SERVICE MANUAL

Color Inkjet Printer

Epson Stylus Photo PX650/TX650/TX659
Epson Stylus Photo PX660
Epson Stylus Photo PX660 Premium
Artisan 635

EPSON

EXCEED YOUR VISION

Confidential

Notice:

PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1) Personal injury and 2) damage to equipment.

DANGER   Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by DANGER Headings.

WARNING   Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.
4. WHEN DISASSEMBLING OR ASSEMBLING A PRODUCT, MAKE SURE TO WEAR GLOVES TO AVOID INJURIER FROM METAL PARTS WITH SHARP EDGES.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.
3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.
4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.
5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NON-APPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.
6. WHEN USING COMPRESSED AIR PRODUCTS; SUCH AS AIR DUSTER, FOR CLEANING DURING REPAIR AND MAINTENANCE, THE USE OF SUCH PRODUCTS CONTAINING FLAMMABLE GAS IS PROHIBITED.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of the printer. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Manual Configuration

This manual consists of six chapters and Appendix.

CHAPTER 1.PRODUCT DESCRIPTIONS
> Provides a general overview and specifications of the product.

CHAPTER 2.OPERATING PRINCIPLES
> Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3.TROUBLESHOOTING
> Describes the step-by-step procedures for the troubleshooting.

CHAPTER 4.DISASSEMBLY / ASSEMBLY
> Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5.ADJUSTMENT
> Provides Epson-approved methods for adjustment.

CHAPTER 6.MAINTENANCE
> Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

CHAPTER 8.Epson Stylus Photo PX660/PX660 Premium/Artisan 635
> Provides particular information for Epson Stylus Photo PX660

Symbols Used in this Manual

Various symbols are used throughout this manual either to provide additional information on a specific topic or to warn of possible danger present during a procedure or an action. Be aware of all symbols when they are used, and always read NOTE, CAUTION, or WARNING messages.

ADJUSTMENT REQUIRED	Indicates an operating or maintenance procedure, practice or condition that is necessary to keep the product's quality.
CAUTION !	Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.
CHECK POINT ✓	May indicate an operating or maintenance procedure, practice or condition that is necessary to accomplish a task efficiently. It may also provide additional information that is related to a specific subject, or comment on the results achieved through a previous action.
WARNING ⚡	Indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.
REASSEMBLY ↩	Indicates that a particular task must be carried out according to a certain standard after disassembly and before re-assembly, otherwise the quality of the components in question may be adversely affected.

Revision Status

Revision	Date of Issue	Description
A	August 5, 2009	First Release
B	July 20, 2010	Revised Contents ☐ All chapters ■ Description about Epson Stylus Photo PX660 has been added. ☐ Chapter 1 ■ Checkpoint has been added in "1.1 Features *(p10)"*. ☐ Chapter 2 ■ Checkpoint has been added in "2.1 Overview *(p35)"*. ■ Made correction in "2.2 Power-On Sequence *(p38)"*. ☐ Chapter 3 ■ Checkpoint has been added in "3.1 Overview *(p42)"*. ■ Information for Epson Stylus Photo PX660 has been added in "3.3.6 Troubleshooting for Motors and Sensors *(p59)"*. ☐ Chapter 4 ■ Checkpoint has been added in "4.1 Overview *(p61)"*. ■ Checkpoint has been added in "4.1.6 Disassembly and Reassembly Procedure *(p63)"*. ■ Checkpoint has been added, made correction in "4.2.5 Scanner Unit *(p69)"*. ■ Checkpoint has been added in "4.2.6 Panel Unit *(p72)"*. ■ Made change in "4.2.7 M/B Cover *(p74)"*. ■ Made correction in "4.2.8 Waste Ink Tray Assy *(p74)"*. ■ Made change for checkpoint in "4.3.1 Main Board Unit *(p78)"*. ■ Checkpoint has been added in "4.3.2 Panel Board *(p81)"*. ■ Made correction in "4.4.1 Printhead *(p85)"*. ■ Checkpoint has been added in "4.4.3 Printer Mechanism *(p88)"*. ■ Checkpoint has been added in "4.4.10 CR Unit *(p98)"*. ☐ Chapter 5 ■ Checkpoint has been added in "5.1 Adjustment Items and Overview *(p111)"*. ■ Made change for "Specified Scanner for BRS/PFP Adjustment" in "5.4 Banding Reduction System (BRS) Adjustment/Paper Feed Amount Profile (PFP) Correction *(p122)"*. ☐ Chapter 6 ■ Checkpoint has been added in "6.1 Overview *(p131)"*. ☐ Chapter 7 ■ Made change in "7.1 Exploded Diagram / Parts List *(p139)"*. ☐ Chapter 8 ■ Information for Epson Stylus Photo PX660 has been added.

Revision Status

Revision	Date of Issue	Description

C	August 25, 2011	Revised Contents
		☐ All chapters
		  ■ Description about Epson Stylus Photo PX660 Premium/Artisan 635 has been added.
		☐ Chapter 1
		  ■ Checkpoint has been added in "1.1 Features *(p10)*".
		  ■ Made change in "1.5.2 Memory Card Slots *(p19)*"
		☐ Chapter 2
		  ■ Checkpoint has been added in "2.1 Overview *(p35)*".
		☐ Chapter 3
		  ■ Checkpoint has been added in "3.1 Overview *(p42)*".
		☐ Chapter 4
		  ■ Checkpoint has been added in "4.1 Overview *(p61)*".
		  ■ Checkpoint has been added in"4.1.6 Disassembly and Reassembly Procedure *(p63)*"
		  ■ Checkpoint has been added in"4.2.5 Scanner Unit *(p69)*"
		  ■ Checkpoint has been added in"4.2.6 Panel Unit *(p72)*"
		  ■ Checkpoint has been added in"4.4.3 Printer Mechanism *(p88)*"
		  ■ Checkpoint has been added in"4.4.10 CR Unit *(p98)*"
		☐ Chapter 5
		  ■ Checkpoint has been added in "5.1.1 Servicing Adjustment Item List *(p111)*".
		  ■ Checkpoint has been added in "5.3 PG Adjustment *(p120)*".
		  ■ Made change for "Specified Scanner for BRS/PFP Adjustment" in "5.4 Banding Reduction System (BRS) Adjustment/Paper Feed Amount Profile (PFP) Correction *(p122)*".
		  ■ Checkpoint has been added in "5.4.2.2 PFP Adjustment *(p125)*".
		☐ Chapter 6
		  ■ Checkpoint has been added in "6.1 Overview *(p131)*".
		☐ Chapter 8
		  ■ Information for Epson Stylus Photo PX660 Premium and Artisan 635 has been added.
		  ■ Checkpoint has been added in "8.2.2 Disassembly Procedures *(p144)*".
		  ■ Checkpoint has been added in "8.2.2.5 CR Unit *(p155)*".
		  ■ Checkpoint has been added in "8.3.1 Overview *(p157)*".
		  ■ "8.3.5 Overview Artisan 635 *(p163)*"has been added.
		  ■ "8.3.6 USB Interface Epson Stylus Photo PX660/PX660 Premium/Artisan 635 *(p163)*"has been added.
		  ■ "8.3.7 Memory Card Slots Epson Stylus PX660/PX660 Premium *(p164)*"has been added.
		  ■ "8.3.8 Memory Card Slots Artisan 635 *(p165)*"has been added.
		  ■ "8.3.9 Electrical Specifications *(p166)*"has been added.

CONTENTS

Chapter 5 ADJUSTMENT

Chapter 6 MAINTENANCE

Chapter 8 Epson Stylus Photo PX660/PX660 Premium/Artisan 635

PRODUCT DESCRIPTION

1.1 Features

> **CHECK POINT** ✓
>
> **Description in this chapter is applied to Epson Stylus Photo PX650/TX650/TX659. For information on Epson Stylus Photo PX660/PX660 Premium/Artisan 635, see below.**
> - **Chapter 8 "Epson Stylus Photo PX660/PX660 Premium/Artisan 635"** *(p140)*

Epson Stylus Photo PX650/TX650/TX659 are color inkjet printers equipped with scanner function. The main features are described below.

☐ **Available Functions**

- Printer
  - Printing from a PC
  - Direct print on CD or DVD (label print)

- Scanner
  - Scanning from a PC
  - Scan to Memory function
    (directly stores a scan data to a memory card inserted)

- Stand-alone copy
  - Stand-alone copy using the printer and scanner functions.

- Memory card slot
  - Direct print from a memory card
  - Accessible from a PC as a USB memory card slot

- USB host interface
  - Direct print from an external USB storage device
  - Direct backup of memory card data to an external USB storage device
  - Direct print from a digital camera (PictBridge)

- 2.5-inch TFD color LCD

☐ **High speed & high quality**

- Maximum resolution: 5760 (H) x 1440 (V) dpi

- High quality with 6 colors dye ink (6 independent cartridges)

- High speed print with F3 Mach Turbo2 head
  (Black: 90 nozzles x 1 column, Color: 90 nozzles x 5 columns)

- Borderless print on EPSON designated paper

☐ **Dimensions**

- Dimensions: 450 mm (W) x 386 mm (D) x 195 mm (H)
  (when the ASF and the stacker are closed. includes the rubber feet)

- Weight: 8.4 kg
  (excludes the ink cartridges, power supply cable and the CD-R tray)
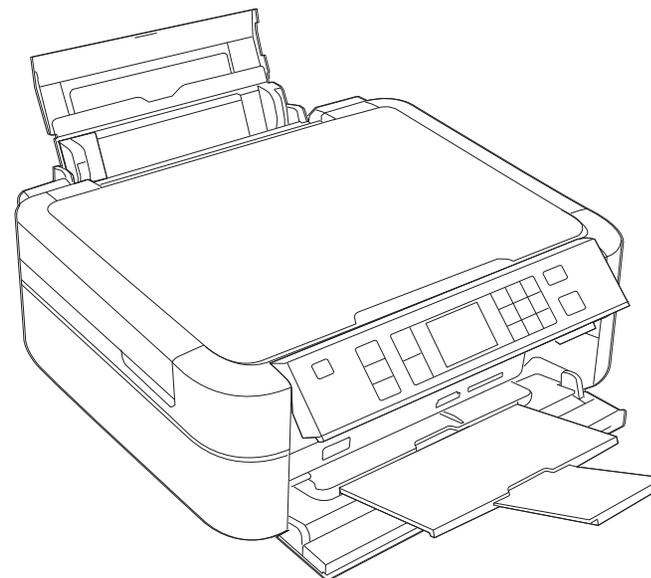
Figure 1-1. External View

1.2 Printing Specifications

1.2.1 Basic Specifications

Table 1-1. Printer Specifications

Item	Specifications
Print method	On-demand inkjet
Nozzle configuration	Black: 90 nozzles x 1 Color: 90 nozzles x 5 (cyan, magenta, yellow, light cyan, light magenta)
Print direction	Bi-directional minimum distance printing, unidirectional printing
Print resolution	Horizontal x Vertical (dpi) • 360 x 180　　• 720 x 540 • 360 x 360　　• 720 x 720 • 720 x 360　　• 5760 x 1440
Control code	• ESC/P Raster command • ESC/P-R (RGB) command • EPSON Remote command
Input buffer size	64 Kbytes
Paper feed method	Friction feed using an ASF (Auto Sheet Feeder)
Paper path	Top feed, front out
Paper feed rate	110 msec. (at 25.4 mm feed)
PF interval	Programmable in 0.01764 mm (1/1440 inch) steps

1.2.2 Ink Cartridge

The product numbers of the Epson ink cartridges for this printer are shown below.

Table 1-2. Product No. of Ink Cartridges

Color	Europe	CISMEA, Asia
Black	T0791 (S) T0801 (2S)	T0811N (S) T0821N (2S)
Cyan	T0792 (S) T0802 (2S)	T0812N (S) T0822N (2S)
Magenta	T0793 (S) T0803 (2S)	T0813N (S) T0823N (2S)
Yellow	T0794 (S) T0804 (2S)	T0814N (S) T0824N (2S)
Light Cyan	T0795 (S) T0805 (2S)	T0815N (S) T0825N (2S)
Light Magenta	T0796 (S) T0806 (2S)	T0816N (S) T0826N (2S)

☐ **Shelf life**

Two years from production date (if unopened), six months after opening the package.

☐ **Storage Temperature**

Table 1-3. Storage Temperature

Status	Storage Temperature	Limit
When stored in individual boxes	-20ºC to 40ºC (-4ºF to 104ºF)	1 month max. at 40ºC (104ºF)
When installed in main unit	-20ºC to 40ºC (-4ºF to 104ºF)	

☐ **Dimension**

12.7 mm (W) x 68 mm (D) x 47 mm (H)

CAUTION !	■ **Do not use expired ink cartridges.** ■ **The ink in the cartridges freezes at -16 °C (3.2°F). It takes about three hours under 25°C (77°F) until the ink thaws and becomes usable.**

1.2.3 Print Mode

Table 1-4. Print Mode (Color)

Media	Print Mode	Resolution (H x V) dpi	Dot Size (cps[1])	Bi-d	Micro Weave	Border -less
• Plain paper • Premium Ink jet Plain Paper • Bright White Ink jet Paper	Draft 1 (Fast economy)	360 x 180	Eco (400 cps)	ON	OFF	NA
	Draft 2 (Economy)	360 x 180	Eco (400 cps)	ON	OFF	NA
	Normal	360 x 360	MC2-1 (360 cps)	ON	OFF	NA
	Photo Fine	720 x 720	MC1-1 (240 cps)	ON	ON	NA
Ultra Glossy Photo Paper	Photo[2]	720 x 720 (1.5 pass)	MC1-2 (240 cps)	ON	ON	OK
	Photo[2]	720 x 720 (2.0 pass)	MC2-2 (280 cps)	ON	ON	OK
	Super Photo	5760 x 1440	MC1-5 (200 cps)	ON	ON	OK
• Photo Paper • Glossy Photo Paper • Premium Glossy Photo Paper • Premium Semigloss Photo Paper	Fine	720 x 360	MC1-1 (240 cps)	ON	ON	OK
	Photo[2]	720 x 720 (1.5 pass)	MC1-2 (240 cps)	ON	ON	OK
	Photo[2]	720 x 720 (2.0 pass)	MC2-2 (280 cps)	ON	ON	OK
	Super Photo	5760 x 1440	MC1-5 (200 cps)	ON	ON	OK
Matte Paper Heavy-weight	Photo[2]	720 x 720 (2.0 pass)	MC2-2 (280 cps)	ON	ON	OK
	Super Photo	5760 x 1440	MC1-5 (200 cps)	ON	ON	OK
Photo Quality Ink jet Paper	Photo[2]	720 x 720 (2.0 pass)	MC2-2 (280 cps)	ON	ON	NA

Table 1-4. Print Mode (Color)

Media	Print Mode	Resolution (H x V) dpi	Dot Size (cps[1])	Bi-d	Micro Weave	Border -less
Envelope	Normal	360 x 360	MC2-1 (360 cps)	OFF	OFF	NA
	Photo Fine	720 x 720	MC1-1 (240 cps)	OFF	ON	NA
Iron-On Cool Peal Transfer Paper	Photo Fine	720 x 720	MC1-1 (240 cps)	OFF	ON	NA
Photo stickers	Photo[2]	720 x 720 (2.0 pass)	MC2-2 (280 cps)	ON	ON	NA
CD/DVD label	Super Photo	5760 x 1440	MC1-5 (200 cps)	ON	ON	NA
High-quality CD/DVD label	Super Photo	5760 x 1440	MC1-5 (200 cps)	ON	ON	NA

Note *1: cps = character per second
*2: Photo mode uses 1.5 pass or 2.0 pass depending on the paper size.
1.5 pass supported size: 4" x 6"
2.0 pass supported size: 16:9 wide, 5" x 7", 8" x 10", Letter, A4

Table 1-5. Print Mode (Monochrome)

Media	Print Mode	Resolution (H x V) dpi	Dot Size (cps[1])	Bi-d	Micro Weave	Border -less
• Plain paper • Premium Ink jet Plain Paper • Bright White Ink jet Paper	Draft 1 (Fast economy)	360 x 180	Eco (400 cps)	ON	OFF	NA
	Draft 2 (Economy)	360 x 180	Eco (400 cps)	ON	OFF	NA
	Normal	360 x 360	MC2-1 (360 cps)	ON	OFF	NA
	Photo Fine	720 x 720	MC1-1 (240 cps)	ON	ON	NA
Ultra Glossy Photo Paper	Photo[2]	720 x 720 (1.5 pass)	MC1-2 (240 cps)	ON	ON	OK
	Photo[2]	720 x 720 (2.0 pass)	MC2-2 (280 cps)	ON	ON	OK
	Super Photo	5760 x 1440	MC1-5 (200 cps)	ON	ON	OK
• Photo Paper • Glossy Photo Paper • Premium Glossy Photo Paper • Premium Semigloss Photo Paper	Fine	720 x 360	MC1-1 (240 cps)	ON	ON	OK
	Photo[2]	720 x 720 (1.5 pass)	MC1-2 (240 cps)	ON	ON	OK
	Photo[2]	720 x 720 (2.0 pass)	MC2-2 (280 cps)	ON	ON	OK
	Super Photo	5760 x 1440	MC1-5 (200 cps)	ON	ON	OK
Matte Paper Heavy-weight	Photo[2]	720 x 720 (2.0 pass)	MC2-2 (280 cps)	ON	ON	OK
	Super Photo	5760 x 1440	MC1-5 (200 cps)	ON	ON	OK
Photo Quality Ink jet Paper	Photo[2]	720 x 720 (2.0 pass)	MC2-2 (280 cps)	ON	ON	NA

Table 1-5. Print Mode (Monochrome)

Media	Print Mode	Resolution (H x V) dpi	Dot Size (cps[1])	Bi-d	Micro Weave	Border -less
Envelope	Normal	360 x 360	MC2-1 (360 cps)	OFF	OFF	NA
	Photo Fine	720 x 720	MC1-1 (240 cps)	OFF	ON	NA
Iron-On Cool Peal Transfer Paper	Photo Fine	720 x 720	MC1-1 (240 cps)	OFF	ON	NA
Photo stickers	Photo[2]	720 x 720 (2.0 pass)	MC2-2 (280 cps)	ON	ON	NA
CD/DVD label	Super Photo	5760 x 1440	MC1-5 (200 cps)	ON	ON	NA
High-quality CD/DVD label	Super Photo	5760 x 1440	MC1-5 (200 cps)	ON	ON	NA

Note *1: cps = character per second

*2: Photo mode uses 1.5 pass or 2.0 pass depending on the paper size.
1.5 pass supported size: 4" x 6"
2.0 pass supported size: 16:9 wide, 5" x 7", Letter, A4

1.2.4 Supported Paper

The table below lists the paper type and sizes supported by the printer. The Supported paper type and sizes vary depending on destinations (between EUR and Asia).

Table 1-6. Supported Paper

Paper Name	Paper Size		Thickness	Weight			EUR		Asia	
			mm	g/m^2	lb.		P*[1]	B*[1]	P*[1]	B*[1]
Plain paper	Legal	215.9 x 355.6 mm (8.5" x 14")	0.08-0.11	64-90	17-24		Y	---	Y	---
	Letter	215.9 x 279.4 mm (8.5" x 11")					Y	---	Y	---
	A4	210 x 297 mm (8.3" x 11.7")					Y	---	Y	---
	B5	182 x 257 mm (7.2" x 10.1")					Y	---	Y	---
	A5	148 x 210 mm (5.8" x 8.3")					Y	---	Y	---
	A6	105 x 148 mm (4.1" x 5.8")					Y	---	Y	---
	User Defined	89 x 127- 329 x 1117.6 mm (3.56" x 5.08" - 13.16" x 44.7")					Y	---	Y	---
Premium Ink jet Plain Paper	A4	210 x 297 mm (8.3" x 11.7")	0.11	80	21		Y	---	Y	---
Bright White Ink jet Paper	A4	210 x 297 mm (8.3" x 11.7")	0.13	92.5	25		Y	---	Y	---
Ultra Glossy Photo Paper	A4	210 x 297 mm (8.3" x 11.7")	0.30	290	77		Y	Y	Y	Y
	5" x 7"	127 x 178 mm					Y	Y	---	---
	4" x 6"	101.6 x 152.4 mm					Y	Y	Y	Y
Premium Glossy Photo Paper	A4	210 x 297 mm (8.3" x 11.7")	0.27	255	68		Y	Y	Y	Y
	5" x 7"	127 x 178 mm					Y	Y	Y	Y
	4" x 6"	101.6 x 152.4 mm					Y	Y	Y	Y
	16:9 wide	102 x 181 mm (4" x 7.11")					Y	---	---	---
Glossy Photo Paper	A4	210 x 297 mm (8.3" x 11.7")	0.25	258	68		Y	Y	Y	Y
	5" x 7"	127 x 178 mm					Y	Y	---	---
	4" x 6"	101.6 x 152.4 mm					Y	Y	Y	Y
Premium Semigloss Photo Paper	A4	210 x 297 mm (8.3" x 11.7")	0.27	250	66		Y	Y	Y	Y
	4" x 6"	101.6 x 152.4 mm					Y	Y	Y	Y

Table 1-6. Supported Paper

Paper Name	Paper Size		Thickness	Weight		EUR		Asia	
			mm	g/m²	lb.	P[*1]	B[*1]	P[*1]	B[*1]
Photo Paper	A4	210 x 297 mm (8.3" x 11.7")	0.24	190	51	Y	Y	Y	Y
	5" x 7"	127 x 178 mm				Y	Y	---	---
	4" x 6"	101.6 x 152.4 mm				Y	Y	Y	Y
Matte Paper Heavy-weight	A4	210 x 297 mm (8.3" x 11.7")	0.23	167	44	Y	Y	Y	Y
Double-sided Matte Paper	A4	210 x 297 mm (8.3" x 11.7")	0.22	185	49	Y	---	Y	---
Photo Quality Ink jet Paper	A4	210 x 297 mm (8.3" x 11.7")	0.12	102	27	Y	---	Y	---
Envelopes	#10	104.8 x 241.3 mm (4.125" x 9.5")	---	75-90	20-24	Y	---	Y	---
	#DL	110 x 220 mm				Y	---	Y	---
	#C6	114 x 162 mm				Y	---	Y	---
Iron-On Cool Peal Transfer Paper	A4	210 x 297 mm (8.3" x 11.7")	0.14	130	35	Y	---	Y	---
Photo Stickers 16	A6	105 x 148 mm (4.1" x 5.8")	0.19	---	---	---	---	Y[*2]	---
Photo Stickers 4	A6	105 x 148 mm (4.1" x 5.8")	0.19	---	---	---	---	Y[*2]	---
CD/DVD CD/DVD Premium Surface	ø12 cm	ø12 cm	---	---	---	Y	---	Y	---
	ø8 cm	ø8 cm	---	---	---	Y	---	Y	---

Note *1: "Y" in the "P" column stands for "the paper type/size is Supported". "Y" in the "B" column stands for "Borderless printing is available".

*2: Select settings of "Epson Matte" instead of "Photo Quality Ink jet Paper".

CAUTION !

- **Make sure the paper is not wrinkled, fluffed, torn, or folded.**
- **Make sure to correct the warpage of the paper before use.**
- **When printing on an envelope, be sure the flap is folded neatly.**
- **Do not use the adhesive envelopes.**
- **Do not use double envelopes and cellophane window envelopes.**

1.2.5 Printing Area

The printing area for this printer is shown below.

Table 1-7. Printing Area (Margins)

Print Mode	Paper Size	Margin*			
		Left	**Right**	**Top**	**Bottom**
Standard print	Any size	3 mm	3 mm	3 mm	3 mm
	Envelope	5 mm	5 mm	3 mm	20 mm
Borderless print	A4/Letter to 5" x 7"	2.54 mm	2.54 mm	2.96 mm	4.02 mm
	4" x 6"			1.34 mm	2.54 mm

Note *:   The margins for Borderless print are margins that bleed off the edges of paper.
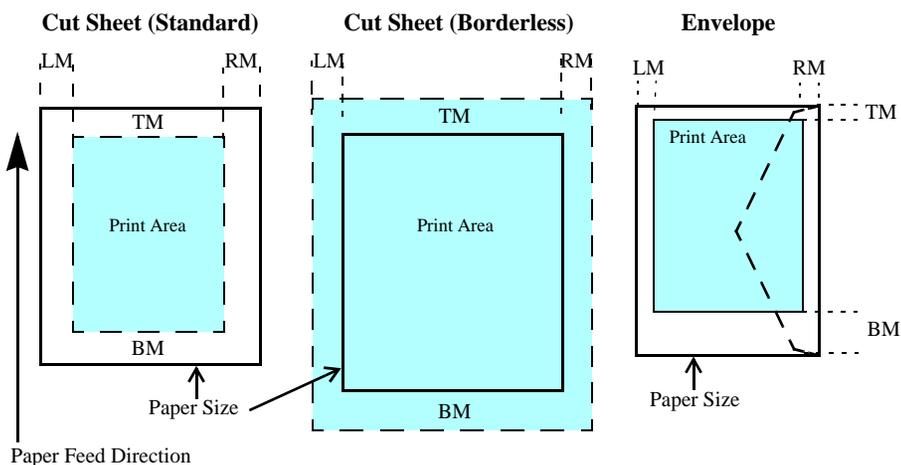
Figure 1-2. Printing Area

1.3 Scanner Specifications

Table 1-8. Basic Specifications

Item	Specification
Scanner type	Flatbed, color
Scanning method	Moving carriage, stationary document
Home position	Far left corner
Photoelectric device	CIS
Light source	LED
Maximum document size	US letter, or A4 size
Scanning range	216 x 297 mm (8.5" x 11.7")
Maximum resolution	Main scan: 1200 dpi / Sub scan: 2400 dpi
Maximum effective pixels	10,200 x 14,040 pixels (with 1200 dpi scanning)
Pixel depth	16 bit per pixel (input), 1 or 8 bit per pixel (output)

SCANNING RANGE

Table 1-9. Scanning Range

RL (read length)	RW (read width)	OLM (left margin)	OTM (top margin)
216 mm	297 mm	1.5 mm	1.5 mm
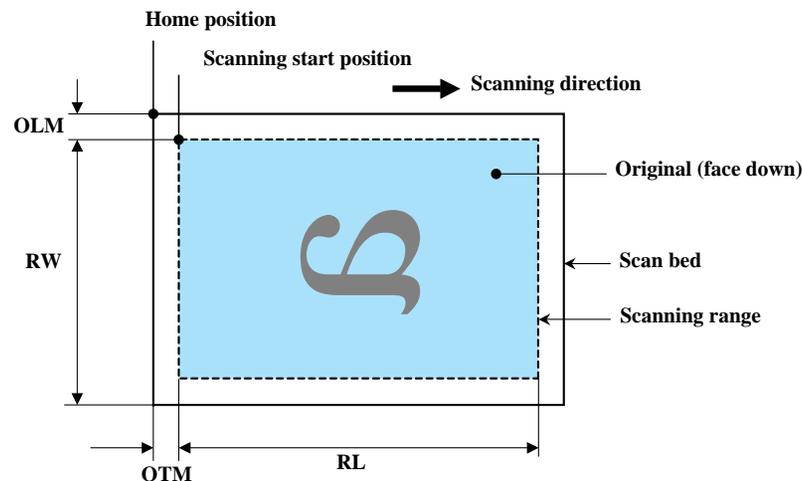
Figure 1-3. Scanning Range

1.4 General Specifications

1.4.1 Electrical Specifications

☐ **Primary power input**

Table 1-10. Primary Power Specifications

Item		100-120V model	220-240V model
Rated power supply voltage		100 to 120 VAC	220 to 240 VAC
Input voltage range		90 to 132 VAC	198 to 264 VAC
Rated current		0.6 A (max. 1.2 A)	0.3 A (max. 0.6 A)
Rated frequency		50 to 60 Hz	
Input frequency range		49.5 to 60.5 Hz	
Insulation resistance		TBD V (for one minute)	
Energy conservation		International Energy Star Program compliant	
Power consumption	Stand alone copy (ISO/IEC24712 pattern)	Approx. 18 W	
	Ready	Approx. 7.0 W	
	Sleep mode	Approx. 1.3 W	Approx. 1.5 W
	Power off	Approx. 0.2 W	Approx. 0.3 W

Note : When no operation is made for more than 13 minutes, it goes to the low power mode within two minutes.

1.4.2 Environmental Conditions

Table 1-11. Environmental Conditions

Condition	Temperature[*1]	Humidity[*1,2]	Shock	Vibration
Operating	10 to 35°C (50 to 95°F)	20 to 80%	1 G (1 msec. or less)	0.15 G, 10 to 55 Hz
Storage (unpacked)	-20 to 40°C[*3] (-4°F to 104°F)	5 to 85%	2 G (2 msec. or less)	0.50 G, 10 to 55 Hz

Note *1: The combined Temperature and Humidity conditions must be within the blue-shaded range in Fig.1-4.

  *2: No condensation

  *3: Must be less than 1 month under 40°C.
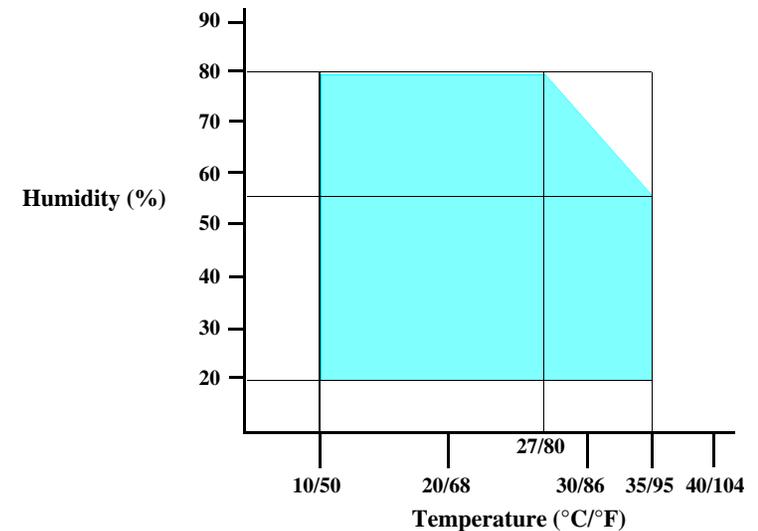
Figure 1-4. Temperature/Humidity Range

CAUTION !	■ When returning the repaired printer to the customer, make sure the Printhead is covered with the cap and the ink cartridge is installed. ■ If the Printhead is not covered with the cap when the printer is off, turn on the printer with the ink cartridge installed, make sure the Printhead is covered with the cap, and then turn the printer off.

1.4.3 Durability

Table 1-12. Durability

Item		Specification
Total print life	Black[*1]	16,000 pages or five years which ever comes first
	Color[*2]	10,000 pages or five years which ever comes first
Printhead		Six billions shots (per nozzle) or five years which ever comes first
Scanner carriage		36,000 cycles of carriage movement

Note *1: Condition: A4, 3.5% duty, ECMA pattern, Plain paper, default mode

  *2: Condition: A4, ISO24712 pattern, Plain paper, default mode

1.4.4 Acoustic Noise

36 dB (when printing from PC, on Premium Glossy Photo Paper, in the highest quality)

1.4.5 Safety Approvals (Safety standards/EMI)

EU	EN60950-1
	EN55022 Class B
	EN61000-3-2, EN61000-3-3
	EN55024
Germany	EN60950-1
Russia	GOST-R (IEC60950-1, CISPR 22)
Korea	K60950-1
	KN22 Class B
	KN61000-4-2/-3/-4/-5/-6/-11
Australia	AS/NZS CISPR22 Class B

1.5 Interfaces

The printer has USB interfaces and memory card slots of the following specifications.

1.5.1 USB Interfaces

The printer has two USB ports; USB Device port for connecting with a host device such as a computer, and USB Host port for connecting with an external device such as DSC (Digital Still Camera).

Table 1-13. USB Interface Specification

Item	USB Device Port	USB Host Port*
Standard	• Universal Serial Bus Specifications Revision 2.0 • Universal Serial Bus Device Class Definition for Printing Devices Version 1.1 • Universal Serial Bus Mass Storage Class Bulk-Only Transport Revision 1.0	• Universal Serial Bus Specifications Revision 2.0
Transfer rate	480 Mbps (High Speed)	
Data format	NRZI	
Compatible connector	USB Series B	USB Series A
Maximum cable length	2 m or less	

Note*: The following devices can be connected to the USB Host port.

  • DSC compliant with CIPA DC-001-2003 Rev.2.0 (PictBridge) Specification.

  • Devices compliant with Universal Serial Bus Mass Storage Class Bulk-Only Transport Revision 1.0, and the Subclass code is one of the followings.

  0x06 (SCSI transparent command set)

  0x05 (SFF-8070i command set)

  0x02 (SFF-8020i command set)

Table 1-14. Device ID

When IEEE 1284.4 is Enabled	When IEEE 1284.4 is Disabled
MFG:EPSON; CMD:ESCPL2,BDC,D4,D4PX,ESCPR1; MDL:*Model Name*; CLS:PRINTER; DES:EPSON<SP>*Model Name*; CID:EpsonRGB;	MFG:EPSON; CMD:ESCPL2,BDC,ESCPR1; MDL:*Model Name*; CLS:PRINTER; DES:EPSON<SP>*Model Name*; CID:EpsonRGB;

Note : The "*Model Name*" is replaced as shown below.

  Europe: Stylus Photo PX650

  Asia/Pacific/CISMEA: Stylus Photo TX650

1.5.2 Memory Card Slots

<table>
<tr><td>CAUTION ❗</td><td>**If you insert a Memory Stick DUO to the Memory Card Slot without using the adapter, make sure to turn off the printer first, then remove the card using tweezers.**</td></tr>
</table>

Table 1-15. List of Supported Memory Card

Priority	Slot	Compatible memory card	Standard	Max. capacity*1	Remarks
1	Memory Stick/ Memory Stick PRO	Memory Stick	"MemoryStick Standard" Format Specification Ver.1.43-00 compatible	128MB	Includes versions with memory select function
		MagicGate Memory Stick	---	---	Copy protection function is not supported
		MagicGate Memory Stick Duo	---	---	An adapter should be used
		Memory Stick PRO	Memory Stick PRO Format Specifications-without security Ver.1.02-00 compatible	32GB	Copy protection function is not supported
		Memory Stick Duo	MemoryStick Duo Format Specification Ver.1.10-00 compatible	---	The Memory Stick Duo adapter should be used
		Memory Stick Pro Duo Memory Stick Pro HG Duo	MemoryStick PRO Duo Format Specification Ver.1.02-00 compatible	---	The Memory Stick Duo adapter should be used
		Memory Stick micro	Memory Stick Micro Format Specification Ver.1.02-00 compatible	---	The Memory Stick adapter for standard size should be used.
	SD/MMC	SD (Security Digital)	SD Memory Card Specifications / PART1. Physical Layer Specification Ver. 2.0 compatible	2GB	---
		miniSD/microSD			The SD adapter should be used
		SDHC		32GB	Speed Class is not supported
		miniSDHC/microSDHC			The SD adapter should be used Speed Class is not supported
		MultiMediaCard MultiMediaCard Plus MMC Mobile/MMC micro	MultiMediaCard Standard Ver. 4.2 compatible	4GB/32GB	Only MultiMediaCard Plus supports 4GB
	xD-Picture card	xD-Picture card*2	xD-Picture Card Specification Ver.1.20 compatible	2GB	Type M/H supported
2	Compact Flash	Compact Flash	CompactFlash Specification Revision 2.1 compatible	32GB	Type-I/Type-II<Storage Card only>
		Microdrive	---	---	CF+Type2 <HDD>

Note *1 : It is necessary to format media for capacity to exceed 2GB with FAT32.
　　 *2 : On the xD-Picture Card specification, FAT32 Format is not provided. A printer doesn't recognized it when the xD-Picture Card is formatted with FAT32.
Note:　• Memory Stick/PRO, SD/MMC and xD-Picture Card shares the same slot.
　　 • When cards are inserted in the two slots at once, the slot which will be accessed first is determined according to the priority shown in the table.
　　 • To select a card that has been inserted in a non-active slot, first remove the card in the active slot.
　　 • In memory card direct printing mode, the image files in the active slot are valid and have assigned frame numbers. The number of images will not change if a card is inserted in another nonselected slot.
　　 • When the card inserted in the slot is accessed from the PC, only one drive is displayed at a time as a removable disk* and only the card that is in the active slot can be accessed via the removable disk. A card that has been inserted into a non-selected slot cannot be accessed. (This is for Windows. For Macintosh, the card in the active slot will be mounted on the desktop.)
　　 • Does not support 5V type of memory cards.
　　 • When a memory card is being accessed, do not touch the memory card.
　　 • For detailed information on the supported file system and formatting the memory card, refer to "1.7.2 Memory Card Direct Print Function *(p.23)*".

1.6 Control Panel

1.6.1 Operation Buttons & LED

The following tables explain the functions of the buttons and LEDs on the control panel.

Table 1-16. Operation Buttons & LEDs

Button/LED		Function
Button	Power	Turns the power ON/OFF.
	Start	Starts printing.
	Copy	Goes to the stand alone copy mode.
	Memory Card	Goes to the memory card direct print mode.
	Specialty Print	Goes to the special mode that provides Reprint/Restore Photos and Print on CD/DVD functions.
	Stop/Clear	• Stops operation and displays the menu screen. • Stops printing and ejects paper. • Returns the print settings of the current mode to their default and displays the Top screen. (Returns to the previous screen during printing maintaining the current settings)
	Setup	Goes to the Setup mode that provides maintenance menu (head cleaning, head alignment, etc.) and various option setting menu.
	Display/Crop	• Goes to the zoom setting screen for the selected image. • Changes the image preview layout (1-up, 9-up, etc.) on the LCD.
	Menu	Goes to the print setting menu screen.
	OK	Accepts the changed settings.
	Back	Cancels the previous operation.
	Cross Key (up/down/left/right)	Selects a menu item of setting value.
	+	Sets the number of copies.
	-	
LED*	Power	Indicates the power On/Off status.
	Mode	Lights during the corresponding mode is selected.

Note *:   See Table 1-17 on page 20 for more information on the LEDs.

Table 1-17. LED Functions

Printer Status	Power LED	Mode LED
Power-on sequence	Flashing	OFF
Power-off sequence	Flashing	The current mode LED lights*
Fatal error	Flashing	All the mode LEDs flash
Standby/The panel being operated	ON	The current mode LED lights*
Printing/Scanning	Flashing	The current mode LED lights*
Printing from an external device (PC/camera)	Flashing	The current mode LED lights*
Running a head cleaning		
Running a nozzle check		
Printing head alignment pattern		
Canceling a print job		
Backup of memory card, or Scan to Memory function is in process		
Running a slide show	ON	The memory card mode LED lights
Displaying the screen-saver	ON	The current mode LED lights*
Power save mode	ON	Flashing each mode LED one by one.

Note* : In the Setup mode, the mode LED corresponds to the previous mode lights.
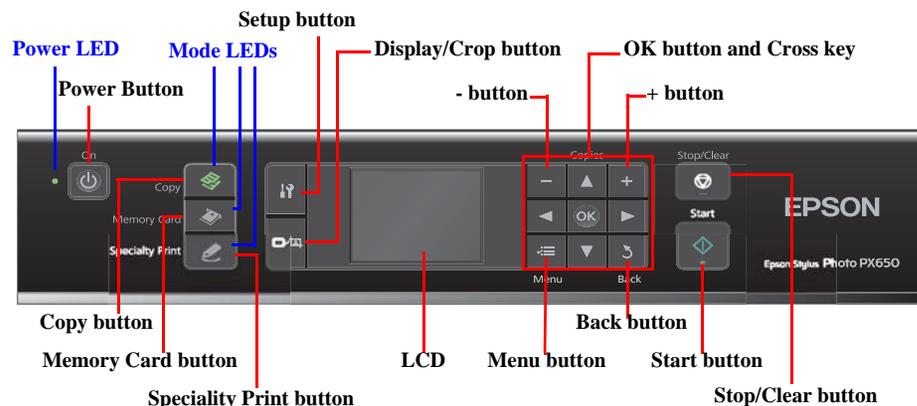

Figure 1-5. Control Panel (Europe Version as a Sample)

1.7 Specifications of Each Function

1.7.1 Stand-alone Copy Function

1.7.1.1 Copy print mode and available paper type/size and print layout

Table 1-18. Copy Print Mode & Available Paper Size by Layout

Paper Type	Quality	Resolution (H x V) dpi	Dot Size	Bi-D	Micro Weave	Available Paper Size by Print Layout					
						With Border	Borderless	Repeat Auto	Repeat 4	2-up	CD
Plain Paper	Draft	360 x 180	Eco	ON	OFF	A4, A5	---	---			
	Standard	360 x 360	MC2-1	ON	OFF	A4, A5	---	A4			CD/DVD
	Best	720 x 720	MC1-1	ON	ON	A4, A5	---	A4			CD/DVD
Matte	Standard	5760 x 1440	MC2-2	ON	ON	A4					---
	Best	5760 x 1440	MC1-5	ON	ON	A4					---
Photo Paper	Standard	720 x 720	MC1-2	ON	ON	10 x 15 cm (4" x 6")				---	---
			MC2-2	ON	ON	A4, 13 x 18 cm (5" x 7")				A4	---
	Best	5760 x 1440	MC1-5	ON	ON	A4, 13 x 18 cm (5" x 7"), 10 x 15 cm (4" x 6")				A4	---
Glossy	Standard	720 x 720	MC1-2	ON	ON	10 x 15 cm (4"x6")				---	---
			MC2-2	ON	ON	A4, 13 x 18 cm (5"x7")				A4	---
	Best	5760 x 1440	MC1-5	ON	ON	A4, 13 x 18 cm (5" x 7"), 10 x 15c m (4" x 6")				A4	---
Prem. Glossy	Standard	720 x 720	MC1-2	ON	ON	10 x 15 cm (4" x 6")				---	---
			MC2-2	ON	ON	A4, 13 x 18 cm (5" x 7")				A4	---
	Best	5760 x 1440	MC1-5	ON	ON	A4, 13 x 18 cm (5" x 7"), 10 x 15 cm (4" x 6")				A4	---
Ultra Glossy	Standard	720 x 720	MC1-2	ON	ON	10 x 15 cm (4" x 6")				---	---
			MC2-2	ON	ON	A4, 13 x 18 cm (5" x 7")				A4	---
	Best	5760 x 1440	MC1-5	ON	ON	A4, 13 x 18 cm (5" x 7"), 10 x 15 cm (4" x 6")				A4	---
CD/DVD	Best	5760 x 1440	MC1-5	ON	ON	---					CD/DVD

1.7.1.2 Stand-alone Copy Menu

Table 1-19. Copy Menu

Menu Item		Function
Number of copies		Sets number of copies within the range of 1 to 99.
Copy type		Selects either color or monochrome.
Document		Selects the document type from "Text", "Graphics", and "Photo".
Layout		Selects print layout from the options listed in Table 1-20.
Print Settings	Paper type	Selects paper type from the options listed in Table 1-18.
	Paper size	Selects paper size from the options listed in Table 1-18.
	Quality	Selects print quality from the options listed in Table 1-18.
	Zoom	Selects scaling factor from the preset factors listed in Table 1-21, Auto Fit Page, or specifies a desired scaling factor within the range of 25 to 400%.
	Density	Selects from the nine density levels of -4 to +/-0 to +4.
	Expansion	Selects the margins level (margins bleed off the edges of paper) from the Standard (100%), Mid. (50%) or Min. (25%).
	CD Inner-Outer	Specifies the printing range on a CD/DVD by entering outer and inner diameter of a CD/DVD. Outer: specifies within the range of 114 to 120 mm Inner: specifies within the range of 18 to 46 mm

1.7.1.3 Copy Layout & Preset Scaling Factors

Available print layout and scaling factors in the stand-alone copy mode are as follows.

Table 1-20. Copy Layout

Layout	Description
With Border	Makes a copy with 3 mm of left/right/top/bottom white margins.
Borderless	Makes a copy with no white margins.
CD/DVD Copy	Makes a copy of a CD/DVD label directly on a CD/DVD.
Repeat Copy	Makes a specified number of copies of one document on a sheet of selected sized paper.
Repeat Copy-4	Makes four copies of one document on a sheet of selected sized paper.
2-up Copy	Makes a copy of two A4 or letter sized documents on a sheet of A4 or letter sized paper.

Table 1-21. Preset Scaling Factors

Zoom Menu Items	Scaling Factor*	
	With Border	Borderless
10 x 15 cm → A4	195%	215%
A4 → 10 x 15 cm	47%	55%
13 x 18 cm → 10 x 15 cm	77%	91%
10 x 15 cm → 13 x 18 cm	115%	132%
A4 → A5	69%	74%
A5 → A4	141%	147%

Note* : A scaling factor corresponds to the selected copy layout and zoom setting is displayed on the LCD.

1.7.1.4 Copy Speed

Table 1-22. Copy Speed

Copy Conditions (e-memo3, Letter, Plain Paper)		Copy Speed
Draft 360 x 180	Monochrome copy	35 cpm
	Color copy	35 cpm
Default 720 x 360	Monochrome copy	10 cpm
	Color copy	10 cpm

1.7.2 Memory Card Direct Print Function

1.7.2.1 Memory card direct print mode and available paper type/size and print layout

Table 1-23. Memory Card Direct Print Mode & Available Paper Size by Layout

Paper Type	Quality	Resolution (H x V) dpi	Dot size	Bi-D	Micro Weave	With Border	Border-less	P.I.F. (Single/Multi)	Upper 1/2	2-up	4-up	8-up	20-up	16-up	30-up	80-up	Photo ID
Plain Paper	Standard	360 x 360	MC2-1	ON	OFF	A4	---	A4	---	A4				---		A4	---
	Best	720 x 720	MC1-1	ON	ON	A4	---	A4	---	A4				---		A4	---
Matte	Standard	5760 x 1440	MC2-2	ON	ON	A4								---		A4	---
	Best	5760 x 1440	MC1-5	ON	ON	A4								---		A4	---
Photo Paper	Draft	720 x 360	MC1-1	ON	ON	A4, 13 x 18 cm (5" x 7"), 10 x 15 cm (4" x 6"), 16:9wide				A4, 13 x 18 cm (5" x 7"), 10 x 15 cm (4" x 6")				---	13 x 18 cm (5" x 7")	A4	10 x 15 cm (4" x 6")
	Standard	720 x 720	MC1-2	ON	ON	10 x 15cm (4" x 6")								---	---		10 x 15 cm (4" x 6")
		720 x 720	MC2-2	ON	ON	A4, 13 x 18 cm (5" x 7"), 16:9wide				A4, 13 x 18 cm (5" x 7")				---	13 x 18 cm (5" x 7")	A4	---
	Best	5760 x 1440	MC1-5	ON	ON	A4, 13 x 18 cm (5" x 7"), 10 x 15 cm (4" x 6"), 16:9wide				A4, 13 x 18 cm (5" x 7"), 10 x 15 cm (4" x 6")				---	13 x 18 cm (5" x 7")	A4	10 x 15 cm (4" x 6")
Glossy	Draft	720 x 360	MC1-1	ON	ON	A4, 13 x 18 cm (5" x 7"), 10 x 15 cm (4" x 6")								---	13 x 18 cm (5" x 7")	A4	10 x 15 cm (4" x 6")
	Standard	720 x 720	MC1-2	ON	ON	10 x 15 cm (4" x 6")								---			10 x 15 cm (4" x 6")
		720 x 720	MC2-2	ON	ON	A4, 13 x 18 cm (5"x7")								---	13 x 18 cm (5" x 7")	A4	---
	Best	5760 x 1440	MC1-5	ON	ON	A4, 13 x 18 cm (5"x7"), 10 x 15 cm (4" x 6")								---	13 x 18 cm (5" x 7")	A4	10 x 15 cm (4" x 6")
Prem. Glossy	Draft	720 x 360	MC1-1	ON	ON	A4, 13 x 18 cm (5" x 7"), 10 x 15 cm (4" x 6"), 16:9wide				A4, 13 x 18 cm (5"x7"), 10 x 15 cm (4" x 6")				---	13 x 18 cm (5" x 7")	A4	10 x 15 cm (4" x 6")
	Standard	720 x 720	MC1-2	ON	ON	10x15 cm (4" x 6")								---			10 x 15 cm (4" x 6")
		720 x 720	MC2-2	ON	ON	A4, 13 x 18 cm (5" x 7"), 16:9wide				A4, 13 x 18 cm (5"x7")				---	13 x 18 cm (5" x 7")	A4	---
	Best	5760 x 1440	MC1-5	ON	ON	A4, 13 x 18 cm (5" x 7"), 10 x 15 cm (4" x 6"), 16:9wide				A4, 13 x 18 cm (5" x 7"), 10 x 15 cm (4" x 6")				---	13 x 18 cm (5" x 7")	A4	10 x 15 cm (4" x 6")
Ultra Glossy	Standard	720 x 720	MC1-2	ON	ON	10 x 15 cm (4" x 6")								---			10 x 15 cm (4" x 6")
		720 x 720	MC2-2	ON	ON	A4, 13 x 18 cm (5" x 7")								---	13 x 18 cm (5" x 7")	A4	---
	Best	5760 x 1440	MC1-5	ON	ON	A4, 13 x 18 cm (5" x 7"), 10 x 15 cm (4" x 6")								---	13 x 18 cm (5" x 7")	A4	10 x 15 cm (4" x 6")
Photo Sticker 16	Standard	720 x 720	MC2-2	ON	ON	---								A6	---		
Photo Stickers	Standard	720 x 720	MC2-2	ON	ON	100 x 148 mm	---			100 x 148 mm			---	100 x 148 mm	---		

1.7.2.2 Supported File Type and Media Type

The following describes the file system, media format, and file type supported by the memory card direct function.

Table 1-24. Supported File System, Types and Media Format

Item		Specification
File System		DCF Version 1.0 or 2.0 [1] compliant. Other than those does not ensure proper operation. File systems available with the card reader are restricted by the host's specification.
Media format	Memory card	• DCF Version 1.0 or 2.0 compliant • DOS FAT format (FAT12/FAT16/FAT32 [2]) with single partition (basic partitioned)
	CD-R	ISO9660 Level1 (Joliet) format
	DVD	ISO9660 Level1 (Joliet), or ISO9660 Level1 (Joliet) & UDF Bridge format[3]
File type	JPEG (*.JPG)	Image files conform to Exif Version 2.21. (Exif version 1.0/2.0/2.1/2.2/2.21 are supported)
	TIFF (*.TIFF)	Image files conform to Exif Version 2.21. (Exif version 1.0/2.0/2.1/2.2/2.21 are supported)
	Camera definition file (*.MRK)	Camera definition files used for DPOF mode. "\MISC\AUTOPRINT.MRK" file is valid.
	P.I.F definition file (*.USD)	Print layout definition files compliant with PRINT Image Framer Rev.2.1 specifications. Files in"/EPUDL/" directory are valid.
	P.I.F definition file (*.FD2)	Print layout definition files compliant with PRINT Image Framer Rev.3.1 [4] specifications. Files in a memory card are valid.

Note *1: For more information on the DCF specifications, see "Camera File System Standard DCF Version 2.0, JEIDA-CP-3461".
　　 *2: Available only when the memory card supports FAT32.
　　 *3: UDF-formatted DVDs are not supported.
　　 *4: The memory card direct print functions supports level 1 of the P.I.F.Rev.3.1.

CHECK POINT ✔
The printer does not detect any files stored under the following directories or their sub-directories.
• Directories containing system properties or hidden properties.
• "RECYCLED" (Windows directory for deleted files)
• "PREVIEW" (directories of CASIO DSC for thumbnail images)
• "SCENE" (directories of CASIO DSC for its Best Shot function)
• "MSSONY" (directories of SONY DSC for e-mail images, voice memos, movies, or non-compressed images)
• "DCIM\ALBUM\IMAGE" (directories of CASIO DSC for its album function)

1.7.2.3 Specifications for Handling Image Data

Table 1-25. Specifications for Handling Image Data

Item	Specification	Remarks
Image size (pixel)	• Horizontal: $80 \le X \le 9200$ • Vertical:　　$80 \le Y \le 9200$	---
Maximum number of images	Up to 999 images	When a memory card stores 1,000 or more images, the first 999 images are detected and become valid in the printer. The detecting order varies depending on the folder configuration in the card, so which images are included in the first 999 cannot be defined. However, images specified by camera definition files can be selected to be printed even when the total number of images has exceeded 999. Up to 999 camera defined image files can be specified.
Maximum number of copies	99 copies for each image. Up to 999 sheets in total.	---
Valid date and time	01/01/1980 00:00:00 to 12/31/2099 23:59:59	---
Thumbnail image data	Supports DCF Ver.1.0 or 2.0-compatible data (Exif format, 160x120 pixels)	Thumbnail images are used for the Print Index Sheet function.
File sorting	The printer sorts image files in ascending ASCII order based on their full-pathnames such as "\DCIM\100EPSON\EPSN0000.JPG", and assigns a number to each of them.	• The image number assigned by the printer may be different from that assigned by the camera. • If two or more files have the same full pathname, the sorting function may not operate properly. (existence of the same full-pathname is not allowed under DOS)

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Table 1-25. Specifications for Handling Image Data

Item	Specification	Remarks
Acquisition of date and time information	The printer acquires date and time information included in image files in the order of precedence shown below. 1. Date and time information in digital camera standard format (Exif) 2. Date and time information applied on DOS-compliant file system. 3. Fixed date and time information (01/01/1980, 00:00:00)	Date and time information included in an image file is not always the shooting date and time. It changes each time the image is edited and restored. The printer acquires the latest date and time information.
Camera shooting information	The following shooting information conforms to Exif standard can be printed with the images. • Exposure time/Shutter speed (example: 1/30s) • F-measure (example: F2.8) • ISO film speed (example: ISO100)	When both an exposure time and shutter speed information exist, the exposure time is printed. No information is printed if the Exif-compliant photo data has no information.

CHECK POINT ✔	**Embedded rotation tag of an image associated with a P.I.F. script** The image's rotational direction specified by a tag embedded in the image file associated with a P.IF. script is always applied when the image is printed using the stand-alone function. Therefore, if a P.I.F. file (layout file) that has not been associated with any images is specified to print an image, the printout result (the image rotational direction) may differ whether the image has been associated with another P.I.F.3 script or not.

1.7.2.4 Memory Card Direct Print Menu

Table 1-26. Memory Card Mode Menu

Menu Item	Function
View and Print Photos[1,2]	Prints the selected images.
Print All Photos[1,2]	Prints all images in a memory card. Specified number of copies is applied to the all images (the default is 1 copy). Specifying it for each of the images independently also can be made in the preview screen.
Print by Date[1]	The date of the images are listed in the descending order with the number of images by date. Selecting date from the list selects the images that has the selected date information. Specified number of copies is applied to the selected images (the default is 1 copy). Specifying it for each of the images independently also can be made in the preview screen.
Print Index Sheet	**Print Index Sheet** Prints an index sheet that prints images in a memory card in thumbnailed form. The number of images to be included in the sheet can be selected from the following four options. "All image" (default), "Latest 30", "Latest 60", "Latest 90"[4] **Make Prints from Index Sheet** Scans the index sheet, and prints images according to markings written on the sheet.
Slide Show[3]	Starts a slide show on the LCD. Images in a memory card is displayed one by one in the order sorted by the printer. Printing one of the images can be made from the paused screen.
Scan to Memory Card	Stores an image scanned by the scanner directly into a memory card. The format in which to save the file can be selected from JPEG and PDF.

Note *1: 0 to 99 copies can be specified for each of the images. Up to 999 copies in total.

*2: The images are listed in ASCII descending order.

*3: While performing the slide show, displaying number of copies, printing from an external device or from a computer cannot be made.

*4: "Latest 60" and "Latest 90" are displayed on the LCD depending on the number of images in the memory card.

CHECK POINT ✔	**Automatic Detection of Images in Media**
	• When a memory card is inserted;
	  The printer automatically searches for all images stored in the memory card and displays them on the LCD.
	• When an external storage device is connected;
	  If the media in the connected device includes a backup folder, a folder selection screen appears. The printer automatically searches for all images in the selected folder and displays them on the LCD. When the backup file does not exist, all images in the media are searched for and displayed.

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1.7.3 Backup Function

The Backup Memory Card function provided in the Setup mode allows the user to make a backup copy of a memory card on a media in an external device. Printing the backed up images directly from the external device also can be made.

1.7.3.1 Backup Function Specifications

Table 1-27. Basic Specifications

Item	Specification
Source media	A memory card conforms to the specifications described in Table 1-24, and that is inserted into the active slot.
Destination media	Supports the following media in an external device connected via the USB Host port. (See Table 1-13 ?USB Interface Specification? on page 18 for information on the available external devices) • MO:　　128MB/230MB/640MB/1.3GB • CD-R:　650MB/700MB [*1,2] • DVD-R: 4.7GB[*2] • USB flash memory[*3]
Target files	All image files in the source media except the following files. • Files that have hidden attribute or system attribute. • Files of which the size is 0 (zero) byte.
Operations disabled during the backup	In order to prevent the possible corruption of data, the following operations are disabled during the backup. • Access from a computer or via a network • Automatic ejection of the destination media • ON/OFF of the printer power

Note *1: A backup on 700MB or larger size CD-R is not ensured.

　　*2: The CD-R/DVD-R must be formatted as described in Table 1-24.

　　*3: The printer cannot recognize USB flash memory that incorporates a hub.

CHECK POINT ✔
- Due to the file system restriction, a backup of a memory card that has eight or more levels deep in folder hierarchy cannot be made on an ISO9660 Level 1-formatted CD-R.
- Due to the logical format of the CD/DVD, the pathname length is restricted as described below;
  - Destination media: ISO9660: up to 255 byte
  Joliet: up to 240 byte
  - Source media: Memory card (FAT12/16/32): up to 260 byte

Table 1-28. Specifications on Writing Backup Data

Item	Specification
Folder hierarchy	A backup folder is automatically created on the destination media to save the backup data keeping the original folder hierarchy[*1] under the folder. A number (001 to 999) is assigned as the folder name.
Format	The printer automatically formats the destination media in a supported format if the media is rewritable and detected as unformatted or formatted in unsupported format.
File name	Because ISO9660 Level1 format is used to write backup data to a CD/DVD, double-byte characters are not allowed to be used for the folder or directory names. Any file or directory names that include double-byte characters are automatically changed in accordance with the rule described below. • A file name is changed to "EPSONxxx"[*2] • A directory name is changed to "EPDIRxxx"[*2] • Replaces an unsupported character in the extension with "_" (underbar)

Note *1: As a backup to CD/DVD media requires time, a folder hierarchy definition file (EPBKINF.DAT) is first created under the backup folder.

　　*2: xxx stands for a 3-digit number. The number is automatically assigned from 001 in each folder of directory.

CHECK POINT ✔
The maximum number of writing times
- FAT12/16-formatted media: up to 512 times (001 to 512)
  If any files other than backup folders exist in the route directly, the max. number of writings becomes less than 512 due to the MS-DOS restriction. When more than 512 times of writing history of an inserted MO is detected, the printer handles it as a backup error (file name, to folder hierarchy error).
- CD-R:　　640MB: up to 47 times
　　　　　700MB: up to 50 times
  This is because each session information must be saved.
- DVD-R:　4.7GB: up to 274 times
  This is because each session information must be saved.

☐ **Other restrictions on the backup function**

- The printer does not have the function to write a backup data on an external media back to a memory card in order to prevent the possible corruption of data.

- Since the printer does not have calendar function, created date and time of backup files is the date and time initially assigned or updated by a device other than the printer.

1.7.3.2 Backup Errors

If a backup operation is cancelled voluntarily or due to an error, a "Backup canceled" message appears with a hexadecimal 8-digit error code on the LCD. The following table lists the leftmost two-digit error codes that are controlled by the printer firmware. For explanations on other backup errors, see

Table 1-29. Backup Error FW Control Code List

Code	Meaning	Code	Meaning
0x00	No error	0xC0	No files to be backed up
0x10	Album function error	0xE7	Parameter error
0x20	Backup function error	0xE8	File open error
0xA0	Other ATAPI/SCSI command error	0xE9	Internal buffer overflow
0xA1	ModeSense command error	0xEA	CD/DVD format error
0xA2	ModeSelect command error	0xEB	Not used
0xA3	Get Disc Information command error	0xEC	Insufficient memory
0xA4	Get Track Information command error	0xED	Some data exist in the destination directory
0xA5	Synchronize Cache command error	0xEE	Not used
0xA6	CloseSession command error	0xEF	Write-protect error
0xA7	Read command error	0xF0	Read/write error
0xA8	Write command error	0xF1	Invalid file open mode
0xA9	Set Speed command error	0xF2	Seek error
0xAA	Eject command error	0xF3	Overflow of root directory
0xAB	Drive lock command error	0xF4	Overflow of file descriptor
0xAC	GetConfigration command error	0xF5	Invalid path name
0xAD	Verify command error	0xF6	No file exist
0xAE	Device error	0xF7	Medium was exchanged
0xB8	Short file name convert error	0xF8	Unformatted medium
0xB9	Unsupported device	0xF9	Device is not ready
0xBA	No medium	0xFA	Invalid device handle
0xBB	Not writable medium	0xFB	Invalid file descriptor
0xBC	Unsupported medium	0xFC	Not used
0xBD	Hierarchical directory error	0xFD	Backup initialization failed
0xBE	Path length is too long	0xFE	Acquiring memory pool failed
0xBF	File name is too long	0xFF	System error

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1.7.4 Camera Direct Print Function (PictBridge)

Printing operations (selecting images to be printed, making print settings, starting/canceling printing, and monitoring print process) can be carried out from a directly connected DSC (Digital Still Camera) that conforms to the standard described below.

1.7.4.1 Available DSC

Those DSCs which are compliant with one of the following standards.

■ "CIPA DC-001-2003 Digital Photo Solutions for Imaging Devices" (DPS Version 1.0)

■ "CIPA DC-001-2003 Rev.2.0 Digital Photo Solutions for Imaging Devices" (DPS Version 1.1).

1.7.4.2 Print Settings Available from DSC

The following print settings can be made from the DSC. However, depending on the DSC, some of the settings may not be available.

Table 1-30. Print Settings Available from DSC

Item	Specification
How to specify images	Single Sheet/Multiple Sheet/DPOF specified/XHTML-Print
Paper type	Plain Paper/Prem. Glossy
Paper size	10 x 15 cm (4" x 6"), 13 x 18 cm (5" x 7"), A4, 16:9 wide, CD/DVD
Layout	Borderless, With Border, 2-up, 4-up, 8-up, 20-up, Index
Date	On/Off
Quality	Draft/Standard/Best
Auto Correct	On/Off
Fit to Frame	On/Off
Print Image Framer	Not available
Control of printer	The following operations are available; Getting the printer status, starting a print job or canceling it immediately or after printing the current page is finished.

1.7.4.3 General Operation Procedure

CHECK POINT ✔	**Before connecting the DSC, check that the printer is in the following status.** • No print job from a computer is processed or performed. • Direct print from a memory card is not processed or performed. • Stand alone copy using the scanner function is not operating. • Backup of a memory card is not proceeded. • No error is occurring such as paper out error or ink out error.

The DSC direct print procedure differs depending on the DSC specifications.The following explains common procedure.

1. Setting on the printer
    Before connecting a DSC with a USB cable, make the print settings such as paper type/size, layout setting on the printer. This may not be required for some DSCs.

2. Setting on the DSC
    Make the following settings on the DSC before connecting it to the printer. Some DSCs may require to first connect to the printer for making the settings.

    • When printing multiple images, specify images and number of copies using the DPOF and Multiple Sheet menus. The menus may not be available on some DSCs.
    • When printing a single image, specify an image and the number of copies. Specifying the number of copies may not be available on some DSCs.
    • Select the paper type/size, layout, and make the Fit to Frame setting if necessary. These settings may not be available on some DSCs.

3. Starting to print
    When the print settings on both the printer and the DSC is completed, follow the procedure below to start printing.

    1. Connect the printer and the DSC with a USB cable. Using a USB cable included in the DSC package is recommended.
    2. Operate the DSC to start printing.
    3. Printing is carried out according to the settings made on the DSC. When some print settings have not been made on the DSC, the corresponding settings made on the printer are applied.

1.7.4.4 Operating Specifications during Connecting DSC

Table 1-31. Operations during Connecting DSC

Operation	Specifications
Connecting DSC (print start)	When a DSC is connected as described in "1.7.4.3 General Operation Procedure *(p. 28)*" Step 3-(1), PictBridge logo is displayed on the LCD.
Canceling printing	A print job can be canceled from the DSC. The [Stop/Clear] button on the control panel also cancels the print job.
After printing is completed	When performing memory card direct print after printing from a DSC, the USB cable connecting the DSC must be disconnected from the printer in advance.
Exclusion control	Print settings made on both the DSC and the printer can become impossible settings for the printer due to unsupported combination of paper type, paper size and layout. In such case, the settings made on the DSC are maintained and any print setting items that are not specified by the DSC are changed in accordance with the DSC settings. When the paper type is changed, changed to Prem. Glossy, when the paper size is changed, changed to 4" x 6" size, and when the layout is changed, changed to Borderless layout.

1.7.5 Specialty Print Functions

1.7.5.1 Specialty print functions and available paper type/size and print layout

Paper Type	Quality	Resolution (H x V) dpi	Dot size	Bi-D	Micro Weave	Reprint/Restore Photos Borderless	With Border	CD Print 1-up	4-up	8-up	12-up	CD Jacket Jewel Upper	Jewel Index
Plain Paper	Standard	360 x 360	MC2-1	ON	OFF	---		---				A4	
	Best	720 x 720	MC1-1	ON	ON			CD/DVD					
Matte	Standard	5760 x 1440	MC2-2	ON	ON	A4		---				A4	
	Best	5760 x 1440	MC1-5	ON	ON	---							
Photo Paper	Draft	720 x 360	MC1-1	ON	ON	---		---				A4	
	Standard	720 x 720	MC1-2	ON	ON	10 x 15 cm (4" x 6")						---	
			MC2-2	ON	ON	A4, 13 x 18 cm (5" x 7")						A4	
	Best	5760 x 1440	MC1-5	ON	ON	---							
Glossy	Draft	720 x 360	MC1-1	ON	ON	---		---				A4	
	Standard	720 x 720	MC1-2	ON	ON	10 x 15 cm (4" x 6")						---	
			MC2-2	ON	ON	A4, 13 x 18 cm (5" x 7")						A4	
	Best	5760 x 1440	MC1-5	ON	ON	---							
Prem. Glossy	Draft	720 x 360	MC1-1	ON	ON	---		---				A4	
	Standard	720 x 720	MC1-2	ON	ON	10 x 15 cm (4" x 6")						---	
			MC2-2	ON	ON	A4, 13 x 18 cm (5" x 7")						A4	
	Best	5760 x 1440	MC1-5	ON	ON	---							
Ultra Glossy	Standard	720 x 720	MC1-2	ON	ON	10 x 15 cm (4" x 6")		---				---	
			MC2-2	ON	ON	A4, 13 x 18 cm (5" x 7")						A4	
	Best	5760 x 1440	MC1-5	ON	ON	---							
CD/DVD	Best	5760 x 1440	MC1-5	ON	ON	---		CD/DVD				---	

1.7.5.2 Specialty Print Mode

The following explains each of the functions provided in the Specialty Print mode.

1.7.5.2.1 Print on CD/DVD Function

This function allows the user to print an image in a memory card directly on a CD/DVD. Printing a CD jacket on A4 or letter size paper is also provided.

1.7.5.2.2 Reprint/Restore Photos Function

This function allows the user to copy their silver halide film-based pictures. The printer scans the pictures automatically detecting them as silver halide film-based picture, and makes a copy of them. The following explains the specifications of the function.

- ■ Available picture size: 30 x 40 mm to 127 x 178 mm (5" x 7")

- ■ Lay the pictures on the glass face down. The number of pictures available at one time is as follows:

  - 4" x 6" or smaller: up to 2 pictures
  - 5" x 7":   up to 1 picture

- ■ The spaces required between the pictures:

  - 5 mm or more space from the right and front edges of the document glass.
  - 5 mm or more space between pictures.

- ■ The pictures must not be tilted.
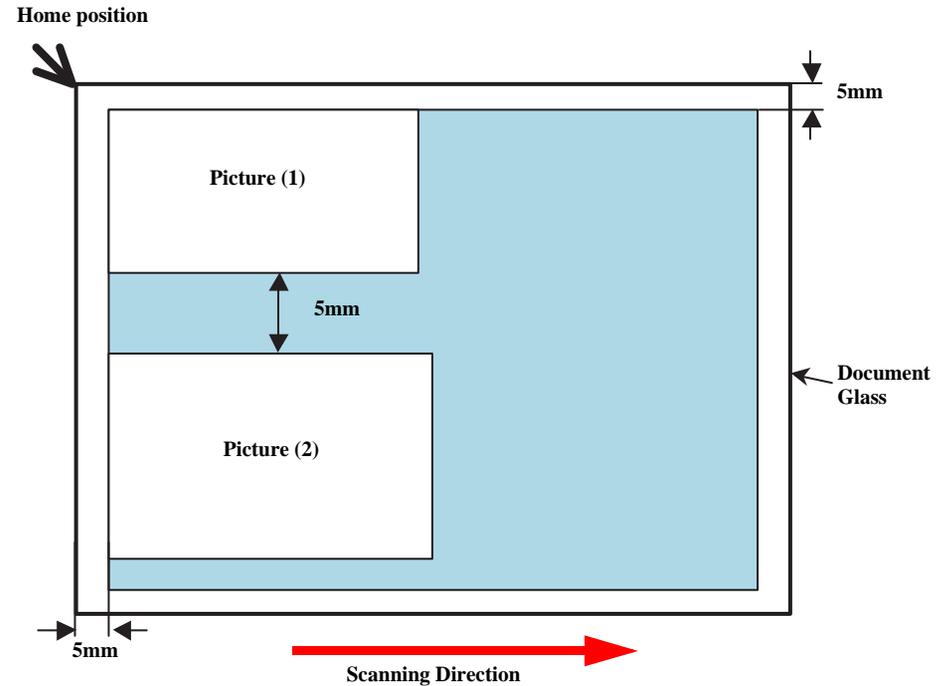
Figure 1-6. Laying Silver Halide Pictures

1.7.6 Setup Mode

The Setup mode provides maintenance menus and various configuration setting menus. The following explains about the menu functions.

1.7.6.1 Maintenance Menu

Table 1-32. Maintenance Menu Functions

Item	Function
Nozzle Check	A nozzle check pattern to check the Printhead nozzles status is printed. A head cleaning can be run if necessary. Figure 1-7 shows the nozzle check pattern printed by the printer.
Head Cleaning	Runs a printhead cleaning. The cleaning cannot be made when low ink level is detected. In such case, an ink low error is displayed instead of running the cleaning.
Head Alignment	An adjustment to ensure the bi-directional print quality. Follow the instructions displayed on the LCD to carry out the adjustment. The default value for each of the four modes is "5", and can be changed within the range of 1 to 9.
Change Ink Cartridge	Runs an ink cartridge replacement sequence. The sequence also can be run from the Ink Levels menu or by following the instructions on the LCD when an ink-related error occurs.
Thick Paper	Setting to "On" widens the platen gap to reduce friction between the printhead and thick paper. The setting is applied until the printer power is turned off, and returns to the default (Off) at the next power-on. • Off: normal platen gap is applied. • On: the wider platen gap is applied.
Language	Changes languages.
Screen Saver Settings	By setting to the "Memory Card Data", the printer automatically runs a slide show using images in a memory card as a screen saver when no control panel operation has been made for 180 seconds in standby mode. If no memory card is inserted, or when this is set to "Off", the LCD display does not change.

Figure 1-7. Nozzle Check Pattern
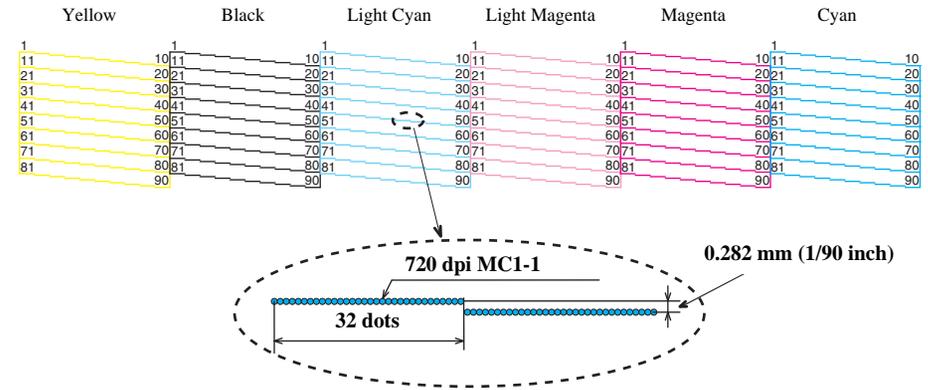
Note : The numbers shown in the figure are nozzle numbers. The numbers and the color names are not printed on an actual nozzle check pattern.

CAUTION

- If the printer power is turned Off during printing the adjustment pattern or entering the adjustment value, the pattern print is canceled, and the values return to the default.
- While the adjustment is carried out, the printer does not goes into the panel power save mode.

CHECK POINT

- If a paper out error occurs, load a paper and press the Start button to cancel the error state.
- If a paper jam error occurs, press the Start button to eject the paper. If the paper is ejected normally, the printer recovers from the error and prints the adjustment pattern.

1.7.6.2 Ink Levels

The current ink levels of each of the cartridges are displayed in bar chart by the rules described below. After displaying the ink levels, the next operation to change the ink cartridge can be performed with "Change Cartridge".

- The bar chart is displayed in the order of yellow, black, light cyan, light magenta, magenta, and cyan from the left.
- When initial ink charge is completed, or after replacing the cartridge, the ink level becomes 100% (full).
- The ink level is indicated in increment of 1%. Lower than 1% is rounded down.
- When the ink level becomes lower than 10%, "!" icon appears to notify the user of the ink low status.

1.7.6.3 PictBridge Setup

The print settings to be used for the camera direct print (PictBridge) can be specified. When print settings (paper type, paper size, layout, quality, auto correct) are specified from the DSC, the DSC settings are applied and the settings made here are ignored. For more details, see "1.7.4 Camera Direct Print Function (PictBridge) *(p.28)"*.

1.7.6.4 CD/Sticker Print Position

The printing range when printing on a CD/DVD or a sticker can be adjusted.

1.7.6.5 Backup Memory Card

This menu allows the user to make a backup copy of a memory card on media in an external device. The "Folder Select" displays a folder selection screen to select the target folder in an external media to be printed.
The "Folder Select" menu item is disabled (grayout) in the following cases.

- When any external device is not connected

- When no image files is detected in the inserted memory card.

See "1.7.3 Backup Function *(p.26)"* for more information on the backup function.

1.7.6.6 Restore Default Settings

This menu allows to restore the default settings of the panel settings.

1.7.6.7 Bluetooth Settings

Bluetooth communication settings can be configured. This menu is enabled only when the optional Bluetooth unit is connected.

Table 1-33. Bluetooth Settings Sub Menus

Item	Explanation
BT PIN Code Set	Sets the passkey to request to an external device when accepting the communication request from the device. The setting range is 0000 to 9999.
BT Printer ID Set	Sets the printer ID to be identified in the Bluetooth communication when multiple same models exist. Enter a one-digit number (1 to 9, 0) to be appended as a suffix to the printer name. The change does not take effect until the printer is rebooted.

BT Mode	Selects the BT communication mode from the following three options.
	• Discoverable
	  Allows an external device to search for the printer and the connection can be established.
	  No authentication or passkey request is made by the printer.
	• Not Discoverable
	  Does not allow an external device to search for the printer but the connection can be established.
	  No authentication or passkey request is made by the printer.
	• Pairing
	  Allows an external device to search for the printer and the connection can be established.
	  The printer requests a passkey to the device. Once the connection is established, the printer remembers the device (only one device can be remembered), and does not request a passkey for the second or later access of the device.

BT Encryption	When this is set to "On", the Bluetooth communication data is encrypted and the printer requests device authentication.
BT Device Address	The physical address (unique value) of the Bluetooth module is displayed. The address is displayed in hexadecimal 12-digit numbers (xx-xx-xx-xx-xx-xx).

OPERATING PRINCIPLES

2.1 Overview

| CHECK POINT ✔ | **Description in this chapter is applied to Epson Stylus Photo PX650/ TX650/TX659/PX660/PX660 Premiun/Artisan 635.** |

This section describes the operating principles of the printer mechanism of Epson Stylus Photo PX650/TX650/TX659/PX660/PX660 Premiun/Artisan 635.

2.1.1 Printer Mechanism

The printer mechanism of this product consists of the printhead, carriage mechanism, paper loading mechanism, paper feed mechanism, and the ink system.

As the conventional models, this product is equipped with two DC motors; one is used to drive the paper loading and paper feed mechanisms, and also the pump mechanism that includes the carriage lock mechanism. The other one is used to drive the carriage mechanism. Paper is fed from the rear at the ASF unit with the LD roller and Retard roller, and ejected to the front at the tray.
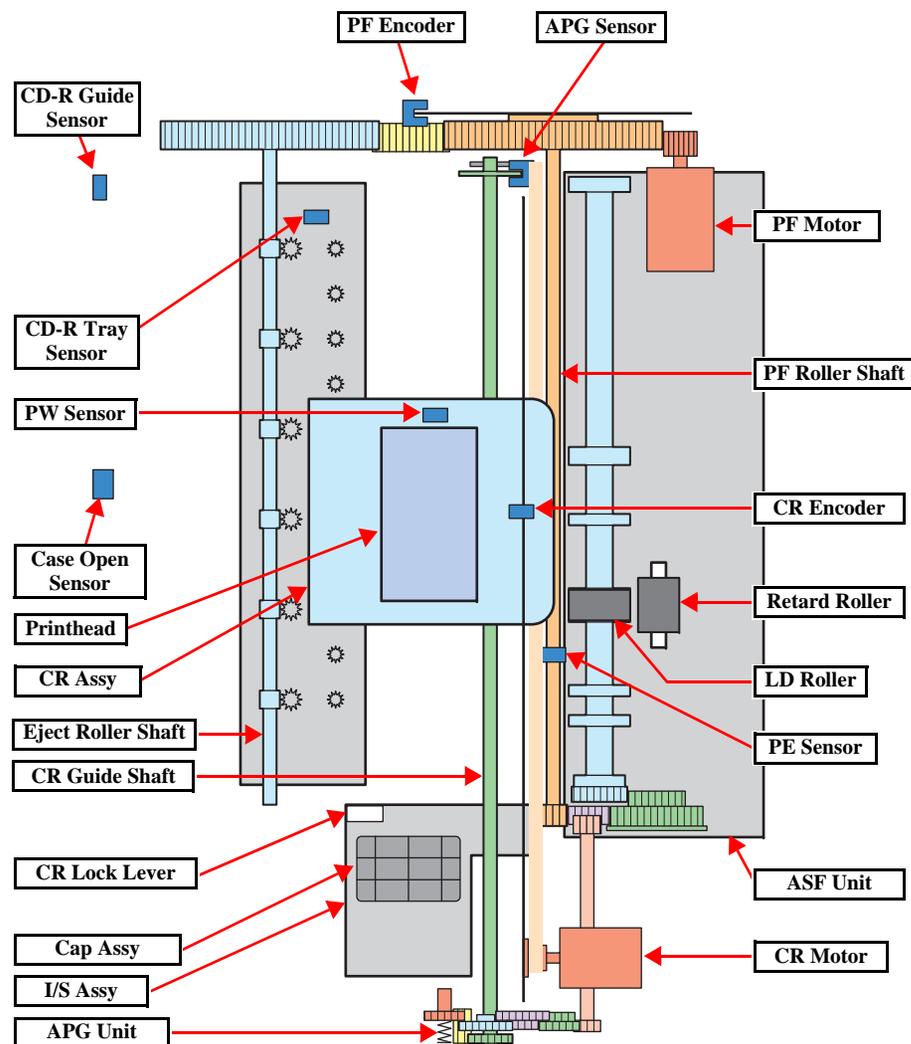
Figure 2-1. Schematic Printer Mechanism

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2.1.2 Motors and Sensors

Epson Stylus Photo PX650/TX650/TX659/PX660/PX660 Premiun/Artisan 635 are equipped with the following printhead, motors and sensors.

Table 2-1. Motors and Sensors (Printer Mechanism)

No.	Name	Function
1	Printhead	F3-MACH Turbo 2 head (6 colors x 90 nozzles)
2	CR Motor	Type: DC motor Voltage: 42V DC ± 5% (voltage applied to the driver) Characteristics: Armature resistance : 22.7 Ω ± 10% Inductance : 17.5 mH ± 25% Drive system: PWM constant-current chopping system
3	PF Motor	Type: DC motor Voltage: 42V DC ± 5% (voltage applied to the driver) Characteristics: Armature resistance : 21.2 Ω ± 10% Inductance : 17.2 mH (1kHz) Drive system: PWM system
4	PE Sensor	Function: Detection of the paper tail end, Paper leading edge positioning control Detection method: Transmissive-type photo-interrupter
5	CR Contact Module	Ink cartridge detection (CSIC)
6	CR Encoder	Type: Transmissive-type photo-interrupter Resolution: 180 pulse/inch
7	PF Encoder	Type: Transmissive-type photo-interrupter Resolution: 180 pulse/inch
8	PW Sensor	Function • Paper left and right edge (before and during printing) • Paper top edge (before printing) • Paper bottom edge (during printing) • CD-R top, bottom, right and left edges (before printing) Detection method: Reflective photosensor
9	APG Sensor	Function: APG position detection Detection method: Transmissive-type photo-interrupter
10	CD-R Guide Sensor	Function: CD-R Guide up/down detection Detection method: Mechanical contact detector
11	CD-R Tray Sensor	Function: CD-R Tray presence detection Detection method: Mechanical contact detector
12	Case Open Sensor	Function: Scanner Unit open/close detection Detection method: Mechanical contact detector
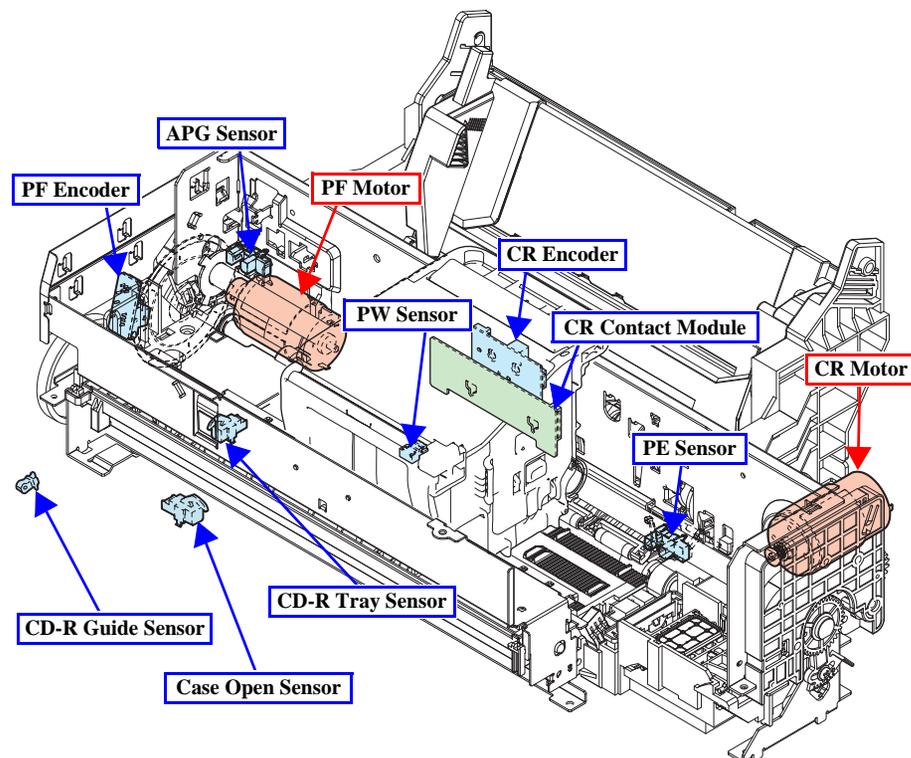
Figure 2-2. Motors and Sensors (Printer Mechanism)

Table 2-2. Scanner Mechanism CIS & Motor

No.	Name	Function
1	CIS Unit	Resolution: 10,200 pixel 16 bit per pixel (input), 8 bit per pixel (output)
2	CR Motor	Type: DC motor Voltage: 42V DC ± 5% (voltage applied to the driver) Drive system: VrefPWM input constant-current chopping
3	Encoder sensor	Type: Linear encoder Resolution 180 pulse/inch
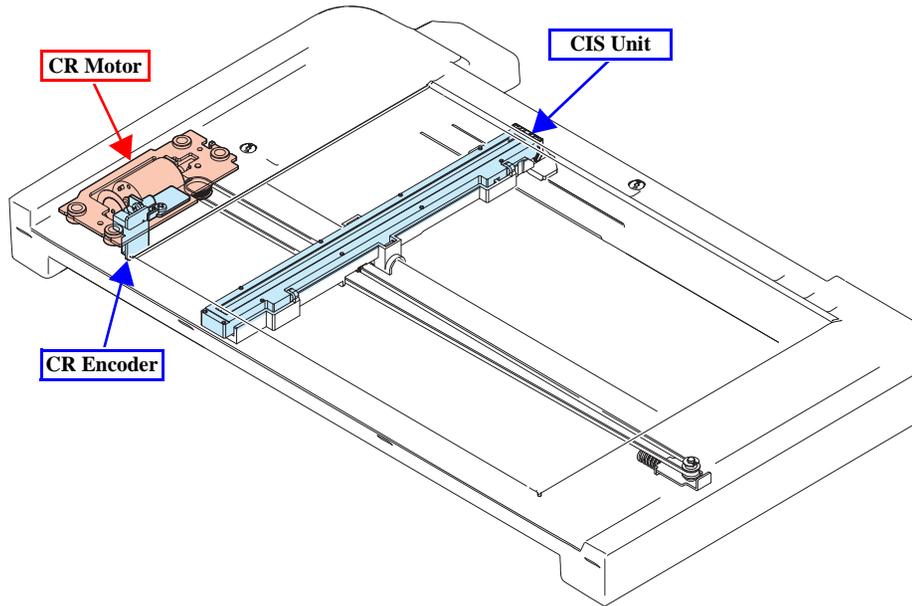
Figure 2-3. Motors and Sensors (Scanner Unit)

2.1.3 Printhead

F3 Mach Turbo2 head type printhead is employed, which produces variable sized dot and economy dot. The printhead configuration is as follows.

☐ Nozzle configuration

■ Black: 90 nozzles x 1

■ Color: 90 nozzles x 5 (yellow, light magenta, light cyan, cyan, magenta)

The nozzle layout as seen from behind the printhead is shown below.
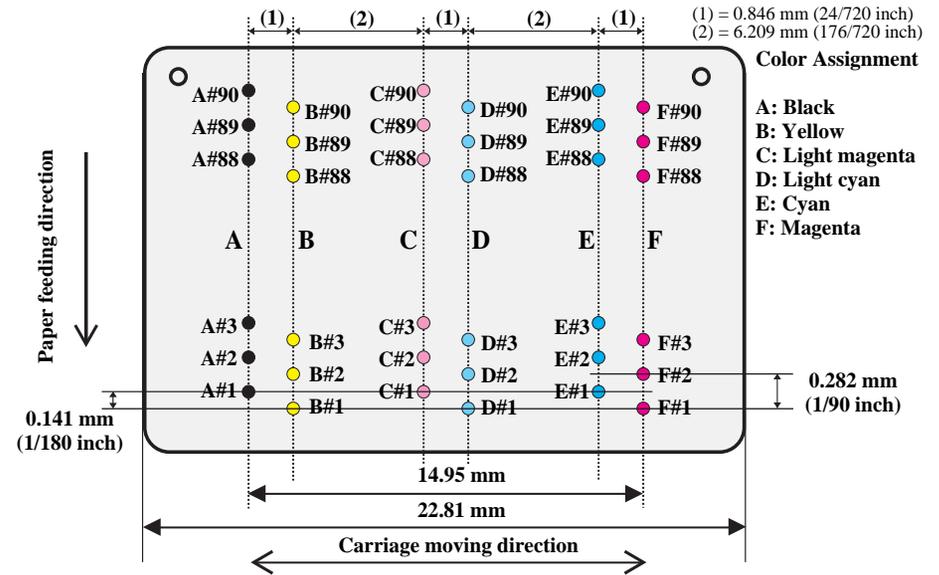
Figure 2-4. Nozzle Layout.

2.2 Power-On Sequence

This section describes the power-on sequences.

☐ Condition

- ■ Completing ink charge.

- ■ No CDR Tray and no paper on the paper path.

- ■ The stacker is not set on the CDR printing position.

- ■ The Printhead is capped with the Cap of the Ink System.

- ■ The Carriage is locked by the CR lock.

Table 2-3. Operation of the power-on sequence

Operation[*1]	Carriage/PF roller movement and position[*2]	PG[*3]
1. Checking waste ink overflow 1-1.Reads out the protection counter value to check waste ink overflow.		Any position
2. Avoiding deadlock sequence[*4] 2-1.The carriage moves to the 0-digit side slowly and confirms it touches the Right Frame.		↓
2-2.The carriage slightly moves to the 80-digit side.		↓
2-3.The PF Motor rotates clockwise and releases the CR lock.		↓
2-4.The carriage moves to the 0-digit side slowly and confirms it touches the Right Frame.		↓
2-5.The carriage returns to its home position.		↓
3. CDR Tray sensor check 3-1.Checks with the CDR Tray sensor if the CDR Tray is not set.		↓
3-2.The PF Motor rotates clockwise to eject the CDR Tray.		↓
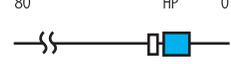
Table 2-3. Operation of the power-on sequence

Operation[*1]	Carriage/PF roller movement and position[*2]	PG[*3]
4. Releasing the CR lock 4-1.The PF Motor rotates clockwise and releases the CR lock.		Any position
5. Seeking the home position 5-1.The carriage slowly moves to the 80-digit side.		↓
5-2.The carriage moves to the 0-digit side slowly and confirms it touches the Right Frame.		↓
5-3.The carriage slowly moves to the CR lock set position.		↓
5-4.The PF motor rotates clockwise and releases the CR lock.		↓
5-5.The PF motor rotates counterclockwise and sets the CR lock.		↓
5-6.The carriage moves to the 80-digit side slowly and confirms it touches the CR lock.		↓
5-7.The carriage slowly moves to the 0-digit side to the CR lock set position.		↓
5-8.The PF motor rotates clockwise and releases the CR lock.		↓
5-9.The carriage moves to the 80-digit side slowly and confirms it does not touch the CR lock.		↓
5-10.The carriage slowly moves to its original position, and home position is fixed. Afterward, the carriage position is monitored according to the signals from the CR Encoder.		↓
6. Resetting APG 6-1.The carriage slowly moves to the Right Frame and stops there.		↓
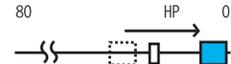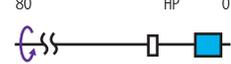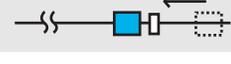
(Continue to the next page)

Table 2-3. Operation of the power-on sequence

Operation[*1]	Carriage/PF roller movement and position[*2]	PG[*3]
6-2. The PF Motor rotates clockwise while monitoring the PG sensor.		Any position
6-3. After the PG sensor switched from Off to On, the PF Motor rotates clockwise by the specified step until it detects the PG-- (APG home position).		↓
6-4. After detecting the APG home position, the carriage slightly moves to the 80-digit side.		↓
6-5. After the PF Motor rotates counterclockwise, it rotates clockwise to confirm the PG sensor is set to On-state.		PG--
6-6. The carriage slowly returns to its home position.		↓
7. Setting the APG to PG++		
7-1. The carriage slowly moves to the Right Frame and stops there.		↓
7-2. The PF Motor rotates clockwise and sets to PG++.		PG++
7-3. The carriage slowly returns to its home position.		↓
8. PF initialization		
8-1. Checks if paper exists by the PE sensor[*5] and the PF Motor rotates clockwise for one second.		↓
9. PF Motor measurement		
9-1. The PF motor rotates clockwise for four seconds, and performs a load measurement.[*6]		↓
10. Low temperature operation sequence[*7]		
10-1. The PF Motor rotates clockwise, and releases the CR lock.		↓
10-2. The carriage moves back and forth between CR lock and the 80-digit side for two times.		↓
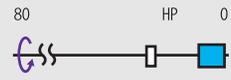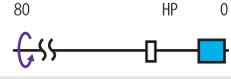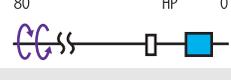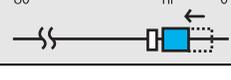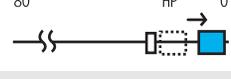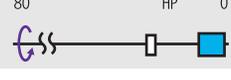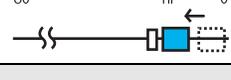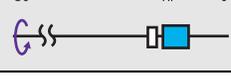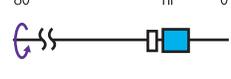
Operation[*1]	Carriage/PF roller movement and position[*2]	PG[*3]
11. Setting the APG to PG--		
11-1. The carriage slowly moves to the Right Frame and stops there.		PG++
11-2. The PF Motor rotates clockwise and sets to PG--.		PG--
11-3. The carriage slowly returns to its home position.		↓
12. CR measurement and PW sensor initialization		
12-1. The carriage slowly moves to the 80-digit side.		↓
12-2. The carriage performs a load measurement while moving to the VH Check position, and records the detected voltage of the PW sensor at the specified three positions, then stops.		↓
12-3. The carriage detects the voltage of the PW sensor at the carriage stop position (the black area at the Paper Guide Front).		↓
12-4. The carriage performs a load measurement while moving to the 0-digit side, and stops.		↓
12-5. The carriage performs a load measurement while moving to the VH Check position, and records the detected voltage of the PW sensor at the specified three positions, then stops.		↓
12-6. The carriage detects the voltage of the PW sensor at the carriage stop position (the black area at the Paper Guide Front).		↓
12-7. The carriage performs a load measurement while moving to the 0-digit side, and stops.		↓
13. Detecting ink cartridge and initializing ink system[*8]		
13-1. The PF Motor rotates clockwise for one second, and resets the PF Roller.[*9]		↓
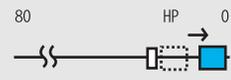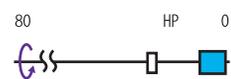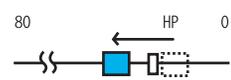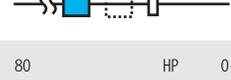
Table 2-3. Operation of the power-on sequence

Operation[*1]	Carriage/PF roller movement and position[*2]	PG[*3]
13-2.The carriage slowly moves to the 0-digit side.	80 HP 0 →□	PG--
13-3.The carriage moves to the 80-digit side to check the ink end sensor. The ink remaining is detected after completing the check.	80 HP 0 ←	↓
13-4.The carriage slowly returns to its home position.	80 HP 0 →	↓
14.CR lock setting		
14-1.The carriage slowly moves to the CR lock set position.	80 HP 0 →	↓
14-2.The PF Motor rotates counterclockwise, and sets the CR lock.	80 HP 0	↓
14-3.The carriage slowly returns to its home position.	80 HP 0 ←	↓
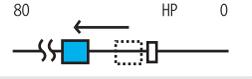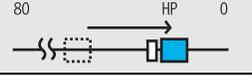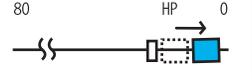
Note *1: The rotation direction of the PF Motor is as follows.
        Clockwise: Paper is fed normally
        Counterclockwise: Paper is fed backward
    *2: The condition of the CR lock is as follows.
        Red: CR lock is set
        White: CR lock is released
    *3: Indicates the PG position. "Any position" means that the PG position is not recognized because APG is not reset yet.
    *4: Checks if the carriage is not deadlock such as the CR lock is caught in the gap of the carriage.
    *5: Eject the paper if any.
    *6: When paper exists, the existing measurement value saved in EEPROM is read out; therefore, the PF Motor does not rotate.
    *7: Executes when the detected temperature is under 5 ºC (41ºF) by the thermistor on the Printhead.
    *8: The empty suction operation may occur depending on the situation.
    *9: If paper remains in the printer, the PF Roller rotates by steps enough to eject the paper forcibly.

2.3 Printer Initialization

There are four kinds of initialization method, and the following explains each initialization.

1. Hardware initialization
    This printer is initialized when turning the printer power on, or printer recognized the cold-reset command (remote RS command).
    When printer is initialized, the following actions are performed.
    (a) Initializes printer mechanism
    (b) Clears input data buffer
    (c) Clears print buffer
    (d) Sets default values

2. Operator initialization
    Initialization when resetting the USB software, and the following are performed.
    (a) Clears input data buffer
    (b) Clears print buffer
    (c) Sets default values

3. Software initialization
    The ESC@ command also initialize the printer.
    When printer is initialized, the following actions are performed.
    (a) Clears print buffer
    (b) Sets default values

4. IEEE 1284.4 "rs" command initialization
    The printer recognized the IEEE 1284.4 "rs" command.
    When printer is initialized, the following action is performed.

    ■ Initialization when an error occurs.

      (a) Initializes printer mechanism
      (b) Clears input data buffer
      (c) Clears print buffer
      (d) Sets default values

    ■ Initialization in normal operation

      (a) Clears input data buffer
      (b) Clears print buffer
      (c) Sets default values

TROUBLESHOOTING

3.1 Overview

```
CHECK
POINT
✔
```

> **Description in this chapter is applied to Epson Stylus Photo PX650/TX650/TX659/PX660/PX660 Premium/Artisan 635.**

With Epson Stylus Photo PX650/TX650/TX659/PX660/PX660 Premium/Artisan 635, almost all troubles can be coped with by following the instructions given on "EPSON Status Monitor 3" (when connected to the PC) or on the LCD.

Once an error occurs, the "EPSON Status Monitor 3" will appear as a pop-up window on the screen of the host PC. It will show details of how to cope with the trouble. In almost all cases, the user can recover the unit from the error, provided that the user follows the instructions indicated on the pop-up window.

In addition, the User's Manual for Epson Stylus Photo PX650/TX650/TX659/PX660/PX660 Premium/Artisan 635 describes detailed steps to be taken for recovery from typical errors.

3.1.1 Specified Tools

Epson Stylus Photo PX650/TX650/TX659/PX660/PX660 Premium/Artisan 635 does not require any specified tools for troubleshooting.

3.1.2 Preliminary Checks

Before starting troubleshooting, be sure to verify that the following conditions are all met:

- The power supply voltage must be within the specification limits. (Measure the voltage at the wall outlet.)
- The POWER CORD must be free from damage, short circuit or breakage, or miswiring in the POWER CORD.
- The Unit must be grounded properly.
- The Unit should not be located in a place where it can be exposed to too high or low temperature, too high or low humidity, or abrupt temperature change.
- The Unit should not be located near waterworks, near humidifiers, near heaters or near flames, in a dusty atmosphere or in a place where the Unit can be exposed to blast from an air conditioner.
- The Unit should not be located in a place where volatile or inflammable gases are produced.

- The Unit should not be located in a place where it can be exposed to direct rays of the sun.
- The Unit must be placed on a strong and steady level table (without an inclination larger than 5 degrees).
- There must be no vibration generating source placed in contact with this Unit.
- The paper used must conform to the specification.
- There must be no error in handling of the Unit.
- Check the inside of the Unit, and remove foreign matters, if any, such as paper clips, staples, bits of paper, paper dust or toner.
- Clean the inside of the Unit and the rubber rolls.

3.1.3 Procedure for Troubleshooting

Perform troubleshooting according to the flowchart shown below.
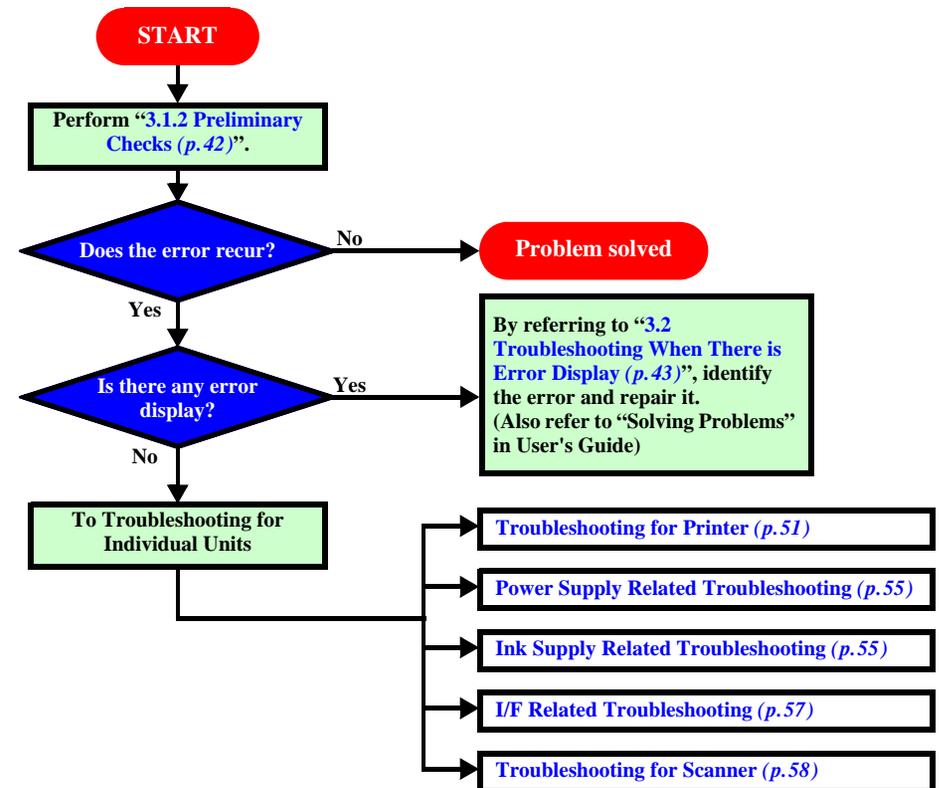
Flowchart 3-1. Procedure for Troubleshooting

3.2 Troubleshooting When There is Error Display

> **CHECK POINT** ✓
>
> **The messages displayed on the LCD that are listed in the "Error List" above and "Warning List *(p.44)*" on the next page and subsequent pages are given only for information. In other words, they are not exactly the same as the messages actually displayed.**

3.2.1 Error List

Table 3-1. Error List

Error Name	Displayed Message	Occurrence Condition	Recovery Procedure
Printer FATAL Error	A printer error has occurred. Turn off the printer, then press On button to turn on. See your documentation.	An irrecoverable error has occurred.	Turn off the power. See "3.2.3 FATAL Error" *(p.47)*
Maintenance Error	The printer's ink pads are at the end of their service life. Please contact Epson Support.	The printer requires maintenance due to waste liquid overflow.	Replace the waste ink pads. See "6.1.1 Maintenance Error" *(p.131)*
Paper jam Error	Paper jam. Load paper and press Start. If the error does not clear, repeat the procedure.	A sheet was loaded in a wrong orientation and caused a jam.	Follow the displayed message until the sheet loaded in a wrong orientation is ejected.
	Paper jam. Open the scanner unit and remove the paper.	The paper jam has occurred.	Turn off the power, and remove the paper or the tray.
	CD/DVD error. Press the Start button. If the error does not clear, remove the media by hand.	The CD/DVD tray is jammed.	
Message related to Ink (1)	Cannot recognize ink cartridges. Make sure the ink cartridges are installed correctly.	The ink cartridges have not been inserted or defective ink cartridges have been inserted.	Install the normal ink cartridges correctly and press the OK button.
Message related to Ink (2)	Ink cartridge cover is open. Open the scanner unit and close the ink cartridge cover.	Ink cartridges were replaced with new ones with the ink cartridge cover open.	Close the ink cartridge cover and press the OK button.
Message related to Ink (3)	Ink cartridges cannot be recognized.	The ink cartridge had not been inserted at an initial filling or the ink cartridge error occurred.	Install the normal ink cartridges filled with ink correctly and press the OK button.
Message related to Ink (4)	Cannot recognize ink cartridges.		
Message related to Ink (5)	Press the OK button to replace ink cartridges.	Ink end.	
Paper Empty Error	Paper out. Load paper and press the Start button.	There is no paper in the sheet feeder.	Press the Start button to feed paper correctly.
CD/DVD Tray Error	The CD/DVD tray is set incorrectly. Set the CD/DVD tray correctly, then press the Start button.	The CD/DVD tray is set incorrectly.	Set the CD/DVD Tray correctly and press the Start button.
Multi-page Feed Error	Multi-page feed error. Remove and reload the paper, then press the Start button.	Multi-page feed error has occurred.	Re-set paper and press the Start button to feed paper correctly.