Telesoft Braille Printer

Command Reference

Rev 1.0　2002/03

Rev 2.0　2002/09

Rev 3.0　2002/11

Rev 3.1　2003/09

Rev 3.2　2005/03

Nippon Telesoft Co., Ltd.

Outline

This reference provides an explanation of the control codes which is used in the Braille printers (DOG-Basic32, DOG-Pro32W, DOG-Multi, Gemini) manufactured by the Nippon Telesoft Co., Ltd.

Telesoft Braille Printer control codes

Command	Hexadecimal	Function
CR LF	0D 0A	Carriage return, Line feed
FF	0C	Form feed
ETX	03	Finish of data to print
SOH	01	Start of print configuration
STX	02	Start of print data
ESC ESC C	1B 1B 43	Number of cells
ESC ESC I	1B 1B 49	Line spacing
ESC ESC H	1B 1B 48	Paper width
ESC ESC V	1B 1B 56	Paper length
ESC ESC B	1B 1B 42	Braille character code
ESC ESC G	1B 1B 47	Set graphics mode
ESC ESC M	1B 1B 4D	Printing mode
ESC ESC Q	1B 1B 51	Double-embossing
ESC ESC F	1B 1B 46	Ink printing above Braille
ESC ESC D	1B 1B 44	Double-high print

Carriage return, Line feed

ASCII	CR LF
Decimal	13 10
Hexadecimal	0D 0A

Explanation

- Prints the data for one line and returns.
- Each Line of the out-put data should be finished with CR-LF.

Form feed

ASCII	FF
Decimal	12
Hexadecimal	0C

Explanation

- Advance a paper to the top of the next page according to the specified paper length.

Finish of data to print

ASCII	ETX
Decimal	3
Hexadecimal	03

Explanation

- To be specified always.
- Finish printing and advance a paper so that the perforation is under the tear bar.

Start of print configuration

ASCII	SOH n1 n2
Decimal	1 n1 n2
Hexadecimal	01 n1 n2
Parameter	0 ≦ n1 ≦ 255
	0 ≦ n2 ≦ 255

Explanation

- To be specified always.
- Put at the Start of print configuration. Please specify the amount of data of each (n1, n2) configuration by parameter.

n1 = Number of bytes to use in commands for Braille printing
n2 = Number of bytes to use in commands for Ink character printing

Start of print data

ASCII	STX m n
Decimal	2 m n
Hexadecimal	02 m n

Explanation

- To be specified always.
- Put at the top of each print data.
- Depends on the value of m, it distinguishes between Braille data and Ink character data.

m = 0 : Ink character data
m = 1 : Braille data
m = 2 : Braille graphics

* When Braille graphics specified, please specify m = 2 in all pages.

- n specifies the line numbers of each data. When graphics specified, it specifies the number of vertical dots.

Number of cells

ASCII	ESC ESC C n
Decimal	27 27 67 n
Hexadecimal	1B 1B 43 n
Parameter	n = 30, 32, 34, 36, 38, 40, 42, 44

Explanation

- To be specified always.
- To set the number of cells of Braille in the page format.
- When the number of characters of each line exceeded this specified value, the rest will be ignored
- The set-up range of these commands depends on the specification of the printer.

* As for the Braille printer for 32 cells, it cannot be set but up to 32 cells as the maximum setting value. (Except the domestic version)

Line spacing

ASCII	ESC ESC I n
Decimal	27 27 73 n
Hexadecimal	1B 1B 49 n
Parameter	n = 0, 1, 2, 3, 4

Explanation

- To be specified always.
- To set the line spacing in the page format.
- Depends on the value of n, available to set 4 patterns of the space.

n = 0 : 235/900 inch	SMALL
n = 1 : 274/900 inch	MIDDLE
n = 2 : 314/900 inch	LARGE (indispensable when double sided but not simultaneous print)
n = 4 : depends on paper length	ST (available to set when double sided simultaneously (IP), embossing at once)

- By the combination with these commands and the paper length, the printable line numbers will be determined. Please refer to the appendices for the details.
- The line numbers for every page data should not exceed the printable line number.

Paper width

ASCII	ESC ESC H n
Decimal	27 27 72 n
Hexadecimal	1B 1B 48 n
Parameter	n = 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130

Explanation

- To be specified always.
- To set the paper width to n inches.
- It's possible to set up to 13 inches by 0.5 inch.
  ex) n = 80 for 8 inches, n = 85 for 8.5 inches
- By these commands, the available cell numbers will be determined. Please specify the value of cell numbers with this available cell numbers Please refer to the appendices for the details.
- The setup range of these commands depends on the specification of the printer.

Paper length

ASCII	ESC ESC V n
Decimal	27 27 86 n
Hexadecimal	1B 1B 56 n
Parameter	n = 100, 105, 110, 115, 120, 125, 130, 135, 140

Explanation

- To be specified always.
- To set the paper length to n inches.
- It's possible to set up to 14 inches by 0.5 inch.
  ex) n = 100 for 10 inches, n = 105 for 10.5 inches.
- By the combination with these commands and command to set line spacing, the available line numbers to print will be determined. Please refer to the appendices for the details.

Braille character code

ASCII	ESC ESC B n
Decimal	27 27 66 n
Hexadecimal	1B 1B 42 n
Parameter	0 ≦ n ≦ 2

Explanation

- To be specified always.
- To set the Braille character code.

n = 0 : EBCC
n = 1 : NABCC (8 dots)
n = 2 : NABCC (6 dots)

- As for 8 dots Braille, it's possible to set only for single sided print. Impossible for double sided print.

Set graphics mode

ASCII	ESC ESC G
Decimal	27 27 71
Hexadecimal	1B 1B 47

Explanation

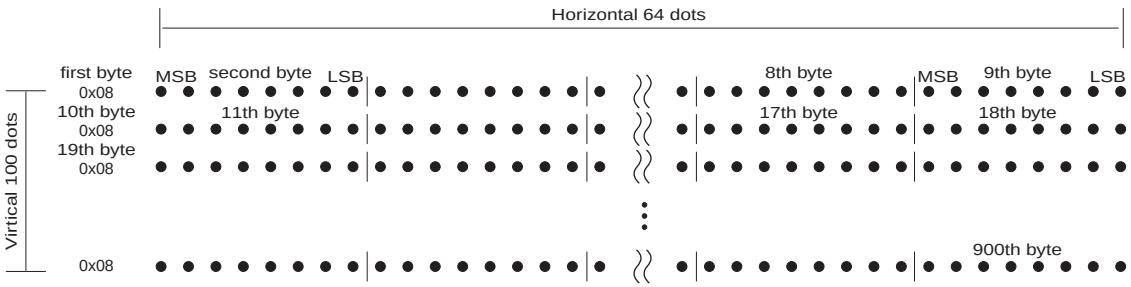
- This command changes Braille printing mode to graphics mode. This specification has priority over Braille character code setting.
- The specified graphic format is common to every page.

Horizontal dot numbers・・ The maximum value is 64 dots. (Depends on the specification of the printer.)

Vertical dot numbers・・・ The maximum value is changeable depends on the paper length. Please refer to the appendices.

- When graphic printing, specify 2 as parameter m and n specifies the Vertical dot numbers in the data start command.
- Horizontal dot numbers depend on the specification of the printer. As for the Braille printer specified for 32 cells, it'll be 8 bytes (64 dots). The data value for format is as below.

ex) n = 100, 9 * 100 = 900 bytes



Printing mode

ASCII	ESC ESC M n
Decimal	27 27 77 n
Hexadecimal	1B 1B 4D n
Parameter	0 ≦ n ≦ 5

Explanation

- To be specified always.
- To set printing mode.
- Depends on each printing mode, it defines supportable printer(s).

Printing Mode		Supportable printer(s)
n = 0 : Braille only	Single side	DOG-Basic, Pro, Multi
n = 1 : Braille only	Single side (on the back)	Dog-Basic, Pro, Multi
n = 2 : Braille & Ink	Single side	DOG-Multi
n = 3 : Braille only	Double side simultaneously(IL)	DOG-Pro
n = 4 : Braille only	Double side simultaneously(IP)	DOG-Pro
n = 5 : Braille & Ink	Double side simultaneously	
n = 6 : Braille & Ink	Single side (on the back)	DOG-Multi

* When n = 1,6 the line spacing should be LARGE.

* Only when n = 4, available to set ST as the line spacing.

Double-embossing (Braille print)

ASCII	ESC ESC Q
Decimal	27 27 81
Hexadecimal	1B 1B 51

Explanation

- When this command is specified, emboss twice each dots. By embossing each dots twice, it increases the quality of dots, but reduces printing speed.

Ink print above Braille

ASCII	ESC ESC F
Decimal	27 27 70
Hexadecimal	1B 1B 46

Explanation

- When this command is specified, it's possible to print Ink characters above Braille.
- It is in effect with printing mode, when n = 2 and 5 only.
- When expanded print is set, it is ignored.

Double-high (Ink character print)

ASCII	ESC ESC D
Decimal	27 27 68
Hexadecimal	1B 1B 44

Explanation

- This command doubles the height of Ink characters. In this case, Braille & Ink characters overprinted.
- On the command of Ink character printing, when the above commands are used together with the command to doubles the width of Ink characters, it's possible to print them witch is four times as size of ever.

Appendices

Maximum printable line numbers and number of dots for graphics. (6 dots)

Line spacing / Paper length	SMALL	MIDDLE	LARGE	ST	Vertical dots/Page
10	22	20	18	22	106
10.5	23	21	19	23	112
11	24	22	20	24	118
11.5	25	26	21	25	124
12	26	24	22	26	130
12.5	27	25	23	27	134
13	29	26	24	29	140
13.5	30	27	25	30	146
14	31	28	26	31	152

Maximum printable line numbers and number of dots for graphics. (8 dots)

Line spacing / Paper length	SMALL	MIDDLE	LARGE	Vertical dots /Page
10	18	16	15	106
10.5	19	17	16	112
11	20	18	17	118
11.5	21	19	18	124
12	22	20	19	130
12.5	23	21	19	134
13	24	22	20	140
13.5	25	23	21	146
14	26	24	22	152

NABCC6 Code

	0	1	2	3	4	5	6	7
0	NU 0	DL 16	SP 32	0 48	@ 64	P 80	` 96	p 112
1	SH 1	D1 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	SX 2	D2 18	" 34	2 50	B 66	R 82	b 98	r 114
3	EX 3	D3 19	# 35	3 51	C 67	S 83	c 99	s 115
4	ET 4	D4 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	EQ 5	NK 21	% 37	5 53	E 69	U 85	e 101	u 117
6	AK 6	SY 22	& 38	6 54	F 70	V 86	f 102	v 118
7	BL 7	EB 23	' 39	7 55	G 71	W 87	g 103	w 119
8	BS 8	CN 24	(40	8 56	H 72	X 88	h 104	x 120
9	HT 9	EM 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	LF 10	SB 26	* 42	: 58	J 74	Z 90	j 106	z 122
B	VT 11	EC 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	FF 12	FS 28	, 44	< 60	L 76	\ 92	l 108	| 124
D	CR 13	GS 29	- 45	= 61	M 77	] 93	m 109	} 125
E	SO 14	RS 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	SI 15	US 31	/ 47	? 63	O 79	_ 95	o 111	DL 127

NABCC8 Code

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NU 0	DL 16	SP 32	0 48	@ 64	P 80	` 96	p 112	128	144	160	° 176	À 192	Đ 208	224	240
1	SH 1	D1 17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	± 177	Á 193	Ñ 209	225	241
2	SX 2	D2 18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	¢ 162	² 178	Â 194	Ò 210	226	242
3	EX 3	D3 19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	Ã 195	Ó 211	227	243
4	ET 4	D4 20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	¤ 164	´ 180	Ä 196	Ô 212	228	244
5	EQ 5	NK 21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	µ 181	Å 197	Õ 213	229	245
6	AK 6	SY 22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	¶ 182	Æ 198	Ö 214	230	246
7	BL 7	EB 23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	§ 167	· 183	Ç 199	× 215	231	247
8	BS 8	CN 24	(40	8 56	H 72	X 88	h 104	x 120	136	152	¨ 168	¸ 184	È 200	Ø 216	232	248
9	HT 9	EM 25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	© 169	¹ 185	É 201	Ù 217	233	249
A	LF 10	SB 26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ª 170	º 186	Ê 202	Ú 218	234	250
B	VT 11	EC 27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	« 171	» 187	Ë 203	Û 219	235	251
C	FF 12	FS 28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	¬ 172	¼ 188	Ì 204	Ü 220	236	252
D	CR 13	GS 29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	½ 189	Í 205	Ý 221	237	253
E	SO 14	RS 30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	® 174	¾ 190	Î 206	Þ 222	238	254
F	SI 15	US 31	/ 47	? 63	O 79	_ 95	o 111	DL 127	143	159	¯ 175	¿ 191	Ï 207	ß 223	239	255

EBCC Code

	0	1	2	3	4	5	6	7
0	NU 0	DL 16	SP 32	0 48	@ 64	P 80	` 96	p 112
1	SH 1	D1 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	SX 2	D2 18	" 34	2 50	B 66	R 82	b 98	r 114
3	EX 3	D3 19	# 35	3 51	C 67	S 83	c 99	s 115
4	ET 4	D4 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	EQ 5	NK 21	% 37	5 53	E 69	U 85	e 101	u 117
6	AK 6	SY 22	& 38	6 54	F 70	V 86	f 102	v 118
7	BL 7	EB 23	' 39	7 55	G 71	W 87	g 103	w 119
8	BS 8	CN 24	(40	8 56	H 72	X 88	h 104	x 120
9	HT 9	EM 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	LF 10	SB 26	* 42	: 58	J 74	Z 90	j 106	z 122
B	VT 11	EC 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	FF 12	FS 28	, 44	< 60	L 76	\ 92	l 108	| 124
D	CR 13	GS 29	- 45	= 61	M 77	] 93	m 109	} 125
E	SO 14	RS 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	SI 15	US 31	/ 47	? 63	O 79	_ 95	o 111	DL 127