DIRECT CARD PRINTER

PR5350

Service Manual

Ver. 1.0

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Section 1 Overview

1. 1 Outline of Equipment

1.1.1 Description of Equipment

This equipment is a full color card printer to print image, characters and protective overlay on a plastic card based on the data supplied from personal computer.

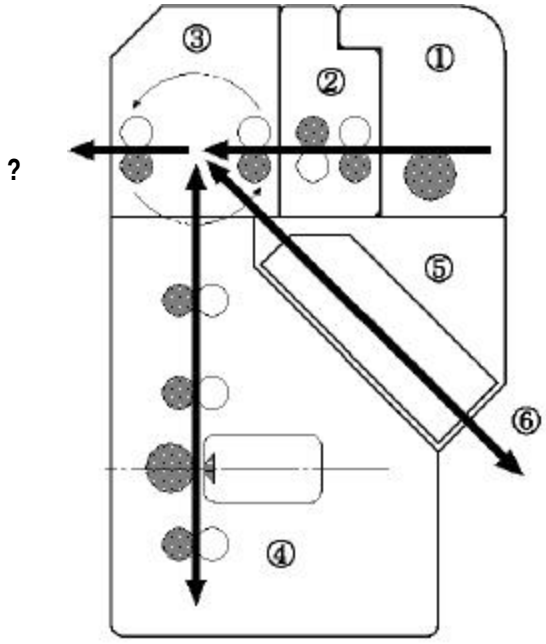
Printing method is dye sublimation heat transfer printing for color image and heat melted ink transfer printing system for characters (black) and protective overlay. With standard built in Flip Turn Block, both side printing is possible in single operation.
Magnetic encoding is possible on the magnetic stripe of the card by connecting Magnetic Encoding Unit, which is available as an optional unit. Also, as an option, Heat Roller Unit is available for printing hologram coating and thicker protective overlay.

1.1.2 Basic Specifications

Printing method	Image Area: Dye Diffusion Thermal Transfer Character Area: Molten Type Thermal Transfer Protective Layer: Molten Type Thermal Transfer
Printing Media	PVC Card *(Recommended Card by NISCA)* Size:Conform to JIS X 6301 (ISO standard CR-80) Thickness:Conform to JIS X 6301(ISO standard CR-80)
Printing Resolution	300dpi (11.81dots/mm)
Printing Grayscale	Input:256 grayscale for each colors R,G and B Output:256 grayscale control for each colors C,M and Y
Printing Size	Max. 85.5mm(card longitudinal) × 54mm(card transverse direction)
Printing Arrangement Area	Max. Entire area
Printing Speed	45seconds per card excluding communication time at the whole area printed as mentioned above.
Supply method and capacity	100 cards(card thickness:0.76mm) ;supplied automatically
Interface	SCSI or USB 2.0 (Fixed in factory)
Power supply	AC 100~ 240V 50/60Hz
Power consumption	120W max.
Equipment dimensions	421mm(H) × 271mm(W) × 331mm(D) (excluding Stack Box)
Equipment weight	13kg:Main body 13.8kg:Including optional magnetic encoder

1.2 Mechanical Operation

This equipment consists of Card Supply Block, Flip Turn Block, Card Ejection Block, Card Encoding Block and Card Rejection Block.



? Card Supply Block

Card Supply Box can contain up to 100 pcs of standard plastic cards (0.76mm thick) so that a continuous printing of high volume card is possible.

The box is made of a transparent plastic for easy checking of the remaining card supply and protecting the cards from dust. The card is fed from the bottom of the pile and automatically transported in the printer. A weight plate is provided to ensure the positive feeding of cards when the remaining cards becomes low.

Card separation is done by the gate at the entrance, which can be adjusted to various thickness of cards.

? Card Cleaning Block

There are two rubber rollers with sticky surface to remove dust .One is for front side of a card and the other is for back side of the card. Since this printer has this feature it is possible to make prin ting process faster and clear at dual side printing.

It is necessary to clean them periodically to let them keep this performance.

See section4 for how to clean them.

? Flip Turn Block

Turns the card for both side printing. This block also serves to switch the card path to Print Block, Eject Block and Reject Block. It is possible to rotate the this block manually. Never touch the part besides green color part when you need to rotate this block manually.

? Print Block

The card moves back and forth in the Print Block 5 times to be printed with 3 colors, black and overlay. Print Block consists of Card Transport Module, Print Head Module and Ribbon Feed Module.

In the Card Transport Module, the card is transported by two pairs of capstan rollers placed in front and behind platen roller. While printing, the nip release mechanism works to eliminate the shock of the card entering the printing block and provide a smooth and clear printing. Each roller is precisely driven by stepping motor to minimize the color deviation and the side of the card is controlled to limit skew. A high resolution (300 dpi) thermal head is used in the Print Head Module for clear and high quality image printing. An even pressure is given to the thermal print head by two coil spring located at both end of the head to maintain uniform contact to the card. The thermal head is assembled in one independent unit so that the replacement is made very easy. Also a user can replace the print head and ribbon at front side by featuring front access system.

Ribbon Feed Module has Feed Bobbin, Transport Roller, Take-up Bobbin and driven by each independent torque limiter so that the ribbon can be fed with constant tension for stable printing. Take up bobbin is driven at two speeds, slow for printing and high for non-printing, which makes the efficient operation possible.

? Card Encode Block

Magnetic Encode Unit, IC Encode Unit, etc are available for this printer as optional unit. By mounting the Encode Unit, printing of image and characters, encoding Magnetic (or IC) data can be processed in one operation in one equipment. As the Encode Unit can be mounted in the Printer, it does not require additional desk space.

? Card Reject Block

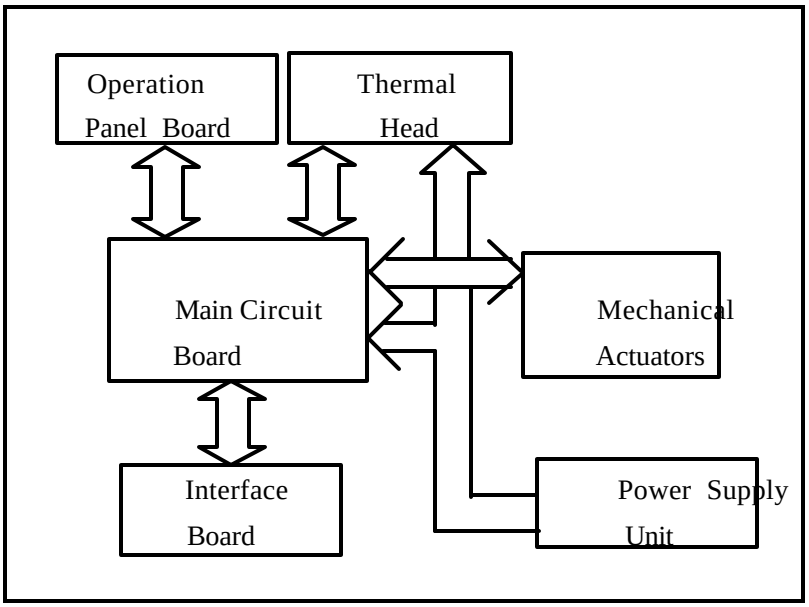
If a trouble occurs while printing, the printer stops automatically. In such case, by pressing "Clear" key, the card currently being printed will be ejected through Reject Exit.

? Card Ejection Block

Card Ejection Block has a transparent card stack box. The printed cards are ejected in this box and stacked (100 cards of standard thickness).
The box has a cut out for easy removal of the printed cards.

1.3 Electrical operation

1.3.1. Electrical Block Diagram



Printer Unit Block Diagram

The Printer Unit is controlled and driven with the following components.

? Main Circuit Board (PBA-MAIN)
Receives commands and data from the host through SCSI interface and controls the operation of the Printer Unit, also controls the thermal print head according to the image data.

? Interface Board (PBA-I/F- SCSI or PBA-IF-USB)
Controls the SCSI or PARALLEL interface.
For SCSI :It has connector and terminator switch for SCSI interface and has connector for optional units.
For USB : It has a connector for USB interface and has connector for optional units

? Operation Panel Board (PBA-OPEPANE)
Constituted with LCD, LED, Push Buttons, and controlled by the Main Circuit Board.

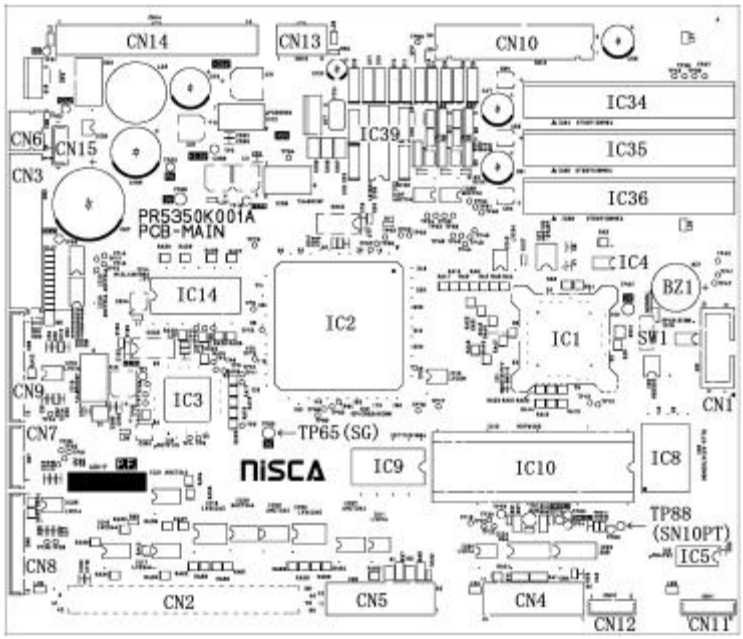
? Power Supply Unit
Supplies DC24V, and DC5V to the Printer Unit and Optional Unit.

? Thermal Head
Supplies head energy for printing the image, characters and OP (over coat).

? Mechanical Actuators
Consists of sensors and the motors to transport the cards.

1.3.2 Main Circuit Board (PBA-MAIN)

There are CPU Block, Memory Block, Actuator Control Block.



Following items are the main components:

? 32 bit CPU (IC1)
32 bit single chip micro processor, activated on the clock of 12.5 MHz

? Flash Memory(IC8)
A memory of 4 M bytes for storing the firmware.
It can be downloaded through the SCSI or USB interface.

? SRAM(IC9)
1 M byte memory to be used for cash memory of CPU(IC1).

? EEPROM (IC4)
4K byte memory to record total frame number, number of errors, setting values of the specific unit, etc.

? Serial interface driver (IC33)
Translated the signal of CPU to RS232C for communication with the built-in encoder unit.

? SDRAM (IC14)
Memory of 16 M byte which stores the data of RGB +characters for 2 frames.

? DSP (IC3)
Digital Signal Processor works for color changing or enhance of edge of an image.

? Control IC (IC2)
A Gate array to control the printer activated on the clock of 20 MHz.
This IC controls following items by setting from CPU

> To control the transfer of the image data to DRAM and also image rotating function.
> To control the thermal head
> Interface for SCSI or USB 2.0 control IC
> To control the LCD
> To supply driving signals for PM 1-3
> To generate the control signal for DM1
> To control sensors

1.3.3 Interface Board (PBA-I/F)

Interface board applies to SCSI-2 or USB 2.0 standard.

<SCSI 2 type interface board>
There are two "half 50" pin connectors on the interface board. Also, there is a connector for connecting the optional device.

? Serial interface driver (IC4)
Translates the signal of CPU to RS422 level for the communication with the attached optional equipment.

? SCSI Controller (IC2)
Operates on the clock frequency (OSC1) of 20MHz and controls SCSI bus.

? SCSI terminator (IC3)
An active terminator IC supporting the SCSI specification, which terminates the SCSI
bus by the input of the switch (SW2) located on the backside of the printer.

<USB 2.0 type interface board>
There is B type connectors on the interface board. Also, there is a connector for connecting the optional device.

? Serial interface driver (IC2)
Translates the signal of CPU to RS422 level for the communication with the attached optional equipment.

? USB controller (IC1)
Controls the interface USB 2.0 bus. (generated by OSC1)

1.3.4 Operation Panel Board (PBA-OPEPANE)

Operation Panel is used to indicate the current status of the Printer to the operator, to change setting, execute printing, and clearing errors.

? LCD (IC1)
LCD panel of 16 characters * 2 lines. Displays the condition of the printer, setting and changes of values, error messages, etc.

? LED1 - LED3
Indicate the Printer condition to operator.

? SW1 - SW3
Switches for operator to operate the Printer.

Note: Details of operating the Operation Panel is explained in Section 3, Operation Panel.

1.3.5 Mechanical Actuators

The Printer Mechanism consists of Sensors and Motors, etc.

<Input mechanisms>

Symbol	Component	Function
SN1	Optical Sensor	Detection of card empty at Card Supply Block.
SN2	Optical Sensor	Detection of card position (Just before Cleaning Roller).
SN3	Optical Sensor	Detection of card position (Just before Flip Turn Unit).
SN4	Optical Sensor	Detection of card position (Just before Print Block).
SN5	Optical Sensor	Detection of card position (to detect the leading edge of a card).
SN6	Optical Sensor	Detection of the home position of Flip Turn unit.
SN7	Optical Sensor	Detection of the angle of Flip Turn unit.
SN8	Optical Sensor	Detection of length of ribbon fed. (taking up side)
SN10	Optical Sensor	Detection of mark on the ribbon.
SN11	Optical Sensor	Detection of print head position.
SN12	Optical Sensor	Detection of print head position.
SN13	Micro switch	Detection of open/close of Front Cover. (with interlock function)
SN14	Micro switch	Detection of open/close of Top Cover. (with interlock function)
SN15	Optical Sensor	Detection of card position (just before encoder)only available when Encoder set.
SN18	Optical Sensor	Detection of length of ribbon fed. (supply side)

<Output Mechanisms>

Symbol	Component	Function
DM1	DC Motor	Rolls up Ink Ribbon. Moves (up/down) Thermal Head
PM1	Pulse Motor	Drives rotation mechanism in Flip Turn Block. Transports a card (Card Supply Block)
PM2	Pulse Motor	Transports a card (Flip Turn Block)
PM3	Pulse Motor	Transports a card (Print Block)
HFAN	Fan Motor	Cools Thermal Head.
DFAN	Fan Motor	Cools Power Supply.

Section 2 Setting Up

2. 1 Setting Up

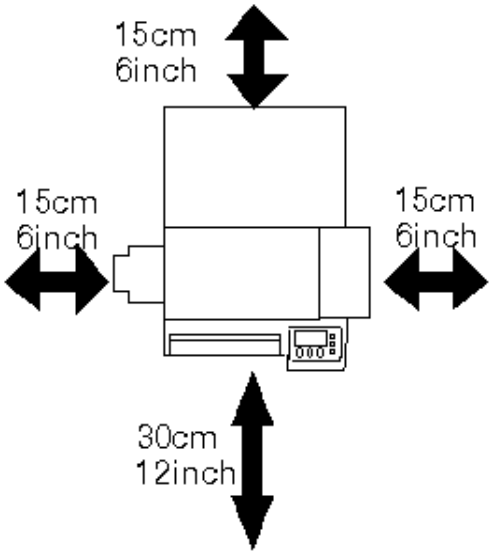
2.1.1 Caution for setting up

Dusty place must be avoided for using this equipment because the printing system of this printer is especially sensitive to dust. When printing on the card with magnetic stripe, do not place the printer at near the equipment which is emitting magnetic field.
Other than above, use general caution for setting up other OA equipments and choose proper place with proper environment. For further details, please read operation manual.

2.1.2 Space for installation

The space for the operation as shown in the illustration should be provided.

? At least 50 cm(20 inch) of clearance should be kept for the Top Cover.
? Table to place the printer should be able to hold minimum 14Kg(31lbs) and have flat top and 4 rigid legs.
? It should not incline more than 1? .



2.1.3 Connection to Host Computer with SCSI or USB

<SCSI type interface>

1) Connection of SCSI Cable

Connect the Printer, PC and Peripheral Units with SCSI Cable.

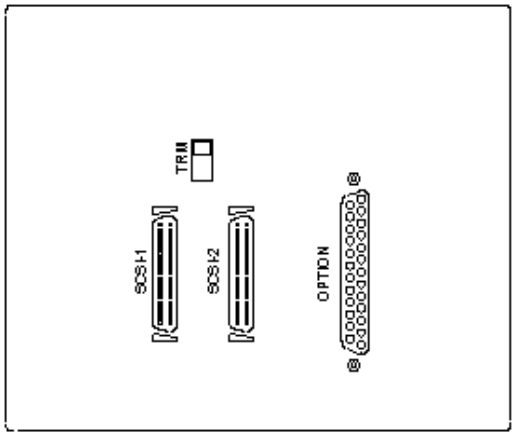
The Printer is equipped with two female connectors of 50 Pins (half type) of SCSI specification. Use suitable SCSI cable with suitable connectors to match the PC and Peripheral Units.

Note 1: Total length of the SCSI cable should be within 6 meters. To ensure stable operation, within 4 meters is recommended.

Note 2: Please use the SCSI - II specification high impedance cable. In case of daisy chain connection, operation may become unstable unless all cables are SCSI-II specification.

Note 3: Turn OFF power switches of the Printer, PC and all units when connecting the cable. The retaining hook should be securely latched.

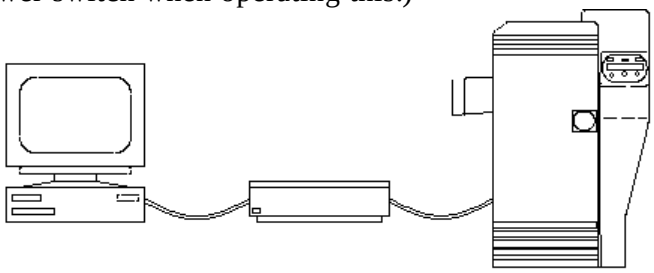
Note 4: On the backside of the Printer, OPTION CONNECTOR located next to SCSI connectors is the connector for the Optional Units of this card printer only. Do not connect any other unit. It may cause a trouble.



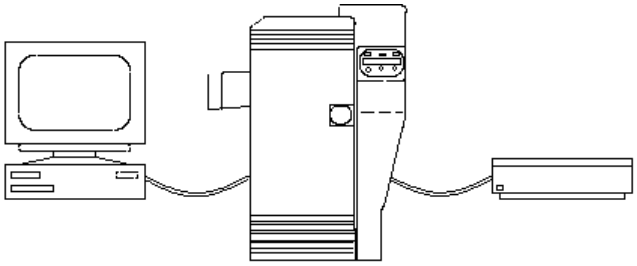
Interface connectors

2) Setting internal SCSI Terminator.

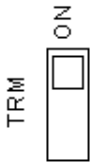
The Printer has Active Terminator for SCSI-I and SCSI-II.
When using the Terminator, turn the switch at the back of the Printer ON (upper side).
(Turn OFF the power switch when operating this.)



To switch on



To switch off



Appearance of Terminator switch

3) Setting SCSI ID Number

The SCSI ID number can be freely selected from 0 to 7 through the operation panel of the printer.

Default ID setting is 4.

Note 1: Do not set the same ID number as the PC and other peripheral units. (It may cause a trouble.)
When setting, check the ID numbers of the other units.

Note 2: When setting the ID number, turn OFF the power switches of PC and all other peripherals.

<USB type interface>

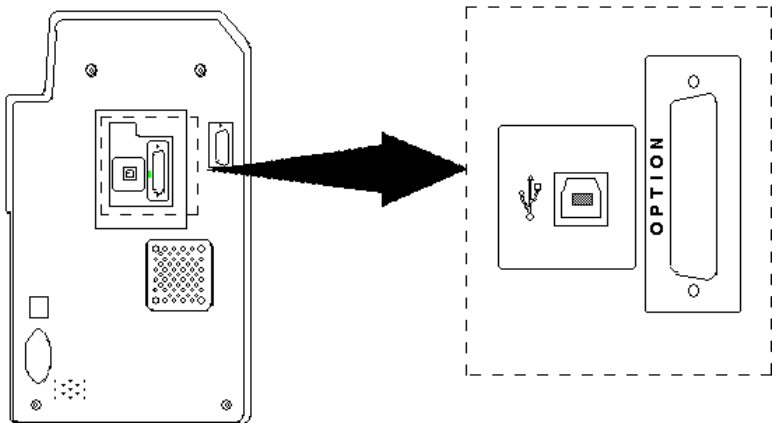
1) Connection of USB Cable

Connect the Printer, PC and Peripheral Units with USB 2.0 Cable.

The Printer is equipped with B type connector

Note 1: Turn OFF power switches of the Printer, PC and all units when connecting the cable.

Note 2: On the backside of the Printer, OPTION CONNECTOR located next to USB connector is the connector for the Optional Units of this card printer only. Do not connect any other unit. It may cause a trouble.

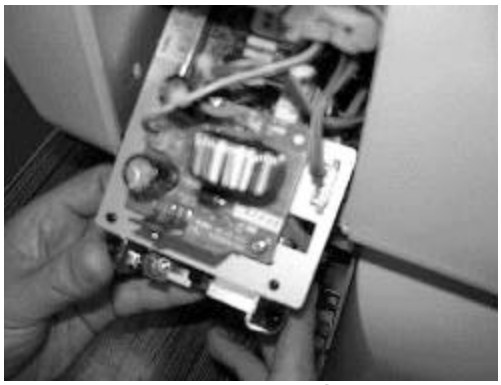


2.2 Installation of the Encoder Unit

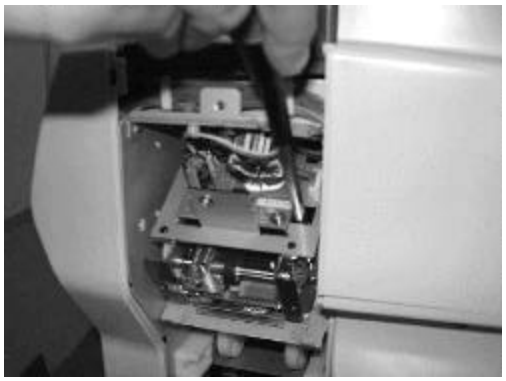
2.2.1 Installing steps

Step 1 Turn OFF the printer power source.
Step 2 Remove RIGHT-COVER. (Remove 2 x M-4 screws)
Step 3 Take the screw off to take out a slide for a card rejected .
Step 4 Insert the ENCODER into the encoder space of the printer with connecting the two harnesses from the printer.
Step 5 Fix the ENCODR with the screw of which was removed in Step3.
Step 6 Put the small Exsit Cover on the RIGHT-COVER with two screws.
The Exit Cover and two screws are supplied with ENCODER.
Step 7 Put the RIGHT-COVER back to the printer and fix with 2 x M-4 screws

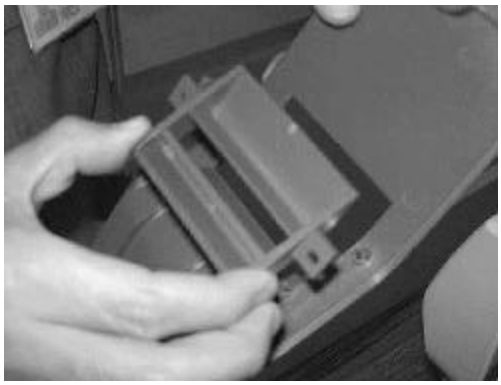
Step 3



Step 4



Step 5



Step 6

Section 3 Operation Panel

3.1 Overview

Operation panel of PR5300 is used as a communication interface with the operator. The Operation Panel has functions to display the printer setting such as image memory mode, ink ribbon selection etc and to check the condition of the printer operation such as finding the cause of error for trouble shooting, Printer adjustment, checking condition of operation etc as well as to show the current operating status of the printer.

3.2 Description of Operation Panel

Refer to Section 4 of the Operation Manual of PR5350.

3.3 Internal Modes of Printer

There are three Operation Panel Modes for PR5350 as following

1. Normal mode — Display the current operating status, such as error, of the Printer during the print operation. The Printer is in this mode when the power is turned ON. Refer to Operation Manual of PR5350 for the actual operation.

2. User mode — This mode is used to set the Printer conditions such as setting of image memory, ink ribbon selection etc. Also, used to show the information such as the ROM version etc. For the operation refer to the Operation Manual. In this section of this booklet, print mode only is explained.

3. Service mode — Adjustment of the Printer, such as the print density etc, is done in this mode. Also, this mode is used for analyzing the cause of troubles such as checking the condition of sensors and operation of individual actuators. Details of this mode is described in this section.

3.3.1 OPERATION OF SERVICE MODE

Service mode is the mode for the service person to adjust and check performance of the printer. The image data in the printer is cleared when switched to and from the service mode.

Switching to Service Mode

? To switch to service mode,

1. Return from the other mode to Normal Mode.
2. In the idle or error mode, keep the MENU key pressed till it becomes Command Reception Mode. ("Input Command" appears on the LCD panel)
3. While pressing the MENU key, press EXE and CLEAR keys alternately (about 8 times) till the display changes from "Input Command" to "Service Mode".
4. Release the MENU key.

? Moving in the Same Directory

To move in the directory, press MENU key to change the menu. MENU will change in the set order when the key is pressed.

? Execution of a menu

See section 3.3.2 and 3.3.3 for operation of current menu.

? Moving to the Lower Layer Directory

To enter into the directory of the lower layer from the present layer, press EXE key at the appropriate menu.

? Returning to the Upper Layer Directory

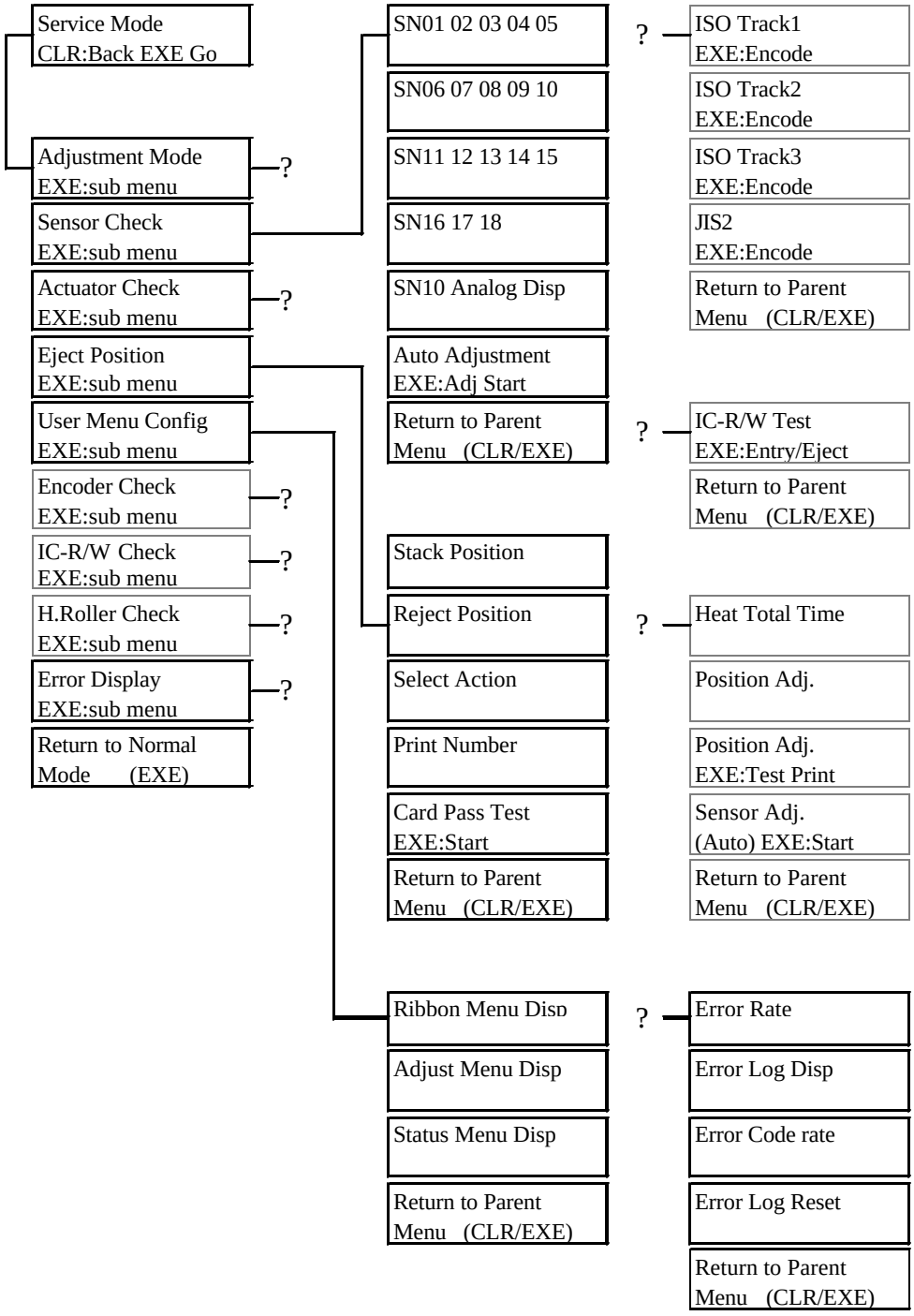
To go one layer higher than the present, switch the menu to "Return to Parent Menu" and press EXE key.

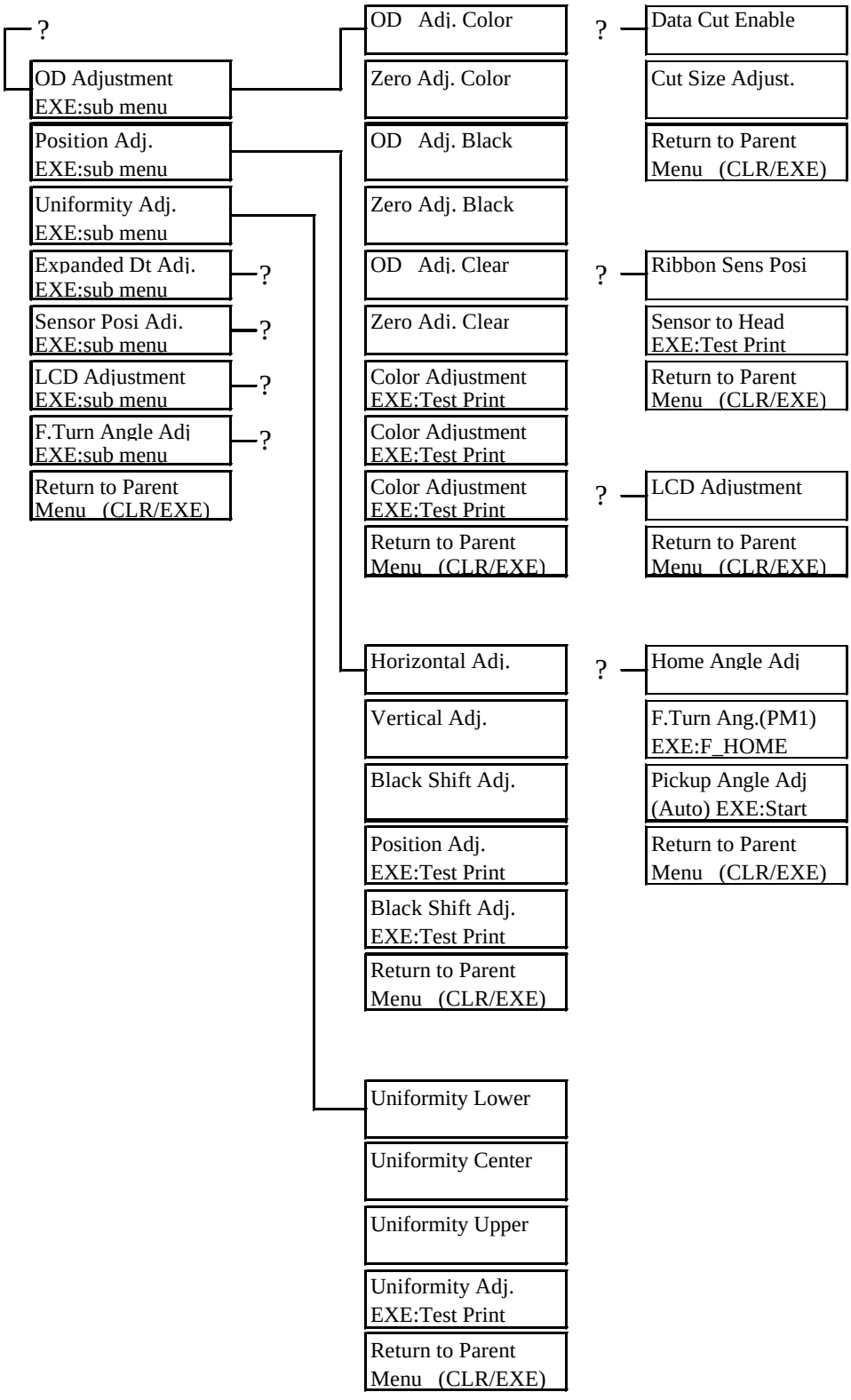
? Returning to Normal Mode

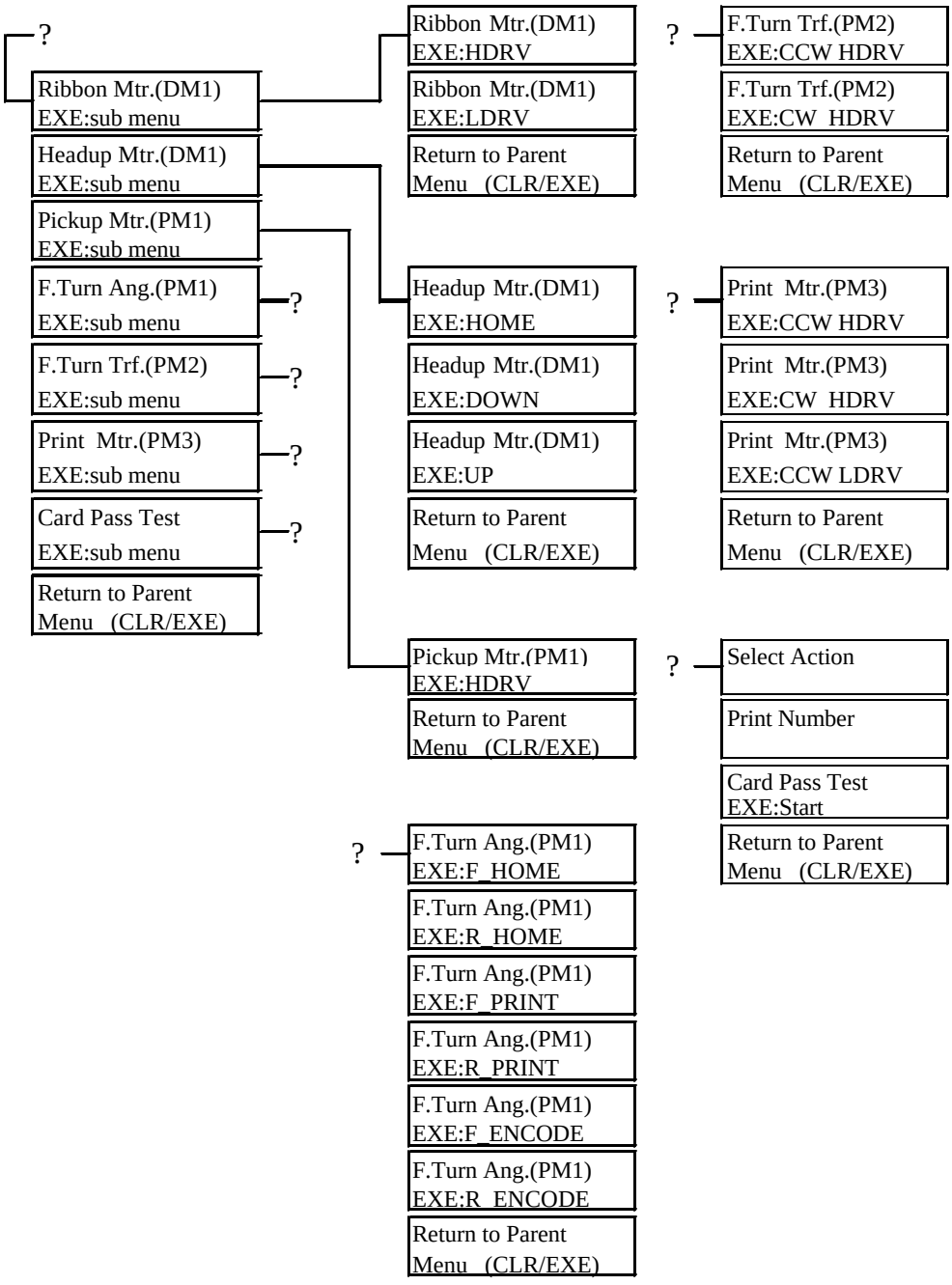
Switch the menu to "Return to Normal Mode" and press EXE key or switch the menu to "Return to Parent Menu" and press CLEAR key.

3.3.2 Menu Structure of Service Mode

The Menus of Service Mode are as follows. The part in rectangle will be displayed only when the referred optional units are connected.




?
OD Adjustment
EXE:sub menu
Position Adj.
EXE:sub menu
Uniformity Adj.
EXE:sub menu
Expanded Dt Adj.
EXE:sub menu
Sensor Posi Adj.
EXE:sub menu
LCD Adjustment
EXE:sub menu
F.Turn Angle Adj
EXE:sub menu
Return to Parent
Menu (CLR/EXE)
OD Adj. Color
Zero Adj. Color
OD Adj. Black
Zero Adj. Black
OD Adj. Clear
Zero Adj. Clear
Color Adjustment
EXE:Test Print
Color Adjustment
EXE:Test Print
Color Adjustment
EXE:Test Print
Return to Parent
Menu (CLR/EXE)
Horizontal Adj.
Vertical Adj.
Black Shift Adj.
Position Adj.
EXE:Test Print
Black Shift Adj.
EXE:Test Print
Return to Parent
Menu (CLR/EXE)
Uniformity Lower
Uniformity Center
Uniformity Upper
Uniformity Adj.
EXE:Test Print
Return to Parent
Menu (CLR/EXE)
Data Cut Enable
Cut Size Adjust.
Return to Parent
Menu (CLR/EXE)
Ribbon Sens Posi
Sensor to Head
EXE:Test Print
Return to Parent
Menu (CLR/EXE)
LCD Adjustment
Return to Parent
Menu (CLR/EXE)
Home Angle Adj
F.Turn Ang.(PM1)
EXE:F_HOME
Pickup Angle Adj
(Auto) EXE:Start
Return to Parent
Menu (CLR/EXE)


?
Ribbon Mtr.(DM1)
EXE:sub menu
Headup Mtr.(DM1)
EXE:sub menu
Pickup Mtr.(PM1)
EXE:sub menu
F.Turn Ang.(PM1)
EXE:sub menu
F.Turn Trf.(PM2)
EXE:sub menu
Print Mtr.(PM3)
EXE:sub menu
Card Pass Test
EXE:sub menu
Return to Parent
Menu (CLR/EXE)
?
?
?
?
Ribbon Mtr.(DM1)
EXE:HDRV
Ribbon Mtr.(DM1)
EXE:LDRV
Return to Parent
Menu (CLR/EXE)
Headup Mtr.(DM1)
EXE:HOME
Headup Mtr.(DM1)
EXE:DOWN
Headup Mtr.(DM1)
EXE:UP
Return to Parent
Menu (CLR/EXE)
Pickup Mtr.(PM1)
EXE:HDRV
Return to Parent
Menu (CLR/EXE)
?
F.Turn Ang.(PM1)
EXE:F_HOME
F.Turn Ang.(PM1)
EXE:R_HOME
F.Turn Ang.(PM1)
EXE:F_PRINT
F.Turn Ang.(PM1)
EXE:R_PRINT
F.Turn Ang.(PM1)
EXE:F_ENCODE
F.Turn Ang.(PM1)
EXE:R_ENCODE
Return to Parent
Menu (CLR/EXE)
?
F.Turn Trf.(PM2)
EXE:CCW HDRV
F.Turn Trf.(PM2)
EXE:CW HDRV
Return to Parent
Menu (CLR/EXE)
?
Print Mtr.(PM3)
EXE:CCW HDRV
Print Mtr.(PM3)
EXE:CW HDRV
Print Mtr.(PM3)
EXE:CCW LDRV
Return to Parent
Menu (CLR/EXE)
?
Select Action
Print Number
Card Pass Test
EXE:Start
Return to Parent
Menu (CLR/EXE)

3.3.3 Description of Service Mode

(Adjustment Mode: printer adjustment menu)
Adjusting maximum optical density and print position etc.

> Note: Do not make the value higher or lower than you need. It may cause trouble.

*Optical Density (OD) Adjustment Menu

OD Adj. Color : OD Adjustment for color image
OD Adj. Black : OD Adjustment for Black
OD Adj. Clear : OD Adjustment for Clear (over coat)
Clear key : Make image lighter (Min. value :-7)
Exe key : Make image darker (Max. value :7)

*Pre-heat Adjustment Menu

Zero Adj. Color : Pre-heat Adjustment for color print
Zero Adj. Black : Pre-heat Adjustment for Black print
Zero Adj. Clear : Pre-heat Adjustment for Clear (over coat) print
Clear key : Decrement Value (Min. value :-7)
Exe key : Increment Value (Max. value :7)

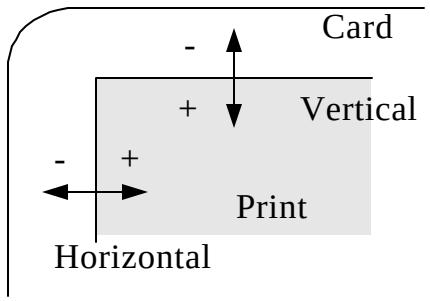
According to a card. In case that color come out even there is no data transferred or color do not come out well, then use this adjustment.

*Print position adjustment

Horizontal Adj. : Position adjustment for horizontal direction
0.085mm/digit (see figure below for adjustment direction)
Clear key : Decrement Value (Min. value :-50)
Exe key : Increment Value (Max. value :50)

*Print position adjustment

Vertical Adj. : Position adjustment for vertical direction
0.085mm/digit (see figure below for adjustment direction)
Clear key : Decrement Value (Min. value :-16)
Exe key : Increment Value (Max. value :16)



*Adjustment for divergence between image and text.

Black shift Adj. : Adjustment for card transportation length for beginning point of printing

Transportation length 0.1% (+ : increment length)

Clear key : Decrement Value (Min. value :-50)

Exe key : Increment Value (Max. value :50)

Note: Use this Adjustment when there is difference on beginning point of printing between color image and black text, and a part or whole print area is overlapped.

Note: This menu is not for adjusting beginning point of printing.

*Adjustment for uniformity of optical density

Uniformity Lower : Uniformity adjustment on lower area of a card

Uniformity Center : Uniformity adjustment on middle area of a card

Uniformity Upper : Uniformity adjustment on upper area of a card

Clear key : Decrement Value (Min. value :0)

Exe key : Increment Value (Max. value :9)

Note: To increment value, an image will be lighter.

Note: Use this menu to make density even for three area framed in blue line.

Note: This menu is not available to adjust the divergence of density in direction of card transportation.

*Set the printing on right edge of a card

Data Cut Enable : Set the data cut function enable or disable when a printer detect the right edge of a card

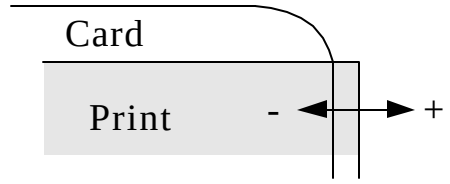
Clear key : N/A

Exe key : enable (ON) or disable (OFF)

Note: Set this function enable if this function does not affect the card design. Because ink ribbon might be cut out by heat of print head when printing on out of a card.

*Adjustment for the position of right edge of a card

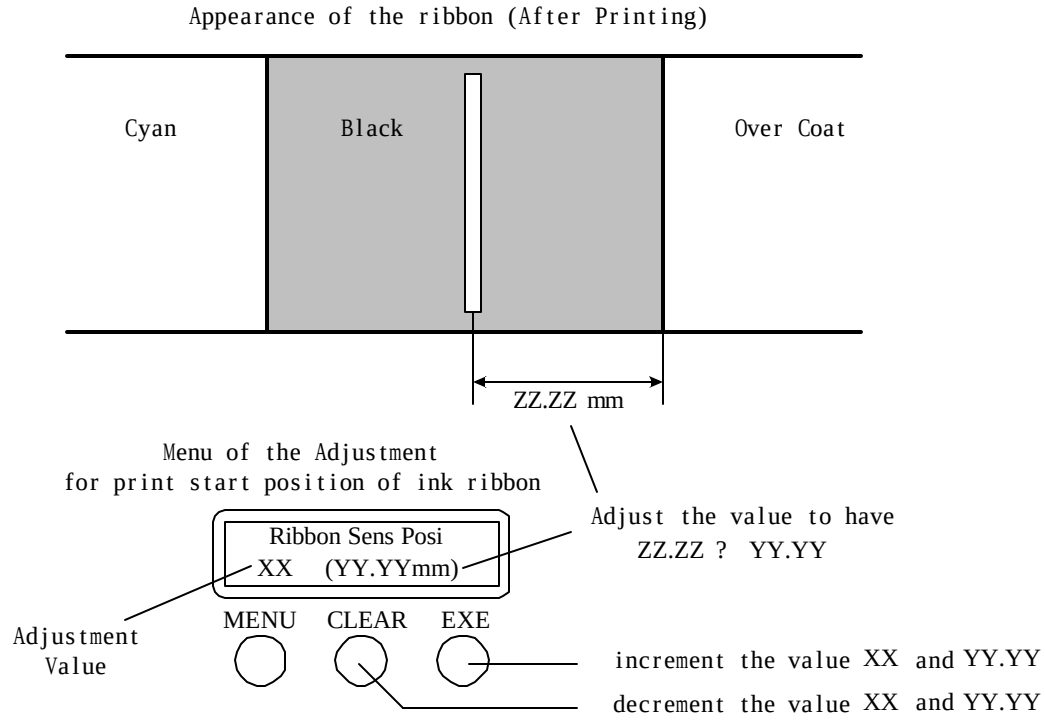
Data Cut Adjust. : Adjustment for the position of data cut off
0.085mm/digit
Clear key : decrement value (Min.-50)
Exe key : increment value (Max.50)



Note : Set the value to negative direction for leeway. Because the end of print area might slightly shift in back and force.

*Adjustment for print start position of ink ribbon

Ribbon Sens. Posi. : Adjustment for print start position of ink ribbon
XX : Adjustment value
YY : distance between sensor and print head
0.5mm/digit
Clear key : decrement value (Min.-9)
Exe key : increment value (Max.9)



*Adjustment of the density of LCD panel

LCD Adjustment

Clear key : Lighter (min. -3)

Exe key : Darker (max. 3)

*Adjustment of the angle of Flip Turn unit

Home Angle Adj. : Adjustment of the angle for the horizontal position of Flip Turn unit

(0.5 degree/digit)

Clear key : decrement value (min.-5)

Exe key : increment value (max. 5)

Note : Adjust the angle correctly. Otherwise it may cause

*Adjustment of the angle of Flip Turn unit (F/T) in case of card picked up

Pickup Angle Adj. : Adjustment the value to revise the angle of the F/T when card picked up.

Clear key : N/A

Exe key : Start auto adjustment function

This menu is for the adjustment to revise the angle of F/T. Because F/T may rotate slightly in not intention when picking up a card. In case of any error happens or F/T rotate beyond the limit while auto adjustment, Auto adjustment will finish as error. When F/T rotate beyond the limit, check the tension of drive belt for F/T .

(Sensor Check)

This menu to display the sensor outputs and automatic sensor adjustment. Used to check the condition of the printer when troubleshooting.

*Sensor level display menu

SN 01 02 03 04 05 : Display of status on sensor 01 02 03 04 05

SN 06 07 08 09 10 : Display of status on sensor 06 07 08 09 10

SN 11 12 13 14 15 : Display of status on sensor 11 12 13 14 15

SN 16 17 18 : Display of status on sensor 16 17 18

Clear key : N/A

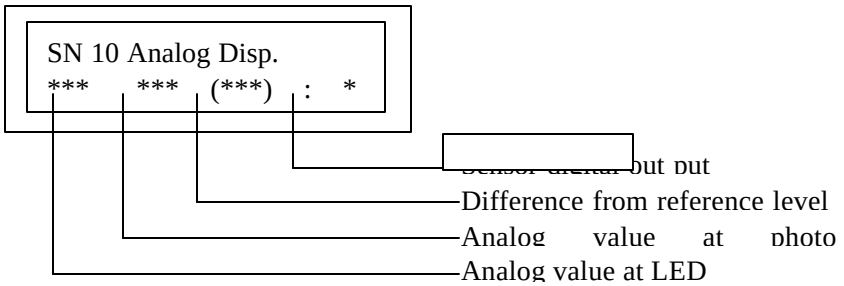
Exe key : N/A

*Display of analog value on the sensor for ribbon detection

SN 10 Analog Disp. : Display of amount of light of sensor for ribbon mark detection

Clear key : Decrease the amount of light

Exe key : Increase the amount of light



Note : Use this menu only when checking the status of the sensor in error occurred , nevertheless it can be changed out put level.

Note : Since this mode is for just checking , The value adjusted in this mode does not memorize in the printer.

*Auto adjustment menu for ribbon detection sensor

Auto Adjustment : Auto Adjustment for ribbon detection sensor

Clear key : N/A

Exe key : Execute auto adjustment

Note : Execute this menu after taking ribbon cartridge out.

Note : Must execute this menu when sensor and/or main board replaced.

Actuator check (Activate the actuators individually)

This menu is for checking the actuators when troubles occur.

Note : Remove the card remained in the printer, otherwise it may cause trouble.

*Action of transferring Ink ribbon

Ribbon Mtr.(DM1) : Winding up the ink ribbon for limited time

HDRV : High speed action (100mm/s)(*)

LDRV : Low speed action (50mm/s)

Clear key : Quit action

Exe key : Start action

*the speed change to 50mm/s at 50mm before stopping.

Note : Must execute this menu in Ribbon put in the printer.

*Action of head up/down

Headup Mtr.(DM1) : to move the print head to position set.

HOME : to move the print head to ready position

DOWN : to move the print head to print position

UP : to move the print head to the position where ink ribbon can be changed

Clear key : stop

Exe key : start

Note : Do not activate the platen roller at the print head is down position, otherwise it may cause a print head and/or platen roller damaged.

*Action of supply roller

Pickup Mtr.(PM1) : activate a supply roller for limited time

HDRV : High speed (300mm/s)

Clear key : stop

Exe key : start

Note : Must execute this menu without cards in the card hopper.

*Action of Flip Turn unit (FT) rotation

F.Turn Ang(PM1) : Rotate FT to set direction
F_HOME : Forward phase at home position (supplying. HR. normal ejection)
R_HOME : Reverse phase at home position (HR. normal ejection)
F_PRINT : Forward phase at print position (print. IC encoding)
R_PRINT : Reverse phase at print position (print. IC encoding)
F_ENCODE : Forward phase at encoding position (Mg. encoding, error ejection)
R_ENCODE : Reverse phase at encoding position (Mg. encoding, error ejection)
Clear key : stop
Exe key : start

Note : Must execute this menu without cards in the card hopper.

*Action of card transportation rollers at FT

F.Turn Trf(PM1) : Activate the rollers in FT for limited time
CCW HDRV : High speed (CCW, 300mm/s)
CW HDRV : High speed (CW, 300mm/s)
Clear key : stop
Exe key : start

Note : Must execute this menu without cards in the card hopper.

*Action of card transportation roller at print block

Print Mtr.(PM) : Activate the rollers at print block in limited time
CCW HDRV : High speed (CCW, 300mm/s)
CW HDRV : High speed (CW, 300mm/s)
CCW LDRV : Low speed (CCW, 200mm/s)
Clear key : stop
Exe key : start

Note : Must execute this menu without cards in the card hopper.

*Setting number of cards issued

Print Number : set the number of times for card transportation test.
Clear key : decrement number (min. 1)
Exe key : increment number (max. 100)

*Setting the pattern of card transportation action

Select Action :
Feeder -> Stack : Feeder → Normal eject
Feeder -> Reject : Feeder → Error eject
Feeder -> Print : Feeder → Print block → Normal eject
Clear key : N/A
Exe key : Selecting action pattern

*Executing of card transportation action

Card Pass Test : Execute the action which has been set above
Clear key : N/A
Exe key : Action start

(Eject Position : setting position of card ejected)

Use this menu for changing the position of card ejected

*Setting position of normal eject

Stack position
Left (default) : ejecting from left side of the printer
Right : ejecting from right side of the printer
Clear key : N/A
Exe key : select ejecting position

*Setting position of error card eject

Reject position
Left (default) : ejecting from left side of the printer
Right : ejecting from right side of the printer
Clear key : N/A
Exe key : select ejecting position

*Setting number of card transportation test

Print Number : Setting number of times for test
Clear key : decrement number (min. 1)
Exe key : increment number (max.100)

*Executing of card transportation action

Card Pass Test : Execute the action which has been set above
Clear key : N/A
Exe key : Action start

(User Menu Config.)

This menu is for limitation of showing the menu in User Mode

*Selecting user menu showed

Ribbon Menu Disp. : “Ribbon Type” menu display/not display
Adjust Menu Disp. : “Image Setup” menu display/not display
Status Menu Disp : “Printer Status” Menu display/not display
Clear key : N/A
Exe key : Change setting (display/not display)

This menu usually use to prevent the settings changed accidentally.

(Encoder Check)
This menu is for checking an encoder .

*Magnetic data writing test

ISO Track 1	: Writing to ISO Track 1
ISO Track 2	: Writing to ISO Track 2
ISO Track 3	: Writing to ISO Track 3
JIS2	: Writing to JIS2 Track
Clear key	: N/A
Exe key	: Action start

To write the data to track of which is set.
When ISO type encoder is set in printer display shows only ISO Track 1 or 2or 3.
******** showed end of data means Total No. of the printer has fed cards.

Writing data is as follows
(ISO Track 1)
ISO_TRACK_1_ENCODE_TEST._ARTLAND_COLOR_PRINTER_PR5350_
TOTAL_NO.____********

(ISO Track 2)
12345678901234567890123456789*******

(ISO Track 3)
1234567890123456789012345678901234567890123456789012345678901234567890
12345678901234567890123456********

(IC-R/W Check : To transport a card at IC-R/W position)

*Menu of Action to transport a card

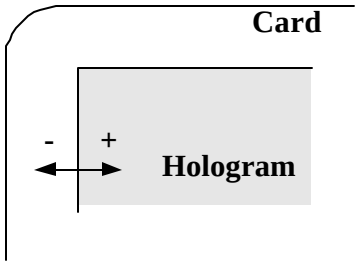
IC-R/W Test	: To check the action of card transported at IC-R/W position
Clear key	: N/A
Exe key	: start action

Once pressing EXE key a card is transported at IC-R/W position and stopped.
Pressing EXE key again the card is ejected from normal exit.

(Heat Roller Check)
To adjust a Heat Roller unit

*Display the total heating time
Heat Total Time : heater total power on time
Clear key : N/A
Exe key : N/A

*To adjust transferring position
Position Adj. : adjusting transferring position (horizontal direction)
unit of adjustment= 0.2mm
Clear key : decrement value (min.-10)
Exe key : increment value (max.+10)



*Sensor adjustment
Sensor Adj : auto adjustment of ribbon detection sensor
Clear key : N/A
Exe key : execute auto adjustment

Note : Execute this adjustment after taking ribbon cassette out.

Note : Must execute this menu when replace sensor and main board.

(Error Display)
Error history display

*Error ratio display
Error rate : displays frequency of error occurred
aa : number of error lately occurred (max.99)
bbbbb : number of prints in term of above
Clear key : N/A
Exe key : N/A

Error rate

*Error history display
Error Log Disp : displays the errors recorded in a printer
aa : error code
bb : detail code
dd : order of error occurred
********* : total count at the error occurred
Clear key : change stored error (decrement dd late -> past)
Exe key : change stored error (increment dd past -> late)

Error Log Disp
Error : aa (bb) dd

Error Log Disp
Count : *******

Displays Total count at every 10 errors.

*Number of error occurred display
Error Code rate : Displays number of the error occurred in order
aa : error code
bb : detail code
cc : total number of error occurred
dd : number of times of the error occurred
ee : number of times of the error with the detail code occurred
Clear key : to switch display error code / detail code
Exe key : to switch display error and/or detail code

Error Code rate
Err. aa (--) dd/cc

Error Code rate
Add. aa (bb)

*Reset the error history
Error Log Reset : Clear error history
Clear key : error history clear (press with exe key)
Exe key : error history clear (Press with clear key)

Section 4 Maintenance

4.1 Maintenance List

To keep the optimum performance of the Printer, periodic maintenance operation is necessary which is described in Section 6, Cleaning and Section 7, Periodic replacement Parts in the Operation Manual.

This section describes the items which may be required to perform considering the user's situation, as well as cleaning and replacements.

Section	Maintenance	Tools
Rubber Roller ? Cleaning Roller	Every 2,000 frames Replace as required (40000 frames) Symptom: Poor transportation	Philips screw driver, Soft Cloth Alcohol Philips screw driver
? Print Roller	Cleaning, every 10000 frames	Soft Cloth. Alcohol
? Feed Roller	Cleaning, every 10000 frames	Soft Cloth. Alcohol
? Other	Cleaning, as required Symptom: Poor transportation ? Trouble shoot	Philips screw driver, Swab Alcohol
Pulley Shaft	Apply Grease, as required Symptom: Noise	Flat-head screw driver, Grease (Molycoat)

4. 2 Method of Maintenance

In this section, the maintenance method is described for the items listed in the maintenance list. For the following items, read the relative sections of Operation Manual.

Cleaning Cleaning Roller	Sec. 6
Replacing Cleaning Roller	Sec. 7
Cleaning Print Roller	Sec. 6
Cleaning Feed Roller	Sec. 6
Cleaning Print Head	Sec. 6
Replacing Print Head	Sec. 7

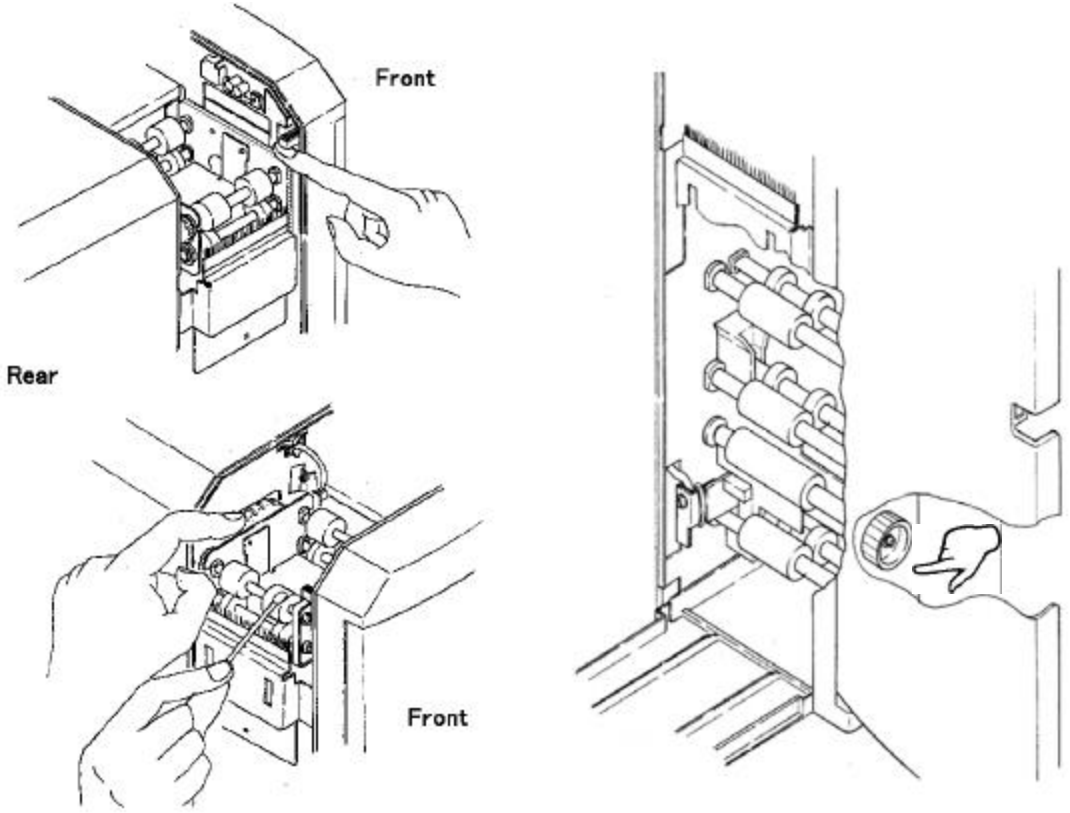
4.2.1 Cleaning Rubber Roller

This printer has several sets of rubber rollers to ensure high reliability of card transportation. However, if the rollers are stained because of use of stained cards or cards coated with special materials, transport error may occur due to reduced transportation power. Though periodic cleaning of rollers may be performed by users with a certain level of experience, the following intensive cleaning should be done if such transportation error occurs.

? Transport Rollers in Flip Turn Module
  ? Open Top Cover and rotate Turn Module so that the rollers come to the position where the cleaning can be done easily.
    ? This operation is done with the green knob in the flip turn module.

  ? Press a soft cloth with alcohol to the rollers and rotate them.
    ? This operation is done by rotating Green handle located at inside of side plate.

? Transport Rollers
  ? Open the left cover and insert a soft cloth with alcohol and press against rollers and rotate them.
    ? This operation is done with Cleaning Knob located on the Front Access Panel.



4.2.2 Applying grease to Pulley Shafts etc.

Plastic rollers used in this Printer is made of self-lubricative plastics.

On the shafts of rollers which are loaded with torque and has friction with shaft, grease is applied at the factory. Although further greasing in not required for normal usage, grease should be applied in case following parts are replaced for some reason or abnormal noise is detected.

Part No.	Name

Section 5 Replacement and Adjustment

5.1 Replacing Main Board (PBA-MAIN)

Step 1: Remove R-COVER

Step 2: Loosen two screws on the lower edge and remove two screws on the upper edge of MAIN-BOARD-PLT and remove a screw to fix the ground cable. Then, lean the board backward.

Step 3: Disconnect all harnesses from the board. (CN1 - CN15)

Step 4: Remove Main Board. (7 screws)

Step 5: Fix new Main Board onto the Printer (7 screws) and connect all harnesses.

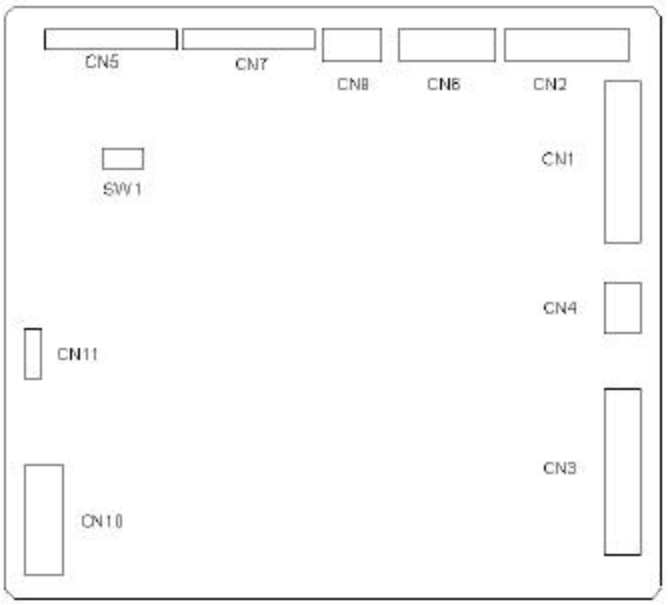
Step 6: Make sure that the SW1 is set as NORMAL MODE.

Step 7: Raise the MAIN-BOARD-PLT and fix with screws. (4 screws)

Step 8: Attach R-COVER.

Step 9: Turn ON the power and make downloading
Download the resistance data of print head first.
Then,:
- ? Adjustment of Print Position, Print Uniformity, Print Density.
- ? Adjustment of Sensor levels.
- ? Settings to be done in User Mode (Buzzer ON/OFF etc.)

Note: Turn OFF all Systems connected each other including PC when performing this operation.



5.2 Adjustment after Main Board replaced.

? In the memory on the Main Board, the adjustment values for the printing operation are stored. Therefore, when replacing the main board, the adjustment in the following steps are necessary. It is advisable to memorize these adjustment values before beginning the replacement work so that the values can be used for the new board.

? If there is a difference in the print quality between before and after there placement of the thermal head, adjust as following.

? For the details of the operation panel, please refer to Section 3, Operation Panel.

? Items to be adjusted in the Serviceman Mode

Adjustment Items	Main Board Replacement	Thermal Head Replacement
Print position	?	?
Print uniformity	?	?
Print density (Color)	?	?
Print density (BK)	?	?
Sensor (SN10) level	?	X

? : Necessary
? : Depending on the print result
X : Unnecessary

? Items to be set in the User Mode (Main Board Replacement only)

Setting Items	Setting
Ribbon Type	Setting the ribbon type to be used
Color Adjustment	Setting the color for color printing
Buzzer	Setting buzzer for the occurrence of error
Memory Mode	Setting the image memory
SCSI ID	Setting SCSI ID number
Parity Set	Setting the parity check of SCSI communication
Encode Type (Note)	Setting the type of magnetic encoding
Encode First (Note)	Setting priority of encoding or printing
Encode Mode (Note)	Setting the card insertion direction to the encoder
EXE Key Print	Setting the printing by EXE key
Print Retry	Setting automatic retry at the error recovery
Parallel Print	Setting parallel processing
Card Eject Face	Setting card side when ejected
Print Area	Setting maximum print area

Note: Setting of the encoder related items can only be made for the device with the built-in encoder.

5.2.1 Adjusting the Print Position

When main board is replaced, check and adjust the print position in the following procedure.

Step 1. Print Test Pattern H in the "Position Adjustment" menu of Service Mode.

Step 2. Adjust Horizontal and Vertical values so that dimensions h and v (distance from the edge of card) become 0.5 +/-0.2mm.

Step 3. Print the Test Pattern H again and confirm the h and v dimensions. Repeat the above if necessary.

Note 1: If h, v, is smaller than 0.5mm, increase the setting value.
If h, v, is larger than 0.5mm, decrease the setting value.

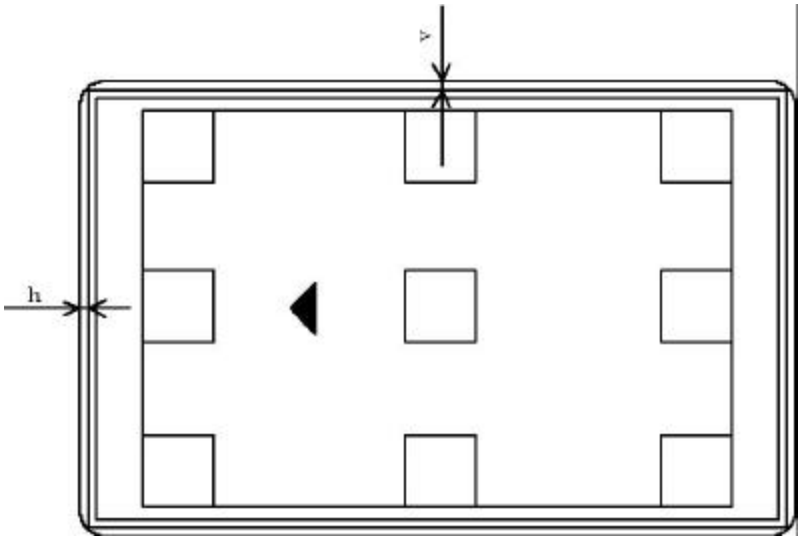
Note 2: Setting value can be calculated in the following formula.

$$H' = H + (0.5-h)/12$$

H' : New setting value (Horizontal)
H : Current value (" ")
h : measured value (mm)

V' can be obtained in the same formula.

Note 3: Start adjustment with the current value (value before replacing Thermal Head) retained.



Test Pattern for print position adjustment

<mm - dot conversion>

The resolution of the Thermal Head is 300 dpi. Therefore, adjustment should be done in this unit. Convert the measured value into the dot number using the table below.

New Setting Value = Current Value + (0.5 - Distance from card edge)

Convert by the following table.
If the distance is (-), dot should also be (-).

dot	mm	dot	mm
0	0.00	26	2.20
1	0.08	27	2.29
2	0.17	28	2.37
3	0.25	29	2.46
4	0.34	30	2.54
5	0.42	31	2.62
6	0.51	32	2.71
7	0.59	33	2.79
8	0.68	34	2.88
9	0.76	35	2.96
10	0.85	36	3.05
11	0.93	37	3.13
12	1.02	38	3.22
13	1.10	39	3.30
14	1.19	40	3.39
15	1.27	41	3.47
16	1.35	42	3.56
17	1.44	43	3.64
18	1.52	44	3.73
19	1.61	45	3.81
20	1.69	46	3.89
21	1.78	47	3.98
22	1.86	48	4.06
23	1.95	49	4.15
24	2.03	50	4.23
25	2.12		

5.2.2 Adjustment of Print Uniformity

When the main board is replaced, check and adjust the print uniformity in the following procedure after adjusting the print position.

Step 1: Print Test Pattern H in "Uniformity Adjustment" menu of "Service Mode".

Step 2: Compare print density of the following three positions A, B, C, and decrease the densities of two positions to the same as the least dense position.

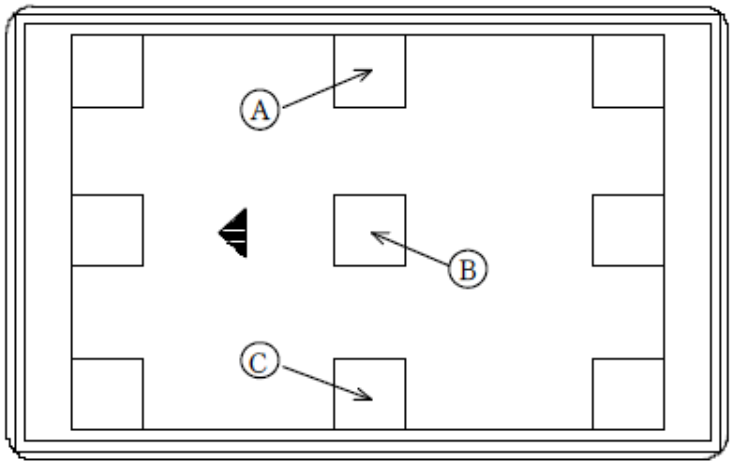
Step 3: Print Test Pattern H again and check the density of the three positions. Adjust again if necessary.

Note 1: Use density meter to compare the densities. If the instrument is not available, check visually.

Note 2: Three positions A, B, C, correspond to the positions shown on the Operation Panel as following:

A: Upper
B: Center
C: Lower

Note 3: Start adjustment with the current value (value before replacing Thermal Head) retained.



Test Pattern for uniformity adjustment

5.2.3 Adjustment of Print Density

When the main board is replaced, check and adjust the print density in the following procedure after adjusting print position and print uniformity.

? Adjustment of Image and Protective Layer

Step 1: Print Test Pattern J in "OD Adjustment" menu of "Service Mode".

Step 2: Change "Color" Setting Value so that there is no color drop off and the average density of Positions A, B, C, becomes within 1.65 +/-0.05.

Step 3: If the starting portion of Protective Layer is not printed, increase value of "Clear". (Caution: Do not set too large value because it may cause a trouble.)

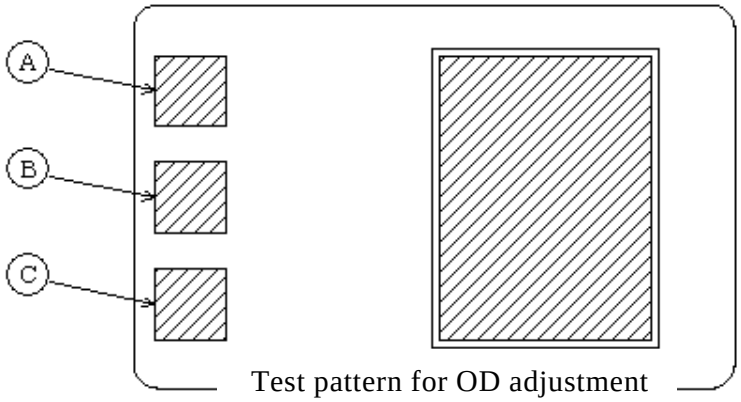
Step 4: Print Test Pattern J again to check the densities of A, B, C. Adjust again if necessary.

Note 1: Use density meter to compare the density, If instrument is not available, use sample card and compare visually.

Note 2: The larger the "Color" value, the higher the density becomes.

Note 3: Start adjustment with the current value (value before replacing Thermal Head) retained.

Note 4: Start adjustment with remaining the value that is set before changing print head



Test pattern for OD adjustment

? Adjustment of BK

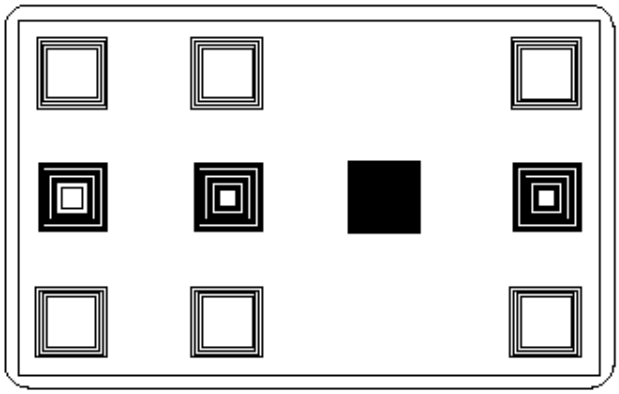
Step 1: Print Test Pattern E in "OD Adjustment" menu of "Service Mode".

Step 2: If there is a drop off in the image, increase the setting value. Conversely, if the image is too thick and lines touches each other, decrease the value.

Step 3: Print Test Pattern E again and check the print condition. Adjust again if necessary.

Note 1: Start adjustment with the current value (value before replacing Thermal Head) retained.

Note 2: As to the operation of the Operation Panel, refer to Section 3 "Operation of Operation Panel".



Test Pattern for resin BK adjustment

5.2.4 Adjustment of Sensor Level

Adjustable sensors of the Printer are factory adjusted at the time of shipment. Readjustment is necessary in the following case:

- ? Sensor is replaced. (light source, receiver)
- ? Mechanically changed affecting the light axis.
- ? Main Board (PBA-MAIN) is replaced.
- ? Ribbon related error occurs frequently.

If the sensor output voltage is below the specified value in spite of the adjustment according to correct procedure, repair the defective parts as instructed in paragraph 3.

Note: Adjust the sensor output level at where the external light will not affect. When measuring the output voltage of the sensor with volt meter, use the meter at 0.1V range.

1) Automatic Adjustment of Sensors

Step 1: With the power OFF, visually confirm that there is no card in the Printer.

Step 2: Open Ribbon Cover and pull out the Ribbon Cartridge. Set the Ribbon Cartridge again in the position so that Yellow Part of the Ribbon comes to block the light to SN10 and close the Ribbon Cover.

Step 3: Turn ON the power and execute "Sensor Auto Adjustment" menu in "Service Mode".

Step 4: Finish "Service Mode".

Note: Refer to Sec. 3 "Operation of Operation Panel".

2) Checking Sensor Output Voltage

Following is the standard voltage reading of Test Pins on the Main Board for checking the sensor voltage with tester.

? SN10(Detection of mark on the Ribbon)

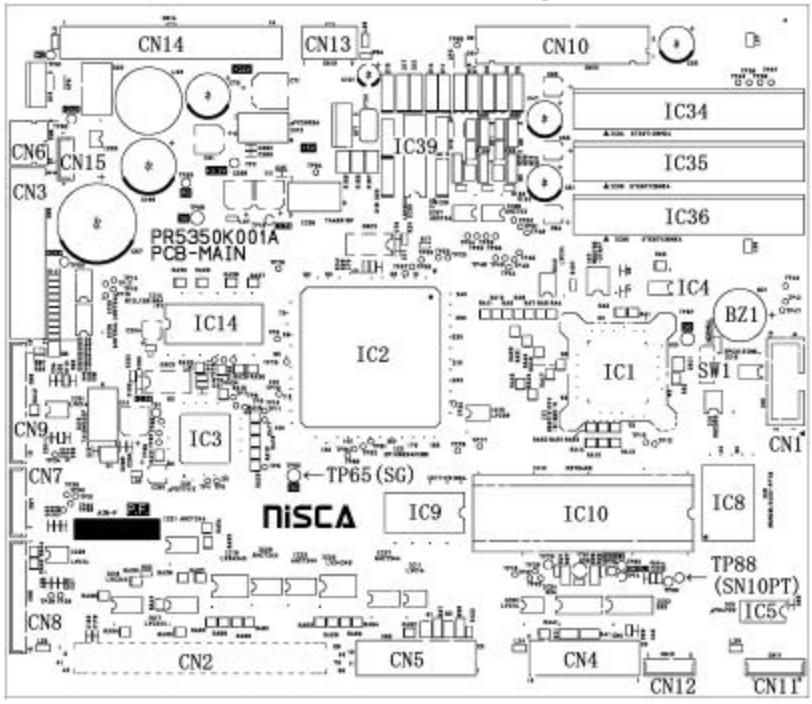
Test Pin: TP88(SN10PT)

Lighted: 1.0V or less (Yellow detection)

Blocked: 3.0V or more (Bk detection)

Note: Above voltage is between TP88 and TP65(SGND) on the Main Board.

Location of Test pins



3) Countermeasure for the Abnormal Sensor Output

If the sensor output as described in 2) is not obtained, locate the defective part and repair in the following procedure.

Possible Defect	Check and Repair
Defective connection of harness and Printed Printed Circuit Board.	Check contcts of all connectors which connects the boards with light sources and sensors to the Main Board.
	Check the contact of each harness with circuit tester following the circuit diagram and if defective connection is found, replace the harness.
Defective mounting of sensor.	Check mounting of the light sources and sensors. If incorrect mounting angle of sensor or loose screw is found, correct the mounting.
	Confirm that the light emitting face and the receiving face of the sensors are facing directly and there is nothing in between to block the light.
Defective sensor.	Replace the sensor (light emitter and receiver) and confirm normal operation.
Defective Main Circuit Board.	Replace the Main Circuit Board (PBA-MAIN) and confirm normal operation.

Note: Turn OFF the power when checking connection of harness and replacing parts.

5.3 Adjusting density of LCD Display

Density of LCD Display on the Operation Panel Board (PBA-OPEPANE) is adjusted to the optimum when shipping from factory. However, it can be adjusted by the user in the following procedure.

Step 1: Turn ON the power and get the LCD Adjustment in Service Mode.

Step 2: To make the density higher, press EXE key
To make the density higher, press EXE key

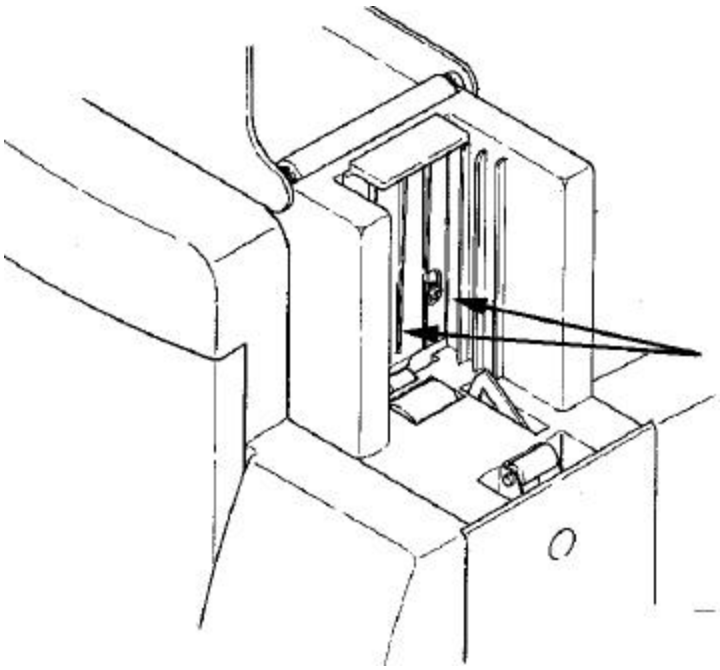
5.4 Adjustment for Card Thickness

? Adjustment of Gap of Separation Gate

Step 1. Open cover of Card Supply Box, loosen 2 screws (M3 x 8) fixing the Gate and lift the Gate.

Step 2. Insert a flat plate 'having about 1.5 times of thickness of the card' beneath the middle of the gate and press down the Gate and tighten the screws.

Step 3. Remove the plate.



Loosen two screws

Section 6 Troubleshooting

This paragraph deals with the causes and countermeasures for various troubles which may occur with the printer system.

6.1 Troubleshooting with the display on the LCD.

When a trouble is detected, the error indication LED on the operation panel is turned ON and the type of the trouble is shown on the LCD. In this section, the cause and the method of recovery are explained based on the display on the LCD.

? The type of the error is indicated with the two digit of error code (Er) and two digit of details code (Ad).
On the LCD panel, it is shown with error message (16 digits x 2 lines: corresponding to the error code) and four digit numbers (2 digits :Er and 2digits:Ad) on the lower right corner.

example

Front Cover is
Open 12-01

In this case
Error Code (Er) : 12h
Details Code (Ad) : 01h

The details code may be indicated with the wild card (**) in this paragraph.

? User operates the error recovery steps based on the error message on the LCD panel. Most of the errors can be recovered by the user. However, in case of unrecoverable error or frequent errors, the service person must be called.

? When there is a service person call from users, please ask to inform detailed symptoms, error message and details code.

6.1.1 Display on the LCD and method of recovery

(1) Display of normal status

The following displays on the LCD are normal status of the printer.

To distinguish from the error, the error indication LED is not lit and the details code is not displayed.

LCD Display	Status
Ready to print	The printer is at the waiting status (normal status). It is possible to transfer the data from the host computer and print.
Ready to print. -Head upside-	The print head is lifted and the ribbon cassette can be removed. It is possible to transfer the data from the host computer and print.
Please wait ... Initializing	Printer is being initialized.
Please wait ... Now printing	Printer is processing the printing job. Depending on the setting of the memory mode, the data transfer is possible in this status.
Please wait ... HeatRoll Warm Up	Optional heat roller unit is being warmed up.
Ready to Down load	This indicates that the booting as safety mode because the main program is damaged . Download the main program. Please read paragraph 7 for the downloading.
HOST -> Fl Memory Loading .....wait	This indicates that now loading.

(2) Messages to prompt manual recovery from the error

The following messages shows the steps of manual operation to recover.
When the [CLEAR] key is pressed after the error, the printer does the recovery operation if the conditions for recovery are met. If not, one of the following messages will be shown. There is no details code. (This shows the condition for recovery only and does not indicate occurrence of any error.)

LCD Display	Status	Recovery Method
Check Ink Ribbon	CLEAR] key is pressed while Ribbon Empty or Ribbon Take Up error.	Take out the ribbon cassette and check the status of the ribbon. Then, close the Front Access Cover and press [CLEAR] key.
Card Empty	[CLEAR]key is pressed while there is no card.	Set the cards in the card hopper and press [CLEAR]key.
Front Cover is Open	CLEAR]key is pressed while the Front Cover is open.	Close the Front Access Cover and press [CLEAR] key.
Top cover is open	[CLEAR]key is pressed while the Front Cover is open.	Close the Side Access Cover and Top Cover Then press [CLEAR] key.
Card Jam Remove the card	[CLEAR]key is pressed while a card is remaining inside of a machine	Turn power off and remove the card manually. See the operation manual for how to remove the card. Turn power on .
Resist Data is not loaded	[CLEAR]key is pressed while the Data is not installed	Download the resistance data of which the ser.# is matched to the ser.# of the print head. See the operation manual Section 7 for downloading.
Can not Recover Please Reset	CLEAR] key is pressed while there is an unrecoverable error.	Turn OFF and ON the power, or execute RESET on the operation panel.

(3) Error message display in the normal usage of the printer. These are the errors which occur while the printer is in normal use. They are easily recoverable by the users. However, the errors may be erroneously detected by the sensor defectives. In such case, the checking and repair by the service person is necessary.

LCD Display	Status	Recovery Method
Card Empty 13-01	Card is empty.	Set the cards in the card hopper and press [CLEAR] key.
Ribbon Empty 20-**	Printing Ribbon is finished.	Set new ribbon in the printing block and press [CLEAR] key.
Front Cover is Open 10-01	Front Access Cover is open.	Check that the Front Access Cover is positively closed and press [CLEAR] key.
Top Cover is Open 11-01	Front Access Cover is open.	Check that the Front Access Cover is positively closed and press [CLEAR] key.
Ribbon Type Incorrect 22-**	The type of ribbon does not match the printer setting.	Check whether the ribbon type is same as the printer setting. if it is different, change the setting of the operation panel.

(4) Card jam related Error messages

Card jam errors occur when the card is not transported in the printer system as the sequence. The basic recovery steps for the card jam errors are described below. The card jam errors may be caused by the cards being used. Check if there is any problem on the card itself such as the specification (thickness, size, etc.), bend, surface finish (anti-static treatment, special finish, etc.).

LCD Display	Status	Recovery Method
Card Jam. Feeder Area- **-**	Card is not fed normally from the card feeder.	Check whether the cards are set correctly in the card feeder and press [CLEAR] key.
Card Jam. Feeder Area- 42-**	A card remains at SN02 and can not pass to F/T unit	Take the card out by hands
Card Jam. F. Turn Area-- **-**	Card transportation error in the flip turn block.	Press [CLEAR] key. If impossible to recover, checking and repair by service person is necessary.
Card Jam. F. Turn Remove-- 47-**	A card remains at SN03 and can not pass to F/T unit	Take the card out by hands
Card Jam. F. Turn Lost-- **-**	A card is lost between F/T and an unit around the F/T	Take the card out by hands
Card Jam. Print Area-- **-**	Card transportation error in the print block.	Press [CLEAR] key. If impossible to recover, check and repair by the service person is necessary.
Card Jam. Encode Area-- **-**	Card transportation error in the Encoder Unit.	Press [CLEAR] key. If impossible to recover, check and repair by the service person is necessary.

(5) Error messages of the internal troubles of the printer.

The following is the error messages of the internal troubles of the printer system.
Most of those troubles needs the check and repair by the service person.

LCD Display	Status	Recovery Method
Service Man Call error Code **-**	There is an unrecoverable error in the printer.	Turn OFF and ON the power or execute RESET. If the error repeats, check and repair by the service person is necessary.

6. 1. 2 Checking and repairing of the hardware related troubles.

Please check and repair in the following steps when the errors are not recovered by the users.

< Note > Read the following without fail before troubleshooting.

? There are Error Message, Error Code, and Details Code for each errors.

· To find diagnosis form the LCD Display, use the combination of Error Message Error Code (Er) and Details Code (Ad).

· Use the combination of Error Code and Details Code for checking the contents of the error log.

? Do not forget to turn OFF the power switch and disconnect the power cord before performing the following operation.

· Replacing the thermal head.

· Removing the front or back cover of the printer.

· Checking connection of the harness etc.

· Replacing the parts of PCB, sensor, motor, etc.

· Installing or dismounting the Encoder Unit to the printer.

· Connecting the optional units.

· Removing the cover of the optional units.

*To use the sensor check mode to check the sensor operation with the cover removed, please be careful not to touch the PCB. It may cause a trouble.

As it is dangerous, please carefully operate the operation panel not to move into other mode than the sensor check mode.

? Card Jam Errors are detected by the sensors located along the card path, and classified in two categories according to the cause.

· Un-arrival Jam: In the card transportation, the card is not detected at a specified position after a specified time.

· Staying Jam: In the card transportation, the card is staying at the position where it should not stop at. (Undesired sensor condition).

? "Area ----" in a message of card jam means detail of where card is stuck. See Area map in section 6.3.

? If the error relating to the adjustable sensors repeats, the incorrect setting of the sensor is doubted. Readjust the sensor sensitivities following the instruction in the paragraph 3.

· SN11 Ink ribbon end sensor.

? When checking the various actuators, please check that no card is remaining in the printer. If the independent checking operation is done while the card is remaining, it may cause other trouble.

? Please follow the steps described in the paragraph 4, for cleaning of the rubber rollers.

List of the hardware error related error messages

Error code 10h-2Fh cover open / card empty / related to ribbon

Error Message	Er. Code	Ad. Code	Description
Front Cover is Open	10	01	Front cover is open
Top Cover is Open	11	01	Top cover is open
Card Empty.	13	01	Hopper is empty
Ribbon Empty.	20	01 03,04 06	End mark is detected Abnormal winding up (Initializing) End mark is detected (Initializing)
Ribbon Wind up miss.	21	03 04	Abnormal velocity is detected on Ribbon transfer roller Abnormal pulse is detected on ribbon supplying spool
Ribbon Type Incorrect.	22	01	length is shorter on a color panel
		02	length is longer on color panel
		03	failure on detecting the mark on panel to panel
		04	could not detect a unique mark
		05	Abnormal cycle of unique mark
	23	**	Ribbon transportation time out

Error code 30h-3Fh Relation to hardware on print block (F/T rotation, head up down)

Error Message	Er. Code	Ad. Code	Description
Service Call Error Code	30	**	Time out error on F/T rotation
	31	02-04	F/T Stops at abnormal position
	32	**	Time out error on action of head UP/down
	36	01,02	Ribbon sensor adjustment range out
		03	Ribbon sensor adjustment time out
		04,05	Ribbon sensor adjustment (fine) range
		06	Ribbon sensor adjustment (fine) time
	37	01	Head cooling fan error
		02	Power supply cooling fan error
	38	01	Thermal sensor for head error
		02	Thermal sensor for power supply error

Error Message	Er.Code	Ad. Code	Description
Service Call Error Code	39	01	DSP information is not applied
		02	DSP data format error
	3A	01	DSP communication (sending) enable time out
		**	DSP command sequence error
	3B	01	DSP communication (receiving) enable time Out
	3C	01	DSP communication DMA control error
Resist data is not Loaded	3E	01	Resist data for print head is not applied
Resist Data Code error	3F	01	Error on format of Resist data for print head

Error code 40h-5Fh Relation to card Jam in card supply, F/T and print block

Error Message	Er.Code	Ad. Code	Description
Card JAM.Feeder Area01	40	**	supply block card JAM (Area 01)
	41	**	supply block card JAM (Area 02)
Card JAM.Feeder Area01	42	**	supply block card JAM (can not eject)
	43	**	
Card JAM.Feeder Remove	44	**	F/T block card JAM (Area 02)
	45	**	F/T block card JAM (Area 03)
Card JAM.F.Turn Area02	46	**	F/T block card JAM (Area 04)
	47	**	F/T block card JAM (Area 08)
Card JAM.F.Turn Area03	48	**	F/T block card JAM (can not eject)
	49	**	Lost a card in F/T (when going in)
Card JAM.F.Turn Area04	50	**	Lost a card in F/T (when going out)
	51	**	Print block card JAM (Area 04)
Card JAM.F.Turn Area08	52	**	Print block card JAM (Area 05)
	53	**	Print block card JAM (Area 06)
Card JAM.F.Turn Remove	54	**	Print block card JAM (Area 07)
Card JAM.F.Turn Lost			Print block card JAM (can not going out)
Card JAM.F.Turn Lost			
Card JAM Print Area04			
Card JAM Print Area05			

Card JAM Print Area06 Card JAM Print Area07 Card JAM Print Remove			

Error code 60h-6Fh Relation to firmware control error

Error Message	Er.Code	Ad. Code	Description
Service Call Error Code	60	**	supply block operation control time out error
	61	**	F.Turn block operation control time out error
	62	**	print block operation control time out
	6A	**	supply block command sequence error
	6B	**	F.Turn block command sequence error
	6C	**	print block command sequence error
	6D	**	En unit command sequence error
	6E	**	H/R unit command sequence error
	6F	2*	print block sequence error
		4*	H/R unit sequence error

Error code 70h-78h Relation to Magnetic encoder unit

Error Message	Er.Code	Ad. Code	Description
Service Call Error Code	70	01-03	Data sending error with Printer-En unit
		0F	Data receiving error with Printer-En unit
	71	10-16	Sequence error with Printer-En unit
	72	01	En unit format error
	73	**	En unit hard ware error
Encoder Write error	74	**	En unit writing error
Encoder Read error	75	**	En unit reading error
Encoder Data error	76	20	En unit incorrect data writing error
Card JAM Encode Area08	77	**	En unit card JAM (Area 08)
Card JAM Encode Area09	78	**	En unit card JAM (Area 09)

Error code 79h-7Fh Relation to Magnetic encoder unit

Error Message	Er.Code	Ad. Code	Description
IC R/W Control Error	7E	01	IC processing error

Error code B0h-CFh Relation to hardware on communication/ memory

Error Message	Er.Code	Ad. Code	Description
Encoder Data Error	BC	01-04	Error with specifying on IF Board
	C0	01	Error with DMA control (DRAM-> CPU)
		1*	Error with DMA control (CPU ->DRAM)
		2*	Error with DMA control (DRAM clear)
	C1	01	Time out error when clearing flash memory
		02	Time out error when writing flash memory
	C3	01-06	EEPROM read/write error

(1) Front Cover Open

Front Cover is Open Er-Ad

Er	Ad	Symptom	Check/Repair
10	01	Front Access Cover is left open If it becomes error despite the cover is closed, see the Check/Repair section.	(1) Check the reaction of SN13 to detect open/close of the Front Cover by using Sensor Check Mode. (2) If the sensor does not react normally, check connection and electric contact of the harness. · ASM-I/F-SW (3) If the harness connection is not normal, replace the following: · SN13 · PBA-MAIN

(2) Top Cover Open

Top Cover is Open Er-Ad

Er	Ad	Symptom	Check/Repair
11	01	Top Cover is left open If it becomes error despite the cover is closed, see the Check/Repair section.	(1) Close the Front cover and check the reaction of SN14 to detect open/close of the Top Cover by using Sensor Check Mode. (2) If the sensor does not react normally, check connection and electric contact of the harness. · ASM-I/F-SW (3) If the harness connection is not normal, replace the following: · SN14 · PBA-MAIN

(3) Card Empty

Card Empty Er-Ad

Er	Ad	Symptom	Check/Repair
13	01	Card is not set in the supply block. If it becomes error despite the cards are set, see the Check/Repair section.	(1) Check the reaction of SN1 by using Sensor Check Mode. (2) If the sensor does not react normally, check the connection and electric contact of the harness. · ASM-SENSOR-A (3) If the harness connection is normal, replace the following: · SN-1 · PBA-MAIN

(4) Ribbon Empty

Ribbon Empty **

Er	Ad	Symptom	Check/Repair
20	01 06	Ribbon Empty mark has been detected. If it becomes error despite the ribbon is set correctly and it has not reached at the empty mark, see the Check/Repair section.	(1)Adjust the sensor SN10in the Sensor Check Mode. If impossible to adjust, check the connection and electric contact of the harness. · ASM-SENSOR-B · ASM-LD RELAY2 (2)If the harness connection is normal, replace the following: · SN10 (LD,PT) · PBA-MAIN
	03	Velocity of winding ribbon is faster than it set. If a ribbon is set correctly and not to reach to end mark yet, See Check/Repair section.	(1) Check the reaction of SN8. by using Sensor Check Mode. If the sensor does not work correctly, go (2b) or (3b) mentioned below (2a) The sensor works correctly, check the connection and electric contact of the harness for DM1 ASM-MOTOR (3a) If the harness connection is normal, replace the following ● Ribbon cassette ● DM1 ● PBA-MAIN (2b)Check the connection and electric contact of the harness for SN8 ASM-SENSOR-C (3b)If the harness connection is normal, replace the following ● SN8 ● PBA-MAIN
	04	Feeder side of ribbon does not rotate. f a ribbon is set correctly and not to reach to end mark yet, See Check/Repair section.	(1) Check the reaction of SN18. by using Sensor Check Mode. (2) If the harness connection for SN18 is abnormal , replace the following * ASM-SENSOR-C (3) If the harness connection for SN18 is normal, replace the following ● Ribbon cassette ● SN18 ● PBA-MAIN

(5) Ribbon Take Up Error

Ribbon Wind up miss **

Er	Ad	Symptom	Check/Repair
21	03	Take up speed of the ink ribbon is too slow. Check whether the ribbon is set correctly. This error occurs when the ribbon adheres on the card. Check if improper card is used, such as double printing Some materials of the card may cause this trouble. If there is no problem as above, see the Check/Repair section.	(1)Check reaction of sensors SN8 in Sensor Check Mode. If the sensors do not react normally, go to (*b) (2a)If there is no problem with the sensor, the motor (DM1) is questionable. Check the connection and electric contact of the harness of DM1. · ASM-MOTOR (3a)If the harness connection is normal, replace the following: · Ribbon Cassette · DM1 · PBA-MAIN (2b)Check connection and electrical contact of harnesses of SN18 ASM-SENSOR-C (3b)If the harness connection is normal, replace the following: · SN18 · PBA-MAIN
	04	Take up speed of the ribbon is too fast. Check if the ribbon is set correctly. If this error occur in spite of Ribbon is set correctly and not come end. If there is no problem as above, see the Check/Repair section.	(1) Check reaction of sensors SN8 in Sensor Check Mode. (2)Check connection and electrical contact of harnesses of SN18 ASM-SENSOR-C (3)If the harness connection is normal, replace the following: · Ribbon Cassette · SN18 · PBA-MAIN

(6) Incorrect Setting of the Ribbon Type

Ribbon Type
Incorrect **

Er	Ad	Symptom	Check/Repair
22	01 02	Distance between the edges of the ribbon does not meet as it is supposed to be.	(1)Clean the ribbon transport rollers. (2)Ribbon Cassette seems to be wrong. Replace the following: · Ribbon Cassette
22	03	Impossible to detect Ribbon Edge.	(1)Check whether there is a damage on the ribbon. (2)Adjust the sensor SN10 in the Sensor Check Mode. If impossible to adjust, check the connection and electric contact of the harness. · ASM-SENSOR-B · ASM-LD RELAY2 (3) If the connection of the harness is normal replace the following: · SN10(LD/PT) · PBA-MAIN
	04	Impossible to detect Unique mark If this error occur in spite of Ribbon is set correctly, see the Check/Repair section.	(1) Check whether there is a damage on the ribbon. (2) Adjust the sensor SN10 in the Sensor Check Mode. If impossible to adjust, check the connection and electric contact of the harness. · ASM-SENSOR-B · ASM-LD RELAY2 (3) If the connection of the harness is normal replace the following: · SN10(LD/PT) · PBA-MAIN
	05	Distance between each unique mark of the ribbon does not meet as it is supposed to be. If this error occur in spite of Ribbon is set correctly, see the Check/Repair section.	(1)Check whether there is a damage on the ribbon. (2) Adjust the sensor SN10 in the Sensor Check Mode. If impossible to adjust, check the connection and electric contact of the harness. · ASM-SENSOR-B · ASM-LD RELAY2 (3) If the connection of the harness is normal replace the following: · SN10(LD/PT) · PBA-MAIN

(7) Hardware damage

Service Man Call
Error Code **

Er	Ad	Symptom	Check/Repair
30	**	No signal fed back from the sensor 6, when F.Turn unit rotating.	(1) Open the top cover and check if there is an obstacle such as a card. (2) If there is a card protruding from the flip turn unit and hitting the sensor etc., card transport accuracy defect is doubted. Remove the staying card and clean the transport rollers in the flip turn unit. (3) If there is no obstacle, check the out put on SN6 in Sensor Check Mode When abnormal situation is found, go (*b) (4a) PM1 is doubted. Check the motion of PM1 in the Actuator Check Mode. (5a) If PM1 does not work, check connection and electrical contact of the harness. · ASM-MOTOR (6a) If the harness connection is normal, replace the following: · PM1 · PBA-MAIN (4b) Turn angle sensors are doubted. Check connection and electrical contact of the harness. · ASM-SENSOR-A (5b) If the harness connection is normal, replace the following: · SN6 · PBA-MAIN
31	02 03 04	F.Turn unit stops the position where is before target position F.Turn unit stops the position where is after target position F.Turn unit stops the position where is not in detection range.	(1) Open the top cover and check if there is an obstacle such as a card. (2) If there is a card protruding from the flip turn unit and hitting the sensor etc., card transport accuracy defect is doubted. Remove the staying card and clean the transport rollers in the flip turn unit. (3) If there is no obstacle, check the out put on SN6 in Sensor Check Mode When abnormal situation is found, go (*b)
Er	Ad	Symptom	Check/Repair

		(4a) Re-adjust the stop position of F.Turn unit. *Home angle Adj. *Pickup angle Adj. (4b) Turn angle sensor (SN7) is doubted. Check connection and electrical contact of the harness. · ASM-SENSOR-A (5b) If the harness connection is normal, replace the following: · SN7 · PBA-MAIN
32	** Head is not detected in the specified position within the specified time when the head lifting motor is activated.	(1) Check the motion of DM3 in the Actuator Check Mode. If the motor works normally, go to (2b). (2a) DM1 is doubted. Check connection and electrical contact of the harness. · ASM-MOTOR (3a) If the harness connection is normal, replace the following: · DM1 · PBA-MAIN (2b) The head position sensors seem to have problem. (SN11, SN12) Check connection and electrical contact of the harnesses. · ASM-SENSOR-C (3b) If the harness connection is normal, replace the following: · SN11 · SN12 · PBA-MAIN
36	01 | 06 Impossible to adjust ribbon leading edge sensor properly.	(1) Check connection and electrical contact of the harnesses. · ASM-SENSOR-B · ASM-LD RELAY 2 (2) If the harness connection is normal, replace the following: · SN10 (LD/PT) · PBA-MAIN
Er	Ad Symptom	Check/Repair

37	01	Head cooling fan trouble has been detected.	(1) Check connection and electrical contact of the harnesses. · ASM-MOTOR (2) If the harness connection is normal, replace the following: · HFAN · PBA-MAIN
	02	Power supply unit cooling fan trouble has been detected.	(1) Check connection and electrical contact of the harnesses. · ASM-MOTOR (2) If the harness connection is normal, replace the following: · DFAN · PBA-MAIN
38	01	Head temperature is out of range.	(1) Check connection and electric al contact of the harness of the thermal head. ASM-HEAD (2) If the harness connection is normal, replace the following. Thermal Head PBA-MAIN
	02	Temperature around the main board is out of range	(1) Make sure of ambient temperature is in the range of what is mentioned in user manual (2) If the temperature is in that range, replace the following. PBA-MAIN
39	01	The information of DSP is not registered	(1) Download the main program (2) If this symptom repeats, replace following PBA-MAIN
	02	The information of DSP is broken.	
3A 3B 3C	01 **	A communication between DSP and CPU has been finished Abnormally.	

(8) Relation to Print Block (resist data)

Resist Data is Not Loaded Er-Ad	Resist Data Code Error Er-Ad

Er	Ad	Symptom	Check/Repair
3E	01	The information of a resister is not registered	(1) Download the data of which serial number is as same as Thermal head. (2) If this symptom repeats, replace following PBA-MAIN
3F	01	The information of a resister is broken.	

(9) Card Jam in the Card Feed Block

Card JAM. Feeder Area 01 Er - Ad

Er	Ad	Symptom	Check/Repair	
40	**	Card does not arrive at SN2 while feeding.	(1)Check that the card is not arrived at the SN2. If it has arrived or passed through, go to (2b). (2a)Check the motion of PM1 in the Actuator Check Mode. If the motion is normal, clean the feed rollers in the card feeding block and adjust the separation gate. (3a)If it does not work normally, check the connection of harness. · ASM-MOTOR (4a)If the harness connection is normal, replace the following: · PM1 · PBA-MAIN (2b)Check the reaction of SN2 in the Sensor Check Mode. (3b)If SN2 does not react, check the connection of the harness. · ASM-SENSOR-B (4b)If the harness connection is normal, replace the following: · SN2 · PBA-MAIN	

(10) Card Jam in the Card Feed Block

Card JAM. Feeder Area 02 Er - Ad

Er	Ad	Symptom	Check/Repair
41	**	A card jam has occurred at SN2.	(1) Check that the card is staying at the SN2. If there is not the card , go to (2b). The card has reached at Cleaning Roller, there is possibility of transporting motor failure on Flip Turn Unit . Then see the Error Code 43 part. (2a) Check the motion of PM1 in the Actuator Check Mode. If the motion is normal, clean the feed rollers in the card feeding block and adjust the separation gate. (3a) If it does not work normally, check the connection of harness. · ASM-MOTOR (CN118) (4a) If the harness connection is normal, replace the following: · PM1 · PBA-MAIN (2b) Check the reaction of SN2 in the Sensor Check Mode. (3b) If SN2 does not react, check the connection of the harness. · ASM-SENSOR-B (4b) If the harness connection is normal, replace the following: · SN2 · PBA-MAIN

(11) Card Jam in the Card Feed Block

Card JAM. Feeder
Remove Er - Ad

Er	Ad	Symptom	Check/Repair
42	**	A card is detected at SN2 in when F.Turn unit is not ready to receive the card.	(1) Check that the card is staying at the SN2. If there is not the card , go to (2b). (2a) Adjust the separation gate. (2b) Check the reaction of SN2 in the Sensor Check Mode. (3a) If SN2 does not react, check the connection of the harness. · ASM-SENSOR-B (3b) If the harness connection is normal, replace the following: · SN2 · PBA-MAIN

(12) Card Jam in the Flip Turn Block

Card JAM F.Turn Area 02 Er - Ad

Er	Ad	Symptom	Check/Repair
43	**	Card jam error in the Area02(SN2 or SN3) when the card is transported from Feeder to Flip Turn. block	(1)Check that the card is staying at the problem area. If there is not a card, go to (2b) The card has not reached at Cleaning Roller, there is possibility of feeder motor failure on Feeder Block . Then see the Error Code 41 part. (2a) After removing the card, check the motion of PM2 in the Actuator Check Mode. If normal, clean the transport rollers in the flip turn block and Cleaning Roller then adjust the separation gate. (3a)If PM2 does not work normally, check connection and electrical contact of the harness. · ASM-MOTOR (4a)If the harness connection is normal, replace the following: · PM2 · PBA-MAIN (2b)Check reaction of SN2 and SN3 in the Sensor Check Mode. (3b)If SN2 or SN3 does not react, check connection and electrical contact of the harness. ASM-SENSOR-B (4b)If the harness connection is normal, replace the following: · SN2 or SN3 · PBA-MAIN

(13) Card Jam in the Flip Turn Block

```
Card JAM F. Turn
 Area03      Er -
Ad
```

Er	Ad	Symptom	Check/Repair
44	**	Card jam error in the Area03 (Flip Turn Unit) when it comes out from Flip Turn unit .	(1)Check that the card is staying at the problem area. If there is not a card, go to(*b) Check the angle of Flip Turn unit is positioned correctly toward Feeder Block or Print Block or Magnetic Encoder Block. If it is not positioned correctly, see the Error Code 31 part. (2a) After removing the card, check the motion of PM2 in the Actuator Check Mode. If normal, clean the transport rollers in the flip turn block. (3a)If PM2 does not work normally, check connection and electrical contact of the harness. · ASM-MOTOR (4a)If the harness connection is normal, replace the following: · PM2 · PBA-MAIN (2b)Check reaction of SN3, SN4, SN15 (when encoder connected) in the Sensor Check Mode. (3b)If there is any sensor which does not react, check connection and electrical contact of the harness. · SN3,SN4 · ASM-SENSOR-B · SN15 (when encoder connected) · ASM-EN-RELAY · ASM-ENC (4b)If the harness connection is normal, replace the following: · SN2 · SN3 · SN15 (when encoder connected) · PBA-MAIN

(14) Card Jam in the Flip Turn Block

Card JAM. F. Turn Area04 Er - Ad

Er	Ad	Symptom	Check/Repair
45	**	Card jam error in the Area04(SN4) when it is transported from Feeder Block to Flip Turn Block or from Flip Turn to Feeder.	(1)Check that the card is staying in the problem area. If no card, go to (*b). (2a) After removing the staying card, check the motion of PM2, PM3 in the Actuator Check Mode. If normal, clean both the transport rollers of Flip Turn block and the Print Block. (3a)If PM2 and PM3 does not work normally, check connection and electrical contact of the harness. · PM2,PM3 ASM-MOTOR (4a)If the harness connection is normal, replace the following: · PM2 · PM3 · PBA-MAIN (2b)Check the reaction of SN4 in the Sensor Check Mode. (3b)If SN4 does not react, check connection and electric al contact of the harness. · ASM-SENSOR-B (4b)If the harness connection is normal, replace the following: · SN4 · PBA-MAIN

(15) Card Jan in the Flip Turn Block

Card JAM. F.
Turn Area08
Er - Ad

Er	Ad	Symptom	Check/Repair
46	**	Card jam error in the Area 08(SN15) when the card is transported from Flip Turn to Encoder or from Encoder to Flip Turn.	(1)Check that the card is staying in the problem area. If no card, go to (*b). (2a) After removing the staying card, check the motion of PM2, in the Actuator Check Mode. If normal, clean the transport rollers of flip turn block. Check that there is "Encoder Check" menu in the service mode. If there is not "Encoder Check" menu, the printer does not recognize the Encoder. Then see section 6.2 (Errors which can not be checked on the LCD panel.) (3a)If PM2 does not work normally, check connection and electrical contact of the harness. · ASM-MOTOR (4a)If the harness connection is normal, replace the following: · PM2 · PBA-MAIN (2b)Check the reaction of SN15 in the Sensor Check Mode. (3b)If SN15 does not react, check connection and electrical contact of the harness. · ASM-EN-RELAY · ASM-ENC (4b)If the harness connection is normal, replace the following: · SN15 · PBA-MAIN

(16) Card Jan in the Flip Turn Block

Card JAM. F.
Turn Remove
Er - Ad

Er	Ad	Symptom	Check/Repair
47	**	A card is detected at SN3,4,15 when F.Turn unit is not ready to receive the card.	(1)Check that the card is staying at the SN3,4,15. If there is not the card , go to (*b). (2a) Check the angle of Flip Turn unit is positioned correctly toward Feeder Block or Print Block or Magnetic Encoder Block. If it is not positioned correctly, see the Error Code 31 part. (2b) Check the reaction of SN3,4,15 in the Sensor Check Mode. (3b) If SN3,4,15 does not react, check the connection of the harness. SN3,4 · ASM-SENSOR-B SN15 (when encoder connected) ASM-ENC ASN-EN-RELAY (4b) If the harness connection is normal, replace the following: · SN3 · SN4 · SN15 (when encoder connected) · PBA-MAIN

(17) Card Jan in the Flip Turn Block

Card JAM. F. Turn
Lost Er - Ad

Er	Ad	Symptom	Check/Repair
48	**	A card is lost when the card is transported from feeder block or printing block or encoder to F.Turn unit .	(1)Check that the card is staying around F.Turn If there is not the card , go to (*b). (2a) Check the reaction of SN3,4,15 in the Sensor Check Mode. (3a) If SN3,4,15 does not react, check the connection of the harness. SN3,4 · ASM-SENSOR-B SN15 (when encoder connected) ASM-ENC ASN-EN-RELAY (4a) If the harness connection is normal, replace the following: · SN3 · SN4 · SN15 (when encoder connected) · PBA-MAIN (2b) Check the angle of Flip Turn unit is positioned correctly toward Feeder Block or Print Block or Magnetic Encoder Block. If it is not positioned correctly, see the Error Code 31 part. (2c) A card could be fallen inside of equipment. Then remove the card.
49	**	A card is lost when the card is transported from F.Turn unit to feeder block or printing block or encoder .	

(18) Card Jam in the Printing Block

Card JAM. Print Area 04 Er - Ad

Er	Ad	Symptom	Check/Repair
50	**	Card jam error in the Area04(SN4) while the card is transported from Print Block to Flip Turn or from Flip Turn to Print Block.	(1)Check that the card is staying in the problem area. If no card, go to (*b). (2a) After removing the staying card, check the motion of PM2,PM3 in the Actuator Check Mode. If normal, clean the transport rollers of Flip Turn block and the Print Block. (3a)If PM2 and PM3 does not work normally check connection and electrical contact of the harness. · ASM-MOTOR (4a)If the harness connection is normal, replace the following: · PM2 · PM3 · PBA-MAIN (2b)Check reaction of SN4 in the Sensor Check Mode. (3b)If SN4 does not react, check connection and electrical contact of the harness. · ASM-SENSOR-B (4b)If the harness connection is normal, replace the following: · SN4 · PBA-MAIN

(19) Card Jam in the Printing Block

Card JAM. Print Area05 Er-Ad	Card JAM. Print Area06 Er-Ad	Card JAM. Print Area07 Er-Ad

Er	Ad	Symptom	Check/Repair
51	**	Card jam error in the Area05(SN4-SN5) while th card is transported in the Print Block.	(1)Check that the card is staying in the problem area. If no card, go to (*b). (2a) After removing the staying card, check the motion of PM3, in the Actuator Check Mode. If normal, clean the transport rollers of the Print Block. (3a)If PM3 does not work normally, check connection and electrical contact of the harness. · ASM- MOTOR (4a)If the harness connection is normal, replace the following: · PM3 · PBA-MAIN (2b)Check the reaction of SN5 in the Sensor Check Mode. (3b)If SN5 does not react, check connection and electrical contact of the harness. · ASM-SENSOR-B · ASM-SENSOR-RELAY (4b)If the harness connection is normal, replace the following: · SN5 · PBA-MAIN
52	**	Card jam error in the Area06(SN5) while th card is transported in the Print Block.	
53	**	Card jam error in the Area07(not at SN5) while the card is transported in the Print Block.	

(20) Card Jam in the Printing Block

Card JAM. Print Remove Er - Ad

Er	Ad	Symptom	Check/Repair
54	**	A card is detected at SN4,5 when the card is transported.	(1) Take a remaining card out. (2) Check reaction of SN4,SN5 in the Sensor Check Mode. (3b) If SN4,SN5 do not react, check connection and electrical contact of the harness. · SN4 ASM-SENSOR-B · SN5 ASM-SENSOR-B ASM-SENSOR-RELAY (4b) If the harness connection is normal, replace the following: · SN4 · SN5 · PBA-MAIN

(21) Firmware control error

Service call Error Code Er - Ad

Er	Ad	Symptom	Check/Repair
60 61 62 6A 6B 6C 6D 6E 6F	**	An error of which relation to firmware program.	(1) Turn power off and on again. (2) If this symptom repeats, call service person

(22) Firmware control error

Service call Error Code Er - Ad

Er	Ad	Symptom	Check/Repair
70 71	01 02 03 0F 10 | 16	Some Error of which relation to communication has occured on encoder.	(1) Turn power off and on again. *ASM-ENC *ASM-EN-RELAY *ASM-POW-ENC (2) If this symptom repeats, encoder is suspected. Replace the encoder. *PBA-DC-DC *PBA-MAIN
72	01	Unsupported encoder has connected.	Make sure the specification of the encoder is supported on firmware.
73	**	Some failure has occurred with an encoder.	(1) Turn OFF and ON the power switch. (2) If this symptom repeats, there is some problem with the encoder.

(23)Magnetic Encoder Writing Error

Encoder Write Error Er - Ad

Er	Ad	Symptom	Check/Repair
73	01 | 07	A writing error has occurred on ISO track 1 or JIS type 2	(1)Check that the card is set correctly in card hopper. It depends on the settings in the printer and/or operation of an application to put the card surface of which has magnetic stripe side up or down. Check the magnetic stripe of the card meets a writing format. (2)Make a cleaning on encoding head . (3)Replace the encoder unit
	11 | 17	A writing error has occurred on ISO track 2	
	21 | 27	A writing error has occurred on ISO track 3	

(24) Magnetic Encoder Reading Error

Encoder Read Error Er - Ad

Er	Ad	Symptom	Check/Repair
75	01 | 06	A reading error has occurred on ISO track 1 or JIS type 2	(1)Check the card is set correctly in card hopper. It depends on the settings in the printer and/or operation of an application to put the card surface of which has magnetic stripe side up or down. Check the magnetic stripe of the card meets a writing format. (2)Make a cleaning on encoding head . (3)Replace the encoder unit
	11 | 17	A reading error has occurred on ISO track 2	
	21 | 27	A reading error has occurred on ISO track 3	

(25) Magnetic encoder data error

Encoder Data Error Er - Ad

Er	Ad	Symptom	Check/Repair
76	20	Illegal character(s) is included in the data for magnetic encoder.	Compare with specification of magnetic encoder

(26)Card Jam error in Encoder

Card JAM. Encode Area 08 Er - Ad

Er	Ad	Symptom	Check/Repair
77	**	Card jam error in the Area08(SN15) while the card is transported from Encoder to F.Turn or from F. Turn to Encoder.	(1) Check that the card is staying in the problem area. If no card, go to (*b). (2a) After removing the staying card, check the motion of PM2 in the Actuator Check Mode. If normal, clean the transport rollers of the Encoder. Check the transport roller working normally. If it does not work normally, replace the Encoder. (3a) If PM2 does not work normally, check connection and electrical contact of the harness. · ASM-MOTOR (4a) If the harness connection is normal, replace the following: · PM2 · PBA-MAIN (2b) Check the reaction of SN15 in the Sensor Check Mode. (3b) If SN15 does not react, check connection and electrical contact of the harness. · ASM-EN-RELAY · ASM-ENC (4b) If the harness connection is normal, replace the following: · SN15 · PBA-MAIN

(27) Card Jam error in Encoder

Card JAM. Encode Area 09 Er - Ad

Er	Ad	Symptom	Check/Repair
78	**	Card jam error in the Area09(SN15) while the card is transported in Encoder .	(1) Check that the card is staying in the problem area. If no card, replace following things. (2a)Check there is something of which obstruct the card transportation around the stacked card. After removing stacked card, then check roller working in the Encoder. If it does not work correctly , replace the Encoder.

(28) IC R/W Access Error

IC R/W Control Error Er-Ad

Er	Ad	Symptom	Check / Repair
7E	01	Printer received the command to quit the access to internal IC R/W (Non contact type)	A printer is no problem. See an operation manual of application software or contact the administrator of the total system.

(29) Other Hardware trouble

Service Call

Error Code Er - Ad

Er	Ad	Symptom	Check/Repair
BC	01 | 04	An I/F board does not meet the printer.	(1)Turn OFF and On the power. (2) If this symptom repeats, the I/F board may have problem. Replace I/F board.
C0	01 1* 2*	Some abnormal status has detected when finishing to access to image memory.	(1)Turn OFF and On the power. (2) If this symptom repeats, main board may have problem. Replace main board.
C1	01 02	Some abnormal status has detected when finishing to access to flash memory.	
2D	01 02 03	Some abnormal status has detected when finishing to access EEPROM. When this error has occurred The settings in user mode may be back to default.	

6.1.3 Error Message Relating to Communication

Following is the errors relating to the communication between host PC and the Printer.

? Errors relating to command transmission/reception is displayed on the LCD panel, it is shown with error message (16 digits x 2 lines: corresponding to the error code) and four digit numbers (2 digits :Er and 2digits:Ad) on the lower right corner.

ensample

Printer is not Ready 92 - 49

In this case
Error Code (Er) : 92h
Details Code (Ad) : 49h

Error Message: Indicates the cause and nature of the error.
Error Code: Encoded error message
Details Code: Indicated the command received which has caused the error as shown as Error Message.

Refer to the "Command Specification" regarding the details.

? Errors in the transmission/reception of commands are usually caused by errors in the data or sentence which are transmitted from the host PC. Therefore, the user and/or the software developer are required to cope with.

? Errors in the transmission/reception of commands are cleared automatically when the following conditions are met.

SCSI : Received commands other than "Request Sense" from the initiator which has returned "Check Command".

USB :

? Errors in communication, other than "Unrecoverable Error" can be recovered by pressing CLEAR key.

No.	LCD Display	Contents	Method to Recover
80	Unsupported SCSI Command Er-Ad	A SCSI Command from PC is not supported.	(1) Check whether the transmitted SCSI Command is listed in the Command Specification. (2) Clear the error by pressing the CLEAR key and send the command again.
81	Parameter List Length Err Er-Ad	Group Code of the SCSI command does not meet with the specification or actually transmitted byte does not match the set byte number.	(1) Check the group code of the sent SCSI command and transfer byte number of the command description block. (2) Clear the error by pressing CLEAR key and send the command again.
82	Invalid Field in CDB. Er-Ad	There is error in the description block of the received SCSI command	(1) Check if the command description block meets the contents of the Command Specification. (2) Clear the error by pressing the CLEAR key and send the command again.
83	Logical Unit Not Supported Er-Ad	LUN of the received SCSI command is not zero.	(1) Check whether the LUN of the command description block is zero or not. (2) Press CLEAR key to clear the error and send the command again.
85	SCSI Parity Error Er-Ad	Parity error has occurred while communicating through SCSI interface.	(1) Turn OFF the power and check the command and data. Check whether the SCSI controller of the host supports the parity adding function. If not supporting, select "Parity OFF" on the Operation Panel and communicate. (2) If the error repeats, replace the following. PBA-IF

Er	LCD display	Contents	Method to Recover
86 87 8D	SCSI Hardware Error. Er-Ad	Error occurred in the SCSI protocol control on the interface board.	(1) This is unrecoverable error. Turn OFF and On the power. (2) If the error repeats, replace the following. PBA-IF
88	SCSI Command Time Out. Er-Ad	Time out error has occurred while receiving command and data.	(1) Check if the transmitted command and data is in accordance with the command specification. Also, check the setting of the number of byte of the transmitted data. (2) Press CLEAR key to clear the error and transmit the command again.
89	Invalid field in Identify Er-Ad	There is error in the Identify of the received SCSI.	(1) Check the transmitted description of Identify. (2) Press CLEAR key to clear the error and transmit the command again.
8A	Message Out Data Length Err Er-Ad	The data length of Message Out phase is over 33 bytes	(1) Check the number of bytes of message transmitted. (2) Press CLEAR key to clear the error and transmit the command again.

(2) SCSI/USB interface common error

Er	LCD display	Contents	Method to Recover
90 97 98 99 9A	Unsupported Print CMD Er-Ad	Received Print command is not supported.	(1) Check whether the transmitted command is in accordance with the command specification. (2) Clear the error with CLEAR key and transmit the command again.
92	Printer is not Ready. Er-Ad	Read Magnetic Encode command was received while the printer (mechanical control module) is not ready	(1) Check whether the printer is in ready condition before transmitting the Read Magnetic Encode command. (2) Transmit the command again after clearing the error with "CLEAR" key.
93	Print Command Parameter Er-Ad	Parameter of the received Print command is incorrect.	(1) Check whether the Parameter is in accordance with the specification. (2) Clear the error with CLEAR key and transmit the command again.
94	Multi Parameter Received Er-Ad	An error that received Print Command repeatedly while receiving request plural times to flip over.	(1) Check weather the Print command is transferred repeatedly to the same memory when transferring the request plural times to flip over. (2) Clear the error with CLEAR key and transmit the command again.
95	Transfer Byte Size Error. Er-Ad	Actual number of transmitted byte does not match the designated number of byte.	(1) Check the designated byte number of the transmitted command and the actual byte number. (2) Clear the error with CLEAR key and transmit the command again.
96	PreTransfer not Completed. Er-Ad	The Print Data Transferring Command is received while not completed to receive previous Print Data Transferring Command	(1) Check whether the Parameter is in accordance with the specification. (2) Clear the error with CLEAR key and transmit the command again.

No	LCD Display	Contents	Method to Recover
A0	Print Data Size Over Error Er-Ad	Received Print Data is larger than the printable area of card.	(1) Check the print start position and print size of the transmitted Print data. (2) Clear the error with CLEAR key and transmit the data again.
A1	Barcode Data Size Over. Er-Ad	Received barcode data has too many characters or too large size.	(1) Check the character number and barcode creation condition. (2) Clear the error with CLEAR key and transmit the command again.
A2	Encode Data Size Over. Er-Ad	Number of characters of the received magnetic encode data exceeds the standard.	(1) Check whether the type and number of the magnetic encoding characters meets the standard. (2) Clear the error with CLEAR key and transmit the command again.
A3	Encode Format Select Error. Er-Ad	Encode Unit which supports the designated magnetic encoding type is not connected.	(1) Check whether the recording type of the magnetic encodings of actually connected Encode Unit matches with the set type (2) Clear the error with CLEAR key and transmit the command again.
A5	IC Encoder not Connected Er-Ad	IC encoding request command has been received while IC Encode Unit is not connected.	(1) Turn OFF the power and check the connection of the IC Encode Unit. (2) Clear the error with CLEAR key and transmit the command again.

No	LCD Display	Contents	Method to Recover
A6	Heat Roller Unit not Connected. Er-Ad	Hologram print command has been received while Heat Roller Unit is not connected.	(1) Turn OFF the power and check the connection of the Heat Roller Unit. (2) Clear the error with CLEAR key and transmit the command again.
A8	Encode/Barcode Data Empty. Er-Ad	Magnetic encode or barcode data has been received while the transmission byte number is zero.	(1)Check whether the format and the number of transfer byte of magnetic encode or barcode and the data are transmitted correctly. (2) Clear the error with CLEAR key and transmit the command again.
A9	Character Error in Encode. Er-Ad	Magnetic encode data has characters which is not standard.	(1) Check whether non standard characters are included in the character chain and recording type of the magnetic encode. (2) Clear the error with CLEAR key and transmit the command again.
AA	Character Error in Barcode. Er-Ad	Non standard character is in the barcode data.	(1) Check the type of barcode and character string to see whether non standard characters are included. (2) Clear the error with CLEAR key and transmit the command again.

(3) Errors of which related to downloading.

No	LCD Display	Contents	Method to Recover
B0 B1 B2 B5 B6 B7	Download Command Parameter Er - AD	Command format is not correct.	(1)Reboot the printer and download again. (2)If problem persist, call your dealer. .
B3 B4 B9		A value of SUM or LRC is not correct	(1)Reboot the printer and download again. (2)When problem persist, change the boards below PBA-MAIN PBA-IF (3)If the problem is not gone after done above, call your dealer.
BA	Download Ap. Abort Er - Ad	Downloading is interrupted by application soft ware	(1)Reboot the printer and download again. (2)If the "Service call----" is displayed on LCD, then recover the error with following this manual (3)If the problem is not gone after done above, call your dealer.
BB	Service Call Error Code Er - Ad	To write the data for flash memory is not finished normally.	(1)Reboot the printer and download again. (2)If the problem is not gone after done above, call your dealer.

6. 2 Errors which can not be checked on the LCD panel.

The recovery methods for the troubles that are not checked on the LCD panel are described in the following.

<Note> Do not fail to read before troubleshooting.
? When performing the following works, turn OFF the power switch and plug off the power cord from the outlet without fail.

- Replacing the thermal head
- Removing front and/or rear cover of the printer
- Checking the connection and electrical contact of harness
- Replacing the parts such as printed circuit board, sensor, motor, etc.
- Removing or mounting the encoder unit into the printer unit.
- Connecting the optional units
- Removing covers of the optional units

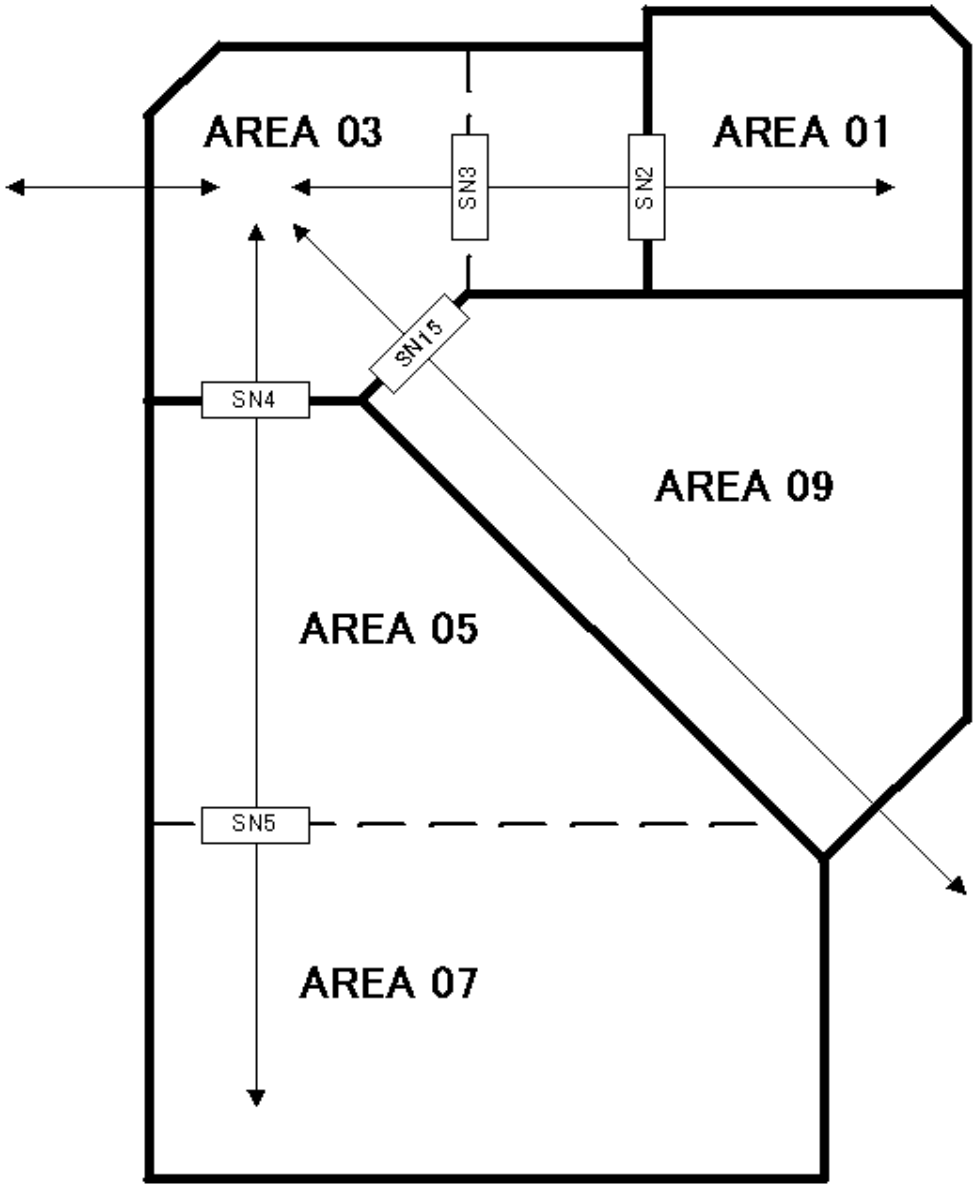
Symptom	Condition	Check/Repair
LED does not light when the power is turned ON.	AC power is not supplied.	(1) Check if the power supply matches specification (voltage range)of the product. (2) Check whether the cable is correctly connected. (3) Check whether the circuit protector is in normal condition.
	Harness connection is not normal.	(1) Check the harness connections. · ASM-AC1 · ASM-AC2 · ASM-DC · ASM-OPERATION
	Defective circuit boards and/or power supply	(1) Replace the following and check operation. · PBA-MAIN · PBA-OPEPANE · POWER SUPPLY
Nothing is shown on the LCD panel when power is turned ON. (LED lights)	Harness connection is not normal.	(1) Check the harness connection. · ASM-OPERATION

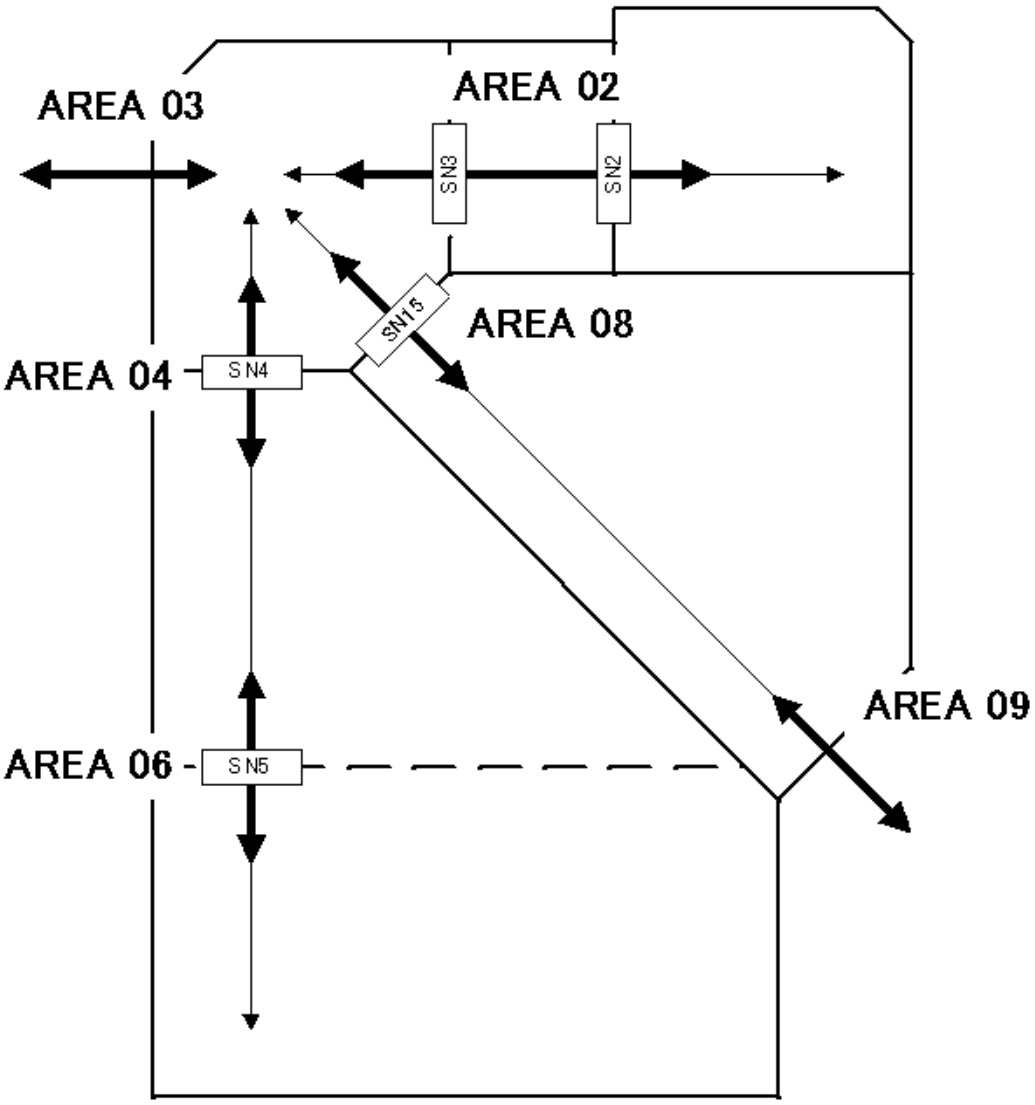
Symptom	Condition	Check/Repair
White line appears in the Longitudinal direction when printing the image and characters.	Dot defect of the thermal head.	(1) Turn OFF the power and replace the following: · Thermal Head Assembly (2) Download the data for print head replaced
Image and characters are not printed at all when printing the image and characters.	Defective harness connection.	(1) Check the harness connection. · ASM- HEAD · ASM- DC
	Defective thermal head.	(1) Turn OFF the power and replace the following: · Thermal Head Assembly (2) Download the data for print head replaced
	Defective circuit board. Defective Power supply	(1) Turn OFF the power and replace the following: · PBA-MAIN · POWER SUPPLY
Image defectives such as uneven color or lost lines, etc. when printing the image and characters	Defective image memory.	(1) Check the image memory (frame memory) using the Hardware check function in the serviceman mode.
	Defective circuit board.	(1) Turn OFF the power and replace the following: · PBA-MAIN
Printer does not respond when data is transmitted from the host computer.	Defective connection of the cable, terminators	(1) Turn OFF the power and check the interface cable connection. (2) In case of SCSI I/F , check overall connections of the cables, and connection of the terminator. Check the setting of the SCSI ID numbers.
	Defective circuit bard.	(1) Turn OFF the power, replace the following and check operation. · PBA-IF
Can not recognize Encoder connection	Defective harness or circuit board	(1) Turn OFF the power, check connection of The following ● ASM-ENC ● ASM-ENC-RELAY (2) Replace the MAIN-BOARD and check operation
Can not recognize Heat Roller connection	Defective harness	(1) Turn OFF the power, check connection of the connection cable.

Defective circuit board	(1) Turn OFF the power, replace the following and check operation. · PBA-IF PBA-MAIN

6.3

Card JAM Location




AREA 03
AREA 02
SN3
SN2
SN15
AREA 08
AREA 04
SN4
AREA 09
AREA 06
SN5

(6) The errors of which relating to program downloading

The errors of which listed below will be appeared when failure to download a firmware and/or replacing main board without downloading the regist data of the print head.

LCD Display	Status	Recovery Method
DownLoad Ap. Abort BA-01	Downloading is interrupted	Reboot the PC and printer restart downloading
ResistData is not Loaded 1E-01	Resist data of the head is not loaded on the printer	Download the resist data of the head

(9)Other particular error

In case of dual side printing :

If a printing process is suspended by some error such as card jam, it may not be continuing the process of the data for another side . In this case it will be created the errors as follows.

LCD Display	Status	Recovery Method
Print Card does not Exist 5F-**	It can not continue the Printing since the card has ejected.	The process of printing data will be finished as error. Reissue the card .