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ESC/Label

Application Development Guide

CW-C6000/CW-C6500 Series

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1 Preface

1.1 Summary

This document explains the technical information necessary for using ESC/Label commands to develop printer control software (drivers, utilities, applications) for the CW-C6000 and CW-C6500 series.   As this document does not explain the specifications for ESC/Label commands in detail, you must refer to the ESC/Label Command Reference Guide.

1.2 Scope of this document

This document applies to the development of printer control software for the CW-C6000 and CW-C6500 series using ESC/Label commands.

1.3 Reference materials

- Ø   ESC/Label Command Reference Guide

1.4 Using this document

This document is to be used as a reference for the design of user interfaces and the design of printer controls, for the functions that are recommended for inclusion in printer control software.
Refer to this document to consider which functions should be included in printer control software, according to the target market and users.
The UI samples and icons that appear in this document are included as examples of how users perform operations and the information that users want to know, but are not specifications about how printer control software should be implemented.
The usage cases that are described for each setting are intended to help users understand the settings, and should be used actively in the help functions and manuals for printer control software.

1.5 Definition of terms

The terms that are used in this document are defined as follows.

Table 1.5-1 List of terms

Term	Description
Printer control software	Refers to drivers, utilities, and applications, or a general term for such software.
Gap, gap between labels	Refers to gaps between labels that are arranged on the backing sheet. The printer uses sensors to detect gaps between labels, in order to determine the optimum printing position for labels.
Left gap	Refers to the distance from the left edge of the paper to the left edge of the label.
Black mark, BM	Refers to the black mark on the back of the backing sheet. The printer uses sensors to detect the black mark, in order to determine the optimum printing position for labels. Sometimes it is abbreviated as BM.
Batch	Refers to printing multiple labels at one time.
Job	Refers to a group of multiple labels that the user prints at one time.
Format	Refers to a group of commands for printing labels, or an image that is rendered by that group of commands. A group of commands starts with ^XA and ends with ^XZ. A label format for printing includes at least one field.
Field	Refers to a group of commands for arranging objects, such as text, barcodes, images, and graphics, in a label format, and the images for each object that is rendered by that group of commands. A field whose content does not change within a batch is called a fixed field, and a field that changes is called a variable field.
Rendering canvas	Refers to the printer's internal memory for rendering images for printing label formats. One sheet of memory is reserved, and a field rendered, for each label format.
Banner print	Refers to printing a label that is longer than the maximum label length supported by the printer.
ICM	Abbreviation for Image Color Management
ICC	Abbreviation for International Color Consortium

2 Models

2.1 Model classification

The CW-C6000 and CW-C6500 series is classified into the following 4 models according to supported paper width and attachments.

Table 2.1-1 Model classification

Media width	Attachment	Model
8-inch	Auto cutter	8-inch wide auto cutter
	Peeler	8-inch wide peeler
4-inch	Auto cutter	4-inch wide auto cutter
	Peeler	4-inch wide peeler

2.2 List of product names

The product names for each of the 4 models above are determined by region.

2.2.1 4-inch models

Table 2.2.1-1 List of product names for 4-inch models

Region	Attachment	Product Name
North America / Latin America	Auto cutter	CW-C6000Au
	Peeler	CW-C6000Pu
Europe	Auto cutter	CW-C6000Ae
	Peeler	CW-C6000Pe
Australia	Auto cutter	CW-C6010A
	Peeler	CW-C6010P
Japan	Auto cutter	CW-C6020A
	Peeler	CW-C6020P
China	Auto cutter	CW-C6030A
	Peeler	CW-C6030P
Korea	Auto cutter	CW-C6040A
	Peeler	CW-C6040P
Taiwan / Singapore / India	Auto cutter	CW-C6050A
	Peeler	CW-C6050P

2.2.2 8-inch models

Table 2.2.2-1 List of product names for 8-inch models

Region	Attachment	Product Name
North America / Latin America	Auto cutter	CW-C6500Au
	Peeler	CW-C6500Pu
Europe	Auto cutter	CW-C6500Ae
	Peeler	CW-C6500Pe
Australia	Auto cutter	CW-C6510A
	Peeler	CW-C6510P
Japan	Auto cutter	CW-C6520A
	Peeler	CW-C6520P
China	Auto cutter	CW-C6530A
	Peeler	CW-C6530P
Korea	Auto cutter	CW-C6540A
	Peeler	CW-C6540P
Taiwan / Singapore / India	Auto cutter	CW-C6550A
	Peeler	CW-C6550P

3 Basic Printing Method

This chapter describes the basic command structure for printing labels.

3.1 Basic print command structure

The basic structure for commands that are transmitted when printing is shown below.
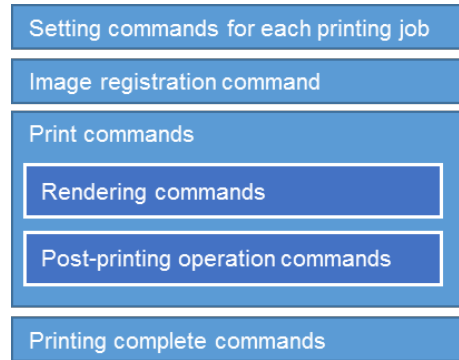
Figure 3.1-1 Basic print command structure

Table 3.1-1 Description of basic print command structure

Item	Description
Setting commands for each printing job	Insert the commands that perform the settings for each printing. - It is recommended to also delete any unnecessary files that remain in the printer during this step. - Specify the resolution before each setting.
Image registration command	Register the image file to be used for printing.
Print commands	Insert commands related to printing and operation instructions for the printer.
Rendering commands	Insert the commands for rendering print data such as text, barcodes, and images.
Post-printing operation commands	Insert the commands for printer operations after printing, such as auto cut, buzzers, and pausing the printer.
Printing complete commands	Insert the commands for the next printing job after a printing job is complete. Delete the files that were registered for printing.

The print settings that should be transmitted for each printing job are described in Chapter 4 Print Settings.   Methods for controlling more advanced printing jobs and post-printing operations are described in Chapter 5 Various Printing Methods.

3.2 Printing 1 label

3.2.1 Print target

The print target is shown below.

Figure 3.2.1-1 Sample label

The rendering components required for printing are shown below.

Table 3.2.1-1 Rendering components for sample label

Type	Details
Graphic Image	BASEIMG.png
Text	"SCHOOL FEET"
Text	"Model :"
Text	"Serial No. :"
Graphic Image	ORIMG.png
Text	"90-22153"
Text	"00000001"
Text	"9"
Barcode	"0123456"

3.2.2 Command

Transmit commands as shown below, using the basic print command structure.

```
[Setting commands for each printing job]
^XA
^IDR*.*^FS                                     Delete files registered previously
^S(CLR,R,600                                   Set format resolution to 600 [dpi]
^S(CLR,P,600                                   Set print resolution to 600 [dpi]
^S(CLR,Z,600                                   Set printer resolution before replacement to 600 [dpi]
^S(CLS,P,2400^S(CLS,L,2400^S(CLS,C,71   Set media size to 4 [inches] x 4 [inches]/Gap 3 [mm]
^S(CLM,T,M1                                    Set media type to Matte Paper
^S(CPC,Q,N                                     Set print quality to Normal
...                                            Other settings are omitted.   Refer to Chapter 4 for details.
^XZ


[Image registration commands]
~DYR:BASEIMG,B,P,430267,0, .PNG...
~DYR:ORIMG,B,P,194,0, .PNG...


[Print commands]
^XA
<Rendering commands>                           Render images, text, and barcodes
^FO0,0^ILR:BASEIMG.PNG^FS
^FO1000,225^A0N,105,84^FDSCHOOLFEET^FS
^FO1000,445^A0N,105,84^FDModel:^FS
^FO1500,445^A0N,105,84^FD90-22153^FS
^FO1500,610^IMR:ORIMG.PNG^FS
^FO1000,785^A0N,105,84^FDSerialNo.:^FS
^FO1500,785^A0N,105,84^FD00000001^FS
^FO1700,1020^A0N,150,120^FD9^FS
^FO1500,1300^BY7,3^B8N,300,Y,N^FD0123456^FS


<Post-printing operation commands>
^S(CUB,S,L                                     Set post-printing buzzer
^XZ


[Printing complete commands]
^XA
^IDR:*.*^FS                                     Delete image files that were registered for printing
^XZ
```

3.3 Printing multiple labels

3.3.1 Command structure

A command structure for a single batch that includes multiple labels is shown below.

```
Batch
 ┌─────────────┐        ┌──────────────────────────────────────┐
 │  Label 1    │        │ Setting commands for each printing job│
 │             │        │ Batch common image registration command│
 │     ┊       │        └──────────────────────────────────────┘
 │  Label n    │
 └─────────────┘        ┌──────────────────────────────────────┐
                        │ Image registration command per label  │
                        │ ┌──────────────────────────────────┐ │
                        │ │ Print commands                   │ │
                        │ │  ┌─────────────────────────────┐ │ │
                        │ │  │ Rendering commands          │ │ │
                        │ │  └─────────────────────────────┘ │ │
                        │ │  ┌─────────────────────────────┐ │ │
                        │ │  │ Post-printing operation command│ │ │
                        │ │  └─────────────────────────────┘ │ │
                        │ └──────────────────────────────────┘ │
                        │ Printing complete commands per label  │
                        └──────────────────────────────────────┘

                        ┌──────────────────────────────────────┐
                        │ Image registration command per label  │
                        │ ┌──────────────────────────────────┐ │
                        │ │ Print commands                   │ │
                        │ │  ┌─────────────────────────────┐ │ │
                        │ │  │ Rendering commands          │ │ │
                        │ │  └─────────────────────────────┘ │ │
                        │ │  ┌─────────────────────────────┐ │ │
                        │ │  │ Post-printing operation command│ │ │
                        │ │  └─────────────────────────────┘ │ │
                        │ └──────────────────────────────────┘ │
                        │ Printing complete commands per label  │
                        └──────────────────────────────────────┘

                        ┌──────────────────────────────────────┐
                        │ Printing complete commands            │
                        └──────────────────────────────────────┘
```
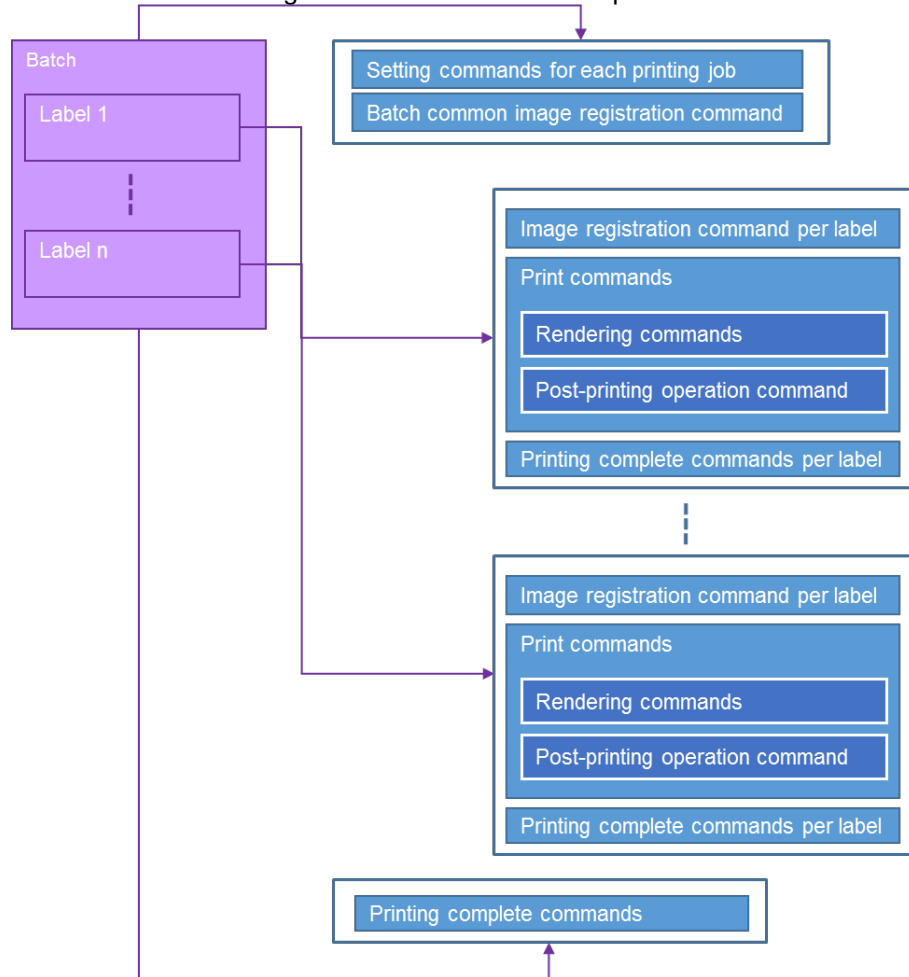
Figure 3.3.1-1 Command structure

- Ø Common print settings and images are registered only once per batch.
- Ø In order to prevent overflow of the printer's internal memory, register and delete the images for each label.
- Ø Common images in a batch are deleted only once at the end of the batch.

3.3.2 **Print target**

The print target is shown below.

Label 1　　　　　　　　　　　Label 2

Figure 3.3.2-1 Sample label

The rendering components required for printing are shown below.

Table 3.3.2-1 Rendering components for sample label

Type	Details	
Graphic Image (Common)	BASEIMG.png	
Text	"SCHOOL FEET"	"SCHOOL FEET"
Text	"Model :"	"Model :"
Text	"Serial No. :"	"Serial No. :"
Graphic Image (Each Label)	ORIMG.png	GRIMG.png
Text	"90-22153"	"90-22153"
Text	"00000001"	"00000002"
Text	"9"	"9"
Barcode	"0123456"	"0123456"

3.3.3 Command

Configure the print settings and register the graphics that are common to a batch.

```
[Setting commands for each printing job]
^XA
^IDR*.*^FS                               Delete files registered previously
^S(CLR,R,600                             Set format resolution to 600 [dpi]
^S(CLR,P,600                             Set print resolution to 600 [dpi]
^S(CLR,Z,600                             Set printer resolution before replacement to 600 [dpi]
^S(CLS,P,2400^S(CLS,L,2400^S(CLS,C,71    Set media size to 4 [inches] x 4 [inches]/Gap 3 [mm]
^S(CLM,T,M1                              Set media type to Matte Paper
^S(CPC,Q,N                               Set print quality to Normal
...                                      Other settings are omitted.
^XZ


[Image registration commands]
~DYR:BASEIMG,B,P,430267,0, .PNG...       Register images that are common to the batch
```

Print the 1st label.

```
 [Image registration commands]
~DYR:ORIMG,B,P,194,0, .PNG...                Register image that is used only for the 1st label


[Print commands]
^XA
<Rendering commands>                         Render images, text, and barcodes
^FO0,0^ILR:BASEIMG.PNG^FS
^FO1000,225^A0N,105,84^FDSCHOOLFEET^FS
^FO1000,445^A0N,105,84^FDModel:^FS
^FO1500,445^A0N,105,84^FD90-22153^FS
^FO1500,610^IMR:ORIMG.PNG^FS                 Render image that is used only for the 1st label
^FO1000,785^A0N,105,84^FDSerialNo.:^FS
^FO1500,785^A0N,105,84^FD00000001^FS         Render serial number for the 1st label
^FO1700,1020^A0N,150,120^FD9^FS
^FO1500,1300^BY7,3^B8N,300,Y,N^FD0123456^FS


<Post-printing operation commands>
^S(CUB,S,L                                   Set post-printing buzzer
^XZ


[Printing complete commands]
^XA
^IDR:ORIMG.PNG^FS                            Delete image file that is used only for the 1st label
^XZ
```

Print the 2nd label.

```
[Image registration commands]
~DYR:GRIMG,B,P,192,0, .PNG...                Register image that is used only for the 2nd label


[Print commands]
^XA
<Rendering commands>                         Render images, text, and barcodes
^FO0,0^ILR:BASEIMG.PNG^FS
^FO1000,225^A0N,105,84^FDSCHOOLFEET^FS
^FO1000,445^A0N,105,84^FDModel:^FS
^FO1500,445^A0N,105,84^FD90-22153^FS
^FO1500,610^IMR:GRIMG.PNG^FS                 Render image that is used only for the 2nd label
^FO1000,785^A0N,105,84^FDSerialNo.:^FS
^FO1500,785^A0N,105,84^FD00000002^FS         Render serial number for the 2nd label
^FO1700,1020^A0N,150,120^FD9^FS
^FO1500,1300^BY7,3^B8N,300,Y,N^FD0123456^FS


<Post-printing operation commands>
^S(CUB,S,L                                   Set post-printing buzzer
^XZ


[Printing complete commands]
^XA
^IDR:GRIMG.PNG^FS                             Delete image file that is used only for the 2nd label
^XZ
```

Perform the batch complete process.

```
[Printing complete commands]
^XA
^IDR:*.*^FS                                   Delete all image files that were used for printing
^XZ
```

4 Print Settings

This chapter describes the functions and commands assumed to be configured each time the user performs printing.

The printer control software should allow the user to enter information easily, and it is recommended for the commands to be transmitted each time printing is performed.

Note that, if commands are not transmitted for each printing job, printing will be performed with the setting values that are saved in the printer.

The settings that can be configured in the printer are categorized in this document as print settings, described in this chapter, and printer settings, described in Chapter 6.   Print settings are assumed to be changed by the user each time printing is performed, and printer settings are assumed to be changed by the user when changes are made to the way the printer is used, such as when replacing paper.

Examples are provided for how printer setting items are categorized, and the printer control software can define the categorization according to the system requirements.   Categorization must observe the command transmission timing and setting storage policy for the printer, with the setting features shown in the table below.

Details that require particular attention are noted below.

- Ø   If the settings for items that are classified in this document as printer settings are changed while printing is in progress, unintended behavior may occur.   If the printer control software implements a printer setting from this document as a print setting, the next print job must not be started while printing is in progress.
- Ø   The setting storage command (^JUS) can be sent to the printer to save settings in the printer control software and retain the settings even when the printer's power is turned off.   However, the setting storage command cannot be sent to the printer for setting items that the printer control software implements as print settings.   This is because there is a limit to the number of times that the printer's internal nonvolatile memory can be overwritten, and this could shorten the service life of the printer.
- Ø   Of the setting items that are categorized as print settings in this document, the settings for the control timing of buzzers, pausing the printer, and cutting cannot be stored in the printer, and therefore they cannot be used as printer settings.

Table 4-1 Setting features

Setting	User requirements	Command transmission timing	Setting storage in printer (Using ^JUS)
Print settings	Change settings for each print job	While printing	Prohibited
Printer settings	Change settings only when changing the way the printer is used	When idling	Allowed

4.1 List of print setting functions

A list of print setting functions is shown below.

Table 4.1-1 List of print setting functions

Category	Function name
Print settings	Media type setting
	Media layout setting
	Post-printing cut setting
	Post-printing peeler setting
	Post-printing buzzer setting
	Post-printing printer pause setting
	Print quality setting
	Ink profile level correction value setting
	Black ratio correction value setting
	Color correction type setting
	Manual color correction setting
	Spot color adjustment setting
	Barcode width correction value setting
	Bidirectional printing setting
	Paper suction strength setting
	Drying time per head pass setting

4.2 Print settings transmission method

As described in Chapter 3 Basic Printing Method, the commands for each setting item in this chapter are transmitted at the beginning of the command sequence for printing.

The command for setting resolution must be transmitted before any other.   There is no particular transmission order stipulated for other commands.

If the printer control software does not support a particular setting item, the printer control software must not send a command related to that setting item.   This is due to the fact that if the printer control software sends that command, the content that has been configured on the printer's panel or with the EPSON tool will no longer be applied to the print result.

An example of the transmission of commands is shown below.

```
[Setting commands for each printing job]
^XA
^IDR*.*^FS                                Delete files registered previously
^S(CLR,R,600                              Set format resolution to 600 [dpi]
^S(CLR,P,600                              Set print resolution to 600 [dpi]
^S(CLR,Z,600                              Set printer resolution before replacement to 600 [dpi]
^S(CLS,P,2400^S(CLS,L,2400^S(CLS,C,71     Set media size to 4 [inches] x 4 [inches]/Gap 3 [mm]
^S(CLM,T,M1                               Set media type to Matte Paper
^S(CMP,M,T                                Set no cutting after printing
^S(CPC,Q,N                                Set print quality to Normal
^S(CPC,D,0                                Set ink profile level correction value to 0
^S(CPC,P,0                                Set black ratio correction value to 0
^S(CPC,C,V                                Set color correction type to vivid colors
^S(CPC,R,0                                Set brightness to 0
^S(CPC,A,0                                Set saturation to 0
^S(CPC,O,0                                Set contrast to 0
^S(CPC,N,0                                Set tone (cyan) to 0
^S(CPC,M,0                                Set tone (magenta) to 0
^S(CPC,L,0                                Set tone (yellow) to 0
^S(CPC,I                                  Set spot color list file to Not apply
^S(CBW,C,0                                Set barcode width correction value to 0
^S(CMP,D,B                                Set printing direction to bidirectional printing
^S(CMF,S,E                                Set paper suction strength setting method to manual
^S(CMF,M,10                               Set paper suction strength to 10
^S(CMS,H,0                                Set drying time per head pass to 0 [seconds]
^XZ
```

4.3 Media type and media layout settings

4.3.1 Media type setting

- n Function description:
    - Ø This function sets the media type to be used.
    - Ø The printer performs printing based on the media type that is set.
    - Ø If you do not set the correct media type, print quality may be reduced.
    - Ø Select the media type from the following.
    - Ø Matte Paper/Synthetic/Glossy Paper/Glossy Film/High Glossy Paper
      Recommended default setting: Matte Paper
- n Usage case:
    - Ø Configure the setting according to the media that is loaded in the printer when printing.
- n Command(s) used
    - Ø ^S(CLM,T

4.3.2 Media layout setting

- n Function description:
    - Ø This function sets the layout information for the media to be used.
    - Ø The printer determines the printing position based on the media layout information that has been set.
    - Ø If the correct media layout information is not set, media size errors may occur.
- n Usage case:
    - Ø Configure the setting according to the media that is loaded in the printer when printing.
- n Implementation recommendations:
    - Ø The user enters intuitive and easy-to-understand values according to the media detection method.
    - Ø The left gap is fixed to 2 mm in the printer.   This setting cannot be changed by the user.
    - Ø Label margins are fixed to 0 in the printer.   If the margin areas are set by the user, offsetting and clipping of the render position are performed by generating the print data in the printer control software, without changing the label width and label length.
    - Ø The blue arrows and values that appear in the layout diagram are not entered by the user, but are displayed in the window for guidance.
- n Command(s) used
    - Ø ^S(CLS,L ^S(CLS,P ^S(CLS,C

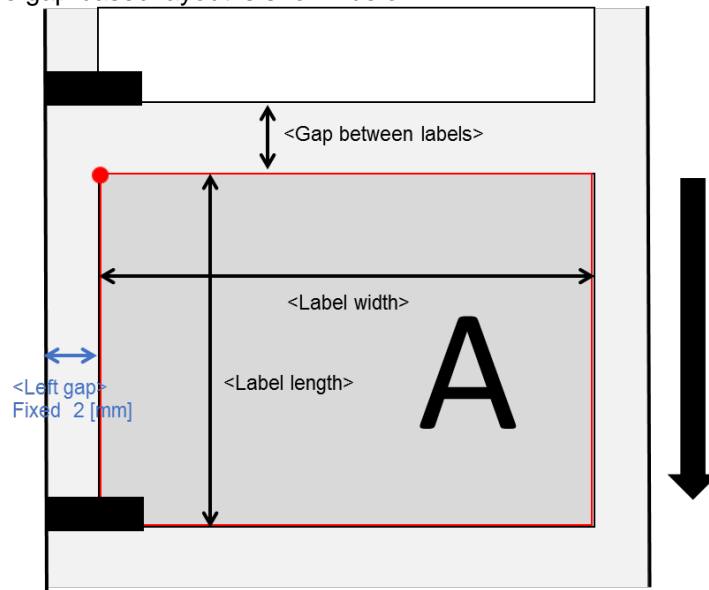2 The gap-based layout is shown below.

Figure 4.3.2-1 Gap-based layout

Table 4.3.2-1 List of gap-based setting values

Item		8-inch models		4-inch models		Command
		Setting range	Recomme nded initial value	Setting range	Recomme nded initial value	
Label width [mm]		21.4 to 211.9	211.9	21.4 to 108.0	108.0	^S(CLS,P
Label length [mm]	No cutting	8.0 to 609.6	304.8	8.0 to 609.6	152.4	^S(CLS,L
	Cut	15.0 to 609.6	304.8	15.0 to 609.6	152.4	
	Peel	12.7 to 609.6	304.8	12.7 to 609.6	152.4	
Gap between labels [mm]		2.0 to 6.0	3.0	2.0 to 6.0	3.0	^S(CLS,C

² The black mark-based layout is shown below.
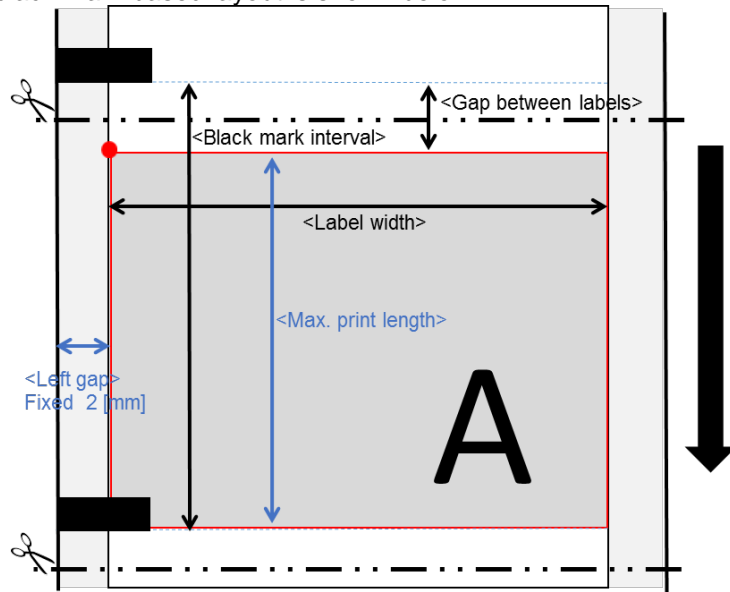
Figure 4.3.2-2 Black mark-based layout

Table 4.3.2-2 List of black mark-based setting values

Item		8-inch models		4-inch models		Command
		Setting range	Recomme nded initial value	Setting range	Recomme nded initial value	
Label width [mm]		21.4 to 211.9	211.9	21.4 to 108.0	108.0	^S(CLS,P
Black mark interval [mm]	No cutting	10.0 to 615.6	307.8	10.0 to 615.6	155.4	-
	Cut	17.0 to 615.6	307.8	17.0 to 615.6	155.4	
	Peel	14.7 to 615.6	307.8	14.7 to 615.6	155.4	
Max. print length [mm]	No cutting	8.0 to 609.6	304.8	8.0 to 609.6	152.4	^S(CLS,L
	Cut	15.0 to 609.6	304.8	15.0 to 609.6	152.4	
	Peel	12.7 to 609.6	304.8	12.7 to 609.6	152.4	
Gap between labels [mm]		2.0 to 6.0	3.0	2.0 to 6.0	3.0	^S(CLS,C

The value obtained by subtracting the gap between labels from the black mark interval is the maximum print length, and is set with a command.

ⴎ The no-mark layout is shown below.
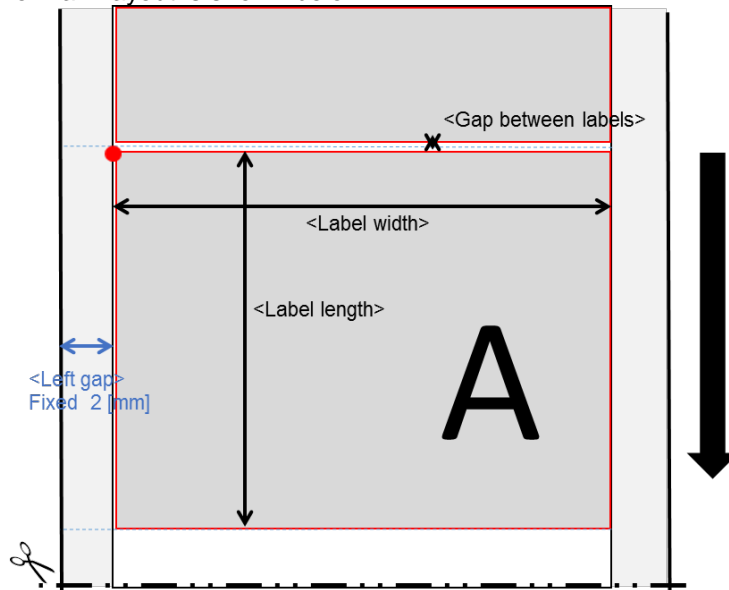
Figure 4.3.2-3 No-mark layout

Table 4.3.2-3 List of no-mark setting values

Item		8-inch models		4-inch models		Command
		Setting range	Recomme nded initial value	Setting range	Recomme nded initial value	
Label width [mm]		21.4 to 211.9	211.9	21.4 to 108.0	108.0	^S(CLS,P
Label length [mm]	No cutting	8.0 to 609.6	304.8	8.0 to 609.6	152.4	^S(CLS,L
	Cut	15.0 to 609.6	304.8	15.0 to 609.6	152.4	
	Peel	12.7 to 609.6	304.8	12.7 to 609.6	152.4	
Gap between labels [mm]		0.0 to 6.0	3.0	0.0 to 6.0	3.0	^S(CLS,C

Banner printing is possible with a no-mark layout. Refer to "Chapter 5.4 Banner print" for more information about the banner printing method.

4.4 Post-printing operation settings

Operations that are performed after printing are determined by the functions that are supported by attachments.

Table 4.4-1 Attachments and supported functions

Function	Attachment	
	Auto cutter	**Peeler**
Cut setting	**ü**	N/A
Peeler setting	N/A	**ü**
Buzzer setting	**ü**	**ü**
Printer pause setting	**ü**	**ü**

Refer to "Chapter 5.3 Controlling buzzers, cutting, and pausing" for details about controlling buzzers, cutting, and pausing the printer.

4.4.1 Cut settings

n Function description:
- **Ø** Use this function to set operations after printing (optimum stop position for an operation) and the auto cut timing.
- **Ø** Select the operation setting from the following.

Table 4.4.1-1 List of post-printing operation settings

Item	Description
Cut	Performs an auto cut at the timing that has been set.
Do not cut (stop at cut position)	The user presses the cut button to perform cutting as necessary.
Do not cut (stop at peeling position)	Cutting is not performed, and the user performs peeling manually.
Rewind	Connect a rewinder.

- **Ø** If the post-printing operation setting is set to "Cut", auto cut is possible while printing by using the ^PQ command.   The following timings are recommended for performing an auto cut.

Table 4.4.1-2 List of auto cut timings

Item	Description
Each specified label	Cuts after each user-specified number of labels.
After printing last label	Cuts after the last label of a batch is printed.

n Usage case:
- **Ø** Use to set the cutting method after printing.

n Implementation recommendations:
- **Ø** This function is enabled only for auto cutter models.

n Command(s) used:
- **Ø** ^S(CMP,M ^PQ

4.4.2 **Peeler setting**

- n Function description:
    - Ø Use this function to set operations after printing (optimum stop position for an operation).
    - Ø Select the operation setting from the following.

Table 4.4.2-1 List of post-printing operation settings

Item	Description
Manual apply	Peeling is performed manually by the user.
Auto apply	Peeling is performed by the peeler.
Rewind	Connect a rewinder.

- n Usage case:
    - Ø Use to set the peeling method after printing.
- n Implementation recommendations:
    - Ø This function is enabled only for peeler models.
- n Command(s) used:
    - Ø ^S(CMP,M

4.4.3 **Buzzer setting**

- n Function description:
    - Ø Use this function to sound the buzzer on the printer at the timing after printing that is specified by the user.
    - Ø The following timings are recommended for sounding the buzzer.

Table 4.4.3-1 List of buzzer timings

Item	Description
Do not sound	The buzzer is not sounded after printing.
Each specified label	The buzzer is sounded after each user-specified number of labels.
After printing last label	The buzzer is sounded after the last label of a batch is printed.

- n Usage case:
    - Ø Use this function to sound a buzzer when the number of units specified by the user have been printed.
- n Implementation recommendations:
    - Ø For auto cutter models, link the timing of the buzzer with the auto cut timing.
- n Command(s) used:
    - Ø ^S(CUB,S

4.4.4 Printer pause setting

- **n** Function description:
  - **Ø** Use this function to pause the printer at the timing after printing that is specified by the user.
  - **Ø** The following timings are recommended for pausing the printer.

Table 4.4.4-1 List of printer pause timings

Item	Description
Do not pause	The printer does not pause after printing.
Each specified label	The printer is paused after each user-specified number of labels.
After printing last label	The printer is paused after the last label of a batch is printed.

- **n** Usage case:
  - **Ø** Use when the user must perform some action after printing, such as checking the printed media or removing paper that has been cut.
- **n** Implementation recommendations:
  - **Ø** For auto cutter models, it is recommended to link the timing for pausing the printer with the auto cut timing.
- **n** Command(s) used:
  - **Ø** ^PQ

4.4.5 Associating auto cut with other post-printing operation settings

The following figure shows how to associate auto cut with the timing for a buzzer or pausing the printer.
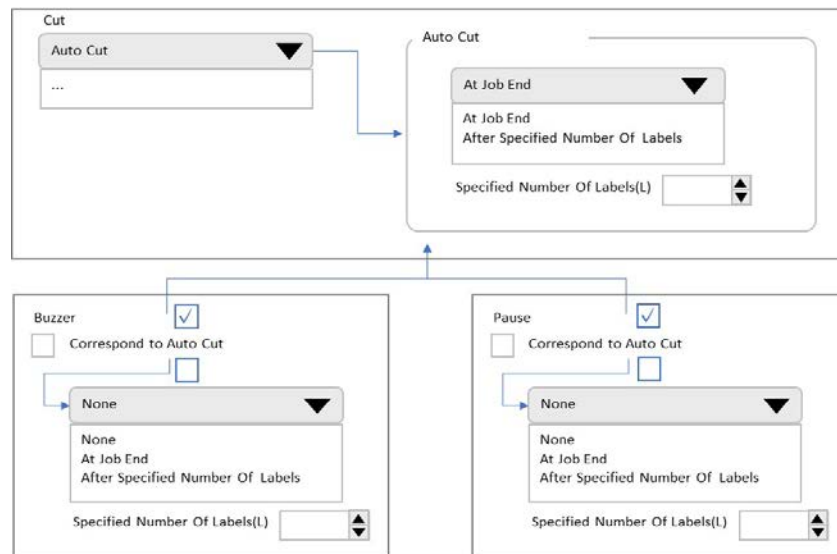
Figure 4.4.5-1 Associating auto cut with other post-printing operations

4.5 Image quality setting

The degree of the effect of the settings described in this chapter may vary depending on the media that is used.　It is recommended to inform the user to check the results of the print settings on the media that will actually be used.

4.5.1 Print quality setting

- **n** Function description:
    - **Ø** Use this function to set the print quality according to the content to be printed.
    - **Ø** The printer performs printing based on the quality that is set.　If a high print quality is set, the print speed will become slower.
    - **Ø** Select from the following print quality settings.
        Max Speed/Speed/Normal/Quality/Max Quality
- **n** Usage case:
    - **Ø** Use to set an optimum print quality according to the content to be printed.
- **n** Implementation recommendations:
    - **Ø** The print quality settings that can be selected and the recommended default setting are determined based on the media type that has been set.
        The printer control software informs the user of the available selections based on media type.

Table 4.5.1-1 Media type and print quality

Media type	Print quality				
	Max Speed	Speed	Normal	Quality	Max Quality
Matte Paper	ü	ü	ü default	ü	N/A
Synthetic	ü	ü	ü default	ü	N/A
Glossy Paper	N/A	N/A	ü	ü default	ü
Glossy Film	N/A	N/A	ü	ü default	ü
High Glossy Paper	N/A	N/A	ü	ü default	ü

- **n** Command(s) used:
    - **Ø** ^S(CPC,Q

4.5.2 **Ink profile level correction value setting**

- **n** Function description:
  - Ø Use this function to set the correction value for the standard ink profile level.
  - Ø When this setting is changed, the ink profile amount (volume of ink used) changes.
  - Ø Using the default setting as the standard, you can set 6 grades toward light and 4 grades toward dark (for a total of 11 grades).
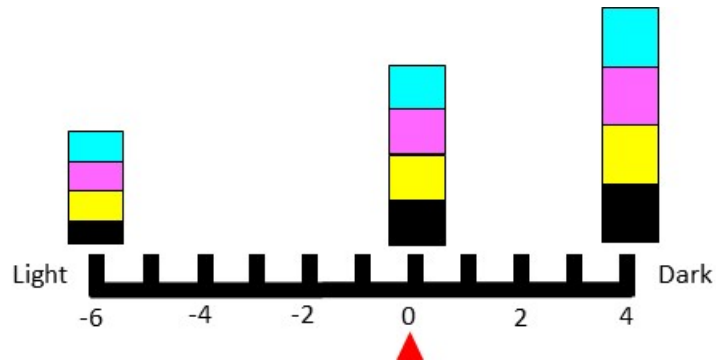
    Default setting: 0

Figure 4.5.2-1 Ink profile amount

- **n** Usage case:
  - Ø Use to reduce or increase the volume of ink used according to media type and the content that is printed.
- **n** Implementation recommendations:
  - Ø When the ink profile level is changed, the barcode scanning quality may drop. In addition, if the grade is changed toward dark, print quality may reduce in regard to bleeding, transfer, abrasion resistance, and water resistance.   Inform the user of the risk of reduced barcode scanning quality and reduced image quality if the ink profile level is changed.
- **n** Command(s) used:
  - Ø ^S(CPC,D

4.5.3 **Black ratio correction value setting**

- **n** Function description:
    - **Ø** Use this function to set the correction value for the ink ratio that makes up the color black.
    - **Ø** If this setting value is changed, the ratio of ink that is used when printing black will change.
    - **Ø** Using the default setting as the standard, you can set 6 grades for a lower ratio of black ink.
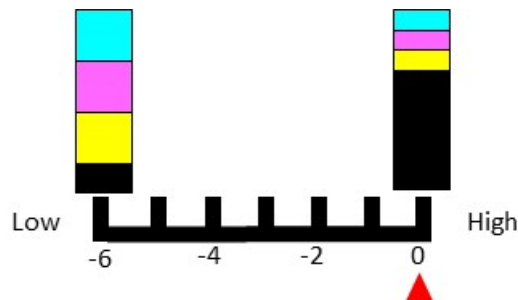
    Default setting: 0

Figure 4.5.3-1 Black ratio correction

- **n** Usage case:
    - **Ø** Lower the blank ink ratio when you check the printed media and find that the ink can easily peel off.
        - **≥** Depending on the quality of the media, black ink can easily peel off when printing with the default black ratio correction value.   If this occurs, correct the value.
- **n** Implementation recommendations:
    - **Ø** When the black ratio correction value is changed, the barcode scanning quality may drop and there is a risk of a reduction in black density.   Inform the user of the risk of reduced barcode scanning quality and reduced image quality if the black ratio correction value is changed.
- **n** Command(s) used:
    - **Ø** ^S(CPC,P

4.5.4 **Color correction type setting**

- **n** Function description:
    - **Ø** Use this function to set the method of correcting printed colors according to the content to be printed.
    - **Ø** Use the type of color correction that is set for this function to correct colors in order to achieve the best printing results with the printer.
    - **Ø** Select from the following methods of correction.
        Vivid colors / ICM / No color correction
    - **Ø** If you select vivid colors, you can use the manual color correction described later in this document.
    - **Ø** You can select ICM if printing using ICM (described later in this document) is supported by the printer control software. Refer to "Chapter 5.5 Printing using ICM" for details about printing using ICM.
- **n** Usage case:
    - **Ø** Use to set an optimum type of color correction according to the content to be printed.
- **n** Command(s) used:
    - **Ø** ^S(CPC,C

The types of color correction and their command parameters are shown below.
For ICM, specify the command parameter D: No color correction.

Table 4.5.4-1 Types of color correction and their command parameters

Item	Description	Command parameter
Vivid colors	Perform sharp color correction in an sRGB space.	V: Vivid colors
ICM	Use the printer control software to perform color correction, in order to match the colors of the output device with the colors on the display.	D: No color correction
No color correction	Color correction has already been performed with the application used to create the image, and is not performed by either the printer control software or the printer.	D: No color correction

4.5.5 **Manual color correction setting**

- ■ Function description:
    - Ø Use this function to set more detailed color correction.
    - Ø The printer corrects the colors of an image based on the setting values.
    - Ø Manual color correction is not performed if the type of color correction is set to ICM or no color correction.

Table 4.5.5-1 Correction content

Item	Description
Brightness	Adjust the brightness of the entire image.
Saturation	Adjust the vividness of the image.
Contrast	Adjust the difference between the light and dark areas of the image.
Tone (cyan)	Adjust the strength of red and cyan.
Tone (magenta)	Adjust the strength of green and magenta.
Tone (yellow)	Adjust the strength of blue and yellow.

- ■ Usage case:
    - Ø Use if the application that was used to create the image has no color correction function.
- ■ Implementation recommendations:
    - Ø Manual color correction is possible only if the type of color correction is set to vivid colors. The printer control software displays the settings window for manual color correction and allows the values to be changed only when the type of color correction is set to vivid colors. When the type of color correction is set to ICM or no color correction, either the settings window for manual color correction is not displayed or the values cannot be changed.

Table 4.5.5-2 Types of color correction and manual color correction

Type of color correction	Manual color correction
Vivid colors	ü
ICM	N/A
No color correction	N/A

- Ø If the user changes the type of color correction from vivid colors to another setting, the printer control software stores the settings for manual color correction so that they can be displayed again the next time the vivid colors settings is selected.
- ■ Command(s) used:
    - Ø ^S(CPC,R ^S(CPC,A ^S(CPC,O ^S(CPC,N ^S(CPC,M ^S(CPC,L

The setting items and their commands are shown below.

Table 4.5.5-3 List of manual color correction setting values

Item	Setting range	Recommended initial value	Command
Brightness	-25 to +25	0	^S(CPC,R
Saturation	-25 to +25	0	^S(CPC,A
Contrast	-25 to +25	0	^S(CPC,O
Tone (cyan)	-25 to +25	0	^S(CPC,N
Tone (magenta)	-25 to +25	0	^S(CPC,M
Tone (yellow)	-25 to +25	0	^S(CPC,L

For ICM or no color correction, the commands for manual color correction are not sent.   Examples of these commands are shown below.

Example 1: When the type of color correction is set to vivid colors

```
^XA
^S(CPC,C,V                          Set color correction type to vivid colors
^S(CPC,R,0                          Set brightness to 0
^S(CPC,A,0                          Set saturation to 0
^S(CPC,O,0                          Set contrast to 0
^S(CPC,N,0                          Set tone (cyan) to 0
^S(CPC,M,0                          Set tone (magenta) to 0
^S(CPC,L,0                          Set tone (yellow) to 0
^XZ
```

Example 2: When the type of color correction is set to ICM or no color correction

```
^XA
^S(CPC,C,D                          Set color correction type to no color correction
                                    Manual color correction commands not sent
^XZ
```

4.5.6 Spot color adjustment setting

■ Function description:
  Ø Use this function to set specific colors in an image to colors designated by the user for printing.
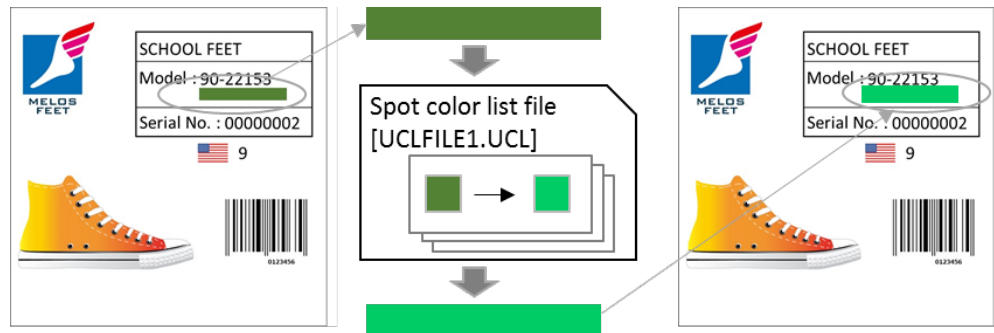
Figure 4.5.6-1 Spot color adjustment

  Ø The user uses the EPSON tool to create in advance a spot color list file that contains color conversion information.
  Ø The user selects whether to apply spot color adjustment and the target spot color list file on the printer control software when printing.
  Ø The printer control software sends a spot color list file to be applied to the printer with each printing and enables the file.
  Ø The printer converts a specific color according to the enabled spot color list file and prints it.
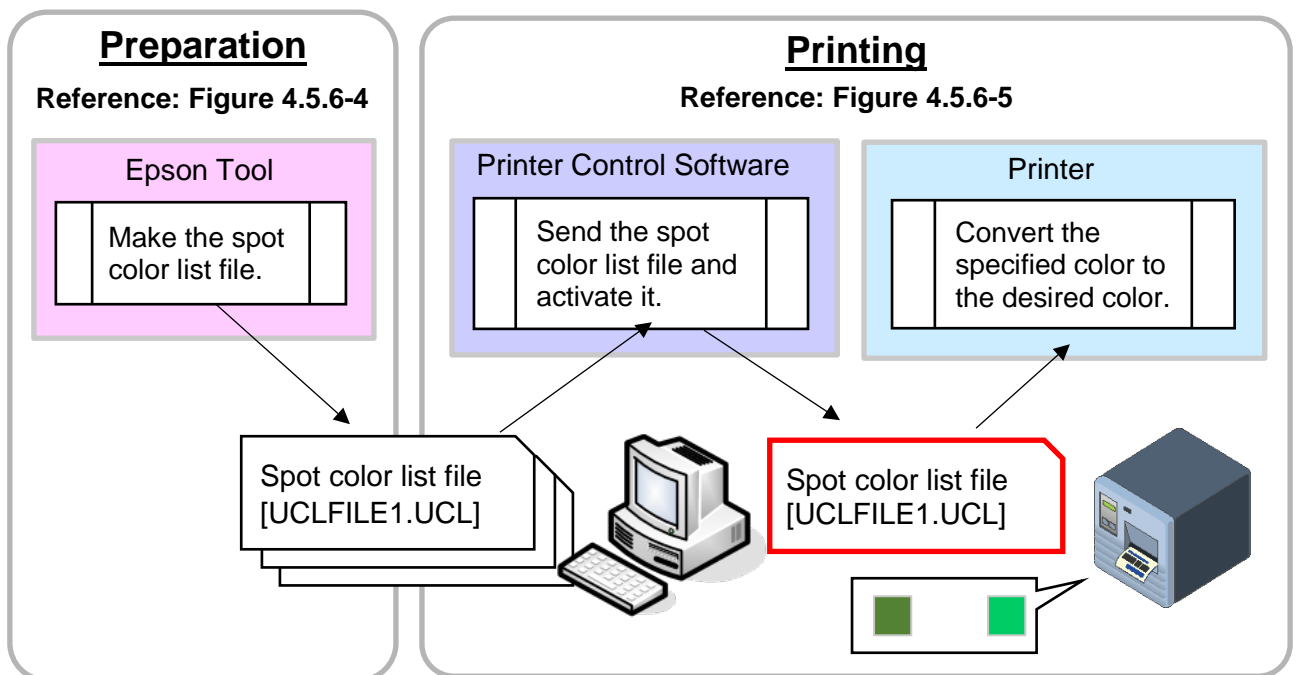
Figure 4.5.6-2 Outline flow of the Spot color adjustment

- **n** Usage case:
  - **Ø** Use this function for components that you particularly want to print with an appropriate color, such as logos or other symbols.
- **n** Implementation recommendations:
  - **Ø** When printing with spot color adjustments, the printer control software should display a note that recommending that the user use the same image quality setting as when creating a spot color list file.
    If the image quality settings are different, the color designated as the spot color may not be reproduced correctly.
    The related image quality settings are as follows:
    - Print quality setting
    - Ink profile level correction value setting
    - Black ratio correction value setting
    - Color correction type setting
    - Manual color correction setting
  - **Ø** The printer control software should display a note recommending that users not use spot color adjustments with ICM.   That is because the color specified as a spot color may change in ICM.
- **n** Command(s) used:
  - **Ø** ~DY ^ID ^S(CPC,I

The items and UI samples that the user sets when printing are shown below.

Table 4.5.6-1 User setting items

| Item		Description
Don't apply		Choose this when not applying spot color adjustment with this print.
Apply		Choose this when applying spot color adjustment with this print.
	Spot color list file name	From the spot color list files that the user saved on the computer with the EPSON tool in advance, specify the one to this printing. - The default folder displayed in the dialog when selecting a spot color list file is shown below. This is also the default location where the EPSON tool saves the file. - We recommend a user interface that allows users to easily specify the information that was previously specified. <Default folder> [Public documents]¥EPSON¥SpotColorData¥CW-C6000 Series * [Public document] is a path that can be obtained by specifying CSIDL_COMMON_DOCUMENTS in Windows API, etc.
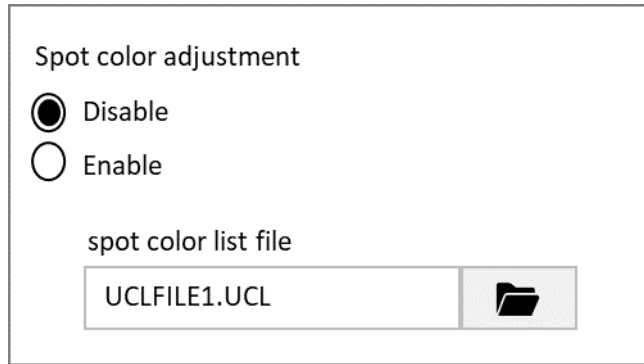
Figure 4.5.6-3 UI sample for enabling / disabling spot color adjustment and specifying spot color list file

The method for transmitting commands is shown below.

If a spot color list file is not applied, the printer control software sends only the spot color list file selection command (^S(CPC, I).

In this case, the file name in the command parameter is left blank.

If a spot color list file is applied, the printer control software sends the spot color list file selected by the user using the file registration command (~DY).

Next, the printer control software sends a spot color list file selection command (^S(CPC, I).

The spot color list file name is specified as the command parameter file name.

The printer control software deletes the spot color list file using the file deletion command (^ID) after printing.

Note that the maximum file name length that can be set in the command parameter is 8 characters, so the printer control software limits the file name length to 8 characters or less and specifies it in the command parameter.   Examples of these commands are shown below.

Example 1: Not applying a spot color list file

```
< Setting command group for each printing >
^XA^S(CPC,I^XZ                          Do not apply spot color list file
```

Example 2: Applying spot color list file "UCLFILE1.UCL"

```
< Spot color list file registration command >
~DYR:UCLRILE1.UCL,B,UCL,820,0,…        Register spot color list file

< Setting command group for each printing >
^XA^S(CPC,I, R:UCLFILE1.UCL^XZ        Set to apply spot color list file

Other commands required for printing are omitted. See Chapter 3 for details.

< Print end command group >
^XA^IDR:*.*^FS^XZ                      Delete image files and spot color list files registered for printing
```

Detailed flowcharts of the overall spot color adjustment system are shown below.

1. The flow of creating a spot color list file is shown here.   Although the user does not use the printer control software to create the spot color list file, this is provided as reference information.
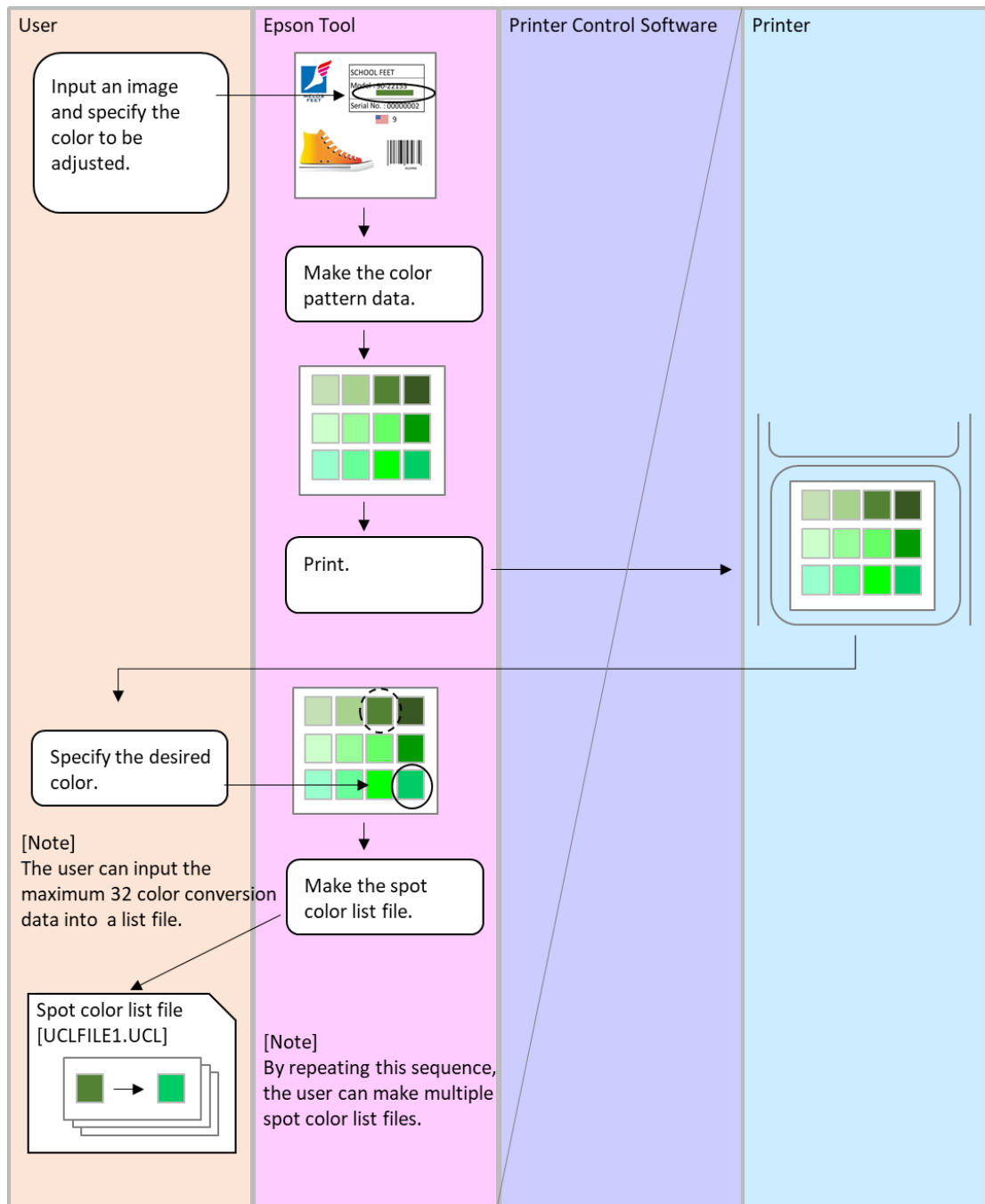

Figure 4.5.6-4 Creating a spot color list file

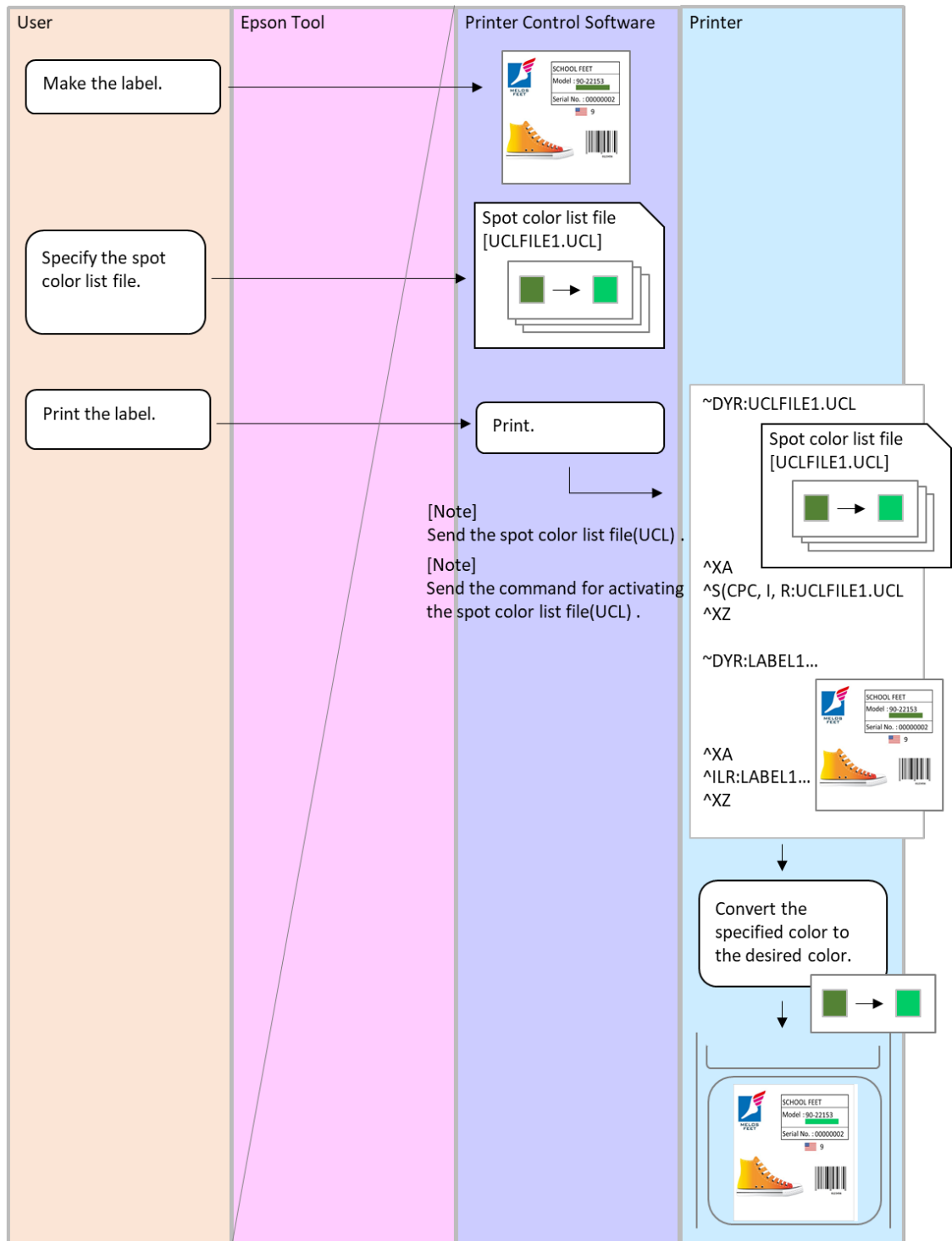2. This shows the flow of printing when applying spot colors.

Figure 4.5.6-5 Printing with applied spot colors

4.5.7 Barcode width correction value setting

- ■ Function description:
  - Ø Use this function to set the bar width correction value for barcodes.
  - Ø If you change this setting, the bar width will change when barcodes are printed.
    - ⋝ By correcting the bar width of barcodes, you can prevent reduced barcode scanning quality due to ink bleeding.
    - ⋝ Target barcodes
      UPC-A, UPC-E, JAN13(EAN), JAN8(EAN), Code39, ITF, Codabar, Code93, Code128, GS1-128, GS1 DataBar Truncated, GS1 DataBar Expanded, GS1 DataBar Limited,
      PDF417, Micro PDF, GS1 DataBar Stacked,
      GS1 DataBar Stacked Omnidirectional, GS1 DataBar Expanded Stacked,
      QR Code, Micro QR, Aztec, DataMatrix
    - ⋝ If the bar width adjustment is changed by 1 step, the bar width changes by 1 dot at a conversion of 600 dpi.
      For 300 dpi, a 2-step change makes a change of 1 dot.
    - ⋝ Even with the default conditions, corrections are made to improve the barcode scanning quality. When the adjustment value is set to the default setting (0), the bar width is narrowed by 2 dots, at a conversion of 600 dpi in comparison with the width calculated using the standards for each symbol. For 300 dpi, it is narrowed by 1 dot.
- ■ Usage case:
  - Ø Check the scanning of printed barcodes, and use this function if the scanning quality is low.
- ■ Implementation recommendations:
  - Ø Inform the user of the risk that the barcode scanning quality might drop paradoxically if the barcode width correction value is changed.
- ■ Command(s) used:
  - Ø ^S(CBW,C

4.5.8 Bidirectional printing setting

- ■ Function description:
  - Ø Use this function to set whether to allow bidirectional printing or use only unidirectional printing.
  - Ø If you allow bidirectional printing, the printer will print in the optimal printing direction according to the print quality setting. If you fix the setting to unidirectional printing, printing will always be performed in unidirectional. However, the print speed is slower for unidirectional printing.
  - Ø Select one of the following printing directions.
    Bidirectional/Unidirectional
    Default setting: Bidirectional
- ■ Usage case:
  - Ø Usually, this function is used to allow bidirectional printing. If letters and lines in the head's scanning direction are doubled or blurred, change the setting to unidirectional printing.
- ■ Implementation recommendations:
  - Ø Inform the user that the print speed will be slower if unidirectional printing is set.
- ■ Command(s) used:
  - Ø ^S(CMP,D

4.5.9 **Paper suction strength setting**

- ∎ Function description:
  - Ø Use this function to set the paper suction strength.
  - Ø Select one of the following setting methods for paper suction strength.

Table 4.5.9-1 Setting method for paper suction strength

Item	Description
Auto	The printer configures the setting automatically.
Manual	The user configures the setting manually.

  Default setting: Auto
  - Ø When set to Auto, the printer uses a suction strength based on settings such as media type to hold the paper to the platen.
  - Ø When set to Manual, the printer uses the paper suction strength set by the user to hold the paper to the platen.
  - Ø For Manual, you can set the level for paper suction strength to a value from 1 to 10, in increments of 1.
    Default setting: 10
- ∎ Usage case:
  - Ø When using the recommended media, the printer uses an appropriate suction strength with the Auto setting. However, use the Manual setting to set an appropriate suction strength when using a variety of different paper.
  - Ø When using thin and soft paper, the suction strength might be set too high.   If printing is not affected but you want to reduce noise, lower the paper suction strength setting.
  - Ø When using thick and hard paper, the suction strength might be set too low, causing friction with the head.   In this case, increase the setting for paper suction strength.
- ∎ Command(s) used:
  - Ø ^S(CMF,S ^S(CMF,M

4.5.10 **Drying time per head pass setting**

- ∎ Function description:
  - Ø Use this function to set the drying time per head pass.
  - Ø The printer waits for the drying time that has been set per pass before printing the next pass.
  - Ø Set the drying time between 0 and 5.0 seconds, in increments of 0.1 seconds.
    Default setting: 0 seconds
- ∎ Usage case:
  - Ø Use this function when printing items with a high print density, such as photos, or when printing on paper that takes some time to dry.
    If the paper does not dry sufficiently, the print surface might be smudged when coming into contact with your hands or another sheet of paper.
- ∎ Command(s) used:
  - Ø ^S(CMS,H

5 Various Printing Methods

This chapter describes a variety of printing methods using settings and commands.

5.1 Selecting an optimum input resolution

With the CW-C6000 and CW-C6500 series, you can set multiple print qualities.   The print speed is faster with lower quality settings, and even faster printing is possible by setting a lower input resolution for the printer.   However, if you lower the input resolution while using a high quality setting, the desired image quality might not be possible.   In order to achieve optimum printing results, it is recommended to generate print data with an input resolution suitable for the print quality.

The recommended input resolution for each print quality setting is shown below.

Printing is possible even without the recommended combination of settings.

Table 5.1-1 Print quality and recommended input resolution

Print quality	Recommended input resolution [dpi]
Max Speed	300
Speed	600
Normal	600
Quality	600
Max Quality	600

An example using an input resolution of 600 dpi was shown in Chapter 3.   The information provided here is for an input resolution of 300 dpi.

- Ø   Set each resolution to 300 dpi in the print settings.   Be sure to configure this setting before any other.   The resolutions that must be set are the format resolution, the print resolution, and the printer resolution before replacement.
- Ø   Set images that are registered in the printer to 300 dpi.
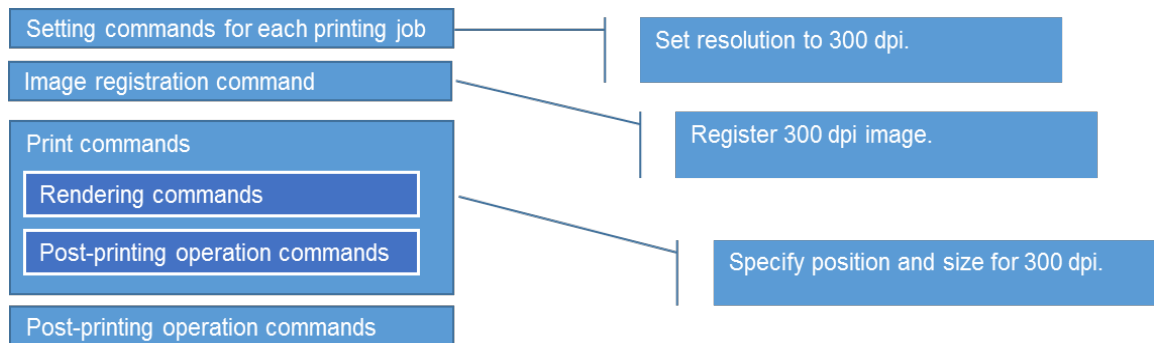- Ø   Set the position and size for the print command to values suitable for 300 dpi.

Setting commands for each printing job	Set resolution to 300 dpi.
Image registration command	
Print commands	Register 300 dpi image.
Rendering commands	
Post-printing operation commands	
Post-printing operation commands	Specify position and size for 300 dpi.

Figure 5.1-1 Command structure for an input resolution of 300 dpi

5.1.1 **Print target**

The print target is shown below.   Prepare images of 300 dpi in advance.

Figure 5.1.1-1 Sample label

The rendering components required for printing are shown below.

Table 5.1.1-1 Rendering components for sample label

Type	Details
Graphic Image	BASEIMG2.png
Text	"SCHOOL FEET"
Text	"Model :"
Text	"Serial No. :"
Graphic Image	ORIMG.png
Text	"90-22153"
Text	"00000001"
Text	"9"
Barcode	"0123456"

5.1.2 **Command**

```
[Setting commands for each printing job]
^XA
^IDR*.*^FS
^S(CLR,R,300                                  Set format resolution to 300 [dpi]
^S(CLR,P,300                                  Set print resolution to 300 [dpi]
^S(CLR,Z,300                                  Set printer resolution before replacement to 300 [dpi]
^S(CLS,P,1200^S(CLS,L,1200^S(CLS,C,35         Specify paper size at 300 [dpi]
^S(CLM,T,M1
^S(CPC,Q,D                                    Set print quality to Max Speed
...                                           Other settings are omitted.
^XZ


[Image registration commands]
~DYR:BASEIMG,B,P,95318,0, .PNG...
~DYR:ORIMG,B,P,162,0, .PNG...


[Print commands]
^XA
<Rendering commands>                          Specify object position and size for 300 [dpi]
^FO0,0^ILR:BASEIMG.PNG^FS
^FO500,112^A0N,60,48^FDSCHOOLFEET^FS
^FO500,222^A0N,60,48^FDModel:^FS
^FO750,222^A0N,60,48^FD90-22153^FS
^FO750,305^IMR:ORIMG.PNG^FS
^FO500,393^A0N,60,48^FDSerialNo.:^FS
^FO750,392^A0N,60,48^FD00000001^FS
^FO850,510^A0N,90,72^FD9^FS
^FO750,650^BY4,3^B8N,150,Y,N^FD0123456^FS

<Post-printing operation commands>
^S(CUB,S,L
^XZ


[Printing complete commands]
^XA
^IDR:*.*^FS
^XZ
```

5.2 Efficiently printing multiple labels

The printer renders objects such as text, barcodes, images, and graphics in each field of the rendering canvas according to the commands that are transmitted.   If there are many fields on a single label, the rendering time will be longer and it will take longer for printing to start.

If there are multiple labels in a single batch, there might be a wait time between printing the first and second labels, because the second and subsequent labels are rendered in the same way as the first.   This chapter describes a printing method for reducing the rendering time for the second and subsequent labels, when a single batch includes multiple labels.

We recommend including this function in cases where many labels are printed at once, so that the total print time does not become longer than expected.

5.2.1 Operating principle

Common fields for the first label and each subsequent label are rendered first, and they are saved as a template image.   For both the first and subsequent labels, the template image that was saved is rendered first, and then only the fields that are different for each label are rendered.

If there are many fields to render and there is a high ratio of common fields between multiple labels, you can expect an improvement in the rendering speed.
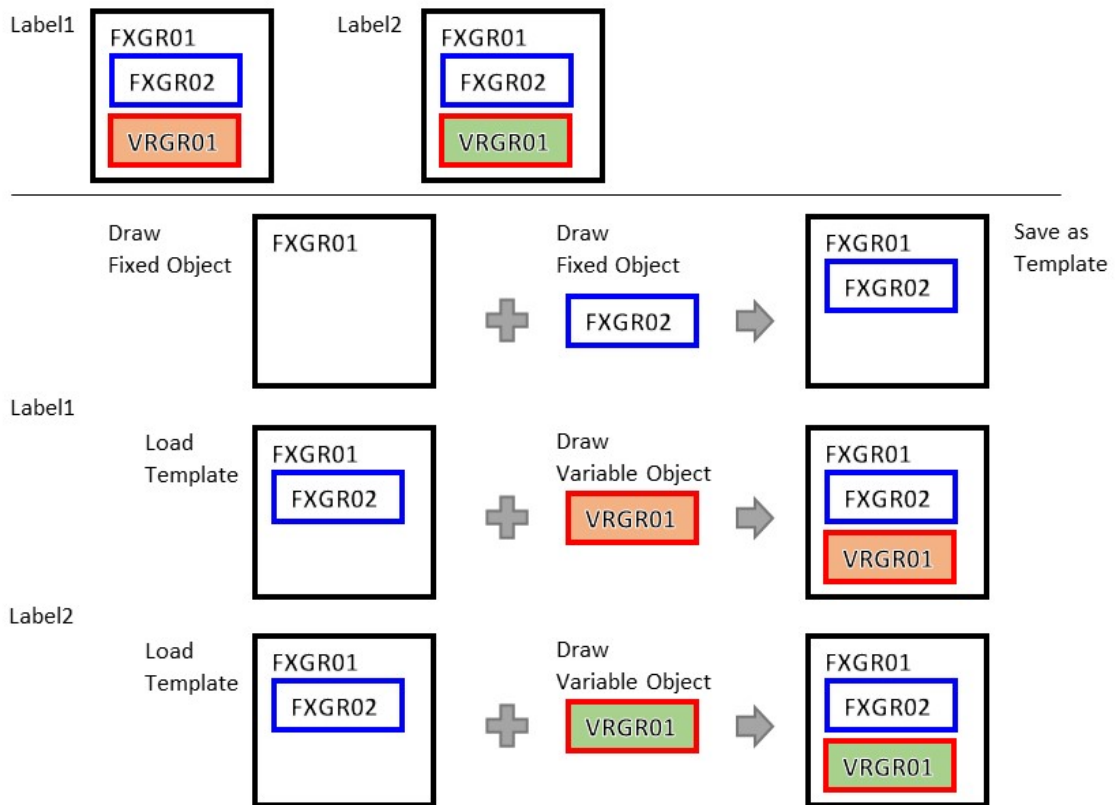

Figure 5.2.1-1 Operating principle

5.2.2 Command structure

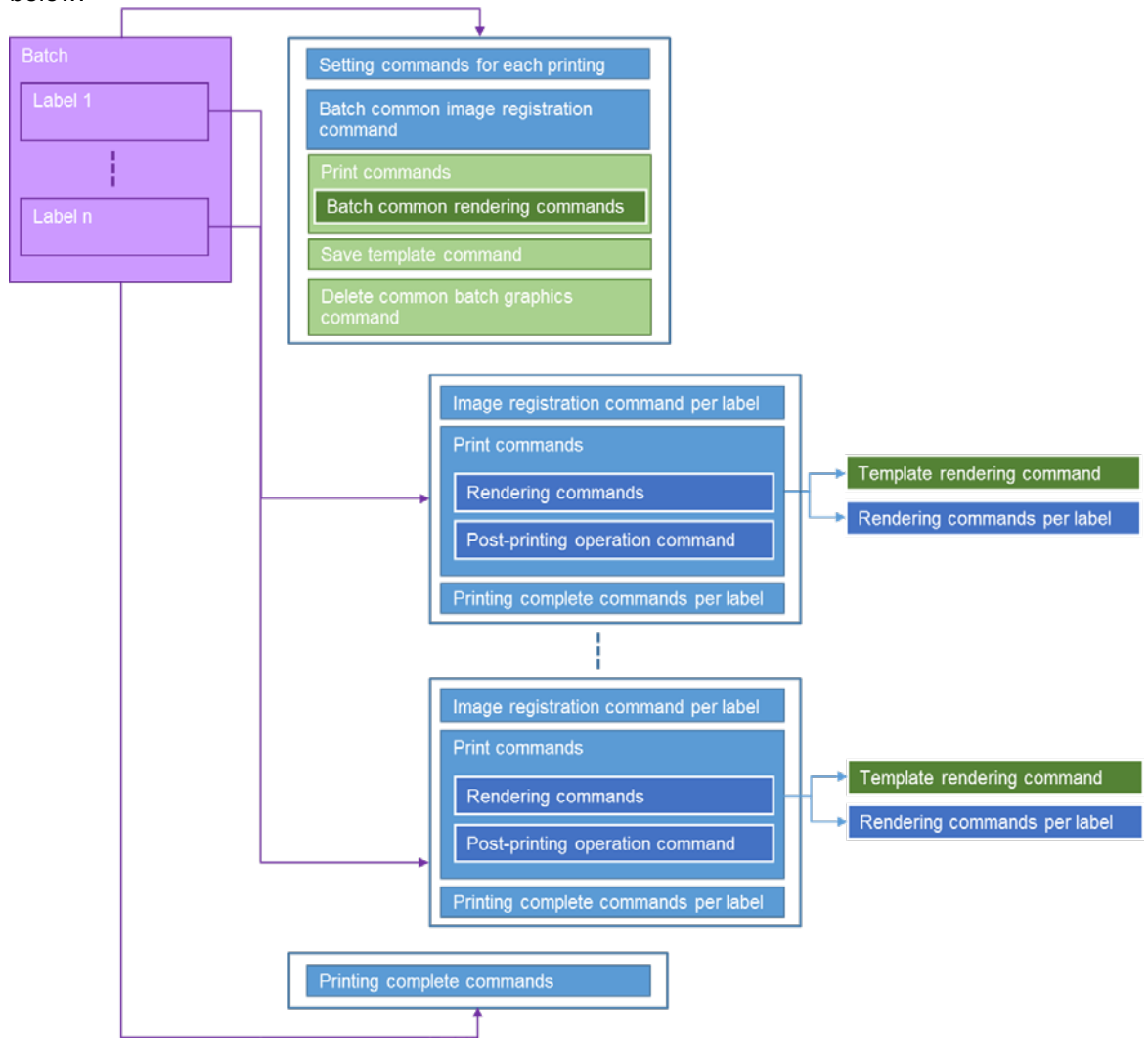The command structure for achieving the operating principle described above is shown below.

Figure5.2.2-1 Command structure

5.2.3 **Print target**

The print target is shown below.   Each of the field names are shown in Label 1.

Label 1

Label 2

Figure 5.2.3-1 Sample label

The rendering components required for printing are shown below.

Table 5.2.3-1 Rendering components for sample label

Attribute	Field name	Type	Details	
Fixed	FXGR01	Graphic Image (Common)	BASEIMG.png	
	FXTX01	Text	"SCHOOL FEET"	"SCHOOL FEET"
	FXTX02	Text	"Model :"	"Model :"
	FXTX03	Text	"Serial No. :"	"Serial No. :"
Variable	VRGR01	Graphic Image (Each Label)	ORIMG.png	GRIMG.png
	VRTX01	Text	"90-22153"	"90-22153"
	VRTX02	Text	"00000001"	"00000002"
	VRTX03	Text	"9"	"9"
	VRBC01	Barcode	"0123456"	"0123456"

5.2.4 **Command**

Configure the print settings and register the graphics that are common to a batch.
Transmit the discard command ^C(D for the rendering canvas as the last setting for each print job.

```
[Setting commands for each printing job]
^XA
^IDR*.*^FS                                    Delete files registered previously
^S(CLR,R,600                                  Set format resolution to 600 [dpi]
^S(CLR,P,600                                  Set print resolution to 600 [dpi]
^S(CLR,Z,600                                  Set printer resolution before replacement to 600 [dpi]
^S(CLS,P,2400^S(CLS,L,2400^S(CLS,C,71  Set media size to 4 [inches] x 4 [inches]/Gap 3 [mm]
^S(CLM,T,M1                                   Set media type to Matte Paper
^S(CPC,Q,N                                    Set print quality to Normal
...                                           Other settings are omitted.
^C(D                                          Discard rendering canvas
^XZ


[Image registration commands]
~DYR:BASEIMG,B,P,430267,0, .PNG...    Register images that are common to the batch
```

Create images and save the template.
Render only the fixed fields, and transmit the temporary save command ^C(S for the rendering canvas before the end of the format.   For the parameter for the temporary save command for the rendering canvas, set no printing after saving.

```
 [Print commands]
^XA
<Rendering commands>                          Render fixed fields
^FO0,0^ILR:BASEIMG.PNG^FS                      FXGR01
^FO1000,225^A0N,105,84^FDSCHOOLFEET^FS         FXTX01
^FO1000,445^A0N,105,84^FDModel:^FS             FXTX02
^FO1000,785^A0N,105,84^FDSerialNo.:^FS         FXTX03

<Post-printing operation commands>
^C(SN                                         Save rendering canvas (no printing)
^XZ


[Printing complete commands]
^XA
^IDR: BASEIMG.PNG ^FS                          Delete image files used to render fixed fields


^XZ
```

The template image that is saved is shown below.

Figure 5.2.4-1 Template image

Print the 1st label.
Use the render command to load and render the render canvas that was saved with the render canvas load command ^C(L.

```
 [Image registration commands]
~DYR:ORIMG,B,P,194,0, .PNG...                Register image that is used only for the 1st label


[Print commands]
^XA
<Rendering commands>
^C(L                                         Load rendering canvas
                                             (All fixed fields are rendered.)

^FO1500,445^A0N,105,84^FD90-22153^FS Render variable fields
^FO1500,610^IMR:ORIMG.PNG^FS
^FO1500,785^A0N,105,84^FD00000001^FS
^FO1700,1020^A0N,150,120^FD9^FS
^FO1500,1300^BY7,3^B8N,300,Y,N^FD0123456^FS


<Post-printing operation commands>
^S(CUB,S,L                                   Set post-printing buzzer
^XZ


[Printing complete commands]
^XA
^IDR:ORIMG.PNG^FS                            Delete image file that is used only for the 1st label
^XZ
```

Print the 2nd label.

```
[Image registration commands]
~DYR:GRIMG,B,P,192,0, .PNG...          Register image that is used only for the 2nd label


[Print commands]
^XA
<Rendering commands>
^C(L                                   Load rendering canvas
                                       (All fixed fields are rendered.)

^FO1500,445^A0N,105,84^FD90-22153^FS   Render variable fields
^FO1500,610^IMR:GRIMG.PNG^FS
^FO1500,785^A0N,105,84^FD00000002^FS
^FO1700,1020^A0N,150,120^FD9^FS
^FO1500,1300^BY7,3^B8N,300,Y,N^FD0123456^FS


<Post-printing operation commands>
^S(CUB,S,L                             Set post-printing buzzer
^XZ


[Printing complete commands]
^XA
^IDR:GRIMG.PNG^FS                       Delete image file that is used only for the 2nd label
^XZ
```

Perform the batch complete process.

```
[Printing complete commands]
^XA
^IDR:*.*^FS                             Delete all image files that were used for printing
^XZ
```

With these command examples, fixed images are loaded for every label format for each label, and the variable fields are rendered.   These definitions can be saved in a format file, and the format file can be loaded at the beginning of a label format.

In addition, if there are no variable graphics in the label format, the sequential number commands ^SN, ^SF can be used to print multiple labels.

Fixed areas and variable areas can be user-defined.   However, it is possible to further improve the effect by using the printer control software to detect changes in the content of a field and then create a template image in the corresponding batch.

5.3 Controlling buzzers, cutting, and pausing

This section describes the control method for instructing the printer to sound a buzzer, make a cut, or pause after the desired label is printed.

Send an instruction for the buzzer each time a label is printed (^XA-^XZ).
Send an instruction to pause the printer by using the ^PQ command or the ^PP command each time a label is printed (^XA-^XZ).
 ^PQ Pause printer each time the specified number of labels is printed
 ^PP Pause printer after the last label is printed
For cutting, use the ^S(C command to set the printer to make a cut.   The last label will always be cut.   However, use the ^PQ command to set the cut timing when selecting whether to make a cut after each page.

Examples of command parameters are shown below.

Table 5.3-1 Examples of command parameters for each function

Function	Command example	Description
Buzzer	^S(CUB,S,N	Printer does not sound buzzer.
	^S(CUB,S,E	Printer sounds buzzer after printing each label.
	^S(CUB,S,L	Printer sounds buzzer after printing last label.
Pause	^PQ1	Printer prints one label and does not pause.
	^PQ1,1	Printer prints one label and pauses after printing one label.
	^PQ3,1	Printer prints three labels and pauses after printing one label.
	^PQ3,3	Printer prints three labels and pauses after printing three labels.
	^PP	Printer prints one label and pauses after printing one label.
	^PQ3^PP	Printer prints three labels and pauses after printing three labels.
Cut	^S(CMP,M,T ^S(CMP,M,P ^S(CMP,M,R	Printer does not make a cut.
	^S(CMP,M,C	Printer makes a cut after the last label.
		Use in combination with ^PQ to make cuts other than after the last label.

5.3.1 **Buzzer**

- **n** Function
  Buzzer timing setting
- **n** Command code
  ^S(CUB,S,c
- **n** Parameters
  - c = N: Printer does not sound buzzer
         E: Printer sounds buzzer after printing each label
         L: Printer sounds buzzer after printing last label

This command is used to set how the printer's buzzer operates.
To change the volume of the buzzer, use the controls on the printer's panel or the ^S(CUB,Z command.

Example 1: Printing three labels, and sounding a buzzer after printing the last label

```
^XA
^S(CUB,S,L                          Set printer to sound buzzer after printing last label
^FO0,0^FDprint 3 pages^FS
^PQ3
^XZ
```

Example 2: Printing three labels, and sounding a buzzer after printing each label

```
^XA
^S(CUB,S,E                          Set printer to sound buzzer after printing each label
^FO0,0^FDprint 3 pages^FS
^PQ3
^XZ
```

Example 3: Printing three labels without sounding a buzzer

```
^XA
^S(CUB,S,N                          Set printer to not sound buzzer
^FO0,0^FDprint 3 pages^FS
^PQ3
^XZ
```

Example 4: Printing two labels, and sounding a buzzer after printing the last label
When specifying whether to sound a buzzer for each ^XA-^XZ, transmit the following commands.

```
^XA
^S(CUB,S,N
^FO0,0^FDprint 1 page(1 of 2)^FS
^XZ

^XA
^S(CUB,S,L
^FO0,0^FDprint 1 page(2 of 2)^FS
^XZ
```

5.3.2 Pause

[^PP command]
- **n** Function
  Pause
- **n** Command code
  ^PP

This command is used to pause the printer after printing the last label.

Example 1: Printing three labels and pausing the printer, repeated three times

```
^XA^S(CMP,M,T^XZ                          Set printer to not make a cut
^XA^FO100,100^FD 1 of 3 ^FS ^PQ3 ^PP ^XZ         Print three labels and pause
^XA^FO100,100^FD 2 of 3 ^FS ^PQ3 ^PP ^XZ         Print three labels and pause
^XA^FO100,100^FD 3 of 3 ^FS ^PQ3 ^PP ^XZ         Print three labels and pause
```

[^PQ command]

- **n** Function
  Number of labels printed setting
- **n** Command code
  ^PQ t, i, c, p
- **n** Parameters
  t = 1 or more   Total number of labels printed
  i = 0 or more   Number of labels printed between pausing or cutting operations
  c = 0 or more   Number of labels printed with serial numbers
  p = Y or N   Set/cancel pause suppression

Example 1: Using the i parameter of the ^PQ command to pause after every three labels are printed

^XA^S(CMP,M,T^XZ	Set printer to not make a cut
^XA^FO100,100^FD 1 of 9 ^FS ^PQ1,0 ^XZ	
^XA^FO100,100^FD 2 of 9 ^FS ^PQ1,0 ^XZ	
^XA^FO100,100^FD 3 of 9 ^FS ^PQ1,1 ^XZ	Print labels and pause
^XA^FO100,100^FD 4 of 9 ^FS ^PQ1,0 ^XZ	
^XA^FO100,100^FD 5 of 9 ^FS ^PQ1,0 ^XZ	
^XA^FO100,100^FD 6 of 9 ^FS ^PQ1,1 ^XZ	Print labels and pause
^XA^FO100,100^FD 7 of 9 ^FS ^PQ1,0 ^XZ	
^XA^FO100,100^FD 8 of 9 ^FS ^PQ1,0 ^XZ	
^XA^FO100,100^FD 9 of 9 ^FS ^PQ1,1 ^XZ	Print labels and pause

Example 2: Printing three labels and pausing the printer, repeated three times

^XA^S(CMP,M,T^XZ	Set printer to not make a cut
^XA^FO100,100^FD 1 of 3 ^FS ^PQ3,3 ^XZ	Print three labels and pause
^XA^FO100,100^FD 2 of 3 ^FS ^PQ3,3 ^XZ	Print three labels and pause
^XA^FO100,100^FD 3 of 3 ^FS ^PQ3,3 ^XZ	Print three labels and pause

Example 3: Printing nine labels, pausing after every three labels are printed

^XA^S(CMP,M,T^XZ	Set printer to not make a cut
^XA^FO100,100^FD 9 pages ^FS ^PQ9,3 ^XZ	Print three labels and pause

5.3.3 **Cut**

- **n** Function
  Post-printing operation settings
- **n** Command code
  S(CMP,M,c
- **n** Parameters
  - c = T Do not cut (stop at cut position)
  -     P Do not cut (stop at peeling position)
  -     R Rewind
  -     C Cut

Labels are cut at the following timing only if cutting is set to be performed after printing.

- Timing specified for parameter i of the ^PQ command
- When printing of the last label is complete

Example 1: Printing and cutting one label

```
^XA
^S(CMP,M,C                          Set printer to make a cut
^FO100,100^FD 1 of 1^FS             Set printer to print a label
^XZ
```


Example 2: Printing three labels, cutting and pausing after each label

```
^XA
^S(CMP,M,C                          Set printer to make a cut
^FO100,100^FD 3 pages^FS
^PQ3,1                              Set printer to print three labels,
                                    cutting and pausing after each label

^XZ
```


Example 3: Printing three labels, cutting but not pausing after each label

```
^XA
^S(CMP,M,C                          Set printer to make a cut
^FO100,100^FD 3 pages^FS
^PQ3,1,,Y                           Set printer to print three labels,
                                    cutting but not pausing after each label

^XZ
```

5.3.4 **Examples of combinations of cutting and pausing**

This section shows examples of commands for cutting labels and pausing the printer according to the operations in the following table.

Table 5.3.4-1 Cutting and pausing operations for command examples

Operation timing	Cut	Pause
After printing third label	Yes	Yes
After printing sixth label	No	Yes
After printing ninth label	Yes	No
After printing other label	No	No

Example 1: Specifying cutting and pausing after printing one label for each ^XA-^XZ

```
^XA^S(CMP,M,T^FO100,100^FD 1 of 9 ^FS ^PQ1,0 ^XZ
^XA^S(CMP,M,T^FO100,100^FD 2 of 9 ^FS ^PQ1,0 ^XZ
^XA^S(CMP,M,C^FO100,100^FD 3 of 9 ^FS ^PQ1,1 ^XZ          Cut and pause
^XA^S(CMP,M,T^FO100,100^FD 4 of 9 ^FS ^PQ1,0 ^XZ
^XA^S(CMP,M,T^FO100,100^FD 5 of 9 ^FS ^PQ1,0 ^XZ
^XA^S(CMP,M,T^FO100,100^FD 6 of 9 ^FS ^PQ1,1 ^XZ          Pause
^XA^S(CMP,M,T^FO100,100^FD 7 of 9 ^FS ^PQ1,0 ^XZ
^XA^S(CMP,M,T^FO100,100^FD 8 of 9 ^FS ^PQ1,0 ^XZ
^XA^S(CMP,M,C^FO100,100^FD 9 of 9 ^FS ^PQ1,0 ^XZ          Cut
```

Example 2: Specifying cutting and pausing after printing three labels for each ^XA-^XZ

```
^XA^S(CMP,M,C^FO100,100^FD1 of 9^SFd^FS ^PQ3^PP^XZ   Print three labels, cut and pause

^XA^S(CMP,M,T^FO100,100^FD4 of 9^SFd^FS ^PQ3^PP^XZ   Print three labels and pause

^XA^S(CMP,M,C^FO100,100^FD7 of 9^SFd^FS ^PQ3^XZ      Print three labels and cut
```

5.4 Banner print

Banner printing refers to printing a label image that is longer than the maximum label length supported by the printer, by dividing it into multiple times.
The method for using the printer control software to achieve banner printing is shown below.

1. If no gap is selected for the media detection method, a user is allowed to set availability of banner printing. At this time, the following values for media layout are switched to the automatic settings.
   Ø   Label length: Label image length/number of divisions
                              Number of divisions = ROUNDUP (label image length/maximum label length)
   Ø   Gap between labels: No gap
2. If banner printing is enabled, label designs that exceed the maximum label length are allowed.
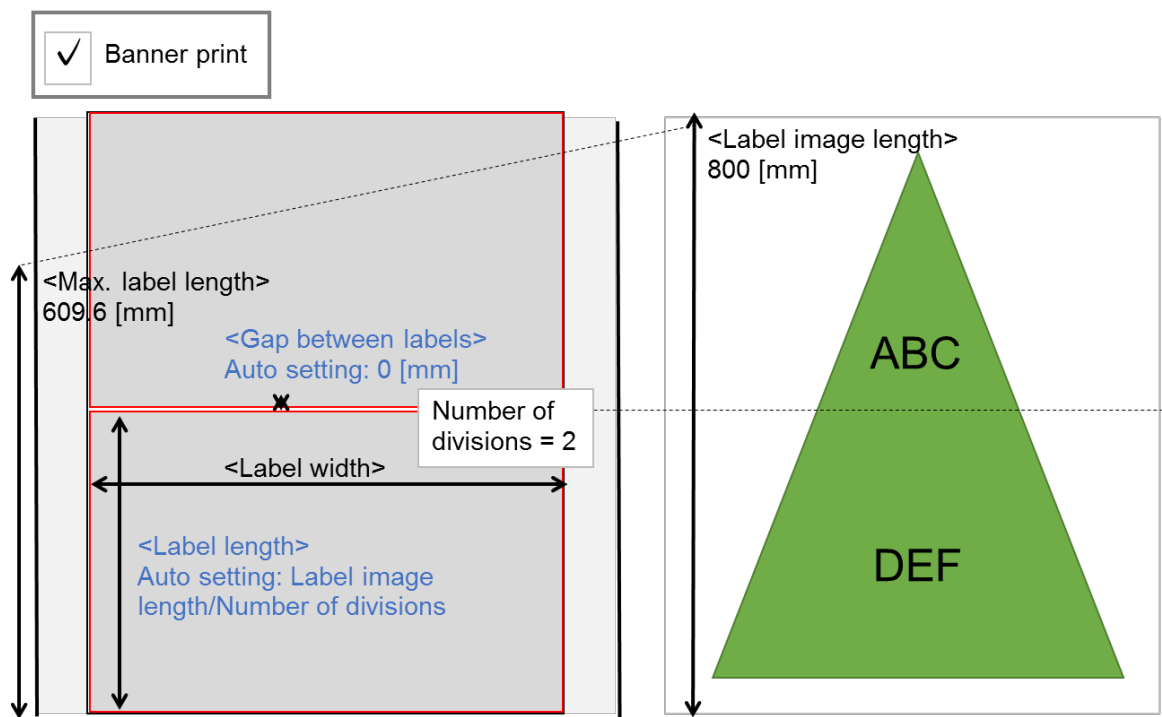
Figure 5.4-1 Banner settings and label design

3. Fit the entire label into a single image, and divide it by the number of divisions in the vertical direction.
   Change the sequence or rotate the images as necessary so that the images will fit together after printing, and then transmit the label data.
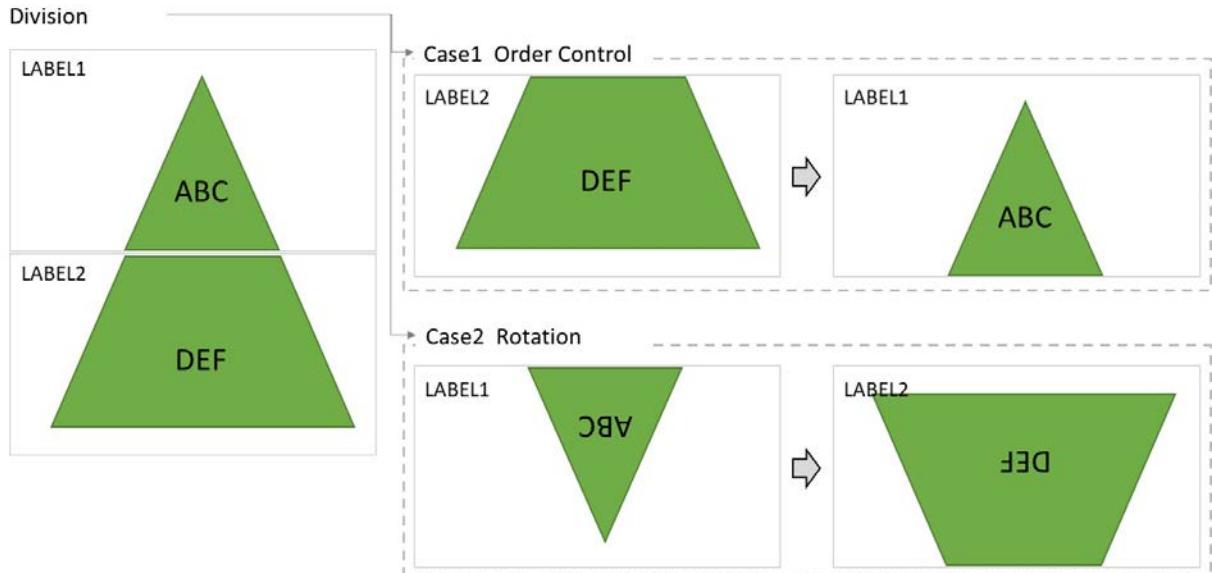
Figure 5.4-2 Transmitting a divided banner label

Examples of commands for controlling the sequence (Figure 5.4-2 Case1) are shown below.

Configure the print settings that are common to the batch.

```
[Setting commands for each printing job]
^XA
^IDR*.*^FS                         Delete files registered previously
^S(CLR,R,600                       Set format resolution to 600 [dpi]
^S(CLR,P,600                       Set print resolution to 600 [dpi]
^S(CLR,Z,600                       Set printer resolution before replacement to 600 [dpi]
^S(CLS,P,9449^S(CLS,L,9449^S(CLS,C,0 Set media size to 400 [mm] x 400 [mm]/Gap 0 [mm]
...                                Other settings are omitted.
^XZ
```

Print the first label.

```
[Image registration commands]
~DYR:LABEL2,B,P,327680,0, .PNG...        Transmit label 2 to the first sheet

[Print commands]
^XA
<Rendering commands>
^FO0,0^ILR: LABEL2.PNG^FS                Render label 2 on the first sheet

<Post-printing operation commands>
^XZ

[Printing complete commands]
^XA
^IDR: LABEL2^FS                          Delete image file that is used only for the 1st label
^XZ
```

Print the second label.

```
[Image registration commands]
~DYR:LABEL1,B,P,327680,0, .PNG...        Transmit label 1 to the second sheet

[Print commands]
^XA
<Rendering commands>
^FO0,0^ILR: LABEL1.PNG^FS                Render label 1 on the second sheet

<Post-printing operation commands>
^XZ

[Printing complete commands]
^XA
^IDR: LABEL1^FS                          Delete image file that is used only for the 2nd label
^XZ
```

Perform the batch complete process.

```
[Printing complete commands]
^XA
^IDR:*.*^FS                              Delete all image files that were used for printing
^XZ
```

5.5 Printing using ICM

Image Color Management (ICM) is a system for managing color information, so that consistent color information is maintained between different devices, such as displays and printers. In addition, a series of data for characterizing I/O devices related to color and color spaces that is used with this system according to standards from the International Color Consortium (ICC) is called an ICC profile.

With this function, the printer control software is used to load an ICC profile for a display and a printer, to make corrections based on the color information.

However, since displays and printers use different methods for generating color, the printed colors will not exactly match the colors that appear on screen.
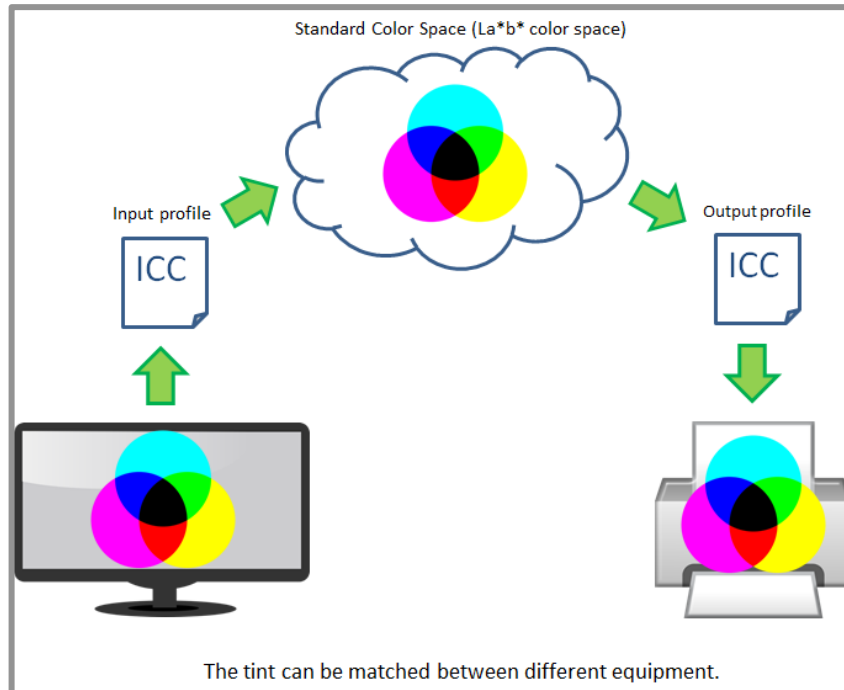
Figure 5.5-1 Application of an ICC profile

This section describes details about the printer control software regarding ICM.

5.5.1 **Installing an ICC profile**

Epson provides ICC profiles that support genuine paper for the CW-C6000 and CW-C6500 series. For the ICC profiles, there is a single file for each combination of media type and print quality, and which combination a file is to be applied to is made clear in the file name.

For example, with the CW-C6000 and CW-C6500 series, if using matte paper as the media type and normal as the print quality, the media type (MattePaper) and print quality (Normal) will be included in the file name as shown below.

Example profile name: CW-C6000Series_MattePaper_Normal.icc

There are a total of 17 combinations of media type and print quality for the CW-C6000 and CW-C6500 series, as shown in "Table 4.5.1-1 Media type and print quality", and Epson provides 17 files for these.   The ICC profiles provided by Epson must be installed in a computer before this function can be used.   It is recommended to install them when installing the printer control software.

5.5.2 ICM settings

The items that the user sets for ICM, and a UI sample are shown below. These settings are enabled when the color correction type is set to ICM.
A list of the profiles in the setting items can be made with ICMAPI in Windows OS, described in the next section.

Table 5.5.2-1 User setting items

Item	Description	
Input profile	List the profile of the display device. The default is sRGB IEC61966-2.1 (OS default).	
Intent	Saturation	Convert while maintaining the saturation.
	Perception	Convert to an image that is natural in appearance. Use when the image data uses a wide range of colors. This setting is recommended as the default.
	Maintain relative color gamut	Convert so that the color coordinates of the original data match the color coordinates when the data is printed, and so that the color coordinates for white points (color temperature) also match. Use when there is a lot of color matching.
	Maintain absolute color gamut	Assign absolute color coordinates to both the original data and the print data before converting. The white points (color temperature) of both the original data and the print data are not subject to color correction. Use for special uses, such as when printing logo colors.
Output profile	Auto select	With default settings, only this option is displayed. The printer control software automatically applies the profile provided by Epson that corresponds to the media settings and print quality settings currently selected by the user.
	List all profiles (Options)	The profiles of all output devices (printers) installed in the computer are listed. The user can select whether to enable or disable the list in the options. It is disabled by default, and it is assumed it will be enabled when applying profiles created by the user themselves. The printer control software applies the profile selected by the user.

Figure 5.5.2-1 UI sample

When using the printer control software to apply ICM, it is not recommended to use this together with the spot color adjustment described previously. ICM might make changes to colors that have been specified with spot color adjustment.

5.5.3 Controlling ICM

The steps from using ICMAPI in Windows OS to display menus to the application of an ICC profile and the printing of data using ICM are shown below.

1. Display menus.
   (1) Use GetColorDirectory() to acquire the path to the directory where the profile is saved.
   (2) Use EnumColorProfiles() to list the monitor class profiles.
   (3) Use EnumColorProfiles() to list the printer class profiles.
2. Select menu items to determine the input profile, output profile, and intent.
   If auto select is selected for the output profile, determine the output profile suitable for media type and print quality that are currently configured.
3. Apply the ICC profile to an image.
   (1) Use OpenColorProfile() to acquire a handle for the profile
   (2) Use CreateMultiProfileTransform() to generate a color transform object from the I/O profiles.
   (3) Use TranslateBitmapBits() to transform colors from the color transform object created in (2) above and the current image (bitmap).
   If the image file is compressed, decompress it to a bitmap file in advance.
   (4) Use DeleteColorTransform() to discard the color transform object that was generated.
   (5) Use CloseColorProfile() to release the handle for the profile.
4. Compress the image (after color transform) to a png file, and transmit it to the printer.

6 Printer settings

This chapter describes printer settings other than printing.

When it is necessary to change these settings, such as when changing media, it is recommended to confirm that the printer is idling before transmitting the setting command.   If data for a job that has not yet been printed remains in the printer when the settings are changed, the changed settings might unintentionally be applied to that print job.

Refer to "Chapter 4 Print Settings" for more information about differences between print settings and printer settings and points to note.

Table 6-1 List of printer settings

Category	Function name
Printer settings	Media detection method setting
	Media source setting
	Media form setting
	Nozzle self-test system setting
	Print start position adjustment setting
	Reprint setting

The sequence from user settings to command transmission is shown below.
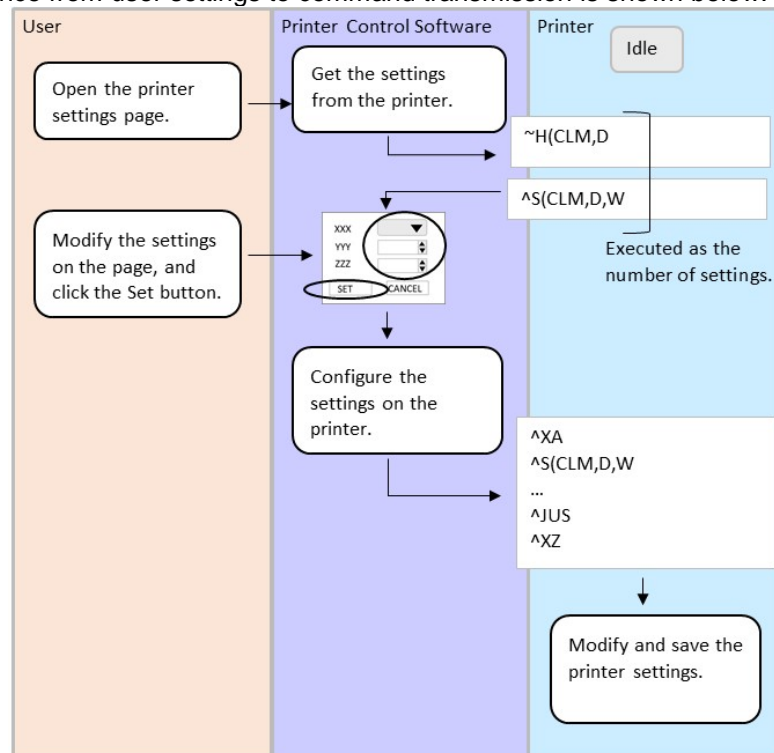
Figure 6-1 Printer settings sequence

6.1 Transmitting printer settings

The settings described in this section can be transmitted in a batch, or transmitted individually. To retain the settings in the printer even when its power is turned off, transmit the setting storage command (^JUS) at the end of the setting commands. If the printer control software does not support a particular setting item, the printer control software must not send a command related to that setting item. This is due to the fact that if the printer control software sends that command, the content that has been configured on the printer's panel or with the EPSON tool will no longer be applied to the printer operations.

In addition, to display the current setting values for the printer in the settings window, you can use the ~H(C command supported by the ^S(C command to acquire the setting values from the printer.

Examples of these commands are shown below.

```
[Acquire printer settings]
~H(CLM,D                          Acquire media detection method
[Response] ^S(CLM,D,W             Media detection method is gap.

Repeat transmission of the acquisition command and the reception of a response in the same way.
```

```
[Printer settings]
^XA
^S(CLM,D,W                        Set media detection method to gap
^S(CLM,P,IR                       Set media source to internal supply
^S(CLM,S,RP                       Set media form to roll paper
^S(CMV,S,E                        Set nozzle self-test to enabled
^S(CMV,I,500                      Set self-test interval to 500 [sheets]
^S(CMV,O,N                        Set operation at clogged nozzle detection to notify
^S(CMV,C,10                       Set nozzle clog tolerance to 10 [nozzles]
^S(CMV,A,E                        Set cleaning after self-test to be executed
^S(CLE,T,0                        Set print start position adjustment (vertical) to 0
^S(CLE,M,0                        Set print start position adjustment (horizontal) to 0
^S(CWR,P,Y                        Set reprint to enabled
^JUS                              Save settings
^XZ
```

6.2 Media detection method setting

- **n** Function description:
  - **Ø** Use this function to set the label edge detection method (black mark, gap, no mark).
  - **Ø** A detection method that matches the media set in the printer must be set.
  - **Ø** If it is not set properly, the printer cannot detect the label edge correctly.
  - **Ø** If the printer cannot detect the label edge correctly, an error will occur after a certain amount of media is fed.
  - **Ø** Select one of the following detection methods.
    Gap/Black mark/No mark
    Recommended default setting: Gap
  - **Ø** A list of detection method settings for each media type is shown below.

Table 6.2-1 List of detection method settings for each media type

Paper	Detector setting
Gap standard die cut label	Gap
Black mark-basis die cut label, full-page label	Black mark
Full-page label with no mark	No mark

- **n** Usage case:
  - **Ø** Set when changing to media with a different detection method.
- **n** Command(s) used:
  - **Ø** ^S(CLM,D

6.3 Media source setting

- **n** Function description:
  - **Ø** Use this function to set the media source to be used in printing.
  - **Ø** Select one of the following media sources.

Table 6.3-1 List of media sources

Item	Description
Internal supply	Select if using roll paper set inside the printer. The supported media form is roll paper.
External supply	Select if using paper set from the rear of the printer. Supported media forms are roll paper and fanfold paper (folded paper).

- **n** Usage case:
  - **Ø** Set this when changing the media source.
- **n** Command(s) used:
  - **Ø** ^S(CLM,P

6.4 Media form setting

- **n** Function description:
  - **Ø** Use this function to set the media form to be used in printing.
  - **Ø** Select one of the following media forms.
    - Roll paper/Fanfold paper
- **n** Usage case:
  - **Ø** Set this when changing the media form.
- **n** Command(s) used:
  - **Ø** ^S(CLM,S

6.5 Nozzle self-test system setting

- **n** Function description:
  - **ø** This function sets the timing for nozzle self-tests while printing, and the operation at clogged nozzle detection.
  - **ø** What is a nozzle self-test?
    - **≥** This is a system for automatically detecting clogged nozzles when the printer is turned on and/or each time the number of sheets set by the user is printed.
    - **≥** If a clogged nozzle is detected, the user is notified according to the settings. The user can be notified to check the print result and decide to continue printing or cancel printing and the like.
    - **≥** If a clogged nozzle is detected, and if the number of clogged nozzles exceeds the tolerance value, cleaning is performed automatically according to the settings. This allows clogged nozzles to be resolved without the user doing any cleaning.
- **n** Usage case:
  - **ø** Set if you want to minimize poor label printing due to clogged nozzles.
- **n** Command(s) used:
  - **ø** ^S(CMV,S ^S(CMV,I ^S(CMV,O ^S(CMV,C ^S(CMV,A

The setting items and their commands are shown below.

Table 6.5-1 List of setting values for the nozzle self-test system

Item	Setting range	Recommended initial value	Command
Enable/disable function	Enable/Disable	Enable	^S(CMV,S
Self-test interval	1 to 13000 [sheets]	500	^S(CMV,I
Operation at clogged nozzle detection	Continue/Notify	Notify	^S(CMV,O
Nozzle clog tolerance value	0 to 16	6	^S(CMV,C
Cleaning after self-test	Execute/Do not execute	Execute	^S(CMV,A

6.6 Print start position adjustment setting

- **n** Function description:
  - **Ø** Use this function to make minor adjustments from the standard vertical and horizontal positions of the print position.
  - **Ø** The standard for the vertical position is determined according to the media detection method.
  - **Ø** The standard horizontal position is 2 mm from the left edge of the media.
- **n** Usage case:
  - **Ø** Use this function if the print position is not aligned with the label.
- **n** Command(s) used
  - **Ø** ^S(CLE,T or ^LT ^S(CLE,M

An image of how these adjustments are made is shown below.
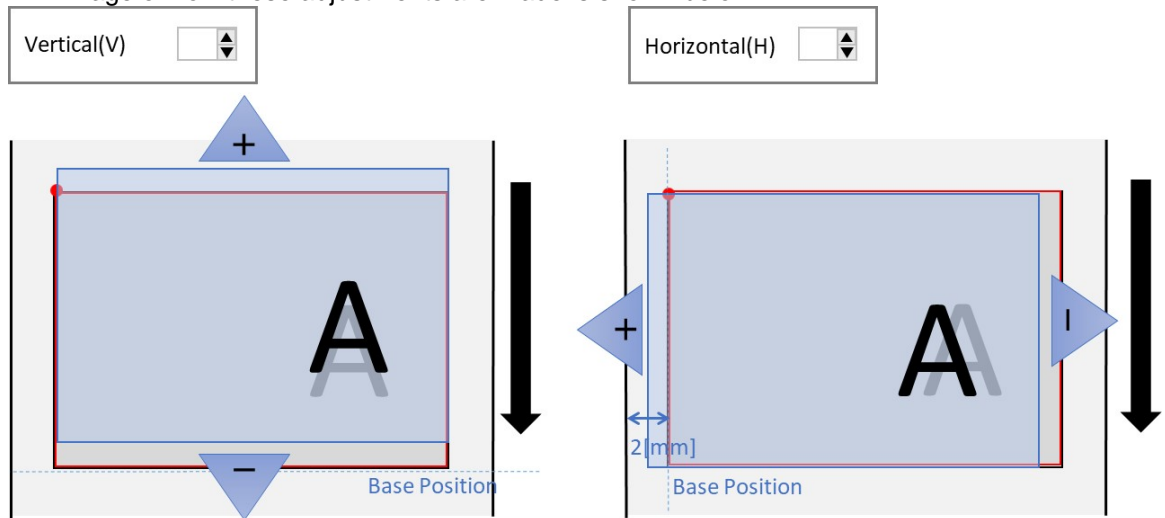
Figure 6.6-1 Print start position adjustment

The setting items and their commands are shown below.

Table 6.6-1 List of print start position adjustment setting values

Item	Setting range	Recommended initial value	Command
Vertical direction [mm]	-10.8 to +10.8	0.0	^S(CLE,T
Horizontal direction [mm]	-1.5 to +1.5	0.0	^S(CLE,M

6.7 Reprint setting

- n Function description:
  - Ø This function sets whether to perform reprinting when an error, such as paper end, occurs during printing.
  - Ø Select the setting from the following.
    Enable/Disable
    Recommended default setting: Enable
- n Usage case:
  - Ø Set if you want to change the reprint settings.
- n Command(s) used:
  - Ø ^S(CWR,P or ^JZ

7 Downloading TrueType Fonts

- **n** Function description:
  - **Ø** Use this function to download TrueType fonts (TTF files) to the printer.
  - **Ø** You can download TrueType fonts to the printer, and use the print function for TrueType fonts to print in a way true to the fonts installed in a device.
- **n** Reason(s) for this function:
  - **Ø** To download TrueType fonts to the printer, and use them to print the same volume of data as the fonts installed in a device.
- **n** Usage case:
  - **Ø** Use this function to print documents using a TrueType font.
- **n** Implementation recommendations:
  - **Ø** Inform the user that, when downloading a TrueType font to the printer, it is necessary to first get permission from the copyright holder of that font.
- **n** Command(s) used:
  - **Ø** ~DY (Use of the ~DU command is not prohibited, but ~DY is recommended.)
- **n** NOTE
  - **Ø** Pay careful attention to the combination of the download command and the extension on the file name at the download destination.   The reason is explained below.

The extension for font files that are downloaded and saved in the printer are determined by the download command that is used.

For ~DY the extension is TTF (when x = T is specified) or TTE (when x = E is specified).   For ~DU, the extension is FNT.

Even if you specify an extension in the parameter for the download command, it will still be set as described above.

To access the font files that are stored in the printer, you must specify the extension for the file that is actually stored in the printer as the file extension for the command.

Commands for accessing font files: ^A@, ^CW, ^ID, ^H(Y, ^HW, ^WD

- **Ø** When using downloaded fonts, be sure to set the character code set as necessary.   In addition, depending on the character code set that is used, it might be necessary to set a character code conversion table.   Character code sets and their character code conversion tables are shown in Table 7-1.

Table 7-1 List of character code sets and their character code conversion tables

Character code set	^CI command	Character code conversion table Parameter d:o.x for ^SE
KS X 1001(KS C 5601-1987)	^CI14	Z:EUCKR2K6.CNV
Shift-JIS	^CI15	Z:SJIS2K3.CNV
EUC-JP	^CI16	Z:EUCJPK7.CNV
EUC-CN	^CI16	Z:EUCCN199.CNV
BIG5	^CI26	Z:BIG52K7.CNV
GB18030	^CI26	Z:GB18030.CNV
UTF-8	^CI28	N/A
(Not recommended) UTF-8	^CI17^F8	N/A
(Not recommended, limitations) UTF-16	^CI17	N/A
(Cannot be used) UTF-16	^CI29, ^CI30	-

Request: Do not install UTF-16.

8 Printer Maintenance

This chapter describes printer maintenance. If printing is faded, marked with streaks, or in an unintended color, maintenance on the printer by the user is necessary. It is recommended to provide support for the maintenance items described in this chapter in the printer control software.

Table 8-1 List of printer maintenance items

Category	Function name
Maintenance	Head cleaning
	Print the clogged nozzle check pattern

The sequence from user operations to command transmission is shown below.
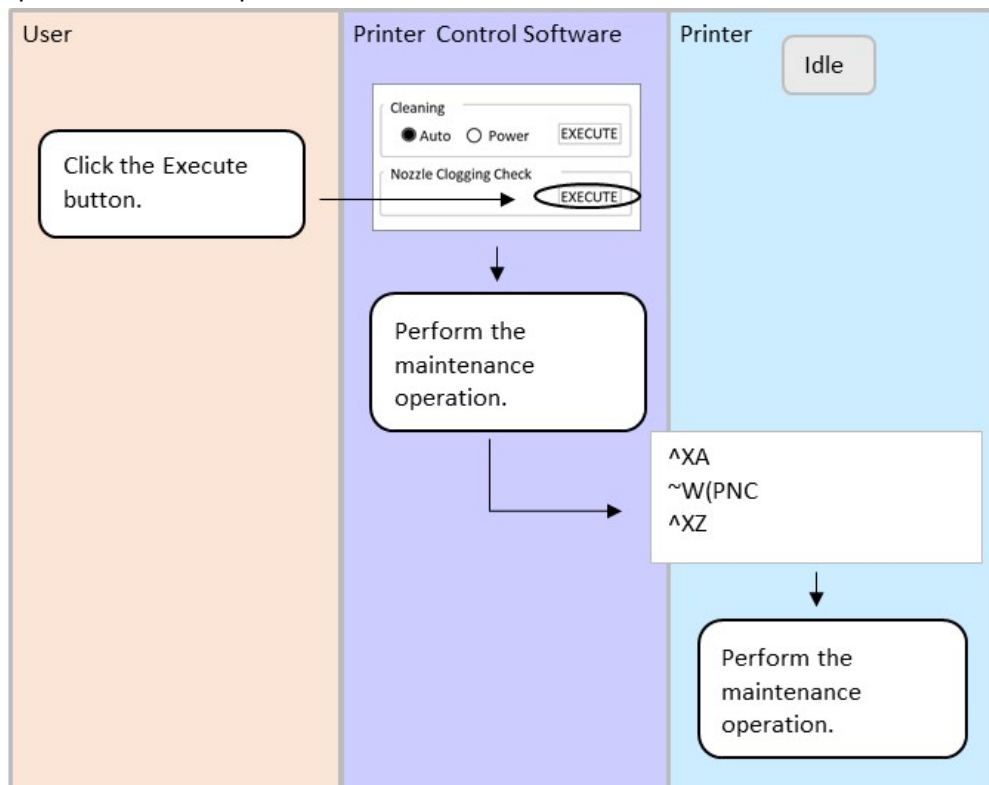
Figure 8-1 Printer maintenance sequence

8.1 Performing maintenance on the printer

When the user triggers a maintenance item, the corresponding command is transmitted.
Examples of such a command are shown below.

Example 1: Performing head cleaning

[Head cleaning]	
~J(MCL,A	Perform auto cleaning

Example 2: Printing the clogged nozzle check pattern

[Print the clogged nozzle check pattern]	
~W(PNC	Print check pattern
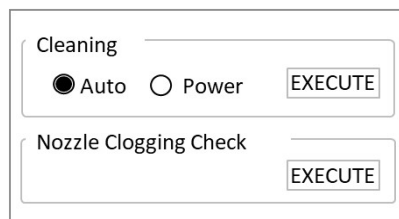
8.2 Head cleaning

- **n** Function description:
    - **Ø** This function performs head cleaning.
    - **Ø** It automatically checks for clogged nozzles and performs head cleaning.
    - **Ø** Select the cleaning type from the following.
        Auto/Power Cleaning
- **n** Reason(s) for this function:
    - **Ø** Nozzle clogging occurs.
- **n** Usage case:
    - **Ø** Use this if there are dots missing in the print data.
- **n** Implementation recommendations:
    - **Ø** Notify the user that a large volume of ink will be consumed when performing power cleaning.
    - **Ø** You can display a page that instructs the user to print out the clogged nozzle check pattern after head cleaning is complete and confirming that the printer is idling.
- **n** Command(s) used:
    - **Ø** ~J(C ~J(MCL

8.3 Print the clogged nozzle check pattern

- **n** Function description:
    - **Ø** This function prints the pattern for checking for clogged nozzles.
    - **Ø** The user visually checks the printed check pattern to determine if any nozzles are clogged.
- **n** Reason(s) for this function:
    - **Ø** This prints the nozzle check pattern to check if there are nozzles clogged.
- **n** Usage case:
    - **Ø** Use this to confirm there are no nozzles clogged before printing.
- **n** Implementation recommendations:
    - **Ø** This function can be used alone without head cleaning by the user.
- **n** Command(s) used:
    - **Ø** ~W(PNC

A UI sample for head cleaning and printing a clogged nozzle check pattern is shown below.

Figure 8.3-1 UI sample for head cleaning and printing a clogged nozzle check pattern

9 Displaying the Printer Status

This chapter describes the statuses that can be acquired from the printer, and shows examples of how they are displayed.   It is recommended to provide support for the functions described in this chapter in the printer control software, so that the user can understand the status of the printer even from a remote location.

9.1 Displaying information about consumables

- n Function description:
    - Ø Use this function to acquire and display the status of consumables that are installed in the printer.
        - ∍ Consumables: Ink cartridges, maintenance box
    - Ø Display the latest status for consumables.
- n Usage case:
    - Ø The user checks to make sure consumables are not lacking before beginning printing.
- n Implementation recommendations:
    - Ø Display the amount of ink remaining in ink cartridges.   (Refer to the UI sample.)
    - Ø Display the available capacity in maintenance box.   (Refer to the UI sample.)
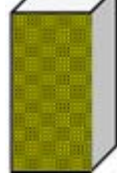- n Command(s) used:
    - Ø ~H(QIQ ~H(QMN
- n UI sample:
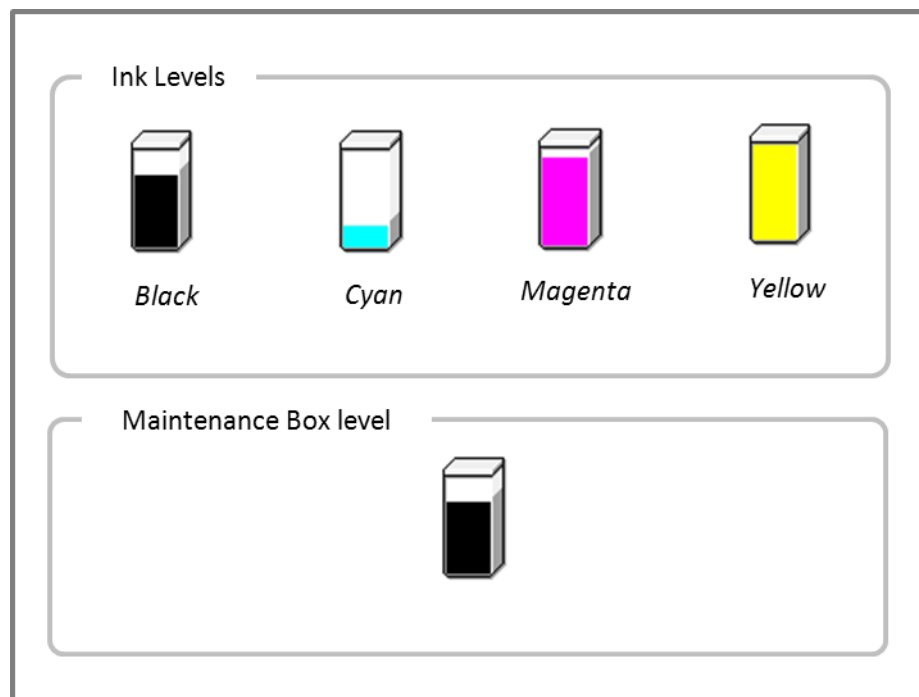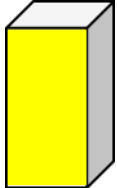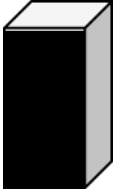

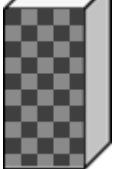**Figure 9.1-1 UI sample for displaying information for consumables**

Ø The amount of ink remaining in ink cartridges is displayed for each color.   Display graphic icons, or graphic icons plus text, that make it easy to identify each of the following statuses.

Table 9.1-1 List of ink cartridge displays

Ink status	Display example	Notes
Sufficient ink remaining: RH Moderate ink remaining: RM Low ink remaining: RL		- Display an image that indicates the ink status that was acquired.
Ink cartridge replacement required soon: RN		
Ink cartridge replacement required: RR		- Display an image that shows little ink remaining.
Ink cartridge not installed: NA		
Ink cartridge installed: CI		- Indicate that ink cartridge installation was detected, but no ink is detected.

Ø Black indicates the available capacity in maintenance box.   As the available capacity drops, the area shown in black also grows smaller.   Display graphic icons, or graphic icons plus text, that make it easy to identify each of the following statuses.

Table 9.1-2 List of maintenance box displays

Ink status	Display example	Notes
Sufficient available capacity in maintenance box: RH Moderate available capacity in maintenance box: RM Low available capacity in maintenance box: RL		- Display an image that indicates the available capacity that was acquired.
Maintenance box replacement required soon: RN		
Maintenance box replacement required: RR		- Display an image that shows little available capacity in maintenance box.
Maintenance box not installed: NA		
Maintenance box installed: CI		- Indicate that maintenance box installation was detected, but no available capacity is detected.

n NOTE:
  Ø What is a maintenance box?
    ≳ The maintenance box stores waste ink.

10 Items to keep in mind regarding transmission

10.1 DeviceID

The Device ID is as follows.
MFG:EPSON;
CMD:ESCLABEL;
MDL: <Product Name>;
CLS:PRINTER;
DES:EPSON<SP><Product Name>;
CID:EPSONCWC<CID>;

Refer to "Chapter 2.2 List of product names" for <Product Name>.
<CID> indicates the last 5 digits (Example:"6010A") or last 6 digits (Example: "6010Au") of <Product Name>.
Refer to "Chapter 2.2 List of product names" for details.

10.2 String Descriptor

The String Descriptor is as follows.
idVendor = 04B8H
idProduct = 0E26H

iManufacturer ="EPSON"
iProduct = <Product Name>;

Refer to "Chapter 2.2 List of product names" for <Product Name>.

10.3 Receive buffer full control

- **n** Description:
  - **ø** Due to the increased amount of data for color printers, it is easy for the printer's receive buffer to become full.
  - **ø** The printer does not receive data when the receive buffer is full.
  - **ø** Because the printer cannot receive data when the receive buffer is full, the status cannot be acquired using the status command.
  - **ø** The printer receives data even during an error.
  - **ø** If the printer continues to receive data during an error, the receive buffer may become full.
- **n** Recommended control:
  - **ø** When registering graphics in the printer, use the printer information request command (for acquiring available capacity of drive) to acquire the available capacity of the drive.
  - **ø** If space is available for the size of the graphic to be registered, transmit the data.
  - **ø** Use the printer information request command (information request with full buffer) to request the receive buffer full status.
  - **ø** If the receive buffer is not full, up to 4096 bytes of data will be sent.
- **n** Command(s) used:
  - **ø** ~H(SDS,R ~H(SPB,F

10.4 Notes for when using printer information request commands

- **n** Description:
  - **ø** If you want to request multiple statuses from the printer, you can combine printer information request commands and transmit them as one command group.
- **n** Recommended usage:
  - **ø** If using command groups, confirm the responses from all the sent commands before sending the next command group.
- **n** Printer information request commands:
  - **ø** ~H(C ~H(I ~H(Q ~H(S

10.5 Notes for when using commands that request a response from the printer

- **n** Description:
  - **Ø** If you send a "command that requests a response from the printer" followed by a "status request command" or "printer information request command", you may not be able to receive the correct response.
- **n** Recommended usage:
  - **Ø** Check the response to the "command that requests a response from the printer" before sending a "status request command" or "printer information request command".
- **n** Commands that request a response from the printer:
  - **Ø** ^HF ^HG ^HH ^HW ^HY
- **n** Status request commands:
  - **Ø** ~HI ~HM ~HS
- **n** Printer information request commands:
  - **Ø** ~H(C ~H(I ~H(Q ~H(S

10.6 Notes for when using both USB and network interface

- **n** Description:
  - **Ø** The printer processes the data of the interface which receives data first.
  - **Ø** When the printer is processing data received via USB, it receives data only from USB. (USB is selected)
  - **Ø** When the printer is processing data received via the network, it receives data only from the network.   (Network is selected)
  - **Ø** While USB is selected, once the printer has completed processing the data received via USB, the printer can immediately receive data from the network.
  - **Ø** While network is selected, once the printer has completed processing the data received via the network, then the printer can immediately receive data from USB.

10.7 Cancel printing

- **n** Description:
  - **Ø** If you perform a spooler cancel or pull out the network cable to cancel printing, unnecessary data remains in the printer and you may not be able to send subsequent data.
  - **Ø** With the cancel button on the printer, you can select to either cancel the first format or cancel all formats.   If you cancel the first format, the oldest of all the formats stored in the printer is deleted.   If you cancel all formats, all of the labels stored in the printer are deleted.
  - **Ø** To delete unnecessary data, you must cancel all formats.
- **n** Recommended control:
  - **Ø** Encourage the user to cancel all formats using the printer's cancel button when canceling printing.

10.8 Limitations on acquiring printer status

With the CW-C6000 and CW-C6500 series, the printer status cannot be acquired by command under the conditions specified below.
If a command to acquire the printer status is issued during these operations, a response will be returned after the operations are completed.

- Ø Currently reprinting from extended I/F
- Ø Currently printing network status sheet and status sheet from printer's panel
- Ø Currently printing nozzle check pattern from printer's panel
- Ø Currently printing adjustment pattern from printer's panel
- Ø Currently initializing with printer's panel
- Ø Currently powering OFF from printer's panel
- Ø Currently printing nozzle check pattern by command
- Ø Canceling

REVISION SHEET (Summary)

Revision	Summary
A	Enactment
B	Modification to wording
	Some changes in list of terms

	Updated according to changes in specifications
	  - Media type
	  - Nozzle self-test

C	Corrections to errors

	Updated according to changes in specifications
	  - Media layout
	  - Image quality setting
	  - Nozzle self-test

	Changes/additions to spot color adjustment specifications
	Added explanation of ICC profiles
D	Corrections to errors
	Changes to spot color adjustment
	Addition of limitations - Limitations on acquiring printer status
E	Corrections to errors

REVISION SHEET (Detail)

Revision	Page or Subject	Detail
A	All	Newly enacted
B	32 to 35	Corrections to errors made previously in English version of Rev. A: Wording in figures
	58	Corrections to errors made previously in English version of Rev. A: "Described below" changed to "described previously"
	60	Corrections to errors made previously in English version of Rev. A: Wording in figures
	68	Corrections to errors made previously in English version of Rev. A: Wording in figures
	5	Changed "long format" in the list of terms to "banner print", and changed the description of "banner print"
	18 25	Change in specifications: The following changes were made, due to Texture paper not being supported. Ø Media type setting: Texture paper deleted from media type Ø Image quality setting: Texture paper row deleted from table of media type and print quality
	61 64 64	Change in specifications: The following changes were made, due to changes in setting items for nozzle self-test. Ø Examples of command transmissions Ø Changes to the descriptions of functions in the nozzle self-test system Ø List of settings for the nozzle self-test system 　- Self-test interval changed to specify cumulative number of sheets only 　- Changed initial value for operation when clogged nozzle is detected to "Notify" 　- Deleted "Execute automatically when job is complete" from selection items for cleaning after self-test, and changed to only two selections: "Execute/Not execute"
C	20	Correction of maximum print length for 8-inch labels without cutting 615.6　　609.6
	21	Change in specifications: Changed the recommended initial value for the gap between labels for continuous paper 0.0　　3.0
	25 40	Change in specifications: The following changes were made, due to changes in name of print quality. Ø Media type and print quality Ø Print quality and recommended input resolution "Standard"　　"Normal", "High speed"　　"Max speed"
	31-37	Changes/additions to spot color adjustment specifications Ø Support no longer provided for not changing the applicability of spot color adjustment with the printer control software for every print job Ø Addition of details for spot color information files

	58-62	Added explanation of ICC profiles
		Ø Installing an ICC profile
		Ø ICM settings
	67	Change in specifications: Changes were made to the initial value for nozzle clog tolerance.
		2 6
D	19-21	Revision in specifications: Revised 4-inch maximum label width and recommended initial value of label width
		108.8 108.0
	31-36	Changes to spot color adjustment
		Ø Function descriptions, implementation recommendations, commands used
		Ø User-set items and UI sample
		Ø How to send commands
		ØDetailed flow
	74, 75	Correction of icons in display examples for ink cartridge and maintenance box
	79	Addition of limitations: Limitations on acquiring printer status
E	-	Corrections to errors