

CONFIDENTIAL

DIGITAL COLOR PRINTER
I/F PROTOCOL SPECIFICATION
MODEL: CP-D90DW

29th June 2018
Rev.A 1st Aug. 2018

Ref: No. NOKP1813

MITSUBISHI ELECTRIC CORPORATION

Rev.

Date

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Record of Revision		
Revision Date	Change Mark	Notes
1st Aug. 2018	A	<p>Add Panorama print Mode parameter and the explanation</p> <p>A1 3.PANORAMA PRINT MODE 3.0PRINT SETTING 3.1DATA and MEMORY CHECK 3.2IMAGE DATA TRANSFER and PRINT</p> <p>A2 ex. Print Sequence for PANORAMA</p> <p>Correct mis-writing</p> <p>A3 2.0.PRINT SETTING, colorTable,sharpnessH,sharpnessV,dataFormat(added)</p> <p>A4 2.5.2.PRINTER STATUSACQUISITION, Ink Ribbon Status, total count</p>

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1. OUTLINE SPECIFICATIONS

1.1 USB I/F SPECIFICATION

1.1.1 CONNECTOR PROFILE

Compliant with USB Ver.2.0, Type-B

1.1.2 SIGNAL LEVEL

Compliant with USB Ver.2.0

1.1.3 DATA TRANSFER METHOD

Compliant with USB Ver.2.0

1.1.4 PIN ASSIGNMENT

[1pin] VBUS
 [2pin] D-
 [3pin] D+
 [4pin] GND
 [Shell] Shield

1.2 ID LIST

USB: Device Descriptor, Device ID is shown below;

MODEL	Device Descriptor		Device ID				
	idVender	idProduct	MFG	CMD	MDL	CLS	DES
CP-D90DW	06D3h	3B60h	'MITSUBISHI'	'MEL'	'CPD90D'	'PRINTER'	'MITSUBISHI_CPD90D'

2.TRANSFER / CONTROL COMMANDS

		supported in Power Save mode																							
2.0	PRINT SETTING	YES Auto wake-up	ESC	S	P	0	mode		parameter *1-5 (52byte)				dummy (454byte)												
			1Bh	53h	50h	30h	00h	33h	xxh	xxh	00h	...	00h	...	00h	...	00h	...	00h				
2.1 DATA and MEMORY CHECK																									
2.1.1	DATA and MEMORY CHECK REQUEST	YES	ESC	G	D	3	mode		parameter *1-5 (52byte)				dummy (454byte)												
			1Bh	47h	44h	33h	00h	33h	xxh	xxh	00h	...	00h	...	00h	...	00h	...	00h				
2.1.2	DATA and MEMORY CHECK ACQUISIT	YES	NESC	G	D	3	result1	result2																	
			E4h	47h	44h	33h	xxh	xxh																	
2.2 GET JOB NUMBER(JOB-ID)																									
2.2.1	JOB NUMBER REQUEST	YES	ESC	G	D	0	dummy		mode																
			1Bh	47h	44h	30h	00h	00h	01h	28h															
2.2.2	JOB NUMBER ACQUISITION	YES	NESC	G	D	0	Job number (JOB-ID)																		
			E4h	47h	44h	30h	0001h-xxxxh																		
2.3	IMAGE DATA TRANSFER and PRINT	YES Auto wake-up	ESC	Z	T	Code	00h	09h	image data positionX*1	image data positionY*1	image data X *2	image data Y *2	reserved	dummy (497byte)		Image data (image data size x 3byte) *3									
			1Bh	5Ah	54h	70h	00h	09h	00h	00h	00h	00h	xxh	xxh	xxh	xxh	00h	00h	...	00h	xxh	...	xxh		
2.4 JOB STATUS																									
2.4.1	JOB STATUS REQUEST	YES	ESC	G	D	mode	dummy		Job number (JOB-ID)																
			1Bh	47h	44h	31h	00h	00h	0001h-xxxxh																
2.4.2	JOB STATUS ACQUISITION MODE		NESC	G	D	mode	Job status *1																		
			E4h	47h	44h	31h	xxh	xxh	xxh	xxh															
2.5 PRINTER STATUS																									
2.5.1	PRINTER STATUS REQUEST	YES	ESC	G	D	0	dummy		mode																
			1Bh	47h	44h	30h	00h	00h	0Ah	1Eh	0Ch	0Eh	13h	0Dh	17h	1Fh	16h	2Ah	29h						
2.5.2	PRINTER STATUS ACQUISITION		NESC	G	D	0	Low-power *1	FW version (32byte) *2		Mecha status *3	Temperature *4	Error code *5	reserved	detailed error				ink ribbon Status (10byte) *6		ink ribbon tag UID (8byte)					
			E4h	47h	44h	30h	xxh	xxh	...	xxh	xxh	xxh	xxh	xxh	xxh	00h	xxh	xxh	00h	00h	xx xx xx xxh		xxh	...	xxh
2.6	Job Cancel	NO	ESC	D	C	A	N	C	E	L	dummy														
			1Bh	44h	43h	41h	4Eh	43h	45h	4Ch	00h	00h	00h	00h											
2.7	Wake-Up (Low-power→Standard)	YES	ESC	E	W	U																			
			1Bh	45h	57h	55h																			

3.PANORAMA PRINT MODE A1

3.0	PRINT SETTING	YES Auto wake-up	ESC	S	P	0	mode		Panoraka parameter (52byte)				dummy (454byte)									
			1Bh	53h	50h	30h	00h	33h	xxh	xxh	00h	...	00h	...	00h	...	00h	...	00h	
3.1 DATA and MEMORY CHECK																						
3.1.1	DATA and MEMORY CHECK REQUEST	YES	ESC	G	D	3	mode		Panorama parameter (52byte)				dummy (454byte)									
			1Bh	47h	44h	33h	00h	33h	xxh	xxh	00h	...	00h	...	00h	...	00h	...	00h	
3.1.2	DATA and MEMORY CHECK ACQUISIT	YES	NESC	G	D	3	result1	result2														
			E4h	47h	44h	33h	xxh	xxh														
3.2	IMAGE DATA TRANSFER and PRINT	YES Auto wake-up	ESC	Z	T	Code	00h	09h	image data positionX*1	image data positionY*1	image data X *2	image data Y *2	reserved	dummy (497byte)		Image data (image data size x 3byte) *3						
			1Bh	5Ah	54h	70h	00h	09h	00h	00h	00h	00h	xxh	xxh	xxh	xxh	00h	00h	...	00h	xxh	...

2.0.PRINT SETTING

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	ESC	S	P	0	00h	33h	PrintPixel(Hex) *1				waitTime *2	reserved	reserved	reserved	margin Cut *3	cut type *1
	1B	53	50	30	00	33	xx	xx	xx	xx	xx	00	00	00	xx	xx
0010	cutlist1 *1				cutlist2 *1				cutlist3 *1				reserved			
	PrintPixel.y		margin cut1	reserved	PrintPixel.y		margin cut2	reserved	PrintPixel.y		margin cut3	reserved	reserved			
	xx	xx	xx	00	xx	xx	xx	00	xx	xx	xx	00	00	00	00	00
0020	reserved															
0030	OP *4	Print Mode *5	color Table *6	sharpness H *7	sharpness V *8	reserved					data Format *9	reserved				
	xx	xx	xx	xx	xx	xx	00	00	00	00	00	00	00	00	00	00
...	reserved															
01F0	reserved															
	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

- *1 PrintPixel Image data pixel size
- cut type Setting of cutlist printing
- cutlist1 cutting position pixel
- cutlist2
- cutlist3

Setting of standard paper size ():Hex

size	printPixel.x	printPixel.y	cutType	cut list1		cut list2		cut list3	
				PrintPixel.y	margin cut1	PrintPixel.y	margin cut2	PrintPixel.y	margin cut3
9x13(3.5x5")	1550 (060E)	1076 (0434)	0	0	0	0	0	0	0
13x13(5x5")	1550 (060E)	1527(05F7)	0	0	0	0	0	0	0
13x18(5x7")	1550 (060E)	2128 (0850)	0	0	0	0	0	0	0
10x15(4x6")	1852 (073C)	1226 (04CA)	0	0	0	0	0	0	0
15x15(6x6")	1852 (073C)	1827 (0723)	0	0	0	0	0	0	0
15x20(6x8")	1852 (073C)	2428 (097C)	0	0	0	0	0	0	0
15x21(6x8.5")	1852 (073C)	2568(0A08)	0	0	0	0	0	0	0
15x23(6x9")	1852 (073C)	2729 (0AA9)	0	0	0	0	0	0	0
5x15(2x6")	1852 (073C)	625 (0271)	0	0	0	0	0	0	0
5x15(2x6") x2	1852 (073C)	1226 (04CA)	1	613 (0265)	1 (OFF)	0	0	0	0
10x15(4x6")x2	1852 (073C)	2488 (09B8)	1	1214 (04BE)	0 (ON)	0	0	0	0

Setting of variable printing

Ink ribbon	printPixel		
	printPixel.x	PrintPixel.y	
		min	max
9x13(3.5x5")	1550 (060E)	625 (0271)	1076 (0434)
13x18(5x7")	1550 (060E)	625 (0271)	2128 (0850)
10x15(4x6")	1852 (073C)	625 (0271)	1226 (04CA)
15x20(6x8")	1852 (073C)	625 (0271)	2488 (09B8)
15x23(6x9")	1852 (073C)	625 (0271)	2729 (0AA9)

- *2 waitTime waiting time for printing the next image in the same ink surface

00	default wait time (5s)
01-64	01(1s)-64(100s)
FF	without waiting

- *3 marginCut

00	ON
01	OFF

- *4 OP

overcoat	
00	Glossy
02	Matte

- *5 Print Mode

00	Auto
02	UltraFine
03	Fine

- *6 colorTable

00	ON
01	OFF

- *7 sharpnessH

- *8 sharpnessV

00	None
01-08	01(Soft)-08(Hard) (default:04)

- *9 dataFormat

00	8bit Format
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2.4.2.JOB STATUS ACQUISITION MODE

*1 Job Status

DATA				Status	Note
00h	00h	00h	00h	No Job	—
10h	01h	00h	00h	transfer and generate a data	During data transfer
	02h	00h	00h		data stack
	03h	00h	00h		data generation - step1
	04h	00h	00h		data generation - step2
	05h	00h	00h		data layout
50h	21h	00h	00h	During printing	Media loading ends / before Y print
	22h	00h	00h		During Y print
	23h	00h	00h		Swing Backward / before M print
	24h	00h	00h		During M print
	25h	00h	00h		Swing Backward / before C print
	26h	00h	00h		During C print
	27h	00h	00h		Swing Backward / before OP print
	28h	00h	00h		During OP print
	2Fh	00h	00h		During paper ejection
	80h	00h	00h		00h
90h	50h	error code		Job end with error	error (Refer to Error code list)
	40h	error code			Job delete

2.5.2.PRINTER STATUSACQUISITION

*1 Low-power

DATA	note
00h	standard
40h	Power Save mode

DATA	FW version (M)				FW sum(M)		FW version (T)				FW sum(T)					
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
DATA	ASCII CODE						xxh	xxh	ASCII CODE						xxh	xxh
DATA	FW version (Z)				FW sum(Z)		FW version (F)				FW sum (F)					
DATA	ASCII CODE						xxh	xxh	ASCII CODE						xxh	xxh

	FW version						FW sum	
	1	2	3	4	5	6	7	8
M	xx	xx	xx	xx	xx	xx	xx	xx
T	xx	xx	xx	xx	xx	xx	xx	xx
Z	xx	xx	xx	xx	xx	xx	xx	xx
F	xx	xx	xx	xx	xx	xx	xx	xx

*3 Mecha status

DATA		note	
00h	00h	standby (no error)	
00h	01h	standby(error)	
50h	10h	Initializing	
	21h	initializing of Yellow	
	22h	printing of Yellow	
	23h	initializing of Magenta	
	24h	printing of Magenta	
	25h	initializing of Cyan	
	26h	printint of Cyan	
	27h	initializing of OP	
	28h	printing of OP	
	2Fh	paper ejection process	
	30h	Rewind inksheet	
	20h	before continuous Yellow	
	38h	return standby position	
	80h	00h	During initialization
		10h	Feed&Cut process
15h		During inksheet initializing	
20h		Initializing	

*4 Temperature

DATA	note
00h	Within temperature range for printing
40h	During Pre-heating
80h	During Cooling
FFh	Abnormal Temperature

*5 Error code

Appendix.1_ErrorCode

*6 Ink Ribbon Status

A4	Ink ribbon										
		1	2	3	4	5	6	7	8	9	10
	Brand Code	Media Type	reserved	reserved	Total	Remain	reserved	reserved			
	9x13(3.5x5")	FFh 01h	-	-	01C2h	xxxxh	-	-			
	13x18(5x7")	FFh 04h	-	-	01CCh	xxxxh	-	-			
	10x15(4x6")	FFh 02h	-	-	0190h	xxxxh	-	-			
	15x20(6x8")	FFh 0Fh	-	-	0190h	xxxxh	-	-			
	15x23(6x9")	FFh 05h	-	-	0168h	xxxxh	-	-			

3.PANORAMA PRINT MODE A1
 3.0 PRINT SETTING

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	ESC	S	P	0	00h	33h	PrintPixel(Hex) *1				waitTime	reserved	reserved	reserved	margin Cut	cut type
	IB	53	50	30	00	33	xx	xx	xx	xx	FF	00	00	00	00	00
0010	cutlist1			cutlist2				cutlist3				reserved				
	PrintPixel.y	margin cut1	reserved	PrintPixel.y	margin cut2	reserved	PrintPixel.y	margin cut3	reserved							
	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0020	reserved															
	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0030	OP	Print Mode	color Table	sharpness H	sharpness V	reserved					data Format *9	reserved	Panorama Mode *11	Panorama Image No. *12	PrintPixel y of first print *13	
	00	02	00	00	00	00	00	00	00	00	01	00	xx	xx	xx	xx
0040	PrintPixel y of last print *13		reserved		Panorama Setting1		Panorama Setting2		Panorama Setting3		reserved					
	xx	xx	00	00	02	58	00	0C	00	06	00	00	00	00	00	00
...	reserved															
01F0	reserved															
	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

- *1 PrintPixel Image data pixel size
- *11 Panorama Mode number of connections
- *12 Panorama Image No. Page of panorama
- *13 PrintPixel y of first print
- PrintPixel y of last print

size	original image size		Panorama Mode *11	Panorama Image No. *12	PrintPixel(Hex) *1		PrintPixel y of first print(Hex) *13	PrintPixel y of last print(Hex) *13
	Pixel.x	Pixel.Y			printPixel.x	printPixel.y		
15x36(6x14")	1852	4232	02	01	1852 (073C)	2428 (097C)	2428 (097C)	2404(0964)
				02	1852 (073C)	2404 (0964)		
15x51(6x20")	1852	6036	03	01	1852 (073C)	2428 (097C)	2428 (097C)	2380(094C)
				02	1852 (073C)	2428 (097C)		
				03	1852 (073C)	2380(094C)		

*9 dataFormat

01	16bit Format
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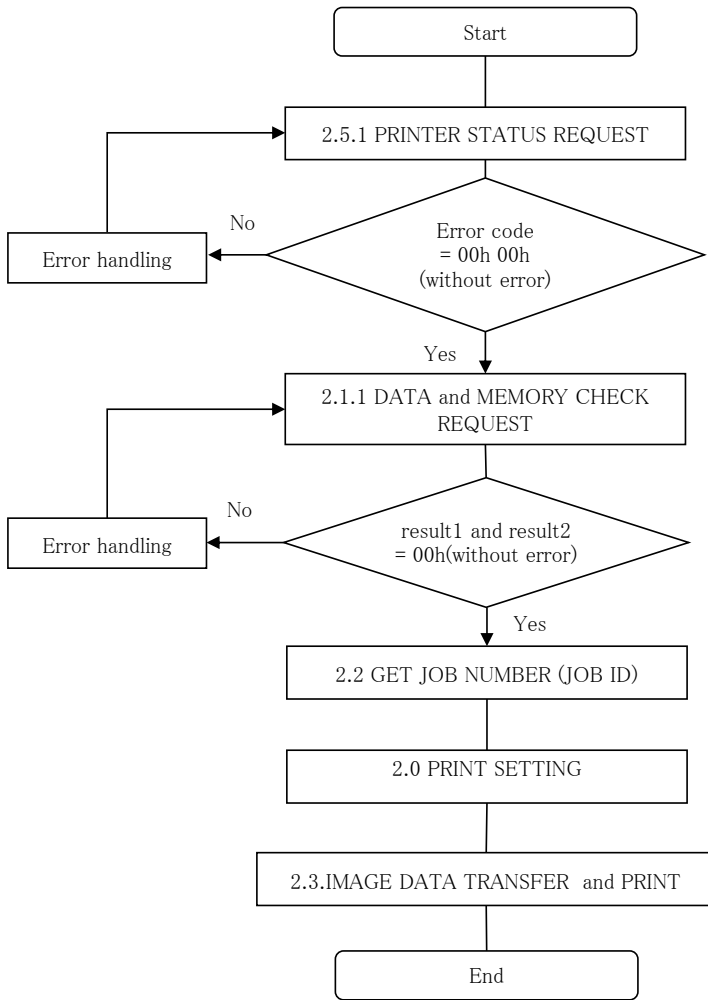
3.1.DATA and MEMORY CHECK

3.1.1.DATA and MEMORY CHECK REQUEST
 parameter is same as 3.0.PRINT SETTING

3.1.2.DATA and MEMORY CHECK ACQUISITION

result1	00	OK
	01	memory full
	FF	parameter error
result2	00	OK
	01	paper size setting and ink ribbon type mismatch
	FF	parameter error

ex. Print Sequence



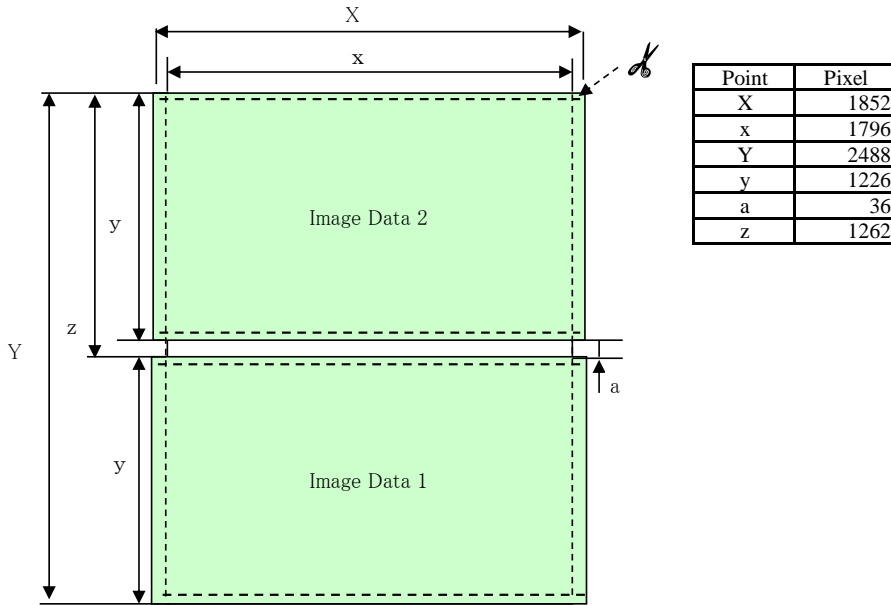
ex. setting cutlist
 Layout Type :10x15(4x6") x 2
 PrintPixel

PrintPixel.x	PrintPxcel.y
1852(073C)	2488(09B8)

cut type and cutlist

cutType	cutlist1
	cutlist1_margincut ON(00)
	PrintPixel.y
01	1214(04BE)

Image Data layout



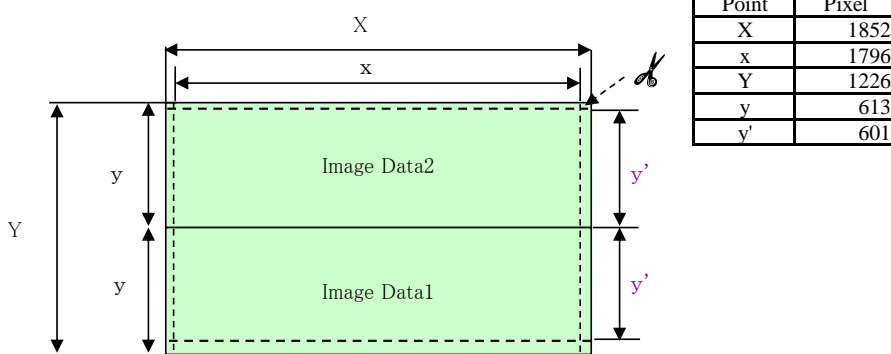
Layout type :6x2"x2
 PrintPixel

PrintPixel.x	PrintPxcel.y
1852(073C)	1226(04CA)

cut type and cutlist

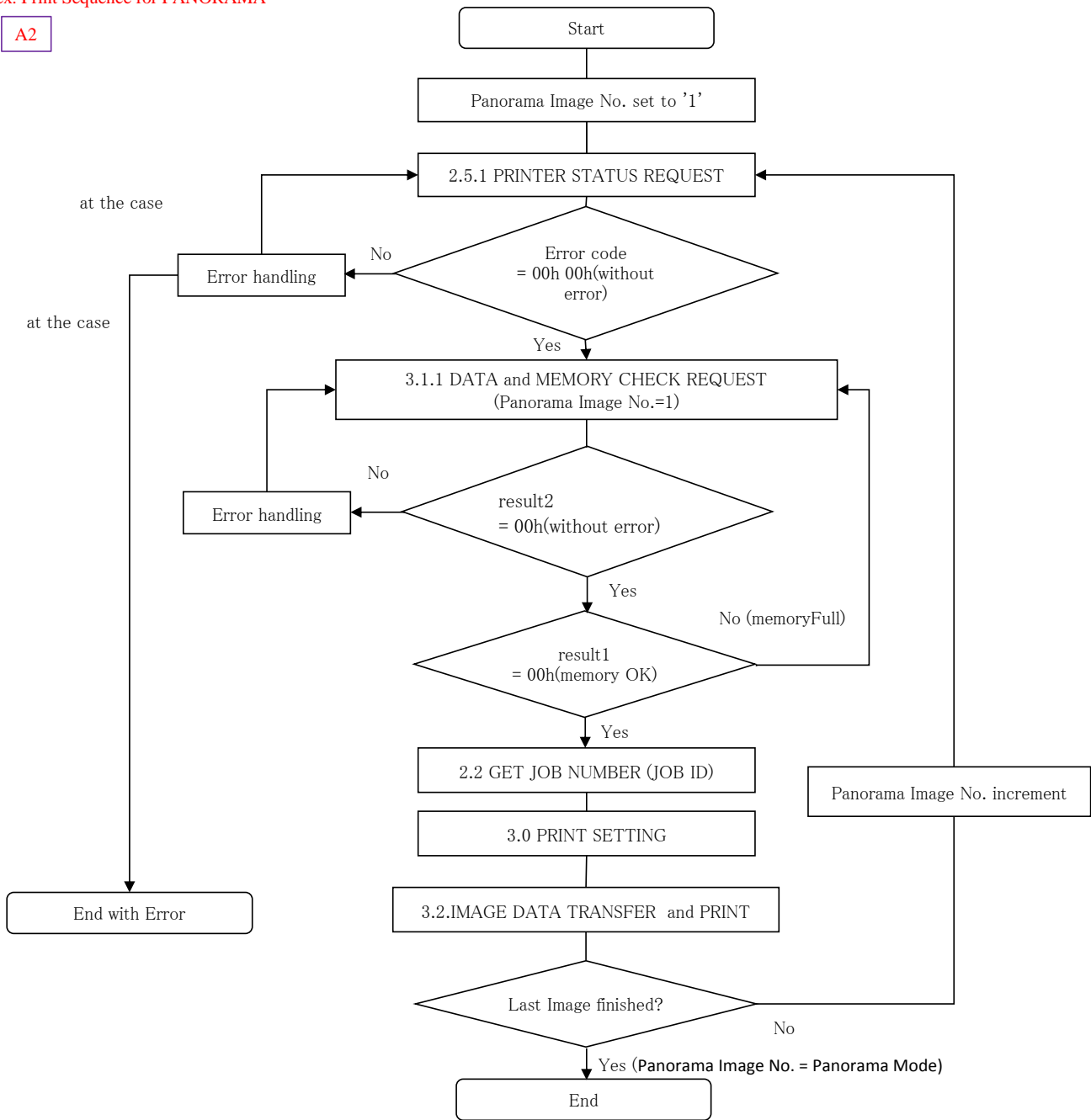
cutType	cutlist1
	cutlist1_margincut OFF(01)
	PrintPixel.y
01	613(0265)

Image Data layout



ex. Print Sequence for PANORAMA

A2



Appendix 1: ERROR CODE

Priority	Mode	Detail	LED				PRINTER ERROR CODE (HEX)				Error recovery condition
			POWER Orange (STBY)	POWER Green (RDY)	MEDI	Alarm	ERROR CODE Upper		ERROR CODE Lower		User operation
Low	USB command error (No error on printer)	Can not receive the picture data	●	○	●	●	8	1	0	0	—
		Timeout during receiving the picture data	●	○	●	●	8	2	0	0	—
		Can not receive the picture data, because the picture data size is out of paper size	●	○	●	●	8	3	0	0	—
		Received Illegal data on [ESC+SP] before JOB completed.	●	○	●	●	8	4	0	0	—
		Can not start printing by CANCEL command	●	○	●	●	8	5	0	0	—
		Can not start printing by the previous JOB error	●	○	●	●	8	9	0	0	—
No paper strip bin		During waiting (except the printing)	●	◎	●	◎	2	8	0	0	Attach Paper strip bin
		Between continuous printing	●	◎	●	◎	2	8	1	0	Attach Paper strip bin
Can not detect the ink ribbon		Can not access the RFID TAG	●	○	○	●	2	1	9	0	Load Ink Ribbon
No paper		-	●	○	○	●	2	2	0	0	Load Paper
Ink ribbon and Paper type do not match		-	●	○	◎	●	2	3	0	0	Change Ink Ribbon or Paper
Out of the ink ribbon remain		remain 0	●	○	○	●	2	1	0	0	Load Ink Ribbon
		remain 1(2 necessary)	●	○	○	●	2	1	1	0	Load Ink Ribbon
Illegal ink ribbon		-	●	○	◎	●	2	6	*	*	Load Ink Ribbon
Mismatch between the ink ribbon size and the picture size		-	●	○	◎	●	2	3	9	0	Change Ink Ribbon & Paper
Paper end		Detect End hole	●	○	○	●	2	2	0	2	Load Paper
Ink ribbon end		Can not detect Y ink	●	○	○	●	2	1	2	0	Load Ink Ribbon
		Can not detect Y ink because of rotation stop	●	○	○	●	2	1	3	0	Load Ink Ribbon
Door open		At the ready	●	○	●	◎	2	9	0	0	Close Printing Unit
		During mecha initialization	●	○	●	◎	2	9	1	0	Close Printing Unit
Door open during printing		-	●	○	●	◎	2	9	9	0	Reload Paper
Power OFF during printing		-	●	—	—	—	2	F	F	F	Power ON
Ink ribbon error		Ink ribbon skip 1 (time out)	●	○	◎	◎	3	2	9	0	Reload Paper
		Ink ribbon skip 2	●	○	◎	◎	3	3	9	0	Reload Paper
		Ink sticking (rotation stop in printing)	●	○	◎	◎	3	4	9	0	Reload Paper
		Skip ink in rewinding (time out)	●	○	◎	◎	3	6	9	0	Reload Paper
		Rotation stop in Ink feed direction(except head heating)	●	○	◎	◎	3	1	9	0	Reload Paper
		Rotation stop in Ink backward direction	●	○	◎	◎	3	5	9	0	Reload Paper
		Detect unexpected ink length	●	○	◎	◎	3	7	9	0	Reload Paper

Paper jam	Can not detect leading edge of paper with S1 sensor in ejection direction (feed direction)	●	○	◎	◎	4	2	9	1	Reload Paper
	Can not detect leading edge of paper with S3 sensor in ejection direction (feed direction)	●	○	◎	◎	4	2	9	3	Reload Paper
	Can not detect leading edge of paper with S3 sensor in printing direction (backward	●	○	◎	◎	4	4	9	3	Reload Paper
	Can not detect leading edge of paper with S1 sensor in printing direction (backward	●	○	◎	◎	4	4	9	1	Reload Paper
	Can not detect leading edge of paper with S2 sensor in printing direction (backward direction)	●	○	◎	◎	4	4	9	2	Reload Paper
	Detect unexpected leading edge of paper with S1 sensor in printing direction (backward direction)	●	○	◎	◎	4	3	9	1	Reload Paper
	Detect unexpected leading edge of paper with S3 sensor in printing direction (backward direction)	●	○	◎	◎	4	3	9	3	Reload Paper
	Detect unexpected leading edge of paper with S1 sensor in ejection direction (feed direction)	●	○	◎	◎	4	1	9	1	Reload Paper
	Detect unexpected leading edge of paper with S1 sensor without paper feeding	●	○	◎	◎	4	0	9	1	Reload Paper
Mechanism error	Can not detect target positions except HOME position for PLATEN	●	○	●	○	7	1	9	4	Reload Paper
	Can not detect HOME position for PLATEN	●	○	●	○	7	0	5	4	Power OFF-ON
	Can not detect target position for CUTTER	●	○	●	○	7	1	9	2	Power OFF-ON
	Can not detect HOME position for CUTTER	●	○	●	○	7	0	9	2	Power OFF-ON
	Cutter motor lock	●	○	●	○	7	3	9	2	Power OFF-ON
	Cutter sensor error	●	○	●	○	7	4	5	2	Power OFF-ON
	Can not detect HOME position for CUTTER after position error	●	○	●	○	7	5	5	2	Power OFF-ON
Electric parts error	Preheating error	●	○	●	○	6	0	2	0	Power OFF-ON
	Thermistor error	●	○	●	○	6	0	0	*	Power OFF-ON
		●	○	●	○	6	0	1	*	Power OFF-ON
	Humidity sensor error	●	○	●	○	6	0	0	4	Power OFF-ON
	MatteOP error	●	○	●	○	6	1	1	0	Power OFF-ON
		●	○	●	○	6	1	1	1	Power OFF-ON
	DATA transfer error	●	○	●	○	6	2	0	0	Power OFF-ON
		●	○	●	○	6	2	1	0	Power OFF-ON
		●	○	●	○	6	2	2	0	Power OFF-ON
	EEPROM error	●	○	●	○	6	3	0	0	Power OFF-ON
		●	○	●	○	6	3	1	0	Power OFF-ON
		●	○	●	○	6	3	2	0	Power OFF-ON
	FLASH MEMORY error	●	○	●	○	6	4	0	0	Power OFF-ON
	FPGA configuration error	●	○	●	○	6	5	0	0	Power OFF-ON
		●	○	●	○	6	5	1	0	Power OFF-ON
		●	○	●	○	6	5	2	0	Power OFF-ON
		●	○	●	○	6	5	3	0	Power OFF-ON
	Power voltage error(VBUS)	●	○	●	○	6	5	4	0	Power OFF-ON
	Power voltage error(24V)	●	●	●	●	6	6	0	0	Power OFF-ON
		◎	●	●	●	6	6	1	0	Power OFF-ON
		◎	●	●	●	6	6	2	0	Power OFF-ON
	RFID access error	◎	●	●	●	6	7	0	0	Power OFF-ON
Fan lock error	◎	●	●	●	6	8	0	0	Power OFF-ON	
MDA error	◎ HighSpeed	●	●	●	6	8	9	0	Power OFF-ON	
DDR error	◎ HighSpeed	●	●	●	6	9	1	0	Power OFF-ON	
Other errors	◎ HighSpeed	●	●	●	6	9	0	0	Power OFF-ON	

High