Brother QL Series Command Reference (QL-500/550/560/570/580N/ 650TD/700/1050/1060N)

October 3, 2011 Version 6.0

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1.Introduction

This material provides the necessary information for directly controlling the Brother QL-500/550/560/570/580N/650TD/700/1050/1060N. This information is provided assuming that the user has full understanding of the operating system being used and basic mastery of USB in a developer's environment.

Details concerning the USB interface are not described in this material. If a USB interface is being used, refer to "7. USB Specifications" to prepare the interface.

We accept no responsibility for any problems caused by programs that you develop using the information provided in this material, affecting software, data or hardware, including the Brother QL-500/550/560/570/580N/650TD/700/1050/1060N, and any problems resulting directly or indirectly from them. These materials are provided in their current condition, and we assume no responsibility for their content. Use this material only if you accept these terms.

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2.Overview

The printing procedure is described below. For details on each command, refer to "5.Command Details".

By using the machine's button (E/EL), QL-700 can be switched between operating in the printer class and the mass storage class.

These materials assume that the machine is operating in the printer class.

① Open USB/Serial/Network port

Open the USB/Serial/Network port in the operating environment. The procedure for opening the USB/Serial/Network port is not described in this material.

The serial port can only be used with the QL-580N/650TD/1050/1060N.

The network port can only be used with the QL-580N/1060N.

② Check machine status

The "Status information request" command is sent to the printer, the status information received from the printer is analyzed, and then the status of the printer is determined. For details on the "Status information request" command and on the definition of "status", refer to "Status information request" in "5. Command Details".

③ Send print data

If the status analysis concludes that a tape cassette corresponding to the print data is loaded into the printer and that no error has occurred, the print data is sent. The structure of the print data is explained in the next section, "3. Print Data".

Note:

No command can be sent to the printer after the print data is transmitted and until the completion of printing is confirmed.

Even the "Status information request" command cannot be sent during printing.

④ Confirmation of printing completion

When printing is completed, the status is sent from the printer. This status is analyzed and, if printing is completed, one page is printed. If the print job has multiple pages, ② through ④ are repeated.

⑤ Close USB/Serial/Network port

After all printing is finished, close the USB/Serial/Network port.

Note:

In order to print at high speed when the USB port is used, the Brother QL starts printing when it starts to receive print data, instead of waiting for a print command. For the processing flow, for example when managing errors, refer to "6. Flow Charts".

(If the printing data is compressed in Command "4D H + 02 H" for QL-580N/650TD/1050/1060N, the printer starts printing after a print command.)

3.Print Data

3.1.Print data overview

The print data is constructed of the following: ① Initialize, ② Job data, ③ Page data, and ④ Print command. If the print job consists of multiple pages, ② through ④ are repeated

① Initialize

-	Initialize	Clears the mode settings. 1B H, 40 H

② Job data

Added at the beginning of each page and feeds each page.

Sequence	Command Name	Description/Example
1	Command mode switch	Only used with QL-580N/650TD/1050/1060N. Switches to raster mode 1B H, 69 H, 61 H, 01 H
2	Print information command	Sets the print information for the printer. For the starting page of die-cut labels (29 mm × 90 mm) with priority given to print speed: 1BH, 69H, 7AH, 0EH, 0BH, 1DH, 5AH, DFH, 03H, 00H, 00H, 00H, 00H
3	Set each mode	To select “Auto Cut”(except QL-500): 1B H, 69 H, 4D H, 40 H
4	Specify the page number in ”cut every * labels”	Only used with QL-570/580N/700/1050/1060N. When an auto cut setting is effective, specify the number of sheets for auto cut. For each sheets, 1B H, 69 H, 41 H, 01 H
5	Set expanded mode	Only used with QL-570/580N/650TD/700/1050/1060N. To set “Cut at end flag” 1B H, 69 H, 4B H, 08 H
6	Set margin amount	For 3 mm margins: 1B H, 69 H, 64 H, 23 H, 00 H
7	Compression mode selection	Only used with QL-580N/650TD/1050/1060N For QL-650TD, data can only be compressed when the serial port is used.

③ Page data

Repeat for each page in the print job.

Sequence	Command Name	Description/Example
—	Raster graphics transfer	Sends a raster line that contains data with a pixel set to "ON". For a single perpendicular line on 62-mm-wide continuous length tape: 67H, 00H, 5AH, 00H, 0FH, FFH (repeat for 86 bytes), F0H, 00H (QL-500/550/560/570/580N/650TD) 67H, 00H, 5AH, 00H, 0FH, FFH (repeat for 168 bytes), F0H, 00H (QL-1050/1060N)

④ Print command

Specified at the end of the page.

Sequence	Command Name	Description/Example
—	Print command	Specified at the end of a page that is not the last page. 0C H
—	Print command with feeding	Specified at the end of the last page. 1A H

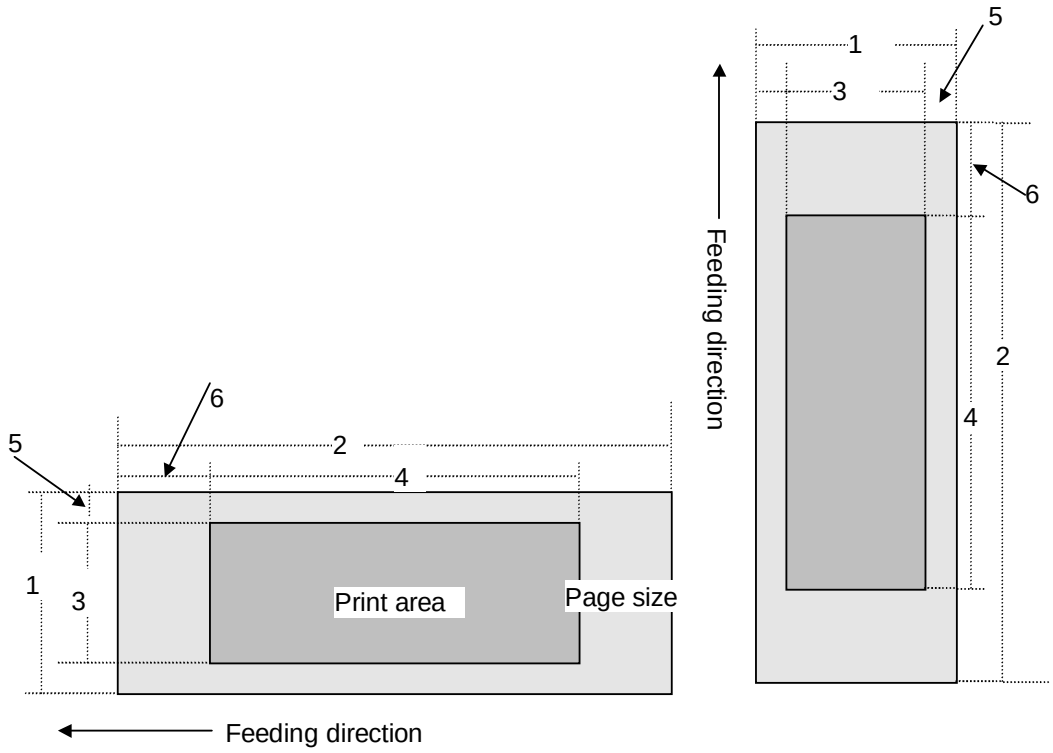
3.2.Page data details

3.2.1. Resolution

Resolution	Height-to-Width Proportion
300 dpi high, 300 dpi wide	1:1
600 dpi high, 300 dpi wide	2:1

3.2.2. Page size

A. Continuous length tape



Landscape Portrait

Number 1 Width 2 Length

3 Print area width (maximum printing width) 4 Print area length

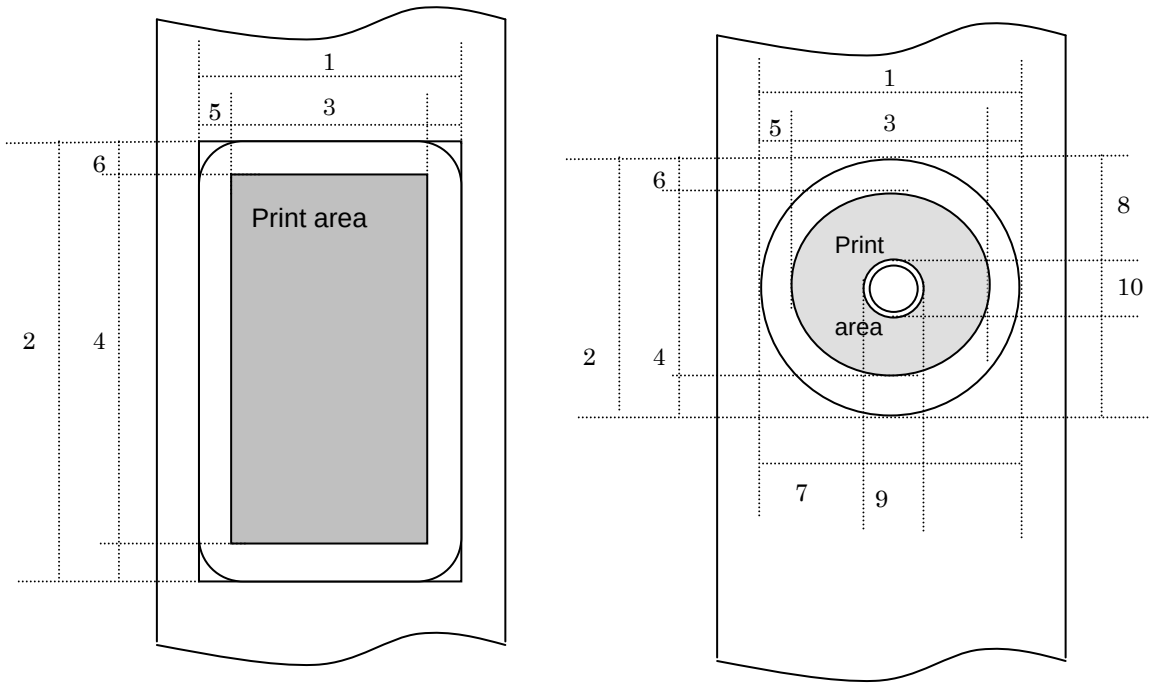
5 Width offset 6 Length offset

ID	Label Size	Designation	1	2	3	4	5	6
257	12mm	12mm 1/2" (0.47")	12.02 mm 142 dots	→3.2.4	8.97 mm 106 dots	→3.2.4	1.5 mm 18 dots	→3.2.3
258	29mm	29mm 1-1/7"(1.1")	28.96mm 342 dots	→3.2.4	25.91 mm 306 dots	→3.2.4	1.5 mm 18 dots	→3.2.3
264	38mm	38mm 1-1/7"(1.4")	38.0mm 449 dots	→3.2.4	35.0 mm 413 dots	→3.2.4	1.5 mm 18 dots	→3.2.3
262	50mm	50mm 2" (1.9")	50.0 mm 590 dots	→3.2.4	46.9 mm 554 dots	→3.2.4	1.5 mm 18 dots	→3.2.3
261	54mm	54mm 2-1/8" (2.1")	53.8mm 636 dots	→3.2.4.	50.0mm 590 dots	→3.2.4.	1.9mm 23 dots	→3.2.3.
259	62mm	62mm 2-3/7"(2.4")	61.98mm 732 dots	→3.2.4	58.93mm 696 dots	→3.2.4	1.5 mm 18 dots	→3.2.3
260	102mm	102mm 4" (4")	101.6mm 1200 dots	→3.2.4	98.59 mm 1164 dots	→3.2.4	1.5 mm 18 dots	→3.2.3

102mm continuous tape is only for QL-1050/1060N

Inch measurements are indicated as decimals with QL-700 and as fractions with all models other than QL-700.

B. Die-cut labels



Number 1 Width 2 Length

3 Print area width (maximum printing width) 4 Print area length

5 Width offset 6 Length offset

7 Width offset of masked area 8 Length offset of masked area

9 Width of masked area 10 Length of masked area

ID	Designation	1	2 *1	3	4 *1	5	6 *1
269	17mm x 54mm 2/3" x 2-1/8" (0.66" x 2.1")	17.02mm 201 dots	53.85mm 636 dots	13.97mm 165 dots	47.92mm 566 dots	1.5 mm 18 dots	3.0 mm 35 dots
270	17mm x 87mm 2/3" x 3-7/16" (0.66" x 3.4")	17.02mm 201 dots	86.87mm 1026 dots	13.97mm 165 dots	80.94mm 956 dots	1.5 mm 18 dots	3.0 mm 35 dots
370	23mm x 23mm 10/11" x 10/11" (0.9" x 0.9")	23.03mm 272 dots	23.03mm 272 dots	19.99mm 236 dots	17.10mm 202 dots	1.5 mm 18 dots	3.0 mm 35 dots
271	29mm x 90mm 1-1/7" x 3-1/2" (1.1" x 3.5")	28.96mm 342 dots	89.83mm 1061 dots	25.91mm 306 dots	83.90mm 991 dots	1.5 mm 18 dots	3.0 mm 35 dots
272	38mm x 90mm 1-1/2" x 3-1/2" (1.4" x 3.5")	38.01mm 449 dots	89.83mm 1061 dots	34.97mm 413 dots	83.90mm 991 dots	1.5 mm 18 dots	3.0 mm 35 dots
367	39mm x 48mm 1-1/2" x 1-8/9" (1.5" x 1.8")	39.01mm 461 dots	47.8mm 565 dots	36.0mm 425 dots	41.9mm 495 dots	1.5 mm 18 dots	3.0 mm 35 dots
374	52mm x 29mm 2" x 1-1/7" (2" x 1.1")	52.0mm 614 dots	28.9mm 341 dots	48.9.mm 578 dots	22.9mm 271 dots	1.5 mm 18 dots	3.0 mm 35 dots
274	62mm x 29mm 2-3/7" x 1-1/7" (2.4" x 1.1")	61.98mm 732 dots	28.87mm 341 dots	58.93mm 696 dots	22.94mm 271 dots	1.5 mm 18 dots	3.0 mm 35 dots

ID	Designation	1	2 *1	3	4 *1	5	6 *1
275	62mm x 100mm 2-3/7” x 4” (2.4” x 3.9”)	61.98mm 732 dots	99.82mm 1179 dots	58.93mm 696 dots	93.90mm 1109 dots	1.5 mm 18 dots	3.0 mm 35 dots
365	102mm x 51mm 4” x 2” (4” x 1.9”)	101.6mm 1200 dots	50.5mm 596 dots	98.59mm 1164 dots	44.53mm 526 dots	1.5mm 18 dots	3.0 mm 35 dots
366	102mm x 152mm 4” x 6” (4” x 6”)	101.6mm 1200 dots	152.75mm 1804 dots	98.59mm 1164 dots	140.60mm 1660 dots	1.5mm 18 dots	6.1mm 72 dots
362	12mm Dia 1/2” Dia (0.47” Dia)	12.02mm 142 dots	12.02mm 142 dots	7.96mm 94 dots	7.96mm 94 dots	2.0 mm 24 dots	2.0 mm 24 dots
363	24mm Dia 1” Dia (0.94” Dia)	24.04mm 284 dots	24.04mm 284 dots	19.98mm 236 dots	19.98mm 236 dots	2.0 mm 24 dots	2.0 mm 24 dots
273	58mm Dia 2-1/3” Dia (2.2” Dia)	58.25mm 688 dots	58. 25mm 688 dots	52.24mm 618 dots	52.24mm 618 dots	3.0 mm 35 dots	3.0 mm 35 dots

Inch measurements are indicated as decimals with QL-700 and as fractions with all models other than QL-700.

ID	7	8 *1	9 *1*2	10 *1*2
273	21.17mm 232 dots	21.08mm 232 dots	19.0mm 224 dots	19.0mm 224 dots

*1 The number of dots in the table is for 300 dpi; it is difference in the high-resolution mode.

*2 Margins of 3 mm (1.5 mm × 2) horizontally and 3 mm (1.5 mm × 2) vertically are added to a diameter of 16 mm.

“102mm x 51mm” and “102mm x 152mm” is only for QL-1050/1060N

3.2.3. Feed amount

The feed amount (left and right margins) is defined below.

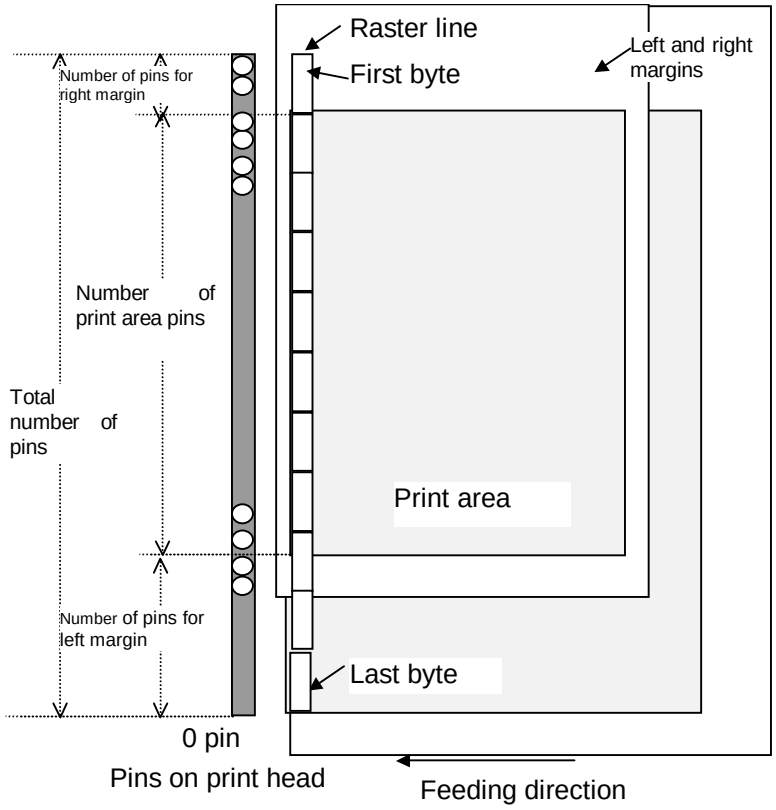
Tape Type	Minimum Margin Setting	Maximum Margin Setting
Continuous length tape	mm setting: 3 mm Inch setting: 0.1” 35 dots	mm setting: 127 mm Inch setting: 5” 1500 dots
Die-cut labels	Set the command for specifying the margin to “0”. In case of using 12 mm Dia for QL-500/550/560/570/580N/700, specify 35 dots.	

3.2.4. Maximum and minimum lengths

The maximum and minimum lengths are defined below.

Tape Type	Minimum Length	Maximum Length
Continuous length tape	(QL-500/550/560/650TD/1050/1060N) 25 mm 295 dots (QL-570/580N/700) 12.7 mm 150 dots	(QL-500/550/560/570/580N/650TD/700) 1000 mm 11811 dots (QL-1050/1060N) 3000 mm 35433 dots
Die-cut labels	Fixed	Fixed

3.2.5. Raster line arrangement



QL-500/550/560/570/580N/650TD/700: Total number of pins 720 pins

Continuous length tape:

Label Size	Number of Pins for Left Margin	Number of Print Area Pins	Number of Pins for Right Margin	Number of Raster Graphics Transfer Bytes
12mm	585	106	29	90
29mm	408	306	6	90
38mm	295	413	12	90
50mm	154	554	12	90
54mm	130	590	0	90
62mm	12	696	12	90

Die-cut labels:

Label Size	Number of Pins for Left Margin	Number of Print Area Pins	Number of Pins for Right Margin	Number of Raster Graphics Transfer Bytes
17 mm x 54 mm	555	165	0	90
17 mm x 87 mm	555	165	0	90
23 mm x 23 mm	442	236	42	90
29 mm x 90 mm	408	306	6	90
38 mm x 90 mm	295	413	12	90
39 mm x 48 mm	289	425	6	90
52 mm x 29 mm	142	578	0	90
62 mm x 29 mm	12	696	12	90
62 mm x 100 mm	12	696	12	90
12 mm Dia	513	94	113	90
24 mm Dia	442	236	42	90
58 mm Dia	51	618	51	90

QL-1050/1060N: Total number of pins 1296 pins

Continuous length tape:

Label Size	Number of Pins for Left Margin	Number of Print Area Pins	Number of Pins for Right Margin	Number of Raster Graphics Transfer Bytes
12mm	1116	106	74	162
29mm	940	306	50	162
38mm	827	413	56	162
50mm	686	554	56	162
54mm	662	590	44	162
62mm	544	696	56	162
102mm	76	1164	56	162

Die-cut labels:

Label Size	Number of Pins for Left Margin	Number of Print Area Pins	Number of Pins for Right Margin	Number of Raster Graphics Transfer Bytes
17mm x 54mm	1087	165	44	162
17mm x 87mm	1087	165	44	162
23mm x 23mm	976	236	84	162
29mm x 90mm	940	306	50	162
38mm x 90mm	827	413	56	162
39mm x 48mm	821	425	50	162
52mm x 29mm	674	578	44	162
62mm x 29mm	544	696	56	162
62mm x 100mm	544	696	56	162
102mm x 51mm	76	1164	56	162
102mm x 152mm	76	1164	56	162
12mm Dia	1046	94	156	162
24mm Dia	975	236	85	162
58mm Dia	584	618	94	162

4.Status

4.1. Overview

The status is sent from the printer to the computer as a reply to the “status information request” command or as an error message. The size is fixed to 32 bytes.

Number	Offset	Size	Name	Value/Reference
1	0	1	Print head mark	Fixed to “80 Hex”
2	1	1	Size	Fixed to “20 Hex”
3	2	1	Reserved	Fixed to ’B’ (42 Hex)
4	3	1	Reserved	QL-500/550/650TD/1050: Fixed to ’0’ (30 Hex) QL-560/570/580N/700/1060N: Fixed to ’4’ (34 Hex)
5	4	1	Reserved	QL-500/550: Fixed to ‘O’ (4F Hex) QL-560: Fixed to ‘1’ (31 Hex) QL-570: Fixed to ‘2’ (32 Hex) QL-580N: Fixed to ‘3’ (33 Hex) QL-650TD: Fixed to ‘Q’ (51 Hex) QL-700: Fixed to ‘5’ (35 Hex) QL-1050: Fixed to ‘P’ (50 Hex) QL-1060N: Fixed to ‘4’ (34 Hex)
6	5	1	Reserved	Fixed to ’0’ (30 Hex)
7	6	1	Reserved	Fixed to “00 Hex”
8	7	1	Reserved	Fixed to “00 Hex”
9	8	1	Error information 1	Refer to section 4.2.1.
10	9	1	Error information 2	Refer to section 4.2.1.
11	10	1	Media width	Refer to section 4.2.2.
12	11	1	Media type	Refer to section 4.2.3.
13	12	1	Reserved	Fixed to “00 Hex”
14	13	1	Reserved	Fixed to “00 Hex”
15	14	1	Reserved	Not set
16	15	1	Reserved	Not set
17	16	1	Reserved	Fixed to “00 Hex”
18	17	1	Media length	Refer to section 4.2.2.
19	18	1	Status type	Refer to section 4.2.4.
20	19	1	Phase type	Refer to section 4.2.5.
21	20	1	Higher order bytes of phase number	Refer to section 4.2.5.
22	21	1	Lower order bytes of	Refer to section 4.2.5.

			phase number	
23	22	1	Notification number	Refer to section 4.2.6.
24	23	1	Reserved	Not set
25	24	8	Reserved	Not set

4.2. Definitions of each part

4.2.1. Error information 1 and error information 2

Error information 1

Flag	Mask	Definition
Bit 0	0x01	No media when printing
Bit 1	0x02	End of media (die-cut size only)
Bit 2	0x04	Tape cutter jam
Bit 3	0x08	Not used
Bit 4	0x10	Main unit in use (QL-560/650TD/1050)
Bit 5	0x20	Not used
Bit 6	0x40	Not used
Bit 7	0x80	Fan doesn't work (QL-1050/1060N)

Error information 2

Flag	Mask	Definition
Bit 0	0x01	Not used
Bit 1	0x02	Not used
Bit 2	0x04	Transmission error
Bit 3	0x08	Not used
Bit 4	0x10	Cover opened while printing (Except QL-500)
Bit 5	0x20	Not used
Bit 6	0x40	Cannot feed (used even when the media is empty)
Bit 7	0x80	System error

4.2.2. Media width and length

The media width and length is described in millimeters. 0 to 255 (FF Hex)

The width of continuous length tape is indicated in millimeters of the tape width, and the width of die-cut labels is indicated by the width of the die-cut section.

The length of continuous length tape is fixed to “00 Hex”, and the length of die-cut labels is indicated by the length of the die-cut section.

Continuous length tape

Media	Media Width	Media Length
12mm	12	0
29mm	29	0
38mm	38	0
50mm	50	0
54mm	54	0
62mm	62	0
102mm	102	0

Die-cut labels

Media	Media Width	Media Length
17 mm x 54 mm	17	54
17 mm x 87 mm	17	87
23 mm x 23mm	23	23
29 mm x 90 mm	29	90
38 mm x 90 mm	38	90
39 mm x 48 mm	39	48
52 mm x 29 mm	52	29
62 mm x 29 mm	62	29
62 mm x 100 mm	62	100
102mm x 51mm	102	51
102mm x 152mm	102	153
12 mm Dia	12	12
24 mm Dia	24	24
58 mm Dia	58	58

4.2.3. Media type

Media Type	Value	Description
No media	00 Hex	Used as print information when the media type is not indicated.
Continuous length tape	0A Hex	Used for both paper and MKP.
Die-cut labels	0B Hex	Used for both paper and MKP.

4.2.4. Status type

Status Type	Value
Reply to status request	00 Hex
Printing completed	01 Hex
Error occurred	02 Hex
Notification	05 Hex
Phase change	06 Hex

If an error occurred during printing, the unit returns the error status.

4.2.5. Phase type and phase number

If the phase type and phase number are not used, both are fixed to “00 Hex”.

Phase State	Phase Type	Phase Number Higher Order Bytes	Phase Number Lower Order Bytes
Waiting to receive	00 Hex	00 Hex	00 Hex
Printing state	01 Hex	00 Hex	00 Hex

When the machine is turned on, it is in the “Waiting to receive” phase state. When printing begins, it changes to the “Printing state” phase state and the machine sends the phase status to the computer. When printing has finished, the machine sends the “Waiting to receive” phase status to the computer. Unless an error occurs during printing, the machine sends the “Printing completed” status.

In sequential printing, In order to print at high speed, printing starts even if a print command has not been sent from the computer. At this time, care should be taken since the “Printing state” phase and “Waiting to receive” phase statuses will be sent. (Refer to “6. Flow Charts”.)

4.2.6. Notification number

Notification	Value
Not available	00 Hex
Cooling (start)	03 Hex
Cooling (finish)	04 Hex

If a high-temperature error occurred during printing, the unit stops printing and enters the cooling state.

At this time, the notification number is used for delivering the status of the cooling state. For details on controlling the actual printing process, refer to “6. Flow Charts”.

5.Command Details

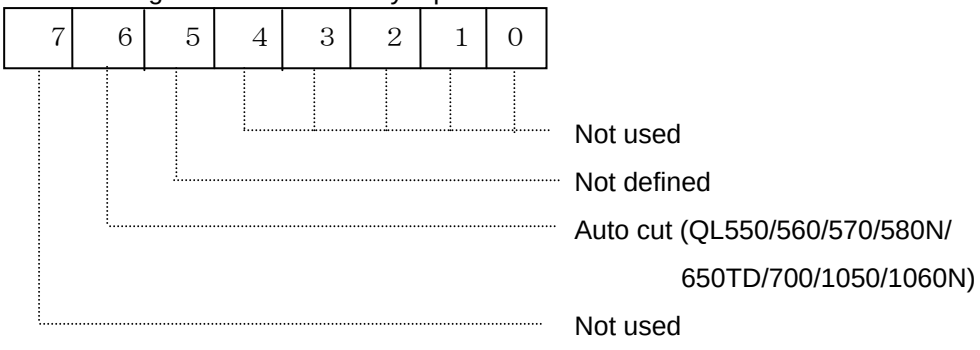
Name	Invalid command
Syntax	NULL 00 H
Description	Skip

Name	Initialize
Syntax	ESC + @ 1B H + 40 H
Description	Initialize mode settings. Also used to cancel printing.

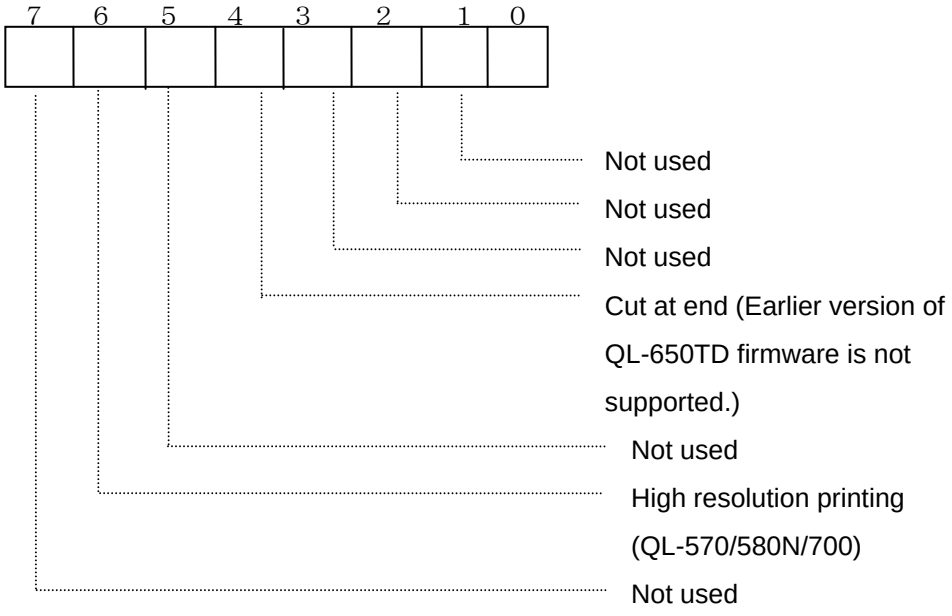
Name	Status information request
Syntax	ESC + I + S 1B H + 69 H + 53 H
Description	Send request to printer to receive status information.

Name	Command mode switch (QL-580N/650TD/1050/1060N)
Syntax	ESC + i + a + {n} 1B H + 69 H + 61 H + {n}
Description	Specifies the command mode. Definition of {n} :ESC/P mode (normal) :Raster mode (default) :ESC/P mode (text) for QL-650TD : P-touch Template mode for QL-580N/1050/1060N

Name	Print information command
Syntax	ESC + i + z + {n1} + {n2} + {n3} + {n4} + {n5} + {n6} + {n7} + {n8} + {n9}+ {n10} 1B H + 69 H + 7AH + {n1} + {n2} + {n3} + {n4} + {n5} + {n6} + {n7} + {n8} + {n9}+ {n10}
Description	Specifies the print information. Definition of {n1} through {n10} {n1}: Valid flag; specifies which values are valid #define PI_KIND 0x02 // Paper type #define PI_WIDTH 0x04 // Paper width #define PI_LENGTH 0x08 // Paper length #define PI_QUALITY 0x40 // Give priority to print quality #define PI_RECOVER 0x80 // Always ON {n2}: Paper type Continuous length tape 0A Hex Die-cut labels 0B Hex {n3}: Paper width; units: mm {n4}: Paper length; units: mm {n5-n8}: Raster number = n8*256*256*256 + n7*256*256 + n6*256 + n5 If the media is not correctly loaded into the printer when the valid flag for PI_KIND, PI_WIDTH and PI_LENGTH are set to “ON”, an error status is returned (Bit 0 of “error information 2” is set to “ON”.) {n9}: Starting page: 0; Other pages: 1 {n10}: Fixed to “0”

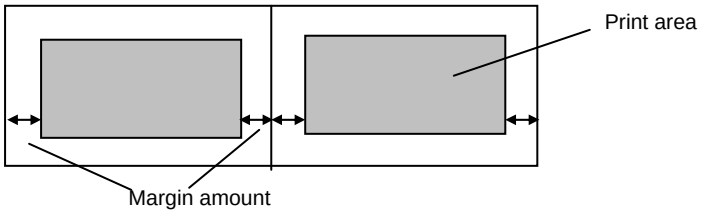
Name	Set each mode
Syntax	ESC + i + M + {n} 1B H + 69 H + 4D H + {n}
Description	Definition of {n} The meaning of each bit in a 1-byte parameter is described below.  Bit 6 Auto cut 1: Auto cut 0:No auto cut When “auto cut” is specified for QL-560/570/580N/700/1050/1060N, following command (ESC + I + A + {n1}) is valid.

Name	Specify the page number in ”cut every * labels” (QL-560/570/580N/700/1050/1060N)
Syntax	ESC + i + A + {n1} 1B H + 69 H + 41 H + {n1}
Description	When “auto cut” is specified, you can specify page number (1-255) in “cut each * labels”. Page number = n1 (1- 255) Default is 1 (cut each label)

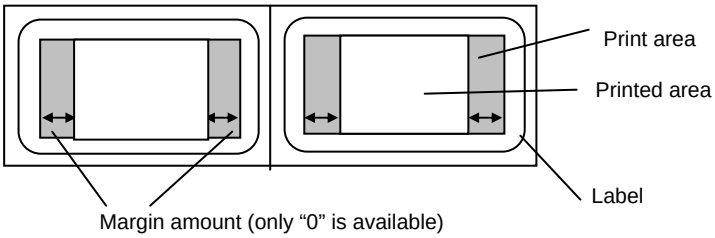
Name	Set expanded mode (QL-560/570/580N/650TD/700/1050/1060N)
Syntax	ESC + i + K + {n} 1B H + 69 H + 4B H + {n}
Description	Definition of {n} The meaning of each bit in a 1-byte parameter is described below.  Bit 3 Cut at end Specify that whether cut at end or not when plural pages printing ON: Cut at end (default) OFF: Not cut at end Bit 6 High resolution printing (QL-570/580N/700) ON: It prints at 600 dpi in the paper length direction. OFF: It prints at 300 dpi in the paper length direction.（default）

Name	Set margin amount (feed amount)
Syntax	ESC + i + d + {n1} + {n2} 1B H + 69 H + 64 H + {n1} + {n2}
Description	Specifies the amount of the margins. Margin amount (dots) = n1 + 256*n2 With this model, the amount of feed cannot be set for each mode. With die-cut labels, the margin amount at the ends of the printed area is “0”. In case of using QL-550/560/570/580N/700, specify 35dots.

Continuous length tape



Die-cut labels



Name	Compression mode selection (QL-570/580N/650TD/1050/1060N)
Syntax	M + {n} 4D H+ {n}

Description	This selects the compression mode. Data compression is only enabled with raster graphic transfer data. Definition of {n} 0 No-compression mode (Enabled) 1 Reserved (Disabled) 2 TIFF (QL-580N/650TD/1050/1060N) In case QL-650TD, only enabled with serial interface In case QL-580N/1060N, serial and LAN interface should set TIFF option. 【TIFF(Pack Bits)】 1. 1-byte unit When the same data is repeated, the number of repetitions and the one-byte data are specified. When the data is different, the number of data items and all data are specified. .When the same data is repeated, the number of data units is specified as the actual number minus 1, expressed as a negative number. When the number of different data units is specified, that number of bytes minus 1 is expressed as a positive number. .If the above process results in more than 90 bytes of compressed data, the data is treated as being all different. As a result, there are 91 bytes, including the 1 byte specifying the data length. Example: Compression example Without compression 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 22 22 23 BA BF A2 22 2B …… With compression ED 00 FF 22 05 23 BA BF A2 22 2B … a b c a. 00H continues for 20 bytes, so 20 Dec -> 19 Dec -> 13 Hex, made into a negative number ED Hex. Therefore, ED 00 b. 22H continues for 2 bytes, so 2 Dec -> 1 Dec -> 1 Hex, made into a negative number FF Hex. Therefore, FF 22 c. The following 6 bytes remain unchanged. 6 Dec-> 5 Dec ->5 Hex. Therefore, 05 23 BA BF A2 22 2B This continues for up to 90 bytes. Even if the remainder of the 90 bytes consists only of 00 Hex, it cannot be omitted. (In case QL-1050, 162 bytes)

Name	Raster graphics transfer
Syntax	g + {s} + {n} + {d1} + ... + {dn} 67 H + {s} + {n} + {d1} + ... + {dn}
Description	{s} The definition of raster information s is as follows. s 0x0: Data transmission 0x1～0xFE: Not used 0xFF: Indicates that data transmission should be stopped. {n} Transfers the specified number of bytes (n) of data. (However, this changes if the data is compressed using the serial interface.) n=90 (QL-500/550/560/570/580N/650TD/700) n=162 (QL-1050/1060N) {d1-dn} Print data.

Name	Zero raster graphics
Syntax	Z 5A H
Description	Raster line is filled in zero data. (Compression mode)

Name	Print command
Syntax	FF 0C H
Description	Used as a print command, except for the last label when multiple labels are printed.

Name	Print command with feeding
Syntax	Control-Z 1A H
Description	Used as a print command for the last label when multiple labels are printed.

Name	Baud rate setting (QL-580N/650TD/1050/1060N)
Syntax	ESC + i + B + {n1} + {n2} 1B H + 69 H + 42H + {n1} + {n2}
Description	This changes the communications baud rate for the main unit. The factory setting is 115200 bps Definition of {n1} and {n2} Setting = n1 + n2 * 256 Setting: 96=9600 bps, 576=57600 bps, 1152=115200 bps

6.Flow Charts

There are following 4 ways of print methods.

- USB Sequential*

  Sequential print by USB interface.

- USB Buffering*

  Buffering print by USB interface.

- Serial Buffering

  Buffering print by serial interface.

- Network Buffering

  Buffering print by LAN interface.

Note:

*Sequential: Start printing immediately after starting to receive print data.

*Buffering: Start printing after one page of print data is received.

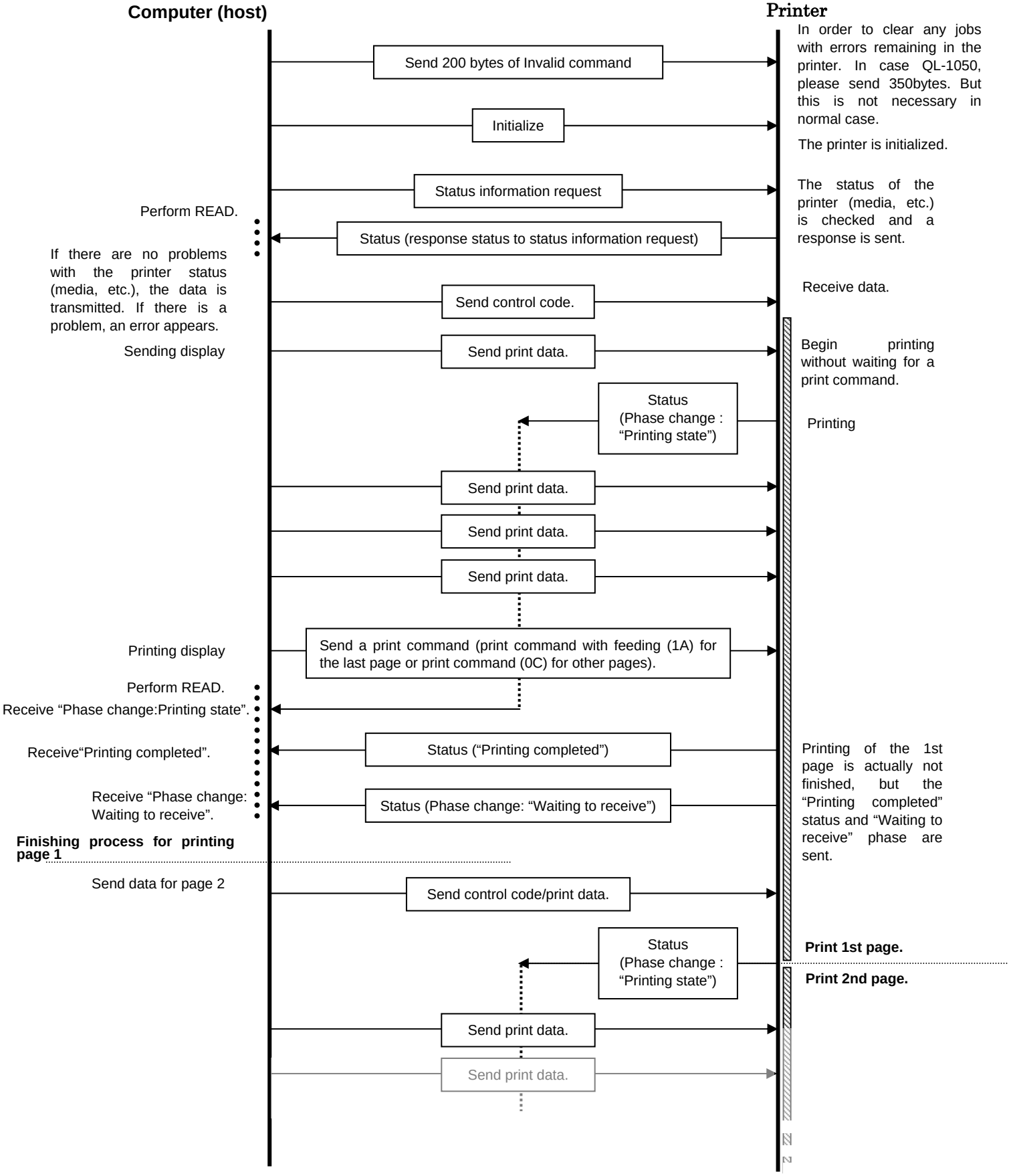
Print methods which each printers support are as below.

Printer	USB Sequential	USB Buffering	Serial Buffering	Network Buffering
QL-500	○	×	×	×
QL-550	○	×	×	×
QL-560	○	×	×	×
QL-570	○	×	×	×
QL-580N	○	○	○	○
QL-650TD	○	×	○	×
QL-700	○	×	×	×
QL-1050	○	○	○	×
QL-1060N	○	○	○	○

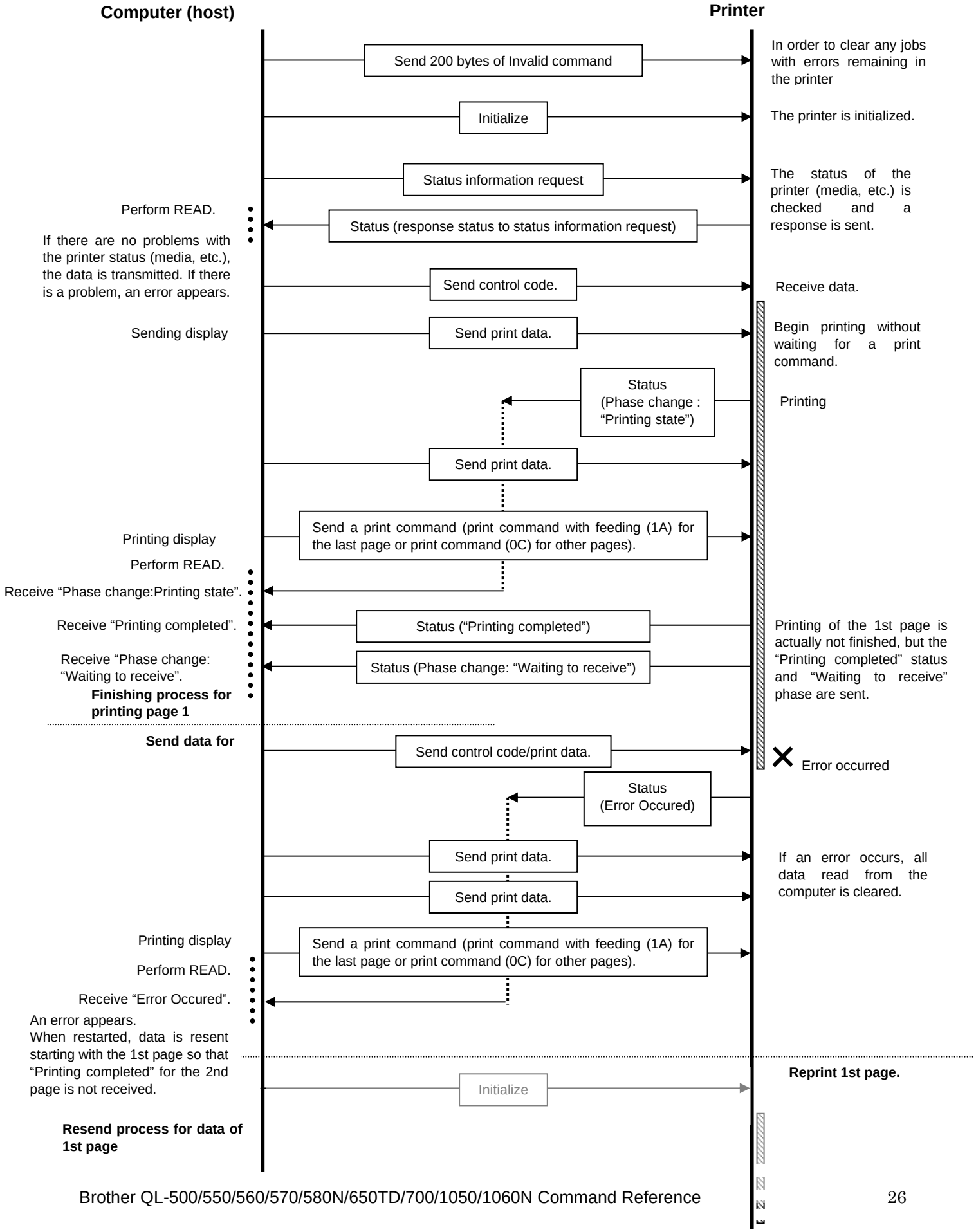
For the each print method, refer to following flow.

- USB Sequential: 6.1, 6.2, 6.3 and 6.4.
- USB Buffering: 6.6 and 6.7.
- Serial Buffering: 6.5, 6.6, and 6.7.
- Network Buffering: 6.9

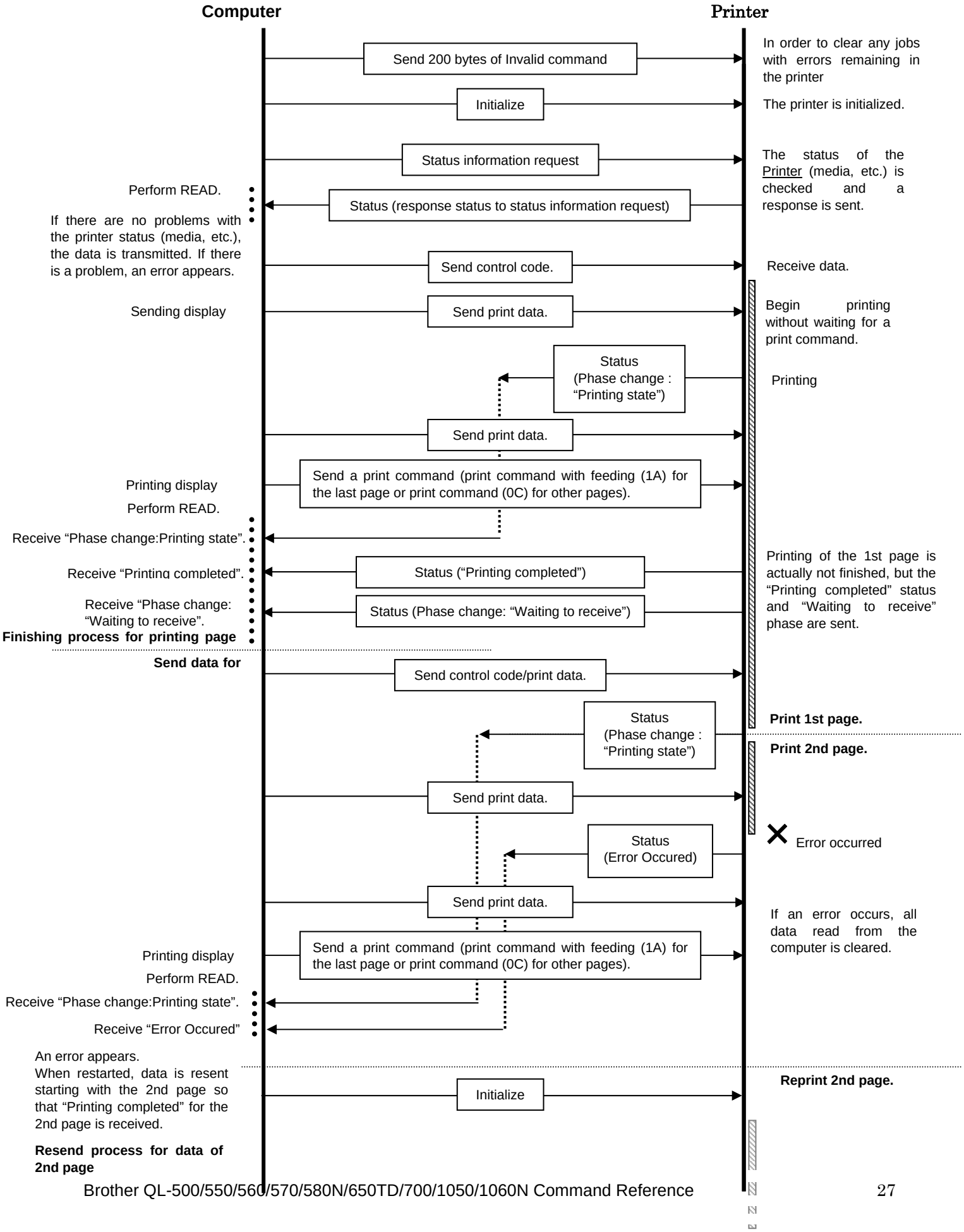
6.1. Sequential Normal Flow for USB connection



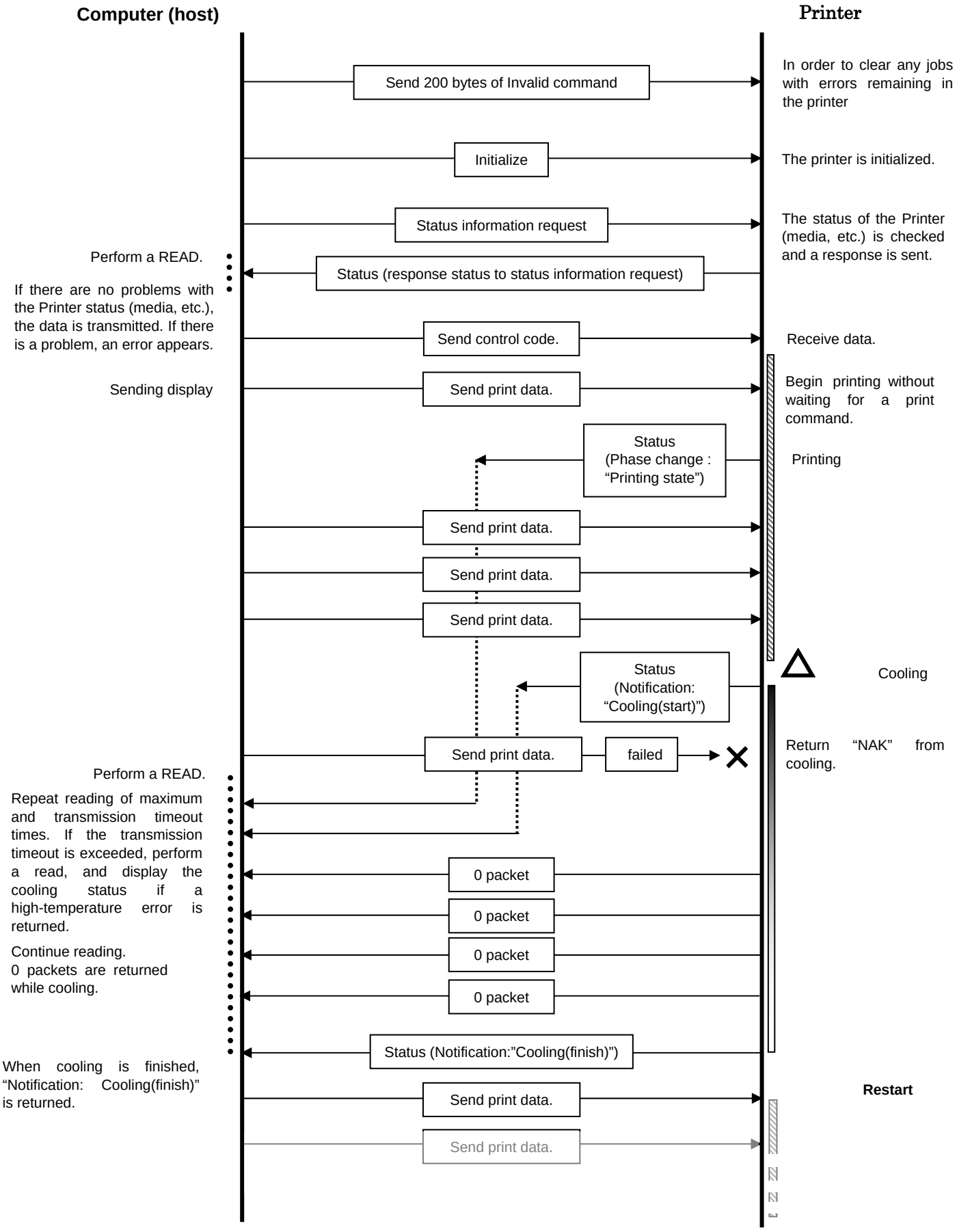
6.2. Sequential Error Flow for USB Connection (Error when feeding at the end of the page, for example, because of a tape cutter jam)



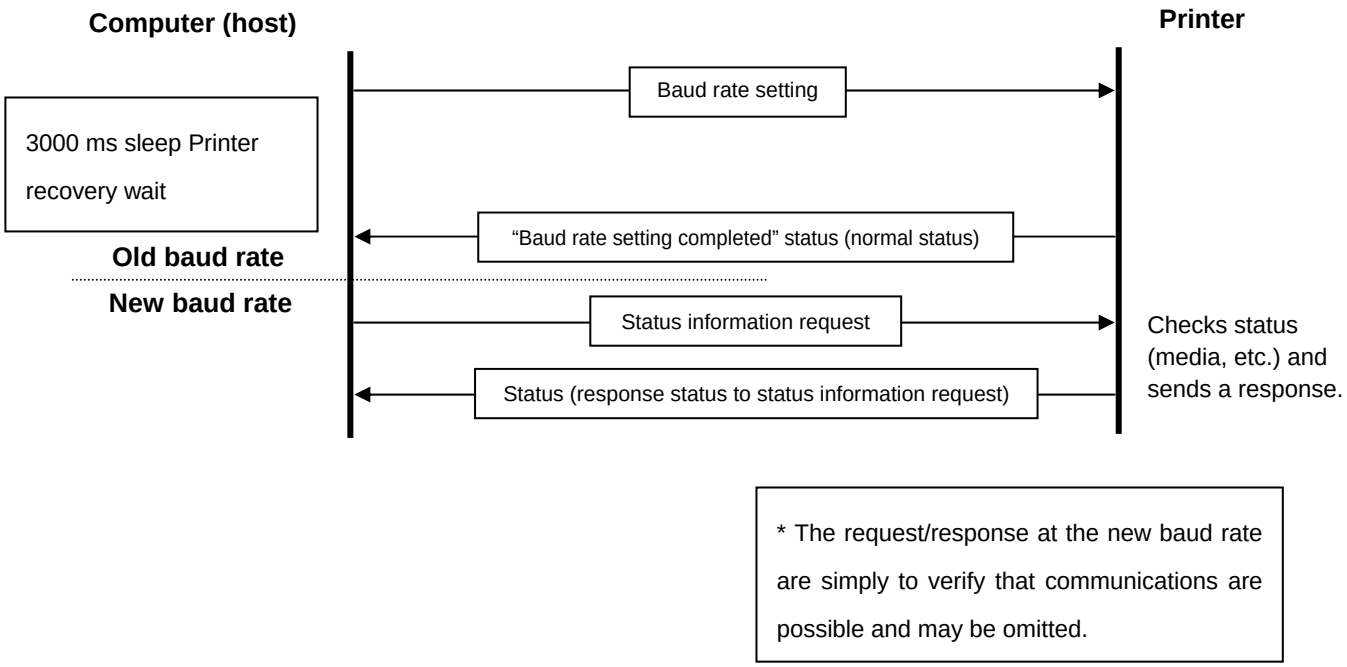
6.3. Sequential Error Flow for USB Connection (Error during continuous printing, for example, because there is no more tape)



6.4. Sequential Cooling Flow for USB Connection

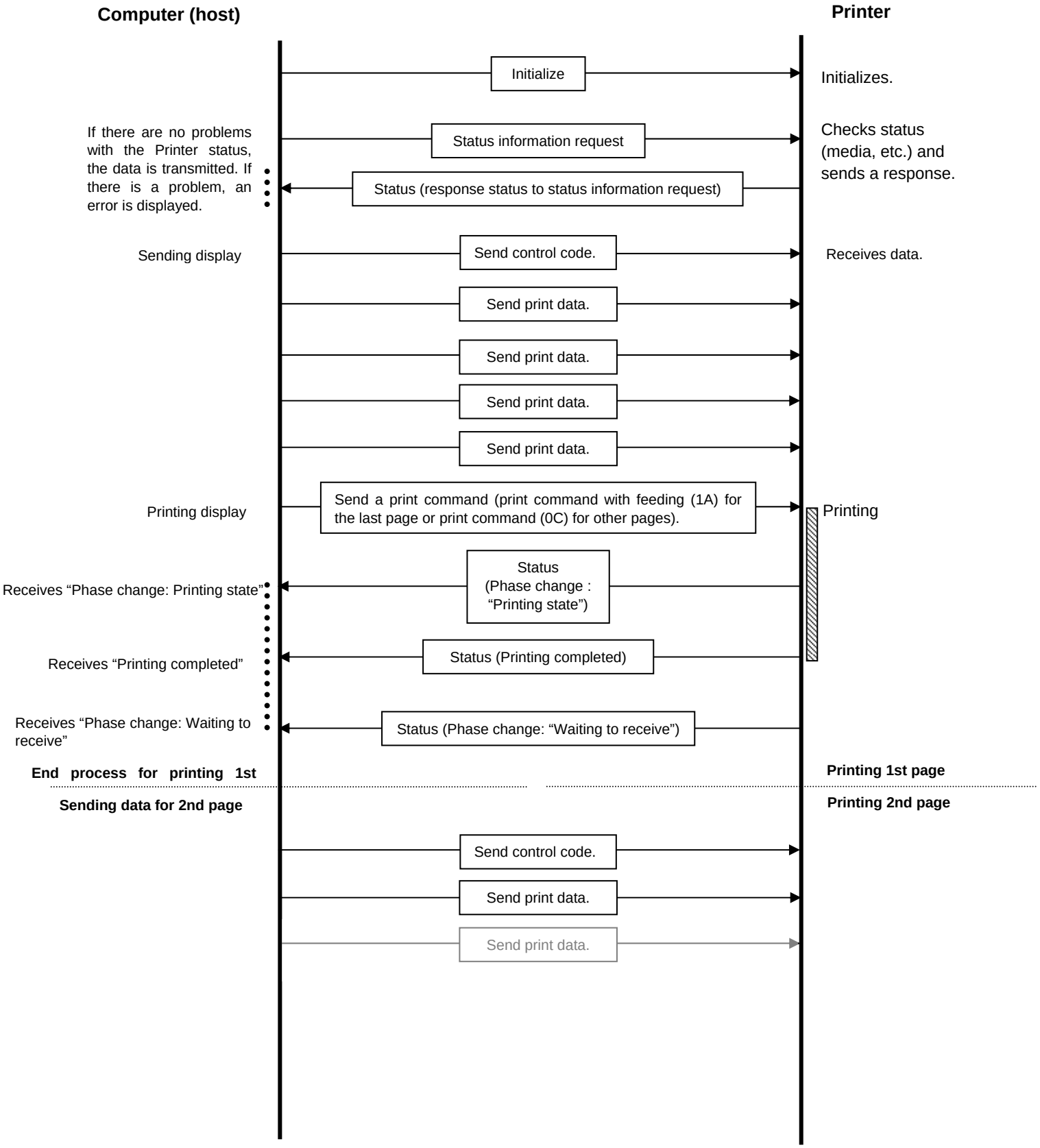


6.5. Flow for Setting Serial Connection Baud Rate

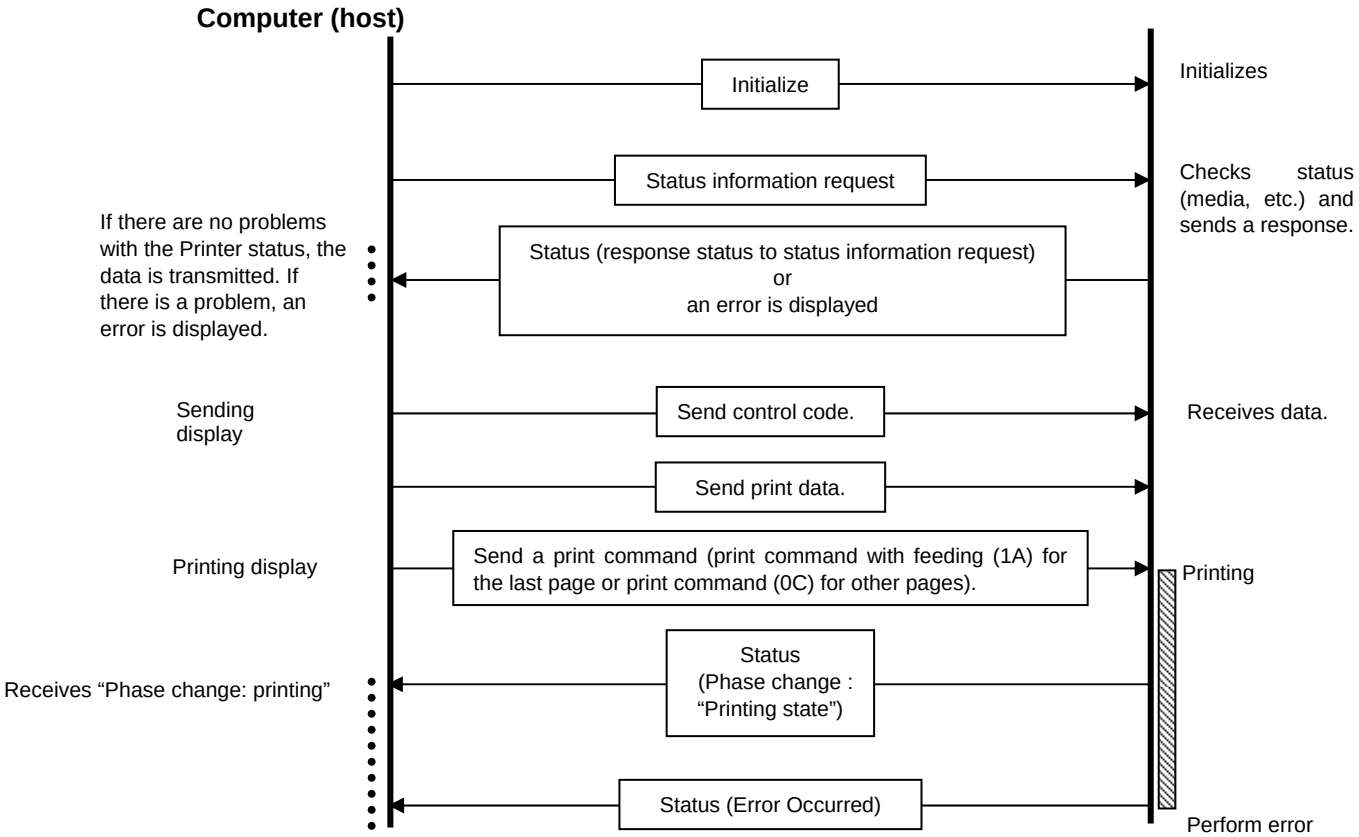


* The request/response at the new baud rate are simply to verify that communications are possible and may be omitted.

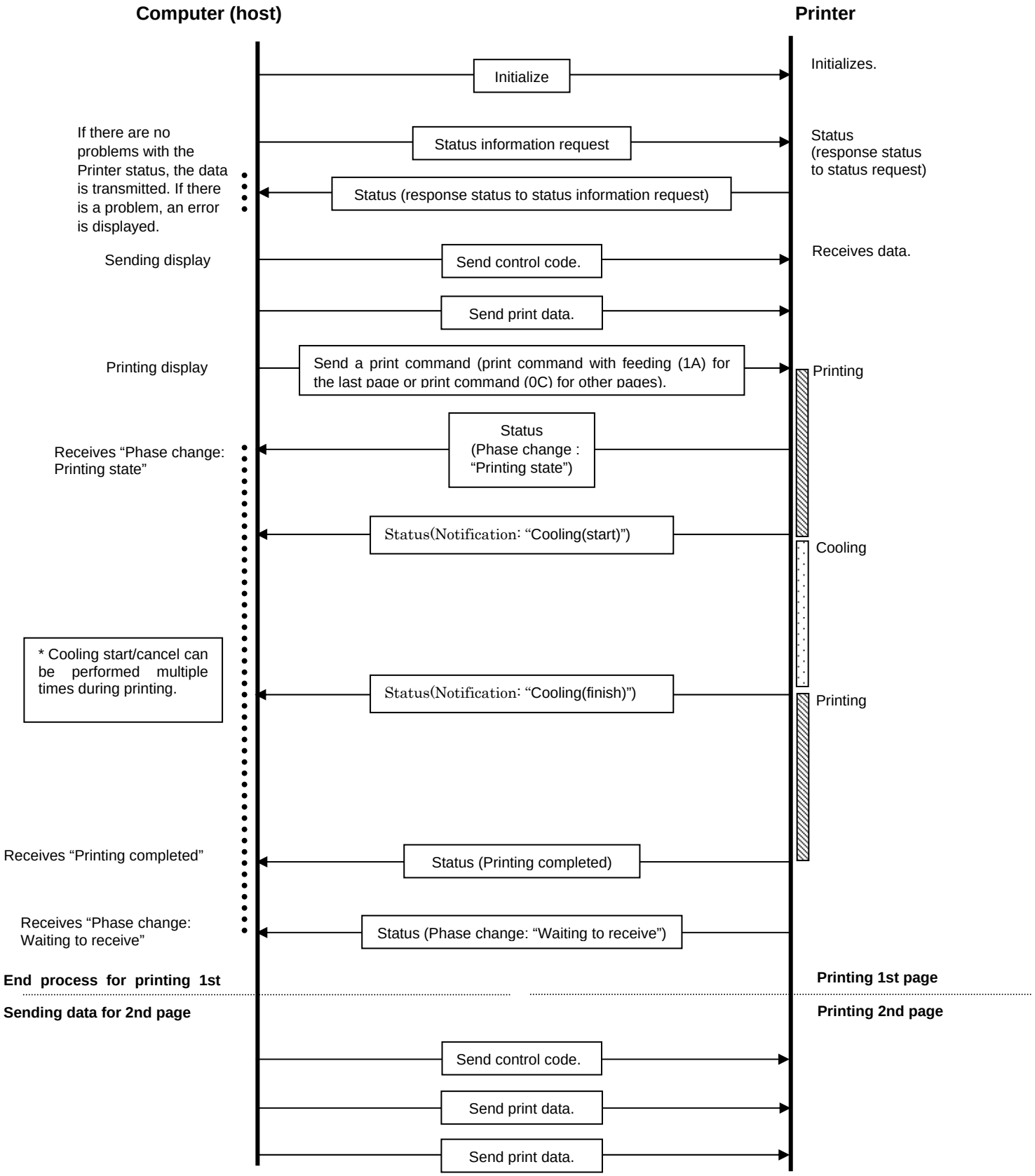
6.6. Buffering Normal Flow for Serial/USB Connection



6.7. Buffering Error Flow for Serial/USB Connection

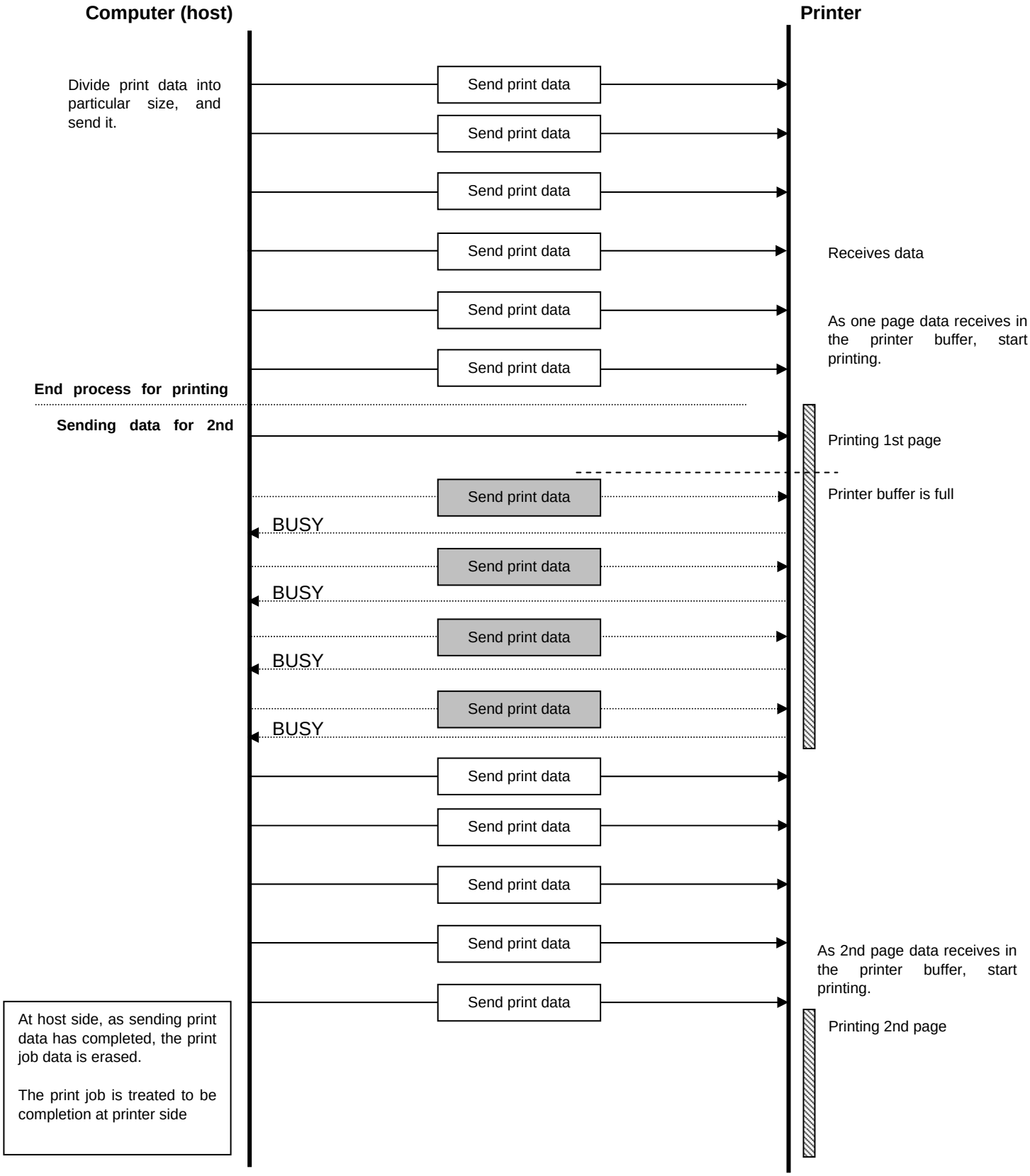


6.8. Buffering Cooling Flow for Serial/USB Connection



6.9. Buffering Normal Flow for Network (Standard TCP/IP / LPR port) Connection

※ When it prints 2 pages data.



7.USB Specifications

USB specifications 1.1

Item	Description
Vendor ID	0x04F9
Product ID	QL-500 0x2015 QL-550 0x2016 QL-560 0x2027 QL-570 0x2028 QL-580N 0x2029 QL-650TD 0x201B QL-700 0x2042 (for printer class) 0x2049 (for mass storage class) QL-1050 0x2020 QL-1060N 0x202a
Class	Printer Mass storage (QL-700 only)
Character string for manufacturer	Character string descriptor: 0x01 0x0409:“Brother"
Character string for product	Character string descriptor: 0x02 0x0409: “QL-50” 0x0409: ”QL-55” 0x0409: “QL-560” 0x0409: “QL-570” 0x0409: “QL-580N” 0x0409: ”QL-650T” 0x0409: “QL-700” 0x0409: ”QL-105” 0x0409: “QL-1060N”
Character string for serial number	Character string descriptor: 0x03 0x0409:“00000000" Last nine digits of the unit’s serial number (The serial number is written on the bottom of the product.)
Device speed	Full speed
Number of interfaces	1 (No alternate interfaces)
With the printer class	
Power supply	Self-powered (As a printer class, Bus power is also set to “ON”.) Maximum packet size: 16 bytes

End point 1	In bulk (Sends the status from the unit to the computer.) Maximum packet size: 16 bytes
End point 2	Out bulk (Sends print commands and data from the computer to the unit.) Maximum packet size: 64 bytes
With the mass storage class (QL-700 only)	
Power supply	Self-powered
End point 1	Out bulk (Sends print commands and data from the computer to the unit.) Maximum packet size: 64 bytes
End point 2	In bulk (Sends the status from the unit to the computer.) Maximum packet size: 64 bytes

History of Changes

Change Number	Created/Modified	Changed Page	Details of Change
000	2004.07.20		Created version 1.0
001	2005.03.25		Created version 2.0 edition adding QL-650TD
002	2006.11.07		Created version 3.0 edition adding QL-1050
003	2008.09.01		Created version 4.0 edition adding QL-560
004	2008.12.25		Created version 5.0 edition adding QL-570/580N/1060N
005	2011.10.03		Created version 6.0 edition adding QL-700