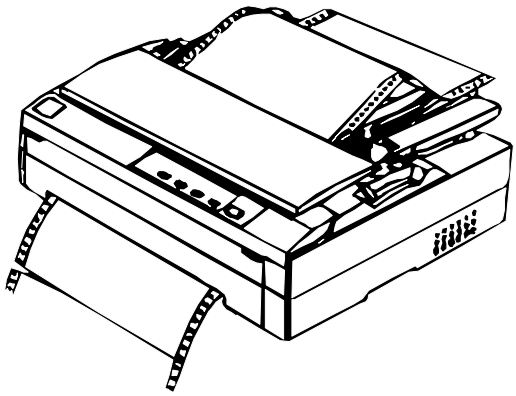
SERVICE MANUAL



9 Pin Impact Dot Printer

EPSON FX-880

COLOR IMAGING EPSON

EPSON®

4008484

NOTICE

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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. NOWORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIER 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.

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 NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

PREFACE

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of FX880. 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. The chapters are organized as follows:

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

Provides the step-by-step procedures for troubleshooting.

CHAPTER 4. DISASSEMBLY AND ASSEMBLY

Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5. ADJUSTMENTS

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.

APPENDIX

Provides the following additional information for reference:

- *Connector pin assignments*
- *Electric circuit boards components layout*
- *Exploded diagram*
- *Electrical circuit boards schematics*

REVISION STATUS

Rev.	Date	Page(s)	Contents
A	1997/09/30	All	First release

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OPERATING PRICIPLES

TROUBLESHOOTING

DISASSEMBLY AND ASSEMBLY

ADJUSTMENT

MAINTENANCE

APPENDIX

CHAPTER

1

PRODUCT SPECIFICATION

1.1 SPECIFICATION

The FX-880 is a small hoot, 9 pins serial impact dot matrix printer. The main specification is as follows;

HARDWARE SPECIFICATIONS

Print method	9 pins Impact dot matrix
Print pin arrangement	9 × 1
Print pin diagrams	0.29 mm (0.0114 inch)

RESOLUTION

Table 1-1. Resolution (dpi)

Printing mode	Horizontal density	Vertical density	Adjacent dot print
High speed draft	90	72	No
Draft	120	72	No
NLQ	240	144	No
Bit image	60, 72, 80, 90 or 120	72	Yes
	120 or 240	72	No

PRINTING SPEED

Table 1-2. Printing Speed (cps)

Printing mode	Character pitch	Printable column	Printing speed	
			Normal	Copy
High speed Draft	10cpi	80	410	345
Draft	10cpi	80	310	260
NLQ	10cpi	80	78	65

- When the power supply voltage drops to the lower limit, the printer stops printing once and then starts to print rest data on that line again more slowly than before.
- When the head temperature rises to the upper limit, the printer stops printing once. If the head temperature falls down to the normal level, it begins to print again more slowly than before.

FEEDING METHOD

Friction feed	Front, Rear
Push tractor feed	Front, Rear
Push & Pull tractor feed	Front, Rear
Pull tractor feed	Front, Rear, Bottom

FEED SPEED

Normal mode	62 ms 0.127MPS (5.0 IPS)	1/6 inch feed continuos feeding
Copy mode	83 ms 0.078MPS (3.1 IPS)	1/6 inch feeding continuos feed

FEEDER

Front push tractor
Rear push tractor
CSF (Option, bin1 / bin2)
Pull tractor (Option)
Roll paper holder (Option)

PAPER / MEDIA

Table 1-3. Cut Sheet

Insertion	Front entry	Rear entry
Width	148 ~ 257mm (5.8 ~ 10.1”)	
Length	182 ~ 364mm (7.2 ~ 14.3”)	92 ~ 364mm (3.6 ~ 14.3”)
Thickness	0.065 ~ 0.14mm (0.0025~ 0.0055”)	
Weight	52 ~ 90g/m^2 (14 ~ 24 lb)	
Quality	Plain paper, Reclaimed paper *, not curled, not folded, not crumpled	

Table 1-4. Cut Sheet (Multi-Part)

Insertion	Front entry
Width	182 ~ 257mm (7.2 ~ 10.1”)
Length	182 ~ 364mm (7.2 ~ 14.3”)
Copies	1(original) + 5
Total thickness	0.12 ~ 0.46mm (0.0047 ~ 0.018”)
Weight	40 ~ 58g/m^2 (12 ~ 15 lb)
Quality	Plain paper, Reclaimed paper, not curled, not folded, not crumpled
Jointing	Line glue at the top or one side of form

Table 1-5. Envelope

Insertion	Rear entry only	
Envelope	No.6	No.10
Width	165mm (6.5”)	241mm (9.5”)
Length	92mm (3.6”)	105mm (4.1”)
Total thickness	0.16 ~ 0.52mm (0.0063 ~ 0.020”)	
	The difference of thickness at the printable area is within 0.25mm (0.0098”)	
Weight	45 ~ 90g/m2 (12 ~ 24 lb)	
Quality	BOND paper, plain paper, air mail, no glue at a flap, not curled, not folded, not crumpled	

Table 1-6 Continuous Paper (Single Sheet and Multi-Part)

Insertion	Front entry	Rear entry	Bottom entry
Width	101.6 ~ 254mm (4 ~ 10”)		
Length	101.6 ~ 558.8mm (4 22”)		
Copies	1(original) + 5		
Total thickness	0.065 ~0.46mm (0.0025 ~ 0.018”)		
Weight	52 ~ 82g/m2 (14 ~ 22 lb)		
Weight (multi part)	40 ~ 58g/m2 (12 ~ 15 lb)		
Quality	Plain paper, Reclaimed paper, carbon less multi part paper		
Jointing	Point glue or both sides paper staple		

Table 1-7. Continuous Paper with Labels

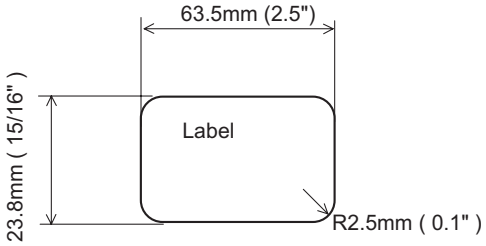
Insertion	Front entry	Bottom entry
Label size	See the figure below;  **Figure 1-1. Label**	
Base sheet width	101.6 ~ 254.0mm (4 ~ 10”)	
Base sheet length	101.6 ~ 558.8mm (4 ~ 22”)	
Base sheet thickness	0.07 ~ 0.09mm (0.0028 ~ 0.0035”)	
Total thickness	0.16 ~ 0.19mm (0.0063 ~ 0.0075”)	
Label weight	68g/m^2 (17 lb)	
Quality	A very continuous form labels, a very mini-line labels or the same quality labels	

Table 1-8. Roll Paper

Insertion	Rear entry
Width	216mm (8.5”)
Thickness	0.07 ~ 0.09mm (8.5”)
Weight	52 ~ 82g/m^2 (14 ~ 22 lb)
Quality	Plain paper, not curled, not folded, not crumpled

TYPEFACE

Bit map Font	EPSON Draft	10cpi, 12cpi, 15cpi
	EPSON Roman	10cpi, 12cpi, 15cpi, Proportional
	EPSON Sans Serif	10cpi, 12cpi, 15cpi, Proportional
Bar code fonts	EAN-13, EAN-8, Interleaved 2 of 5, UPC-A, UPC-E, Code 39, Code 128, POSTNET	

CHARACTER TABLES

Standard version	11 tables
NLSP version	19 tables

INPUT BUFFER

0 Kbytes / 32 Kbytes

ELECTRICAL SPECIFICATION

120 V version	
Rated voltage	AC 120 V
Input voltage range	AC 103.5 to 132 V
Rated frequency range	50 to 60 Hz
Input frequency range	49.5 to 60.5 Hz
Rated current	0.7 A (Max. 1.6 A)
Power consumption	Approx. 34 W (ISO/IEC10561 Letter pattern)
Insulation resistance	Min. 10 MΩ (between AC line and chassis)
Dielectric strength	AC 1000 V rms 1 min. or AC 1200 V rms 1 sec.(between AC line and chassis)
230 V version	
Rated voltage	AC 220 to 240 V
Input voltage range	AC 198 to 264 V
Rated frequency range	50 to 60 Hz
Input frequency range	49.5 to 60.5 Hz
Rated current	0.4 A (Max. 0.9 A)
Power consumption	Approx. 34 W (ISO/IEC10561 Letter pattern) Energy Star compliant
Insulation resistance	Min. 10 MΩ (between AC line and chassis)
Dielectric strength	AC 1000 V rms 1 min. or AC 1200 V rms 1 sec. (between AC line and chassis)

ACOUSTIC NOISE

55 dB(A) (ISO 7779 pattern)

ENVIRONMENTAL CONDITION

Temperature	5 to 35 °C (Operating)
	-30 to 60 °C (Non-operating)
Humidity	10 to 80 % (Operating without condensation)
	0 to 85 % (Non-operation without condensation)

RELIABILITY

Total print volume	6.5 million lines (Except Print head)
MTBF	(4000 POH)
Print head life	approx. 100 million characters

RIBBON CARTRIDGE

Type	Fabric
Color	Black
Ribbon life	Approx. 3 million characters (Draft 10 cpi, 14 dot / chr.)

SAFETY APPROVALS

120 V version	
Safety standards	UL 1950 CSA C22.2 No. 950
EMI	FCC part 15 subpart B class B, CSA C108.8 class B
230 V version	
Safety standards	EN60950 (VDE, NEMKO)
EMI	EN55022 (CISRP pub.22) class B
	AS/NSZ.3548 class B

CE MARKING

230 V version	
Low Voltage Directive 73/23/EEC	
	EN60950
EMC Directive 89/336/EEC	EN55022 class B
	EN61000-3-2
	EN61000-3-3
	EN50082-1
	IEC801-2
	IEC801-3
	IEC801-4

INTERFACE

Bi-directional parallel Interface (IEEE-1284 nibble mode supported)
Type-B I/F level 2 (Option)

CONTROL CODE

ESC/P
IBM 2380 Plus emulation

PHYSICAL SPECIFICATIONS

Dimensions	415mm(W) × 350mm (D) × 154mm (H)
Weight	Approx. 7.6 kg

CONSUMPTION & OPTIONS

Table 1-9. Consumable & Option

Consumption	Code No.
Ribbon cartridge	#8750
Ribbon pack	#8758
Options	
High capacity cut sheet feeder (Bin1)	C80638*
Single bin cut sheet feeder (Bin 2)	C80637*
Pull tractor unit	C80020*
Roll paper holder	#8310
Front paper guide	C81402*
Front sheet guide	C81400*
Serial Interface card	C82305* / C82306*
32KB intelligent serial Interface card	C82307* / C82308*
32KB intelligent Interface card	C82310* / C82311*
Local Talk I/F card	C82312*
32KB IEEE-1284 I/F card	C82313*
Coax I/F card	C82314*
Twinax I/F card	C82315*
IEEE-1284 parallel I/F card	C82345*
Ethernet I/F card	C82347*

"*": According to each destination.

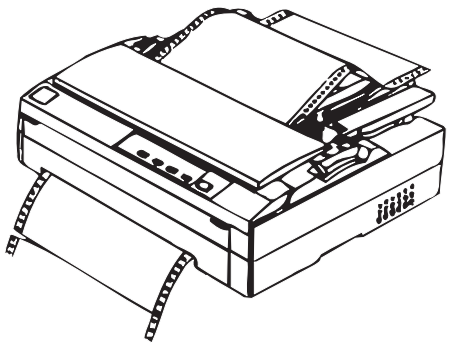


Figure 1-2. Exterior View of the FX-880

1.2 OPERATION

This section describes the operations equipped with this printer.

1.2.1 Control panel

The control panel of this printer consists of 5 switches and 5 LEDs, as shown below;

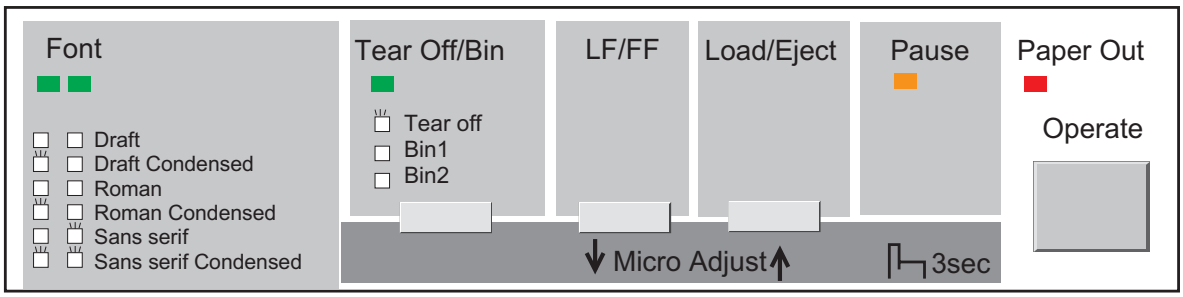


Figure 1-3. Panel Operation Outline

1.2.2 Switches

1.2.2.1 Usual Operation

In the normal mode, pressing panel switches executes the following functions;

(1) **Operate**
This switch turns the printer on and off it is the secondary switch in the power supply circuit.

⚠CAUTION ***Unplug the power cable from the AC Inlet when connecting/ disconnecting the Interface cable to/from the printer.***

(2) **Pause**
This switch alternates printer activity between printing and non-printing states.
If this button is held down for over 3 seconds when the printer is in the non-printing status, the Micro Adjust function and Font selection are enabled. If it is pressed again, these function are disabled.

(3) **Load/Eject**
- Loads the paper when the printer is out of paper.
- Ejects the paper to the paper park.

(4) **LF/FF**
- Feeds a line if pressed shortly.
- Feeds the continuos paper or eject the cut sheet.

(5) **Tear Off**
Advances the continuos paper to the Tear-OFF position. If it is pressed again, the paper is moved to the TOF position.

(6) **Bin**
Selects the CSF bin number when the CSF is used.

(7) **Font**
Selects the font from the list on the panel when the Micro Adjust function is enabled.

(8) **Micro Adjust**
The Micro Adjust switch is available in the Micro Adjust mode.
Micro switch executes micro feed forward or backward by 1/216 inch one by one.
The TOF adjustment is enabled in the TOF position after loading the paper, and the Tear-off adjustment is enable in the Tear-off position.

1.2.2.2 Operations at Power-on

Pressing the specified switch (switches) while turning on the printer enables the following special functions:

1. Self test

   - Switches : **Load / Eject** while turning on the printer.
     Function: Executes the printing LQ self test printing.
   - Switch: **LF / FF** turning on the printer.
     Function: Executes the Draft self test printing.

2. Data dump mode

   Switches : **Load / Eject** and **LF / FF** switches at same time while turning on the printer.
   Function: Executes the data dump function.

3. Clearing the line counter value for the ribbon life in the EEPROM

   Switches: **Tear-off / Bin** and **Pause** at same time while turning on the printer.
   Function: Clears the line counter value stored in the EEPROM.

4. Bi-D adjustment

   Switches: **Pause** switch, while turning on the printer.
   Function: Executes the Bi-D adjustment.

1.2.3 Indicators (LEDs)

This printer has the following indicators to indicate its current condition as shown in the table below:

1. **Pause (Orange)**
   Comes On when the printer is paused, and goes Off when the printer is not paused.
   Blinks when the Micro adjust function and the Font selection are enabled or the printhead is in the overheated condition.

2. **Paper Out (Red)**
   Comes On when the printer is in the Paper out condition.
   Blinks when the paper eject error has occurred .

3. **Tear Off / Bin (Green)**
   Blinks when the continuos paper is in the tear off position.
   Comes On when the CSF Bin1 is selected, and goes Off when the CSF Bin2 is selected.

4. **Font (Green)**
   Indicates the font selections.

Table 1-10. LED Status

Printer status	Font	Tear-Off / Bin	Pause	Paper Out
Pause	—	—	On	—
Paper out error	—	—	On	On
Release lever error	—	—	On	—
Paper eject warning	—	—	On	Blinks
Head hot warning	—	—	Blinks	Blinks
Micro adjust & Font selection	—	—	Blinks	—
Tear off	—	According as paper path	—	—
Bin selection	—	According as bin selection	—	—
Font selection	According as font selection	—	—	—
Fatal error	Blinks	Blinks	Blinks	Blinks

1.2.4 Buzzer

This printer has the buzzer to indicate its current condition with the following indications:

Table 1-11. Buzzer Status

Printer status	Beep sounds
Paper out error	•••
Release lever error	– – – – –
Paper eject warning	•••
Illegal panel operation	•

Note: The symbols used in the table represents the following:
" • " = A beep sounds for approximately 100 ms with the interval of approximately 100 ms.
" – " = A beep sounds for approximately 500ms with the interval of approximately 100ms.

1.2.5 Default setting mode 1

You can change some parameters that the printer refers to at printer initialization.

1.2.5.1 Setting Method

Refer to the following flowchart for the default setting mode 1.

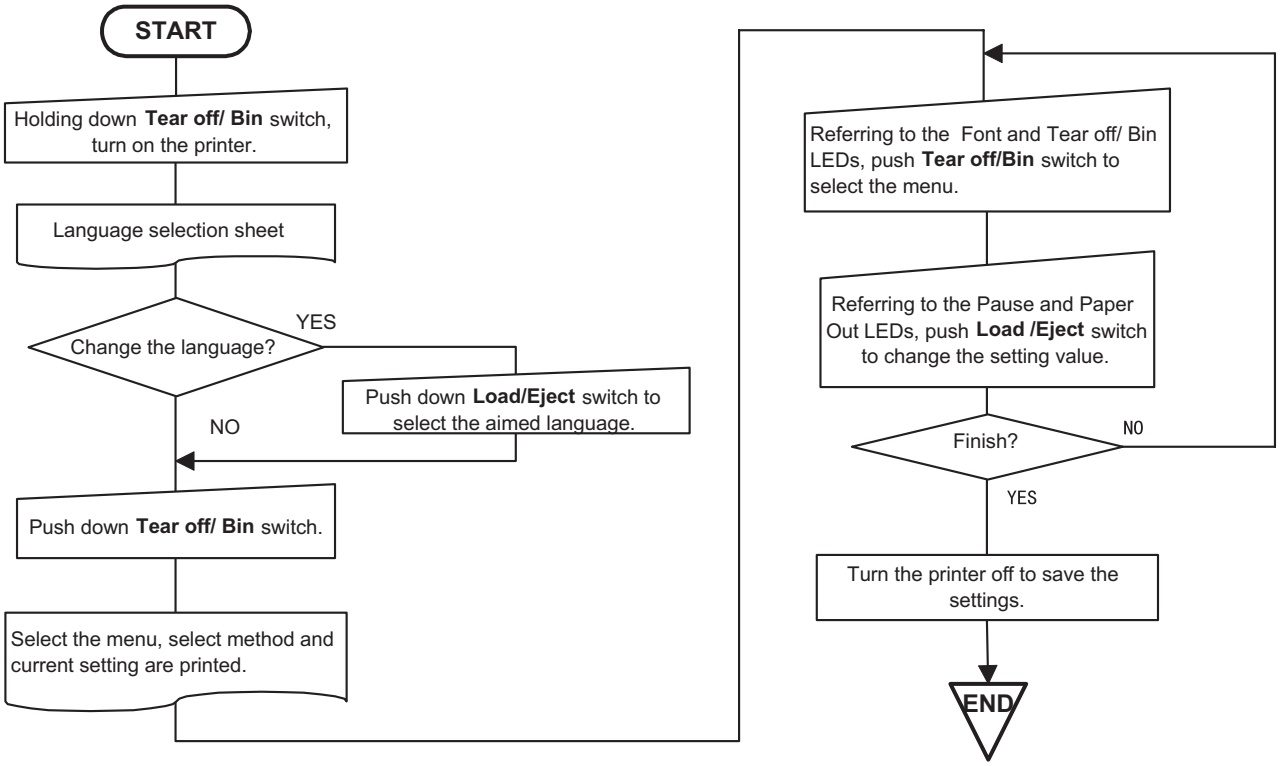


Figure 1-4. Flowchart for Default Setting Mode 1

1.2.5.2 Setting Items

Setting values available for the default setting mode including factory settings are as shown in the following table:

Table 1-12. Setting Values Available for Default Setting Mode 1

Items	Setting values (BOLD font : factory setting)
Skip over perforation	On, **Off**
Auto tear off	On, **Off**
Auto line feed	On, **Off**
Print direction	**Bi-D**, Uni-D
I/F mode	**Auto**, Parallel, Option
Auto I/F wait time	1**0 sec**., 30 sec.
Software	**ESC/P**, IBM 2380 Plus
0 slash	**0**, Ø
High speed draft	**On**, Off
Input buffer	**On**, Off
Buzzer	**On**, Off
Auto CR (IBM 2380 Plus)*1	On, **Off**
IBM character table (IBM 2380 Plus)*1	**table 2**, table 1

**1: This setting is effective when the IBM 2380 Plus emulation is selected only.*

1.2.6 Default Setting Mode 2

Refer to the following flowchart for the default setting mode 2.

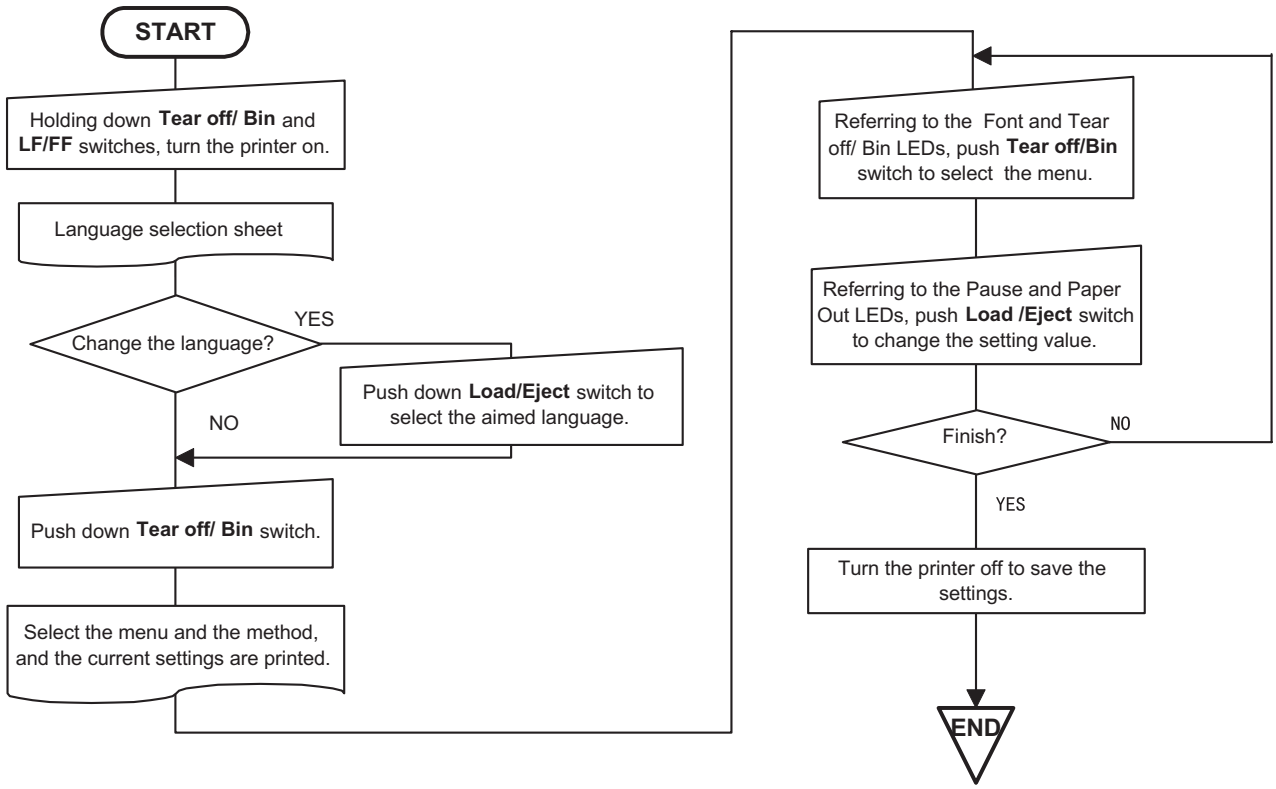


Figure 1-5. Flowchart for Default setting mode 2

1.2.6.1 Setting Items

Setting values available for the default setting mode including factory settings are as shown in the following table:

Table 1-13. Setting Values Available for Default Setting Mode 2

Items	Setting values (BOLD font : factory setting)
Page length for front tractor	3 inch, 3.5 inch, 4 inch, 5.5 inch, 6 inch, 7 inch, 8 inch, 8.5 inch, **11 inch**, 70/6 inch, 12 inch, 14 inch, 17 inch
Page length for rear tractor	3 inch, 3.5 inch, 4 inch, 5.5 inch, 6 inch, 7 inch, 8 inch, 8.5 inch, **11 inch**, 70/6 inch, 12 inch, 14 inch, 17 inch
Character table	Standard version: Italic, **PC437**, PC850, PC860, PC863, PC865, PC861, BRASCII, Abicomp, Roman 8, ISO Latin 1
	NLSP version: Italic, **PC437**, PC850, PC437 Greek, PC 853, PC855, PC852, PC857, PC866, PC869, MAZOWIA, Code MJK, ISO 8859-7, ISO Latin 1T, Bulgaria, PC774, Estonia, ISO 8859-2, PC866 LAT.
International character set for Italic table	**Italic U.S.A.**, Italic France, Italic Germany, Italic U.K., Italic Denmark 1, Italic Sweden, Italic Italy, Italic Spain 1

1.2.7 EEPROM Clear Function

You can change some parameters into the factory settings to perform panel operation easily. Pressing **Tear off / Bin** and **Load / Eject** switches at same time while turning on the printer turns the default settings into the factory settings:

Table 1-14. Cleared Items and Values on EEPROM (Standard Model)

Item	Value
Character table selection	PC437
Page length for rear tractor	11 inch
Page length for front tractor	11 inch
Page length for CSF bin 1	22 inch
Page length for CSF bin 2	22 inch
TOF adjustment value for rear tractor	8.5 mm
TOF adjustment value for front tractor	8.5 mm
TOF adjustment value for CSF bin 1	8.5 mm
TOF adjustment value for CSF bin 2	8.5 mm
TOF adjustment value for rear manual insertion	8.5 mm
TOF adjustment Value for front manual insertion	8.5 mm
Bottom margin for rear tractor	11 inch
Bottom margin for front tractor	11 inch
Font Selection	Draft 10 cpi
Print direction setting	Bi-D
I/F mode selection	Auto
Auto I/F waiting time setting	10 sec.
Auto line feed	Off
Auto tear off	Off
Skip over perforation	Off
High speed draft	On
Input buffer	On
Software	ESC/P
0 slash	Off
Buzzer	On
Auto CR	Off
Tear-off adjustment value	0
Manual insertion time	2 or 3 sec.
Tear-off wait time	3 sec.
I/F timing data	BUSY timing data
TOF minimum value	4.2 mm
Paper edge length	0
Paper length for rear manual insertion	22 inch
Paper length for front manual insertion	22 inch
sub number for customization	Standard

1.2.8 Bi-D Adjustment

Refer to the following flowchart for the Bi-D adjustment.

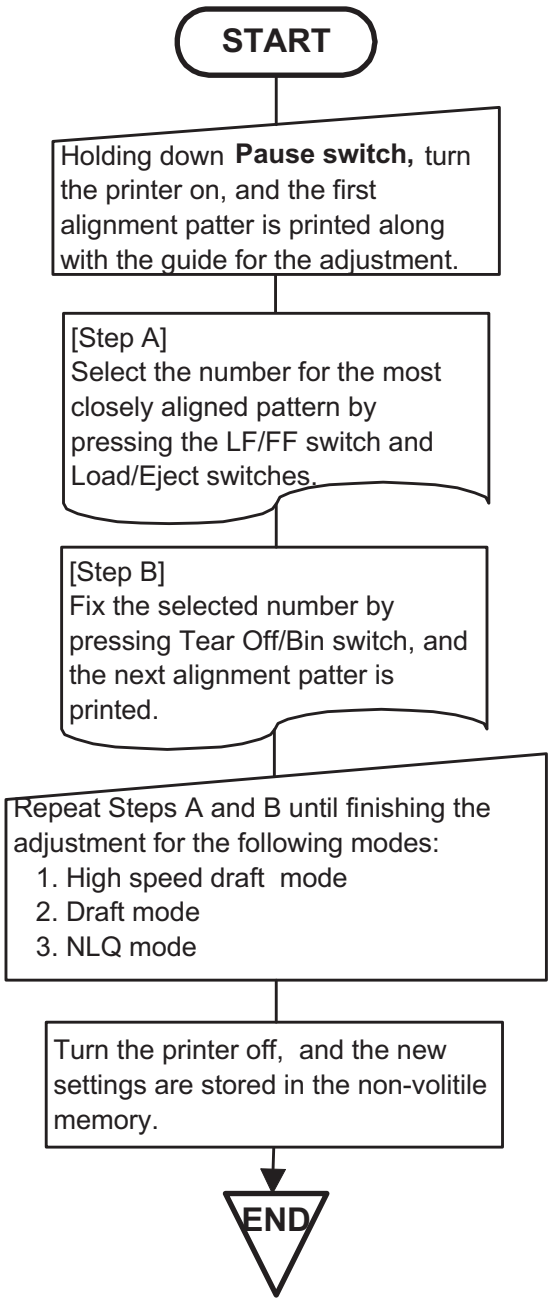


Figure 1-6 . Bi-D Adjustment flowchart

CHAPTER

2

OPERATING PRICIPLES

2.1 MAIN COMPONENTS

This printer is divided into several main components for easy removal and repair. The main components are :

- C229MAIN : Control board
- C229PSB/PSE : Power supply board
- C229PNL : Operation panel board
- M-3J10 : Printer mechanism
- Housing : Upper case, Lower case, Rear sheet guide, Knob, Printer cover

2.1.1 C229MAIN Board

The C229MAIN board consists of CPU TMP96C141AF (IC3), gate array E05B50 (IC2), EEPROM AT93C46 (IC4), 1/4M PSRAM (IC5), 2/4M PROM (IC7), driver elements, and so on.

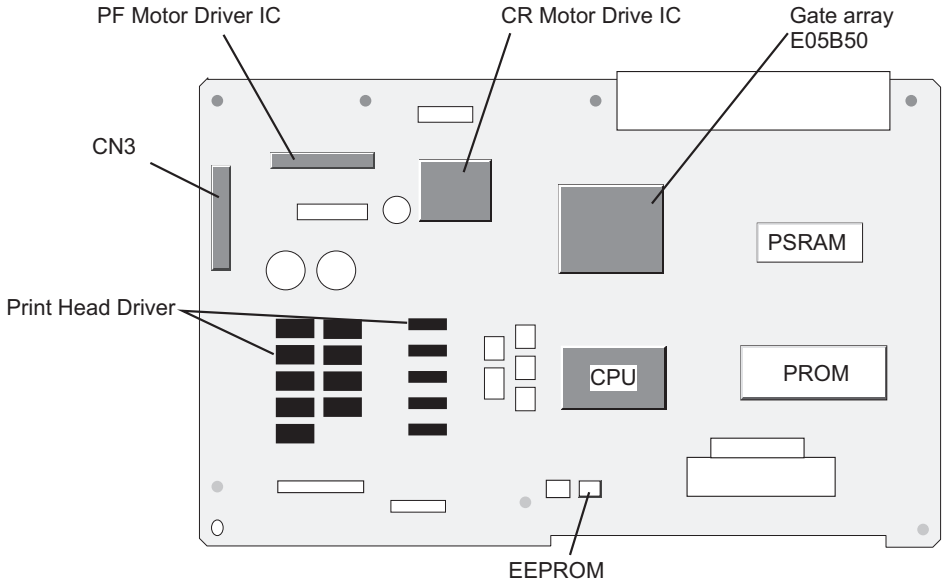


Figure 2-1 . C229MAIN Component

2.1.2 C229PSB/PSE Board

The C229 PSB/PSE power supply board consists of Transformer, Switching FET, Regulator IC, Diode bridge, Fuse, Photo-coupler, and so on.

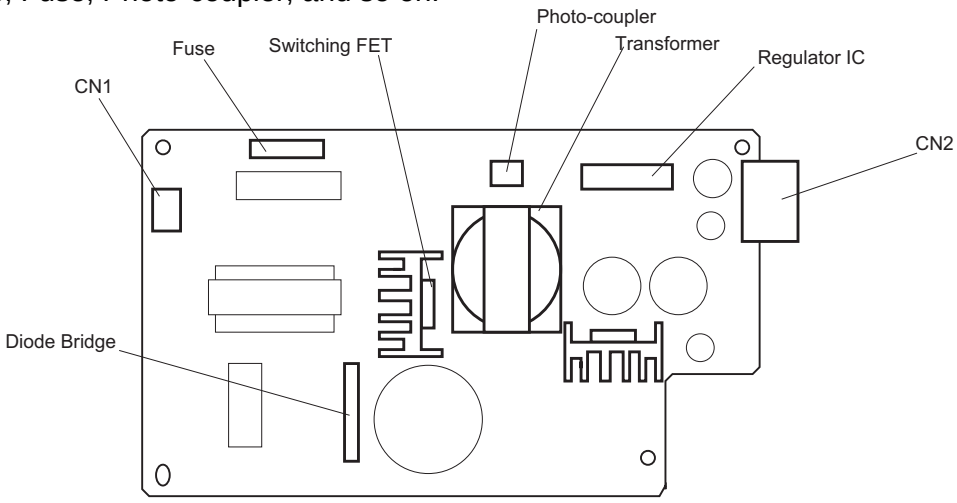


Figure 2-2. C229PSB/PSE Component

2.2 PRINTER MECHANISM

This printer mechanism consists of Printhead, Paper feed mechanism, Carriage movement mechanism, Tractor feed mechanism, Platen gap adjustment mechanism, Ribbon feed mechanism, PF motor, CR motor, detectors, and so on.

2.2.1 Printhead

The printhead prints data from the control board on paper using the ink ribbon. The printhead is mounted on the carriage unit.

2.2.2 Paper Feed Mechanism

The paper feed mechanism picks up paper and transports it to the printhead, then ejects it step by step or continuously driven by the PF motor. PF motor drives the paper feed mechanism gears and the platen roller. The top of form and paper out condition are detected by front and rear PE detector, respectively.

2.2.3 Carriage Movement Mechanism

The carriage movement mechanism carries the carriage unit left and right along the CR guide shaft and mechanism frame and stops it at any position for printing. It is driven by the torque sent from the CR motor via the timing belt. Home position is detected by the HP (home position) detector at power on and CR motor phase changing timing.

2.2.4 Tractor Feed Mechanism

The tractor feed mechanism feeds continuous paper to the printhead and ejects it. The torque from the PF motor is transferred to the tractor unit via the release mechanism in the paper feed mechanism. The release mechanism switches the PF motor torque between cut sheet feeding and continuous paper feeding by the release lever. This printer is equipped with several tractor feeding methods (front / rear push tractor feeding, front / rear push & pull tractor feeding and front / rear pull tractor feeding), which is selected according to the tractor unit setting positions and the lever positions. The tractor detector detects the release lever setting position in cut sheet feeding or continuous paper feeding.

2.2.5 Platen Gap Adjustment Mechanism

The platen gap (the gap between the platen and the printhead) adjustment mechanism consists of CR guide shaft, parallelism adjustment bushing, PG adjust lever and PG detector. PG adjust lever is attached to the left side of the CR guide shaft. The bushings are attached to the both sides of the frame. As the both sides part of CR guide shaft is eccentric toward external form of it, printhead approaches or recedes from the platen roller to turn the PG lever forward or backward. PG detector detects PG lever position. If the lever is set 2nd and more position, the printer gets into copy mode.

2.2.6 Ribbon Feed Mechanism

The CR motor drives the ribbon feed mechanism via the timing belt. The ribbon feed mechanism has the sun and planetary gear system. No matter the carriage unit is driven left and right, the ink ribbon is driven in one direction.

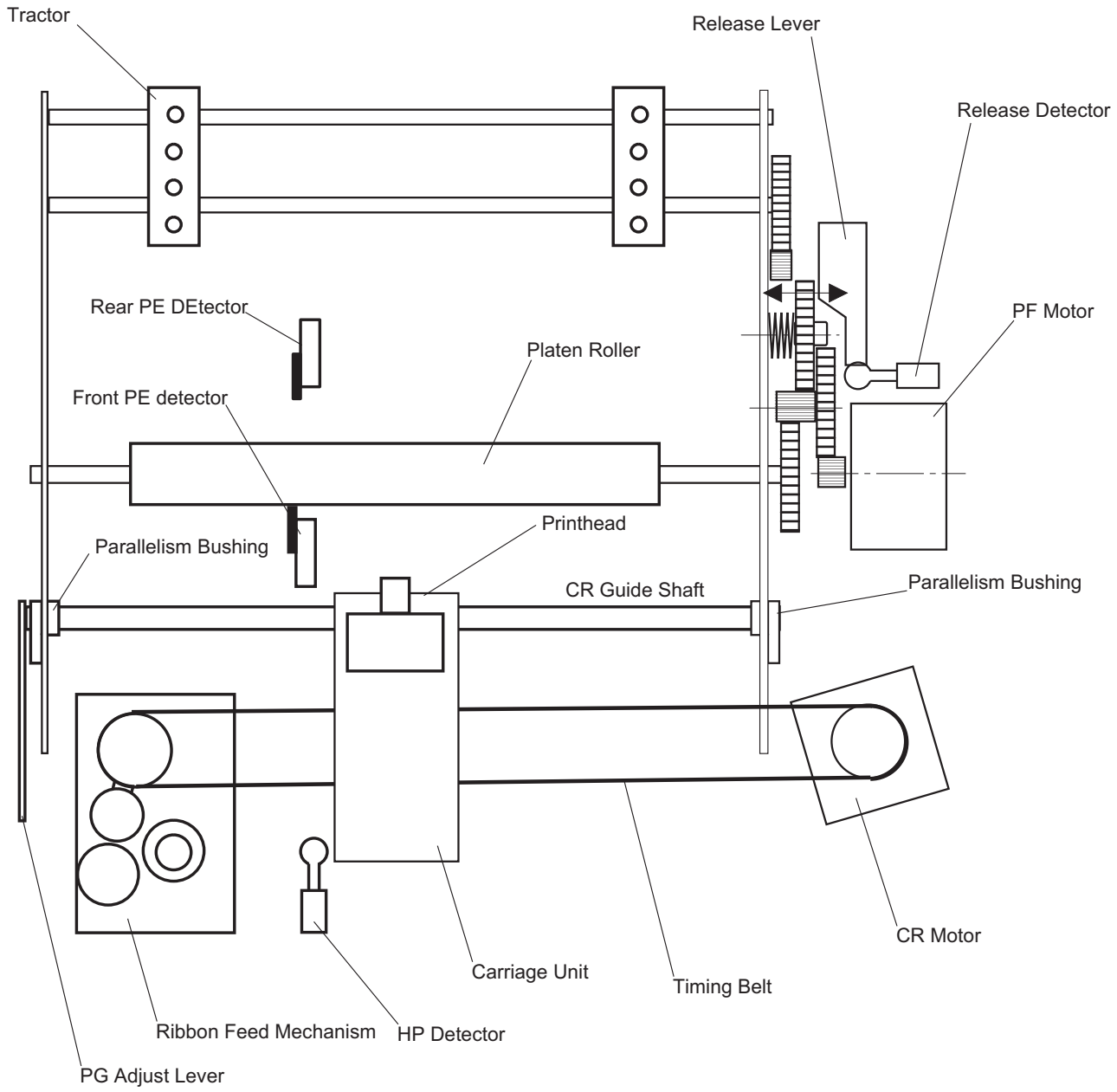


Figure 2-3. Printer Mechanis Outline

2.3 CIRCUIT OPERATION

2.3.1 C229PSB/PSE Power Supply Circuit

This printer can be powered by either of two power supply boards: the C229PSB (120V) board or the C229PSE (230V) board. The function of these two boards is the same , except for a difference in the primary circuitry. The power supply outputs the DC current necessary to drive the printer control circuit and drive the mechanism. The input voltages and fuse ratings for these boards are as shown in the following table:

Table 2-1. Input Voltage and Fuse Rating

Board	Input Voltage	Fuse F1 Rating
C229PSB	85-138VAC	4A, 125V or 250V
C229PSE	187-276VAC	T2.0AH, 250V

The power supply circuit outputs voltages used to drive the various control circuits and the mechanism, as shown in the following table:

Table 2-2. Output Voltages and Applications

Output Voltage	Applications
5V•}5% 0.7A (Type-B I/F output is included.)	Logic lines
	Detectors
	Panel Switches & LEDs
35V•}6% 0.8A	CR Motor
	PF Motor
	Printhead

The power supply circuit consists of the line filter circuit, ZC-RCC (Zero-Cross Ringing Choke Converter) switching circuit and 5V chopper regulator IC. The AC voltage is first input to the line filter circuit for higher harmonics absorption, then input to the switching circuit and transformed to +35VDC. +5VDC is generated from +DC35V by the regulator IC. The over current / voltage protection circuit is also designed on the board.
The power switch is set in the secondary circuit that is controlled by the signal PSC from the control panel.

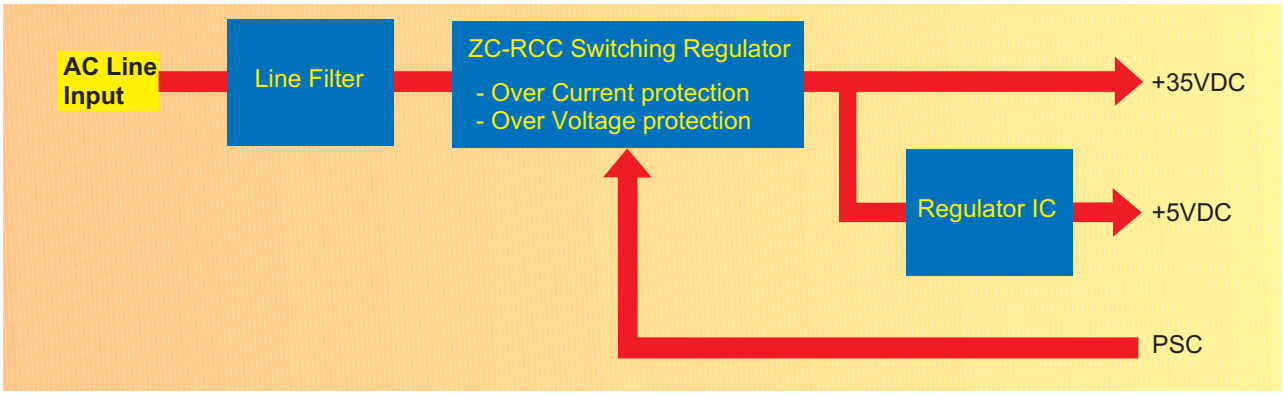


Figure 2-4. Power Supply Circuit Block Diagram

2.3.2 C229MAIN Board Circuit

The C229MAIN board is the control circuit board of this printer. This board consists of several IC chips and drivers, as shown in the table below:

Table 2-3. Function of the Main IC

Element	Location	Function
TMP96C141AF	IC3	16 bit CPU runs at 14.47MHz - Main controller - Detectors control - CR Motor Control
E05B50	IC2	Gate array : System Controller - Parallel I/F control - Option Type-B I/F control - Panel Switch, LED control - Printhead Control - PF Motor Control - CR Motor Current control
PST594E	IC1	Reset IC : Hardware reset function
AT93C46	IC4	EEPROM : System control data (Market, TTL threshold, Bi-D setting, Page length, TOF, etc.) containing
PSRAM	IC5	1M/4M bit - Buffer and Working area of CPU & Gate array
ROM	IC7	2/4M bit EPROM/ Mask ROM - Control program containing
SLA7024M	IC8	CR Motor driver
A2917SEB	IC11	PF Motor driver
Comparator	IC12	Power-off signal sensing

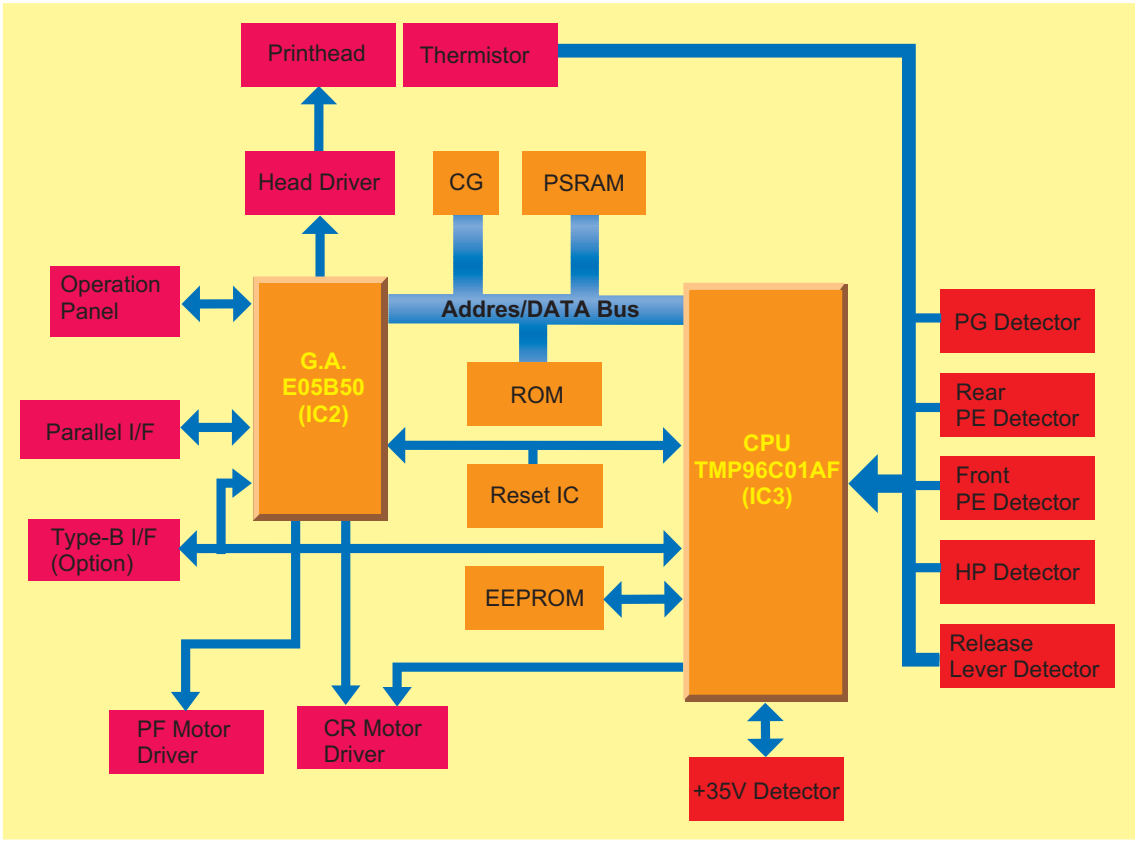


Figure 2-5 . C229MAIN Board Circuit Block Diagram

The data from the host computer is stored in the input buffer once, then converted into image data and transmitted to the printhead through the gate array, as shown in the figure below:

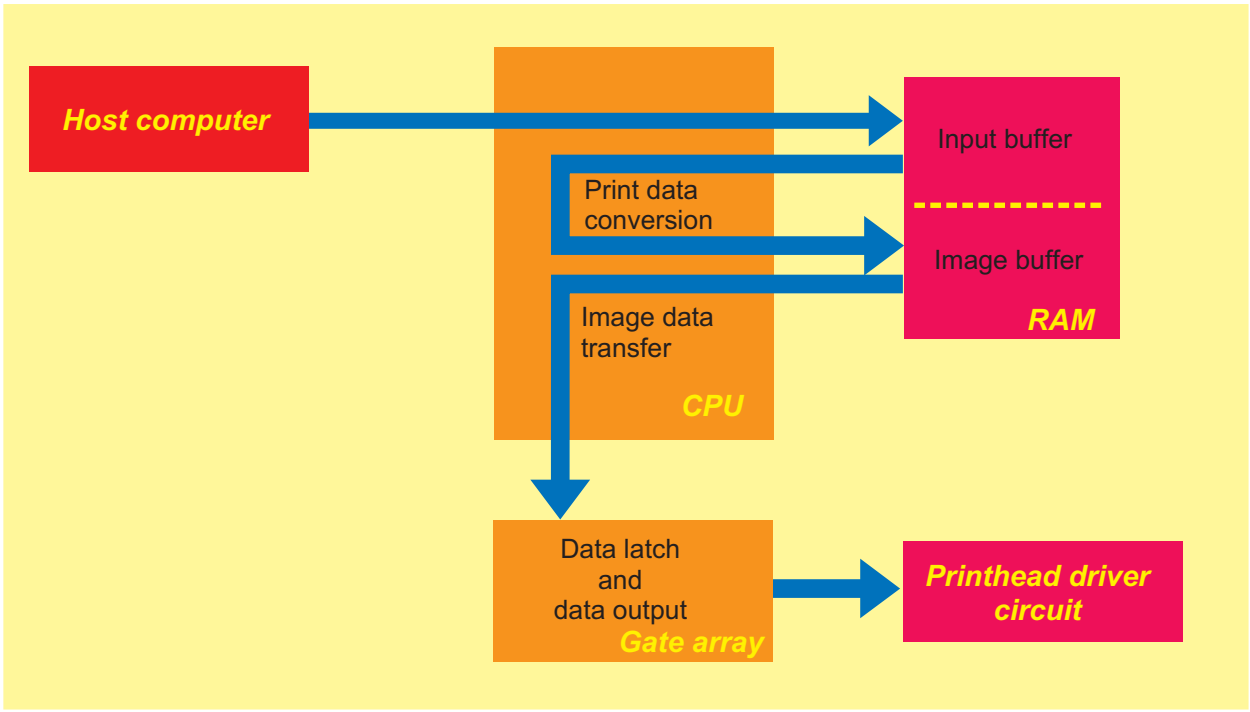


Figure 2-6. Data Flow

CHAPTER

3

TROUBLESHOOTING