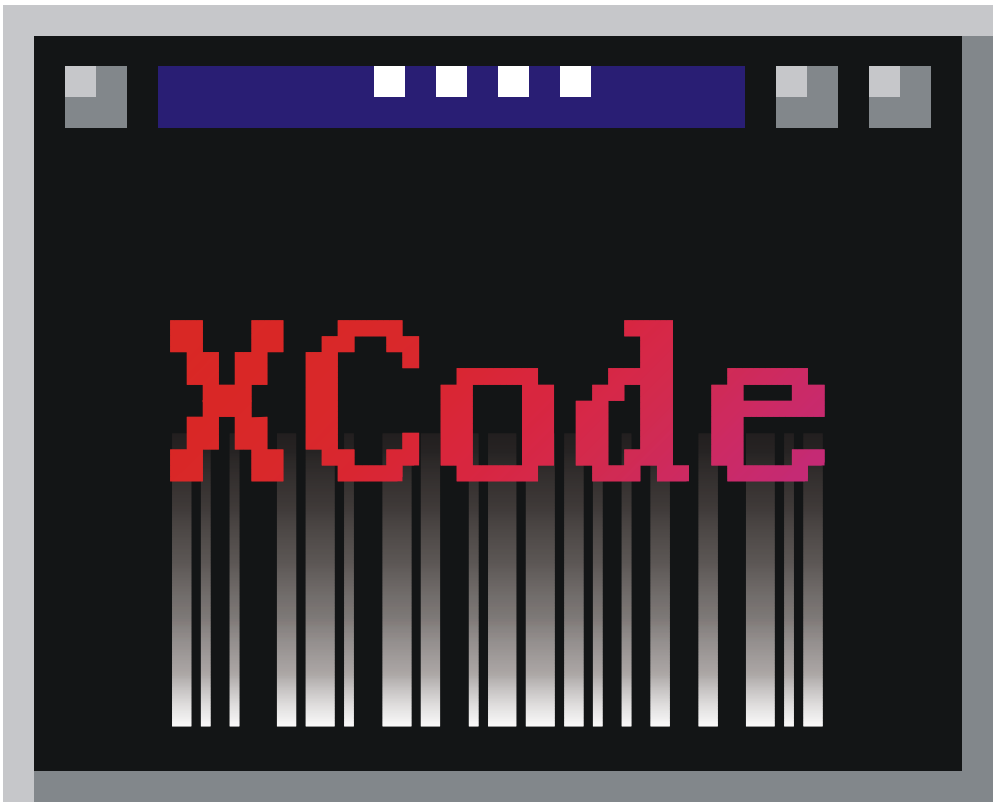

Version 1.0

WARNING – SERIALIZED COPY

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SUMMARY

Introduction

xCODE® is a software package including three Ms-Dos executables for directly printing bar codes on several kind of printers. The supported printers are:

- PCL 4 laser compatibles (e.g. HP LaserJet family)
- PCL 5 laser compatibles or better (e.g. HP LaserJet 4, 5, 6 families)
- Epson-LX compatibles
- Epson-LQ compatibles
- IBM Proprinter II compatibles

All generators can create barcodes in the following symbologies:

- Code 39
- Code 93
- Interleaved 2/5 (‘0’-padded on the left)
- Interleaved 2/5 (NULL-padded on the right)
- Industrial 2/5
- 5 Bars 2/5
- 3 Bars 2/5
- BCD Matrix 2/5
- MSI
- EAN-13
- EAN-8
- UPC-A
- UPC-E
- Codabar/Monarch
- Code 128

The bar codes created following the directions in this manual can be read with traditional instruments, such as optical pen, CCD readers and laser scanners.
All barcode generators can be interactively configured and the settings can be saved inside the executable or to an external file.
The codes to be printed can be specified on the command line or inside a script file.
The properties of the barcodes, such as large/narrow bar width, symbology, check digit, positioning, readable text, can be modified by the user.
The check digit, which is always needed for a few symbologies (such as Code 128 and EAN/UPC family), reccomended for others (Interleaved 2/5) or optional (e.g. Code 39), is calculated with a different algorithm for each symbology and is determined from the contents being encoded; it supplies the decoder with an additional information that can be used to determine if the barcode was interpreted correctly, thus increasing the degree of security.
Every symbology is characterized by a few features, the most important of which are:

- alphabet – every symbology admits digits 0 to 9; a few symbologies let you use alphabetic characters and special characters, others include the full ASCII set;
- length – fixed or variable, limited only by the size of the resulting symbol;
- compactness – the same contents, expressed in different symbologies, create symbols of different lengths; moreover, a few symbologies, given the same length of text to be encoded, create bar codes of different size; this is because these symbologies optimize the information in different ways, depending on both contents and disposition (e.g. Code 128);
- security – a few symbologies should include a check digit, for being read with a high degree of security (e.g. Interleaved 2/5); more complex symbologies make use of bars of different

thickness, thus it is necessary that both printing and reading devices can handle them correctly.

The field of application very often determines the symbology which should be used.

Installation

To speed up execution, copy the file(s) needed to your hard drive. If necessary, it is possible to run the generators from cd-rom; in this case, it will not be possible to modify default values.
To obtain the list of the main options for each generator, type the name of the executable without any parameter: a short summary of options will be printed to screen, with the default values between [brackets]; for the full list of options, read the rest of this manual.
If you specify the parameter SETUP when invoking the generator, it will be possible to set the features of your printer and change default values for many options.

Patcode

PATCODE.EXE is a barcode generator designed for the maximum performance on the latest laser printers: the bar codes are sent using 300-dpi user defined patterns, and this results in lesser bytes to be sent to printer (compared to raster graphics) and faster printing times.

PATCODE works on HP LaserJet IIIP and LaserJet 4-6 families, and with all the printers PCL-5 compatible that allow user defined patterns.

Since PATCODE redefines by default the user pattern with ID 1, if you are printing without additional escape sequences (option Nx), avoid using user pattern 1, or specify a new ID by setting x in Nx as needed.

Features

The main features of this generator are:

- barcode printing, with support for full set of characters, in the following symbologies: EAN-13, EAN-8, INDUSTRIAL, INDUSTRIAL 5 BAR, BCD MATRIX, MATRIX 3 BAR, MSI, INTERLEAVED, UPC-A, UPC-E, CODABAR/MONARCH, 39, 93, 128;
- large and narrow bar width user selectable;
- Interleaved 2/5 ‘0’-padded or NULL-padded;
- user-selectable start letter for Codabar barcode (a/b/c/d);
- check digit for all symbologies calculated according to standard algorithms;
- MSI with single or double check digit;
- barcodes can be printed without check digit, to use a different control algorithm;
- human readable code can be printed in 4 alignments (left, right, center, following barcode) and can also be excluded;
- multi-line text can be added above barcode and can be aligned to the left, to the right or centered;
- possibility to print single barcodes, codes belonging to an interval and repeated codes, or a combination of these;
- user selectabled barcode height (in mm);
- print to any parallel port (LPT1-LPT2-LPT3), with or without stop at the end of the page, or to a file;
- full page management: form feed, printable area, first code position, horizontal and vertical separation, number of labels per row, number of rows per page, horizontal and vertical compensation offset (to fix uneven label separation), HRC distance, text pitch;
- barcodes can be printed in 4 directions (right to left, left to right, up-down, bottom-up);
- configuration settings can be saved and restored from separate files, so that multiple configurations can be quickly selected;
- script-file support, to overcome Ms-Dos command line length limit and to integrate the generator in other applications;
- ability to print only the pattern for the barcode, without escape sequences for page settings and without HRC.

Command line parameters

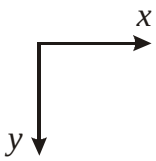
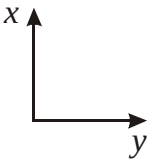
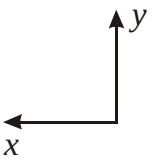
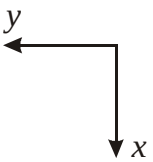
All the following parameters can be specified in any order and without distinction between uppercase and lowercase, unless specified. All parameters, except C and L, have default values that can be saved and that are used if omitted or wrong.

E.g. default values: labels per row = 5, rows per page = 10

D:15	labels per row = 5, rows per page = 15
D6	labels per row = 6, rows per page = 10
D6:15	labels per row = 6, rows per page = 15

Syntax	Function	Remarks
@name	reads the setup stored in name.PAT and replaces default values at the end of the executable	the setup file must have been previously saved with option '&' and must be in the same directory as the generator
&name	writes default setup values to name.PAT, that is created in the same directory of the generator	setup values can be later restored using option '@'
Cx[;s]	specifies code to be printed	it is possible to specify up to 10 commands 'C'; for barcodes 39 and 128 on the command line, the character '_' is automatically translated to blank; use a script file to print this character under Code 128
Cx:y[;s]	prints barcodes from x to y, with the number of digits of y (if the codes are of different lengths); y must be greater than x; if s is specified, s labels are skipped before printing the y-x+1 barcodes in the interval	it is possible to specify up to 10 commands 'C'
Cx,n[;s]	prints code x for n times	it is possible to specify up to 10 commands 'C'
Llabel	specifies the text to be printed above the barcode	it is possible to specify up to 10 'L' commands; the labels follow the order of 'C' parameters; if the number of 'C' commands is greater than the number of 'L' commands, the last label specified is used also for the other 'C' commands; the label is case-sensitive – every character is allowed except for blank, that must be replaced by '_'
Zx	text alignment above barcode; x can be: S left aligned C centered D right aligned	
Tx[+]	specifies the symbology for barcodes; x can range from 0 to 8, according to the following table: x symbology 0 EAN-13 1 INDUSTRIAL 2 MATRIX 3 BAR 3 MSI (1 check digit)	 variant (with +) 0+ EAN-8 1+ INDUSTRIAL 5 BAR 2+ BCD MATRIX 3+ MSI (2 check digits)

	4 INTERLEAVED (NULL-padded) 5 UPC-A 6 CODABAR/MONARCH 7 39 8 128 Note: The parameter T modifies the symbology for the **following** barcodes on the line, while previous codes are generated according to the previous T parameter or to the default (if missing).	4+ INTERLEAVED ('0'-padded) 5+ UPC-E 6+ * 7+ 93 8+ ** * For x = 6, it is possible to specify starting letter for Monarch barcode, that is a, b, c or d, with the syntax: T6A, T6B, T6C e T6D. ** Code 128 variant have check digit in readable text; the check digit is substituted with '.' if it is a non-printable character, and can also be represented by a pair of digits.
Xx	horizontal position for first label (mm)	the distance is measured from the top left angle of the barcode
Yx	vertical position for first label (mm)	the distance is measured from the top left angle of the barcode
Ax	barcode height (mm)	the height is for barcode only, without human readable text or label
Gx	readable code (HRC) alignment; x can have one of the following values: N no human readable code C centered D right-aligned S left-aligned A following barcode	
J	form feed at the end of printing	PCL printers are built so that they don't feed paper if there is nothing to print
F[+ | –]	stop at the end of page: + enables stop; – disables stop.	if only 'F' is specified (no '+' or '– ') the current value is switched (enable if disable and viceversa)
Sx	parallel port	x can be 1, 2 or 3, depending on the port to print to
Ufilename	redirect printing to filename	if filename exists, the program asks the user if it is to be overwritten; if a directory with the same name exists or the file cannot be created, the program ends signaling the condition
Ox	print direction; x can have the following values: 0 prints from left to right 1 prints bottom-up 2 prints from right to left 3 prints up-down	print direction allows to print barcodes vertically or horizontally; text and human readable code follow the same disposition. Actually, this parameter changes the axis as showed on the left, thus margins and coordinates should be changed accordingly.

	0 =  1 =  2 =  3 = 	
Mxx:yy	margins and printable area (mm)	every laser printer can print only well inside the page: this option allows to specify the coordinates at which printable area starts, to match coordinates specified and actual coordinates; to obtain typical values for your printer, use the following parameters to print a barcode: M0:0 X100 Y100 Then : xx = dist. from left border – 100 yy = dist. from top border – 100
Whh:vv	horizontal/vertical separation (mm)	the separation is the distance between two adjacent barcodes
Der:rp	number of labels per row, number of rows per page	
K[+ | –]	check digit status: + enables check digit, – disables check digit	if only ‘K’ is specified (without + or –), check digit status is switched
Px	character pitch (10..15)	the pitch is the number of characters per inch; the higher the pitch, the smaller the character; only fixed-pitch fonts are allowed, because variable fonts do not obey pitch; this option must be combined with the following option I
Id1:d2	text distance from barcode (mm)	when a different pitch or a different font is used, it is useful to change the distance between text and barcode; d1 is the distance between the bottom of the barcode and the bottom of the HRC; d2

		is the distance between the base of the label above the barcode and the top of the bars
Ex	split character for label (1..255)	this character is used to split the label on several lines; the last line is printed above the barcode, at a distance of d2 mm (see parameter I)
Bwi:wb	bar width (1/300 of inch); values in the range 1 to 16	all barcodes are made of black bars and spaces of different widths; EAN/UPC/ 93 barcodes are made only of bars of width wi, the others are made of bars of width wi and wb, black and white; by changing the width of the bars, the barcodes are more compact, but they require a higher resolution for the reading device; by default, wb = wi * 2; changing the default could render the barcodes unreadable; if you use Bwi: the generator assigns to wb the value 2 * wi; if B:wb is specified, wi gets the default value
Hx:xx Vy:yy	offset for horizontal (H) or vertical (V) re-alignment, values in mm; x and y can have any value in the range –5 to +5	the offsets can be used to re-align printing on label-sheets where the horizontal/vertical separation is not an integer number; with this parameter, every xx mm/yy mm the printing coordinates are incremented by x/y mm
Nx	prints only the pattern for the code, without any additional escape sequences for page formatting, HRC or additional text. The parameter x can be used to specify user pattern ID (default = 1)	this parameter can be used to integrate the printing of the barcode with a generic PCL print; the result is: o user pattern ID declaration; o data block for pattern; o print pattern at the current position and with the current print direction. Even if more than one barcode is specified, the block created is always for the first barcode requested. The option N cannot be pre-set in the setup.
SE(TUP)	change and save the default values for all parameters (except C and L) by using interactive menus	

Using script files

In place of using parameters C and L, it is possible to specify all barcodes to be printed by using a script file.

A script file is a text file that is passed to PATCODE as a parameter in this way:

```
PATCODE +script [additional parameters..]
```

where script is the name of the file. It is possibile to specify other parameters, such as, for example, a setup file to be used; any command line parameter C and L is ignored.

PATCODE interprets only the lines in the script that begins with C, S, T, K or J (uppercase or lowercase), ignoring all other lines.

The syntax is the following:

Pfilename	sends the contents of filename to the parallel port
Ccode[,label]	prints the code and the optional label at the current position; the label can include any character, including space; thus, '_' is printed as is
Snumber	skips number labels
K[+ | –]	enables (+), disables (–) or switches the status of the check digit for the following codes
Tx[+ | A-D]	changes the symbology for the following barcodes (see T parameter for additional information)
J	form feed; the next label becomes the first of the new sheet

The function for printing file is available **only** in script files.
By using script files and setup files it is possible to pilot PATCODE from other applications, without the limitations on command line length imposed by Ms-Dos.

Qrastcod

QRASTCOD is a barcode generator designed to be used with PCL 4 and 5 printers; barcode printing is done by creating a raster image, of which only the first line is sent, followed by a series of empty delta-row lines; the efficiency is very good, even though PATCODE is normally more efficient; QRASTCOD, on the other side, can directly create (without resolution enhancement technology) barcodes at 600 dpi, if the printer supports this resolution. Besides, the parameter N can create a single raster block with the barcode, without text and escape sequences, to integrate barcode printing inside another PCL print. If the printer being used does not support PCL 5, disable delta-row compression.

Features

The main features of this generator are:

- barcode printing, with support for full set of characters, in the following symbologies: EAN-13, EAN-8, INDUSTRIAL, INDUSTRIAL 5 BAR, BCD MATRIX, MATRIX 3 BAR, MSI, INTERLEAVED, UPC-A, UPC-E, CODABAR/MONARCH, 39, 93, 128;
- large and narrow bar width user selectable;
- Interleaved 2/5 ‘0’-padded or NULL-padded;
- user-selectable start letter for Codabar barcode (a/b/c/d);
- check digit for all symbologies calculated according to standard algorithms;
- MSI with single or double check digit;
- barcodes can be printed without check digit, to use a different control algorithm;
- human readable code can be printed in 4 alignments (left, right, center, following barcode) and can also be excluded;
- multi-line text can be added above barcode and can be aligned to the left, to the right or centered;
- possibility to print single barcodes, codes belonging to an interval and repeated codes, or a combination of these;
- user selectabled barcode height (in mm);
- print to any parallel port (LPT1-LPT2-LPT3), with or without stop at the end of the page, or to a file;
- full page management: form feed, printable area, first code position, horizontal and vertical separation, number of labels per row, number of rows per page, horizontal and vertical compensation offset (to fix uneven label separation), HRC distance, text pitch;
- barcodes can be printed in 4 directions (right to left, left to right, up-down, bottom-up);
- configuration settings can be saved and restored from separate files, so that multiple configurations can be quickly selected;
- script-file support, to overcome Ms-Dos command line length limit and to integrate the generator in other applications;
- resolution setting at 75, 150, 300 and 600 dpi;
- delta-row compression can be disabled, for using the generator on PCL 4 printers;
- ability to print only the raster block for the barcode, without escape sequences for page settings and without HRC.

Command line parameters

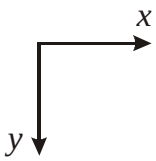
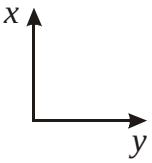
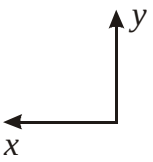
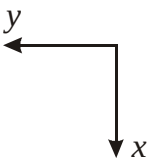
All the following parameters can be specified in any order and without distinction between uppercase and lowercase, unless specified. All parameters, except C and L, have default values that can be saved and that are used if omitted or wrong.

E.g. default values: labels per row = 5, rows per page = 10

D:15	labels per row = 5, rows per page = 15
D6	labels per row = 6, rows per page = 10
D6:15	labels per row = 6, rows per page = 15

Syntax	Function	Remarks
@name	reads the setup stored in name.QRC and replaces default values at the end of the executable	the setup file must have been previously saved with option '&' and must be in the same directory as the generator
&name	writes default setup values to name.QRC, that is created in the same directory of the generator	setup values can be later restored using option '@'
Cx[;s]	specifies code to be printed	it is possible to specify up to 10 commands 'C'; for barcodes 39 and 128 on the command line, the character '_' is automatically translated to blank; use a script file to print this character under Code 128
Cx:y[;s]	prints barcodes from x to y, with the number of digits of y (if the codes are of different lengths); y must be greater than x; if s is specified, s labels are skipped before printing the y-x+1 barcodes in the interval	it is possible to specify up to 10 commands 'C'
Cx,n[;s]	prints code x for n times	it is possible to specify up to 10 commands 'C'
Llabel	specifies the text to be printed above the barcode	it is possible to specify up to 10 'L' commands; the labels follow the order of 'C' parameters; if the number of 'C' commands is greater than the number of 'L' commands, the last label specified is used also for the other 'C' commands; the label is case-sensitive – every character is allowed except for blank, that must be replaced by '_'
Zx	text alignment above barcode; x can be: S left aligned C centered D right aligned	
Tx[+]	specifies the symbology for barcodes; x can range from 0 to 8, according to the following table: x symbology 0 EAN-13 1 INDUSTRIAL 2 MATRIX 3 BAR 3 MSI (1 check digit)	 variant (with +) 0+ EAN-8 1+ INDUSTRIAL 5 BAR 2+ BCD MATRIX 3+ MSI (2 check digits)

	4 INTERLEAVED (NULL-padded) 5 UPC-A 6 CODABAR/MONARCH 7 39 8 128 Note: The parameter T modifies the symbology for the **following** barcodes on the line, while previous codes are generated according to the previous T parameter or to the default (if missing).	4+ INTERLEAVED ('0'-padded) 5+ UPC-E 6+ * 7+ 93 8+ ** * For x = 6, it is possible to specify starting letter for Monarch barcode, that is a, b, c or d, with the syntax: T6A, T6B, T6C e T6D. ** Code 128 variant have check digit in readable text; the check digit is substituted with '.' if it is a non-printable character, and can also be represented by a pair of digits.
Xx	horizontal position for first label (mm)	the distance is measured from the top left angle of the barcode
Yx	vertical position for first label (mm)	the distance is measured from the top left angle of the barcode
Ax	barcode height (mm)	the height is for barcode only, without human readable text or label
Gx	readable code (HRC) alignment; x can have one of the following values: N no human readable code C centered D right-aligned S left-aligned A following barcode	
J	form feed at the end of printing	PCL printers are built so that they don't feed paper if there is nothing to print
F[+ | –]	stop at the end of page: + enables stop; – disables stop.	if only 'F' is specified (no '+' or '– ') the current value is switched (enable if disable and viceversa)
Sx	parallel port	x can be 1, 2 or 3, depending on the port to print to
Ufilename	redirects printing to filename	if filename exists, the program asks the user if it is to be overwritten; if a directory with the same name exists or the file cannot be created, the program ends signaling the condition
Ox	print direction; x can have the following values: 0 prints from left to right 1 prints bottom-up 2 prints from right to left 3 prints up-down	print direction allows to print barcodes vertically or horizontally; text and human readable code follow the same disposition. Actually, this parameter changes the axis as showed on the left, thus margins and coordinates should be changed accordingly.

	0 =  1 =  2 =  3 = 	
Mxx:yy	margins and printable area (mm)	every laser printer can print only well inside the page: this option allows to specify the coordinates at which printable area starts, to match coordinates specified and actual coordinates; to obtain typical values for your printer, use the following parameters to print a barcode: M0:0 X100 Y100 Then : xx = dist. from left border – 100 yy = dist. from top border – 100
Whh:vv	horizontal/vertical separation (mm)	the separation is the distance between two adjacent barcodes
Der:rp	number of labels per row, number of rows per page	
K[+ | –]	check digit status: + enables check digit, – disables check digit	if only ‘K’ is specified (without + or –), check digit status is switched
Px	character pitch (10..15)	the pitch is the number of characters per inch; the higher the pitch, the smaller the character; only fixed-pitch fonts are allowed, because variable fonts do not obey pitch; this option must be combined with the following option I
Id1:d2	text distance from barcode (mm)	when a different pitch or a different font is used, it is useful to change the distance between text and barcode; d1 is the distance between the bottom of the barcode and the bottom of the HRC; d2

		is the distance between the base of the label above the barcode and the top of the bars
Ex	split character for label (1..255)	this character is used to split the label on several lines; the last line is printed above the barcode, at a distance of d2 mm (see parameter I)
Bwi:wb	bar width (1/300 of inch); values in the range 1 to 16	all barcodes are made of black bars and spaces of different widths; EAN/UPC/ 93 barcodes are made only of bars of width wi, the others are made of bars of width wi and wb, black and white; by changing the width of the bars, the barcodes are more compact, but they require a higher resolution for the reading device; by default, wb = wi * 2; changing the default could render the barcodes unreadable; if you use Bwi: the generator assigns to wb the value 2 * wi; if B:wb is specified, wi gets the default value
Hx:xx Vy:yy	offset for horizontal (H) or vertical (V) re-alignment, values in mm; x and y can have any value in the range –5 to +5	the offsets can be used to re-align printing on label-sheets where the horizontal/vertical separation is not an integer number; with this parameter, every xx mm/yy mm the printing coordinates are incremented by x/y mm
Rx	raster resolutions; values for x: 0 600 dpi 1 300 dpi 2 150 dpi 3 75 dpi	use always lower resolution, under normal circumstances, to speed upt printing (75 dpi); change resolution only to print camera-ready copies or to create very high-resolution barcodes, and update also bar widths (parameter I). The parameter R determines the unit of measure for parameter I
Q[+ | –]	compression status: + enables delta row compression, – disables it	by specifying only Q, without + or –, compression status is switched (from enabled to disabled and viceversa); it is necessary to use parameter Q– for PCL 4 printers
N	prints only the raster block for the code, without any additional escape sequences for page formatting, HRC or additional text	this parameter can be used to integrate the printing of the barcode with a generic PCL print; the result is: o resolution declaration; o start of raster graphics; o data block; o end of raster graphics. Even if more than one barcode is specified, the block created is always for the first barcode requested. The option N cannot be pre-set in the setup.

SE(TUP)	change and save the default values for all parameters (except C and L) by using interactive menus	

Using script files

In place of using parameters C and L, it is possible to specify all barcodes to be printed by using a script file.

A script file is a text file that is passed to QRASTCOD as a parameter in this way:

```
QRASTCOD +script [additional parameters..]
```

where script is the name of the file. It is possibile to specify other parameters, such as, for example, a setup file to be used; any command line parameter C and L is ignored.

QRASTCOD interprets only the lines in the script that begins with C, S, T, K or J (uppercase or lowercase), ignoring all other lines.

The syntax is the following:

Pfilename	sends the contents of filename to the parallel port
Ccode[,label]	prints the code and the optional label at the current position; the label can include any character, including space; thus, '_' is printed as is
Snumber	skips number labels
K[+ | –]	enables (+), disables (–) or switches the status of the check digit for the following codes
Tx[+ | A-D]	changes the symbology for the following barcodes (see T parameter for additional information)
J	form feed; the next label becomes the first of the new sheet

The function for printing file is available **only** in script files.
By using script files and setup files it is possible to pilot QRASTCOD from other applications, without the limitations on command line length imposed by Ms-Dos.

Bcode

BCODE is a barcode generator designed to be used with all popular dot-matrix printers, being compatible with EPSON-LX, EPSON-LQ and IBM PROPRINTER II families of printers. The features are very similar to those of PATCODE and QRASTCOD, even though some options are not applicable because of the type of hardware (line printers instead of page printers).
Keep in mind that printhead consumption in dot matrix printers increases a lot when printing barcodes instead of standard text; with very "dense" barcodes (more black than white lines) it can be even twice. Besides, the printing phase should be monitored by an operator, because as the ribbon wear out the barcodes become less contrasted and are difficult to read, and it is often necessary to re-align the paper or to stop the printer to removed jammed labels.
The parameter N allows to create a single line of raster graphics with the bar code, without additional text and escape sequences, to integrate barcode printing in other jobs. The format of the line is the following:

sym	Ec	*	m	n1	n2	data
hex	1B	2A	m	n1	n2	data
dec	27	42	m	n1	n2	data

where:

- ***m*** is the graphic mode (determined from setup)
- ***n1*** + ***n2*** * 256 is the number of columns of graphics
- ***data*** is the bitmap for the code

Keep in mind that the interline for the barcodes is 24 units, no matter what printer is being used; the command to be used to set it (before sending the graphics) is the following:

sym	Ec	3	[24]
hex	1B	33	18
dec	27	51	24

The horizontal positioning of the printhead, to be done before printing each line of the code, is determined by sending the following command:

sym	Ec	$	n1	n2
hex	1B	24	n1	n2
dec	27	36	n1	n2

where, if ***x*** is the distance from the left border of the sheet in mm and ***h*** = ***x****60/25.4, then ***n1*** = ***h*** % 256 and ***n2*** = int(***h*** / 256)

Regarding the vertical separation between adjacent barcodes, it is calculated differently depending on the type of printer; the formula to be used is the following:

v = ***xitl****((180+36*(***itl***-1))/25.4)

where:

- ***xitl*** is the vertical separation between the start of the written part of two adjacent barcodes (in mm)

- ***itl*** is the interline unit: 1 (1/180 of inch) for EPSON LQ, 2 (1/216 of inch) for EPSON LX/IBM PROPRINTER II

Thus, the command to be sent to move from the end of a barcode to the start of the next is:

sym	Ec	3	v
hex	1B	33	v
dec	27	51	v

followed by line feed.

Features

The main features of this generator are:

- barcode printing, with support for full set of characters, in the following symbologies: EAN-13, EAN-8, INDUSTRIAL, INDUSTRIAL 5 BAR, BCD MATRIX, MATRIX 3 BAR, MSI, INTERLEAVED, UPC-A, UPC-E, CODABAR/MONARCH, 39, 93, 128;
- Interleaved 2/5 '0'-padded or NULL-padded;
- user-selectable start letter for Codabar barcode (a/b/c/d);
- check digit for all symbologies calculated according to standard algorithms;
- MSI with single or double check digit;
- barcodes can be printed without check digit, to use a different control algorithm;
- human readable code can be printed in 4 alignments (left, right, center, following barcode) and can also be excluded;
- multi-line text can be added above barcode and can be aligned to the left, to the right or centered;
- text quality selection (draft or HQ) both for HRC and for additional text;
- possibility to print single barcodes, codes belonging to an interval and repeated codes, or a combination of these;
- user selectabled barcode height (in characters);
- print to any parallel port (LPT1-LPT2-LPT3) or to a file;
- two print densities, for better definition of barcodes on quality printers;
- interline unit and vertical separation settings;
- user-selectable number of labels per row, horizontal separation, first label position;
- configuration settings can be saved and restored from separate files, so that multiple configurations can be quickly selected;
- script-file support, to overcome Ms-Dos command line length limit and to integrate the generator in other applications;
- ability to print only the graphics block for the barcode, without escape sequences and without HRC.

Command line parameters

All the following parameters can be specified in any order and without distinction between uppercase and lowercase, unless specified. All parameters, except C and L, have default values that can be saved and that are used if omitted or wrong.
E.g. default values: labels per row = 3, horizontal separation = 50

D:4	labels per row = 4, horizontal separation = 50
D40	labels per row = 3, horizontal separation = 40
D40:4	labels per row = 4, horizontal separation = 40

Syntax	Function	Remarks
@name	reads the setup stored in name.BCO and replaces default values at the end of the executable	the setup file must have been previously saved with option '&' and must be in the same directory as the generator
&name	writes default setup values to name.BCO, that is created in the same directory of the generator	setup values can be later restored using option '@'
Cx[;s]	specifies code to be printed	it is possible to specify up to 10 commands 'C'; for barcodes 39 and 128 on the command line, the character '_' is automatically translated to blank; use a script file to print this character under Code 128
Cx:y[;s]	prints barcodes from x to y, with the number of digits of y (if the codes are of different lengths); y must be greater than x; if s is specified, s labels are skipped before printing the y-x+1 barcodes in the interval	it is possible to specify up to 10 commands 'C'
Cx,n[;s]	prints code x for n times	it is possible to specify up to 10 commands 'C'
Llabel	specifies the text to be printed above the barcode	it is possible to specify up to 10 'L' commands; the labels follow the order of 'C' parameters; if the number of 'C' commands is greater than the number of 'L' commands, the last label specified is used also for the other 'C' commands; the label is case-sensitive – every character is allowed except for blank, that must be replaced by '_'
Zx	text alignment above barcode; x can be: S left aligned C centered D right aligned	
Tx[+]	specifies the symbology for barcodes; x can range from 0 to 8, according to the following table: x symbology 0 EAN-13 1 INDUSTRIAL 2 MATRIX 3 BAR 3 MSI (1 check digit) 4 INTERLEAVED (NULL-padded) 5 UPC-A 6 CODABAR/MONARCH 7 39 8 128	 variant (with +) 0+ EAN-8 1+ INDUSTRIAL 5 BAR 2+ BCD MATRIX 3+ MSI (2 check digits) 4+ INTERLEAVED ('0'-padded) 5+ UPC-E 6+ * 7+ 93 8+ **

	Note: The parameter T modifies the symbology for the **following** barcodes on the line, while previous codes are generated according to the previous T parameter or to the default (if missing).	* For x = 6, it is possible to specify starting letter for Monarch barcode, that is a, b, c or d, with the syntax: T6A, T6B, T6C e T6D. ** Code 128 variant have check digit in readable text; the check digit is substituted with '.' if it is a non-printable character, and can also be represented by a pair of digits.
Xxx	left margin (mm)	distance in mm from the left border of the sheet at which the first barcode in the row is printed
Yyy:i	vertical distance between two adjacent barcodes (mm)/interline unit (1/2)	the vertical distance is measured from the end of the previous barcode to the start of the following barcode; the unit of measure for interline depends on the type of printer being used; EPSON LQ compatible printers use interlines in 1/180 of inch (i = 1), the others use interlines in 1/216 of inch (i = 2)
Ax	barcode height (in characters)	the height is for barcode only, without human readable text or label
Gx	readable code (HRC) alignment; x can have one of the following values: N no human readable code C centered D right-aligned S left-aligned A following barcode	
Sx	parallel port	x can be 1, 2 or 3, depending on the port to print to
Ufilename	redirects printing to filename	if filename exists, the program asks the user if it is to be overwritten; if a directory with the same name exists or the file cannot be created, the program ends signaling the condition
Dxx:er	horizontal separation for labels (mm)/ number of barcodes per row	the separation is measured horizontally between two adjacent barcodes
K[+ | –]	check digit status: + enables check digit, – disables check digit	if only 'K' is specified (without + or –), check digit status is switched
Px	print density: x = 1, 8 dots x = 2, 24 dots	print density is the number of dots that are used to print a vertical line one character high; 24-dot density is possible only on 24-dot printers, while 8-dot density can be used on 8, 9 and 24-dot printers; a barcode printed at 24 dots is three times more defined than one printed at 8 dots, but it takes three

		times the time for being printed
Ex	split character for label (1..255)	this character is used to split the label on several lines; the last line is printed above the barcode, at a distance of d2 mm (see parameter I)
Qx	character quality: x = 0, draft x = 1, HQ	draft text is printed in less time than HQ text, but is less defined
N	prints only the graphics block for the code, without any additional escape sequences, HRC or additional text. Remember to set interline with: sym Ec 3 [24] hex 1B 33 18 dec 27 51 24 and to duplicate the line the number of times needed to reach desired height. Read the start of the guide for instructions about how to determine correct horizontal and vertical separation.	this parameter can be used to integrate the printing of the barcode with a generic print; the result is: sym Ec * m n1 n2 data hex 1B 2A m n1 n2 data dec 27 42 m n1 n2 data where: m is the graphics mode (determined from setup) n1 + n2 * 256 is the number of graphics columns data is the bitmap for the barcode. Even if more than one barcode is specified, the block created is always for the first barcode requested. The option N cannot be pre-set in the setup.
SE(TUP)	change and save the default values for all parameters (except C and L) by using interactive menus	

Using script files

In place of using parameters C and L, it is possible to specify all barcodes to be printed by using a script file.

A script file is a text file that is passed to BCODE as a parameter in this way:

```
BCODE +script [additional parameters..]
```

where script is the name of the file. It is possibile to specify other parameters, such as, for example, a setup file to be used; any command line parameter C and L is ignored.

BCODE interprets only the lines in the script that begins with C, S, T or K (uppercase or lowercase), ignoring all other lines.

The syntax is the following:

Pfilename	sends the contents of filename to the parallel port

Ccode[,label]	prints the code and the optional label at the current position; the label can include any character, including space; thus, '_' is printed as is
Snumber	skips number labels
K[+ | –]	enables (+), disables (–) or switches the status of the check digit for the following codes
Tx[+ | A-D]	changes the symbology for the following barcodes (see T parameter for additional information)

The function for printing file is available **only** in script files.
By using script files and setup files it is possible to pilot BCODE from other applications, without the limitations on command line length imposed by Ms-Dos.

Features for different symbologies

In the following lines, we will discuss briefly the symbologies supported by the package.

Code 39

It is one of the most widespread symbologies, thanks to its versatility and the security of the encoding, even though information density is not high (resulting bar codes are large).
The most interesting features are:

- variable length;
- alphabet: 0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ-._$/+% (space must be replaced by underscore, '_');
- Code 39 is usually represented **without** check digit, which is optional.

The generators convert automatically to uppercase those characters that are lowercase before applying the encoding.

Code 93

It is a very versatile symbology; it was developed as a replacement for Code 39; it has the same alphabet, but is more compact.
The most interesting features are:

- variable length;
- alphabet: 0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ-._$/+% (space must be replaced by underscore, '_');
- Code 93 is usually represented **with** check digit, which consists of two characters from the alphabet.

The generators convert automatically to uppercase those characters that are lowercase before applying the encoding.

Interleaved 2 of 5 (0 padded or NULL padded)

It is a numeric-only symbology very widespread and compact. Since digits are encoded in pairs, they should be even in number if check digit is not used, should be odd otherwise.
The most interesting features are:

- variable length;
- only digits 0 to 9 are allowed;
- the check digit is **reccomended**, because the decoder can decode partial codes otherwise.

The generators add a "0" to the left (or a NULL to the right), if necessary, to obtain even length for the text to be encoded.

Industrial 2 of 5

It is a symbology that uses the same encoding as Interleaved 2/5, but exploits only bars (not spaces). In this way the security of the decoding is greater, even though the resulting barcode is longer.
The most interesting features are:

- variable length;
- only digits 0 to 9 are allowed;
- check digit is optional.

5 bars 2 of 5

It is a numeric-only, low-density symbology, mostly used in photographic laboratories.
The most interesting features are:
- variable length;
- only digits 0 to 9 are allowed;
- check digit is optional.

3 bars Matrix 2 of 5

It is a numeric-only, medium-density symbology.
The most interesting features are:
- variable length;
- only digits 0 to 9 are allowed;
- check digit is optional.

BCD Matrix 2 of 5

It is a numeric-only, medium-density symbology.
The most interesting features are:
- variable length;
- only digits 0 to 9 are allowed;
- check digit is optional.

MSI

It is a numeric-only, low-density symbology.
The most interesting features are:
- variable length, up to 15 digits;
- only digits 0 to 9 are allowed;
- (double) check digit is **reccomended**.

EAN13

It is a numeric-only, high-density symbology, which is mainly used for labeling goods to be sold inside Europe.
The most interesting features are:
- fixed length: 12 digits (with check digit) or 13 digits (without check digit); if the text to be encoded is shorter, it is left-padded with “0”s by the generators;
- only digits 0 to 9 are allowed;
- check digit is always **needed**.

EAN 8

It is a numeric-only, high-density symbology, which is mainly used for labeling goods to be sold inside Europe; it is used in place of EAN 13 when the size of the object being labeled is very small.
The most interesting features are:
- fixed length: 7 digits (with check digit) or 8 digits (without check digit); if the text to be encoded is shorter, it is left-padded with “0”s by the generators;
- only digits 0 to 9 are allowed;
- check digit is always **needed**.

UPC A

It is a numeric-only, high-density symbology, which is mainly used for labeling goods to be sold inside USA.
The most interesting features are:
- fixed length: 11 digits (with check digit) or 12 digits (without check digit); if the text to be encoded is shorter, it is left-padded with “0”s by the generators;
- only digits 0 to 9 are allowed;
- check digit is always **needed**.

UPC E

It is a numeric-only, high-density symbology, which is mainly used for labeling goods to be sold inside USA; it is used in place of UPC A when the size of the object being labeled is very small.
The most interesting features are:
- fixed length: 7 digits (with check digit) or 8 digits (without check digit); if the text to be encoded is shorter, it is left-padded with “0”s by the generators;
- only digits 0 to 9 are allowed;
- the text to be encoded **must** start with 0 or 1;
- check digit is always **needed**.

Codabar/Monarch

The alphabet of this symbology includes the 10 digits, 6 special characters and 4 start/stop sequences. It is very common, especially in medical environments.
The most interesting features are:
- variable length, greater than or equal to 3;
- the text encoded must start and end with a character included in "ABCDEMT*";
- the remaining characters must belong to the following alphabet: "0123456789-$:/.+";
- the check digit is **optional**.

Code 128

This symbology derives its name from the fact that it can encode all 128 characters of the ASCII set; it is characterized by high density of information and high reliability. Information density is increased by encoding digits in pairs whenever it is possible.
The most interesting features are:
- variable length;
- every character belonging to the ASCII set (0-127) can be encoded;
- these additional characters can be encoded:
  128 = NUL
  129 = FNC1
  130 = FNC2
  131 = FNC3
  132 = FNC4
- the check digit is **always needed**, and is added regardless what the user specifies.

Remarks on antiviral packages

The executables for barcode generators modify themselves: when default settings are saved, they are appended to the executable. This can lead to false warnings from a few antivirus packages, that check executables when they are first installed and then verify at every subsequent run that they are unchanged. Obviously, if you don’t run setup, the executables don’t change. If you happen to own an antivirus package that works in this way, install the barcode generators **after** having configured them for your printer.
This configuration system was adopted to make it easier to move the generators (if you want to move them to a new directory, it is sufficient to move just the executable), to speed up execution and to spare disk space, because configuration settings take only a few bytes, while the operating system reserves a whole cluster for each file, even if it would need less space.

The generators modify themselves only if setup is run; under no circumstance they modify other files in the system

Warnings about files modified, other than the generators or the generators themselves (if no setup was run), are to be interpreted as a consequence of a viral agent, against which you should take every necessary action, as usual.

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