FINISHER K1/K2

SERVICE MANUAL

REVISION 0

Canon

MAR.2001 **FY8-13H4-000**

CANON FINISHER K1/K2 REV.0 MAR. 2001 PRINTED IN JAPAN (IMPRIME AU JAPON)

Application

This material has been prepared by Canon Inc. for the purposes of making available the technical information needed for the technical training of technicians responsible for servicing the product, and to assist them in installation, maintenance and repair. This material contains information that is pertinent to all regions where the product is to be sold, and may contain information that is not applicable to individual regions.

Also, the information contained in this material may differ from 'actual machine specifications', 'machine specifications published in advertising literature' and 'other printed matter'. Queries regarding the specifications and content of this material should be directed to the Service Department of the competent sales company.

Revisions

Because of on-going revisions and modifications to the product, some of the details contained in this material may be inaccurate. For this reason, any revisions or changes in the information are published as technical information, as and when necessary.

The following statements do not apply in countries or regions where they conflict with local laws and regulations.

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Warning

This manual is confidential and its content is to be handled with due care.
Failure to do so may result in prosecution.

1 Symbols Used

This documentation uses the following symbols to indicate special information:

Symbol	Description
	Indicates an item of a non-specific nature, possibly classified as Note, Caution, or Warning.
	Indicates an item requiring care to avoid electric shocks.
	Indicates an item requiring care to avoid combustion (fire).
	Indicates an item prohibiting disassembly to avoid electric shocks or problems.
	Indicates an item requiring disconnection of the power plug from the electric outlet.
	Indicates an item intended to provide notes assisting the understanding of the topic in question.
	Indicates an item of reference assisting the understanding of the topic in question.
	Provides a description of a service mode.
	Provides a description of the nature of an error indication.
	Refers to the Copier Basics Series for a better understanding of the contents.

2 Outline of the Sevice Manual

This Service Manual contains basic information needed to service the FINISHER K1/K2 in the field, conducted for the purpose of maintaining its product quality and a specific level of performance.

This Service Manual consists of the following chapters:

Chapter 1 *General Description*, shows the features and specifications of the machine, as well as the names of parts and how to operate it.

Chapter 2 *Operations and Timing*, explains the mechanical and electrical systems of the machine by function in relation to the principles of operation and timing at which they are driven.

Chapter 3 *Mechanical Systems*, shows how to disassemble/assemble the machine and make adjustments.

Chapter 4 *Maintenance and Inspection*, provides tables of periodically replaced parts and consumables/durables and a scheduled servicing chart.

Chapter 5 *Troubleshooting*, contains troubleshooting tables and diagrams of electrical parts, lists of VRs, LEDs, and check pins by PCB, and an outline of self-diagnosis.
In addition, an appendix is added to offer a general timing chart, list of signals/abbreviations, general circuit diagrams, and PCB diagrams.

The machine comes with an Installation Procedure. Refer to the instructions in the booklet when installing the machine.

The following rules apply throughout this document:
As a rule, the descriptions in this documentation are based on the following:

1. As needed, the work of each function and its relationship with electrical and mechanical parts are explained; where applicable, the timing at which associated parts are driven are also outlined.
   In a diagram, the symbol ▬▮▮▮▬ indicates a path of mechanical drive; the symbol ⟶ accompanied by a notation indicates the flow of an electrical signal.
   The expression “power-on” means turning on the power switch, closing the front door, and closing the delivery door so that the parts of the machine are supplied with power.
2. In a digital circuit, the state of a signal is indicated by ‘1’ if its voltage level is high and by ‘0’ if low. The level of voltage, however, differs from circuit to circuit.
   The machine uses a CPU; however, since the internal functions of a CPU is outside the scope of a service person, detailed explanations are omitted from descriptions. In this document, a circuit diagram may cover from sensors to inputs of a controller PCB or from outputs of a controller PCB to loads, or it may be a functional diagram.

The descriptions of the machine are subject to change for product improvement, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to be fully familiar with the contents of this Service Manual and Service Information bulletins to develop a good understanding of the machine, equipping themselves with the ability and skill to identify faults and to maintain the machine in good order.

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CHAPTER 1 GENERAL DESCRIPTION

CHAPTER 2 OPERATION OVERVIEW

CHAPTER 3 MECHANICAL SYSTEMS

CHAPTER 4 MAINTENANCE AND INSPECTION

CHAPTER 5 TROUBLESHOOTING

APPENDIX

CHAPTER 1

GENERAL DESCRIPTION

1 GENERAL DESCRIPTION

1.1 Features

a. Two types of stacking trays

- The product features two different stacking trays, tray A and tray B, which are used for different purposes.

b. Large stacking capacity

- Tray A can accommodate a stack of paper up to a maximum height of 147mm, while tray B can .accommodate a stack of paper up to a maximum height of 285mm (small size) and 147mm (large size).

c. Wide range of paper types

- The product can accommodate a wide range of paper types, from 64 to 200mg/m^2.

d. Stack job offset function

- The stack job offset function is available for the sorting of non-stapled stacks.

e. Three types of auto-stapling

- There are three stapling positions (front-slanted, rear-slanted, two-point).

f. Buffer rollers for increased productivity

- The buffer rollers mean that the copier can keep feeding paper even while the finisher is stapling or off-setting.

g. Punch function (Finisher K2 only)

- The punch function allows holes to be punched in the paper before delivery, to allow the paper to be filed in binders. (Accommodates 64 to 200mg/m^2 paper. Does not accommodate tracing paper or OHP film.)

1.2 Specifications

1.2.1 Specifications

a. Saddle Finisher K3/K4

Finisher assembly

Item		Specification		Remarks
Lifting system		Tray A	up/down	
		Tray B	up/down	
Stacking		Tray A	same as copier delivery method	
		Tray B	face-down	
Stack paper size		Tray A	Postcard to A3/ 279.4 x 431.8mm	Postcards feed in the R direction only. A5/SMT feeds in the R direction only. B5/A4/LTR feed in the horizontal direction only.
		Tray B	A5/SMT to A3/279.4 x 431.8mm	
Paper weight		64 to 200g/m^2		
Modes		Staple stacking, non-staple stacking		Mixed stacking possible under certain conditions. Equivalent to 80g/m^2 paper
Stack height	Non-staple sorting	Tray A	Equivalent to 1,000 sheets (small/ large size) 147mm	
		Tray B	Equivalent to 2,000 sheets (small size) 285mm, or1,000 sheets (large size) 147mm	
	Staple sorting	Tray A	Equivalent to 1,000 sheets or 100 sets (small/ large size)	
		Tray B	Equivalent to 2,000 sheets or 100 sets (small size) 285mm, or1,000 sheets or 100 sets (large size) 147mm	
Mixed staple/ non-staple		Tray B	Stops when either of the following conditions is met. 2,000 sheets or 100 sets (small size)1,000 sheets or 100 sets or 30 folded sheets (large size)	Stacking ability not guaranteed. The whole stack is treated as large size if one large size sheet is included.
Stack thickness with folded paper mixed		Tray A	Max. 20 sheets of folded paper	Equivalent to 80g/m^2 paper
		Tray B	Max. 10 sheets of folded paper per set/ 30 sheets of folded paper per job (1 sheet of folded paper is counted the same as 5 sheets of plain paper.)	
Stacking condition		Tray A	Front/ rear stack offset	No offset stacking in Tray A for non-sort delivery
		Tray B	Staple (one): 20mm Staple (two): 30mm (one staple at 5/B4) Non-staple: 30mm (LTR/11 x 17:36mm)	

Note1: Small size refers to A4, A5, B5, postcards, LTR and STMT.
Large size refers to A3, B4, 279.4 x 431.8mm (11 x 17) and LGL.

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Item		Specification				Remarks
Paper detection		Tray A / Tray B	Yes			
Control panel		No				
Display		No				
Installation method		Latching with mount (height adjustable with casters)				
Measurements		Approx. 802mm (W) x 738mm (D) x 995 (H)				Note 2
Weight		Approx. 127kg/ approx. 192kg (incl. inserter approx. 16kg, feeder approx. 49kg)				
Power supply		100 to 120V/ 50, 60Hz, 230V/ 50Hz.				
Max. power consumption		60W				
Stapling method		Punching by rotating cam (Face-down stapling)				
Stapling position		See below				
Stapling thickness		Staple cartridge type A A4/ B5/ LTR	100 sheets (80g/m^2) or 98 sheets (80g/m^2) + 2 sheets (200g/m^2)and paper stack thickness max. 11mm			20 sheets for 200g/m^2) paper
		Staple cartridge type B A4R/ B4/ A3 B5/ B4/ LTR LTRR/ LGL 297.4 x 4342.8mm (11 x 17)	50 sheets (80g/m^2) or 48 sheets (80g/m^2) + 2 sheets (200g/m^2) and paper stack thickness max. 5.5mm			10 sheets for 200g/m^2) paper
Staple loading		Special cartridge (5,000 staples)				
Staples		Special staples				
Staple cartridge type detection		Yes				
Staple detection		Yes				
Automatic staple reposition		Up to 10 times				
Available stapling sizes	1-point stapling	Front/rear A3, A4, A4R, B4, B5, 279.4 x 431.8mm, (11 x 17) LGL, LTR, LTRR				
	2-point stapling	A3, A4, B4, B5, 279.4 x 431.8mm, (11 x 17) LTR				
Manual stapling		No				
Jogging accuracy		Non-sort	Tray A	Max. 100mm		
		Sort	Tray A/B	Left/right direction (X)	Max. 60mm	
				Front/rear direction (Y)	Within stack Max. 15mm	
					Between stacks Min. 15mm max. 60mm	
		Staple	Tray B	2.0mm max.		

Note 2: Width with folder connected is 986mm
Height with inserter connected is 1138mm (auxiliary tray open)

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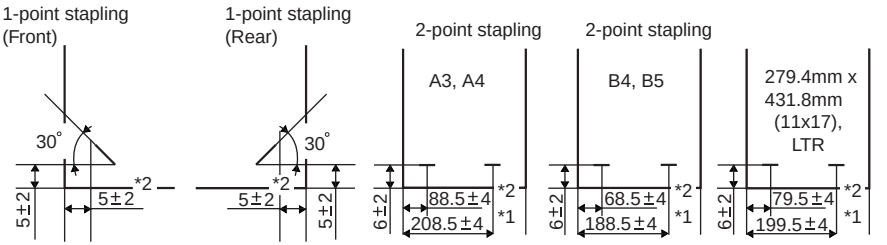
These specifications are subject to change for the purposes of product improvement.



Unit: mm

*1 Stapling interval may be adjusted in user mode.

*2 Stapling position may be adjusted by DIP switch.

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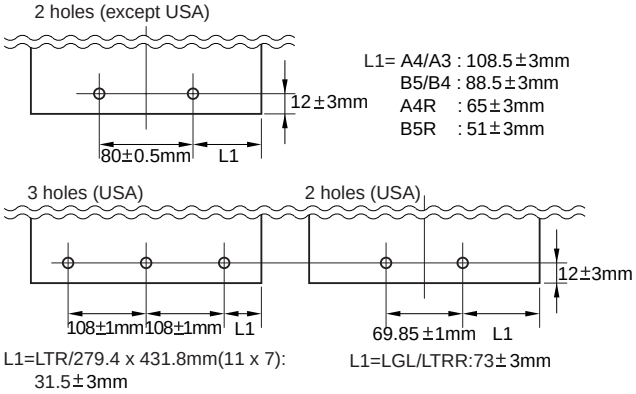
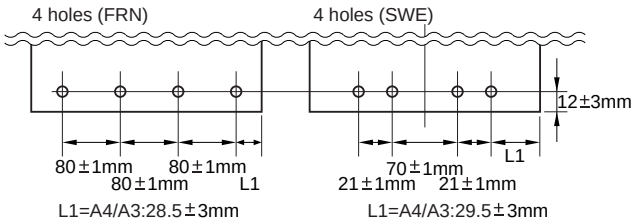
Punch related items (Finisher K2 only)

Item	Specifications
Punching method	Press-punch system (paper stops momentarily to be punched)
Paper type	64 to 200g/m² (OHP film, tracing paper not accommodated)
Paper size	2 holes: A3/ A4/ A4R/ B4/ B5/ B5R (100/ 230V) 3/2 holes: 279.4 x 431.8 (11 x 17) (280V) 2 holes LGL. LTRR 4 holes: A3, A4 (230V)
Hole diameter	2 holes: 6.5mm 3/2 holes: 8mm 4 holes: 6.5mm
Punch waste capacity	2 holes: 20,000 sheets or more (when using 80/m² paper) 3/2 holes: 10,000 sheets or more (when using 80/m² paper) 4 holes: 10,000 sheets or more (when using 80/m² paper)
Punch waste 'Full' display	Displayed on main unit control panel.
Punch mode selection	Selected on main unit control panel.
Punch position	

Item	Specifications
	

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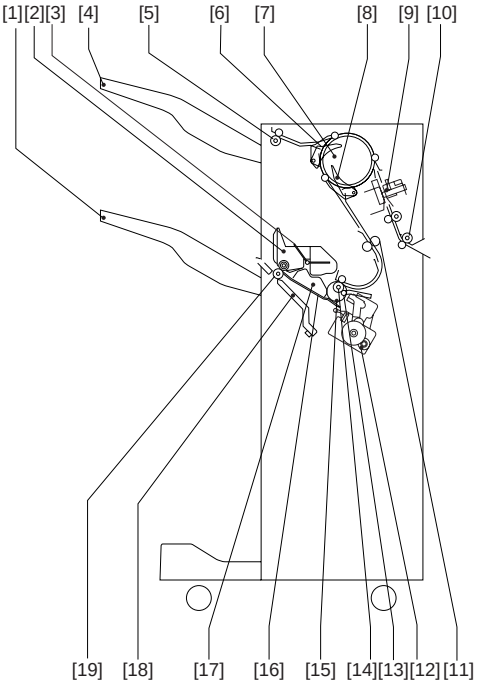
These specifications are subject to change for the purposes of product improvement.

1.2.2 Cross sections

a. Finisher



[1]	Tray B	[11]	Pre-delivery roller
[2]	Swing guide	[12]	Stapler
[3]	Paddle	[13]	Movable roller
[4]	Tray A	[14]	Delivery roller
[5]	Non-sort delivery roller	[15]	Knurled belt
[6]	Upper path switching flapper	[16]	Processing tray
[7]	Buffer roller	[17]	Jogging plate (front, rear)
[8]	Buffer switching flapper	[18]	Tray auxiliary plate
[9]	Punch unit (Finisher K2 only)	[19]	Stack delivery roller
[10]	Inlet roller		

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1.3 Module isolation switch

If a particular error is displayed, the module separation switch on the finisher can be used to isolate the problem module and make copies or printouts from a different part of the machine.

Display and cause	Treatment
E590, E593, E594, E595 Punch unit is broken.	Use the module isolation switch to isolate the punch unit and make copies or printouts from a different part of the machine.Ref: Module isolation switch operation
E540 Tray A is broken.	Use the module isolation switch to secure tray A and make copies or printouts.
E515 The inserter is broken.	Use the module isolation switch to isolate the inserter and make copies or printouts from a different part of the machine.
E518 The folder is broken	Use the module isolation switch to isolate the Z-folding function and make copies or printouts from a different part of the machine.
E503, E5f0, E5f1, E5f2, E5f3, E5f4, E5f5, E5f6, E5f7, E5f8, E5f9 The saddle stitcher is broken.	Use the module isolation switch to isolate centre stitching function and make copies or printouts from a different part of the machine.

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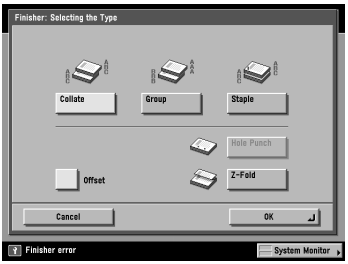
1.4 Operation of the module isolation switch

The module isolation switch is used when a particular service call is displayed. The module isolation switch is used to switch OFF the malfunctioning module, so that copying and printing can be performed from another module.

- The message shown on the right is displayed in the basic window.



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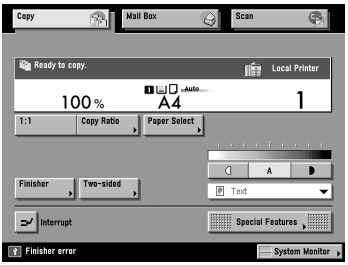

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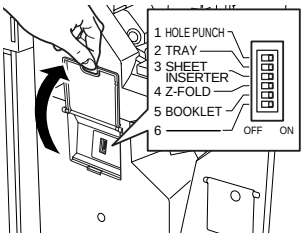
1) Open the front cover.
2) Open the module isolation switch cover and turn the malfunctioning module OFF.



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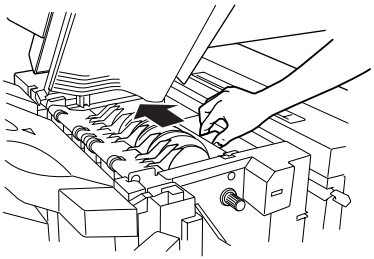
In the event of a malfunction in the punch unit or tray A, the following procedure should be carried out in addition to operating the isolation switch.

- If the saddle stitcher, paper folding unit or inserter are malfunctioning, the following procedures are not necessary. Proceed to step 3), after switching the problem module OFF.

a. Faulty punch unit

Push the punch unit lever around to the position '1111'.



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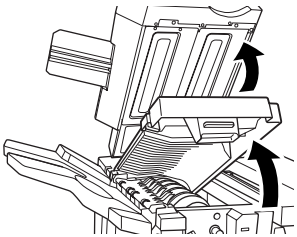
Open the inserter and then open the upper cover.



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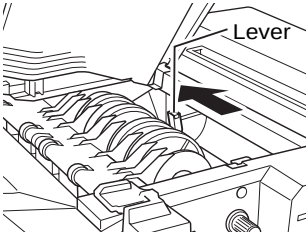
Push the lever all the way to the back.

- If the lever is already at the back, this operation is not necessary.



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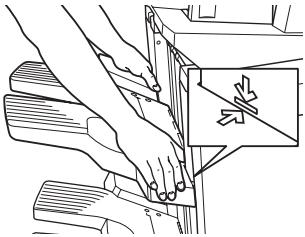
Close the upper cover and return the inserter to its original position.

b. Faulty tray A

Hold the tray at both sides and shift it until it is in the position indicated by the arrows.



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3) Close the front cover.

2 MAINTENANCE BY THE USER

As of February 2001

No.	Item	When
1	Replace staple cartridge (finisher)	indicator flashes (on copier control panel)
2	Replace staple cartridge (saddle stitcher)	indicator flashes (on copier control panel)
3	Remove punch waste paper	indicator flashes (on copier control panel)

T01-201-01

CHAPTER 2

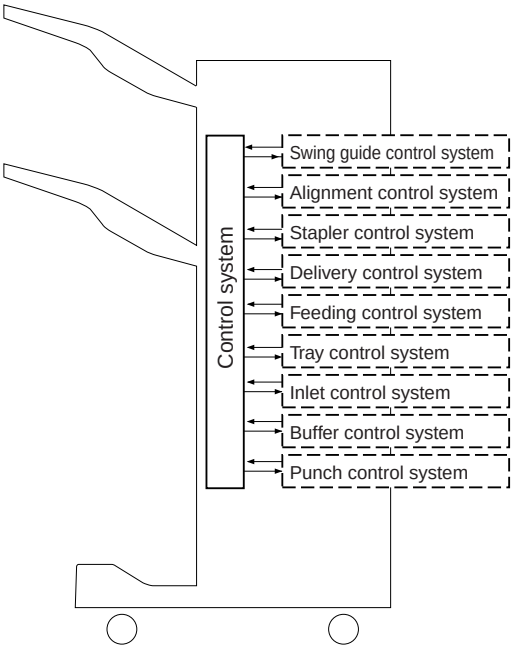
OPERATION OVERVIEW

1 BASIC OPERATIONS

1.1 Specifications

A finisher is designe to d receive the output of its host machine for extra processing before delivery; the mode of delivery may be non-sort stack, job offset*, or staple/punch.

The operations associated with these tasks are controlled by the finisher controller PCB and commands from the host machine.



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In job offset delivery, each stack of sheets is moved to the front or the rear to enable grouping of stacks.

1.2 Outline of Electrical Circuit

1.2.1 Finisher Assembly

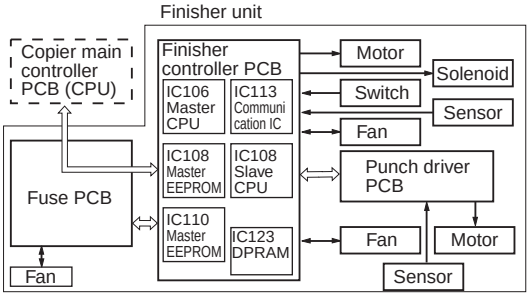
The sequence of operations of the finisher is controlled by the finisher controller PCB, which is a 16-bit microprocessor (CPU); in addition to controlling the sequence, it communicates with the host machine in serial.

In response to the various commands from the host machine through the serial communication line, the finisher controller PCB drives the solenoids and motors. It in turn sends information about the sensors and the switches to the host machine using the serial communication line.

The ICs mounted to the finisher controller PCB have the following major functions:

- IC106 (master CPU): controls sequence of operations.
- IC108 (master EEPROM): backs up adjustment values.
- IC110 (master EPROM): stores sequence programs.
  backs up initial settings data
- IC113 (communication IC): communicates with the copier and the saddle stitcher unit
- IC125 (slave CPU): controls sequence of operations.
- IC123 (DPRAM): controls communication between master CPU and slave CPU.

F02-102-01 shows the flow of signals between finisher and copier:



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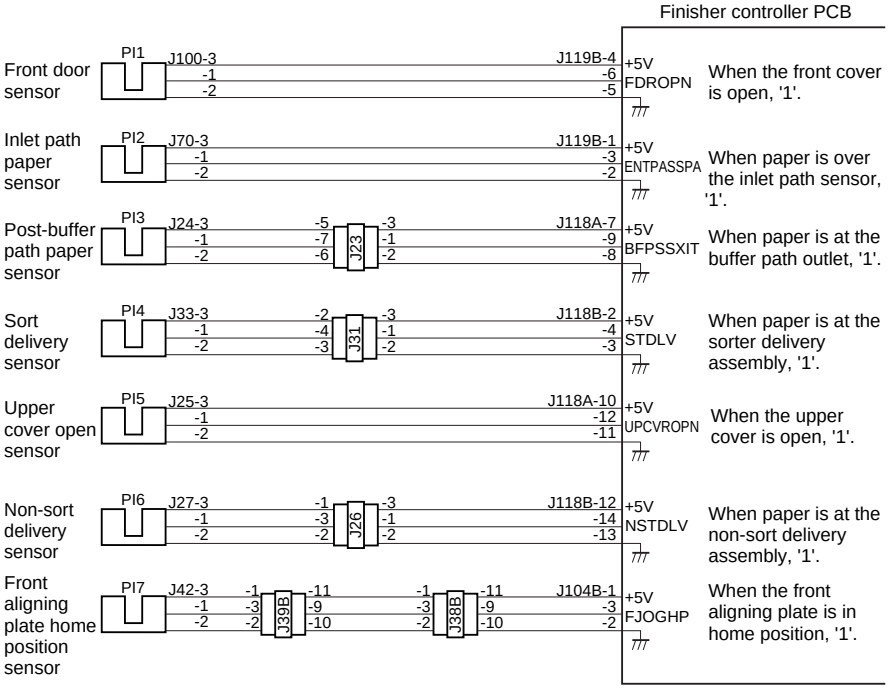
1.3 Inputs to and Outputs from the Finisher Controller PCB

1.3.1 Inputs to the Finisher Controller PCB



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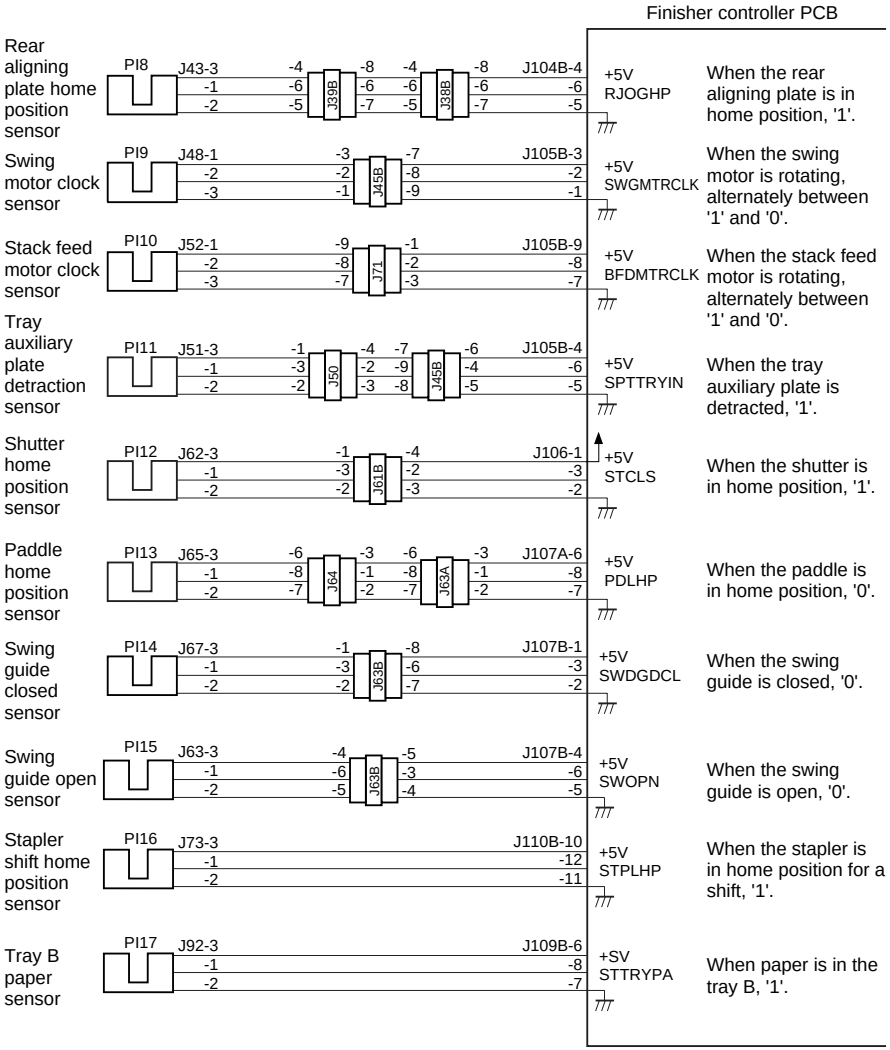
1.3.2 Inputs to the Finisher Controller PCB



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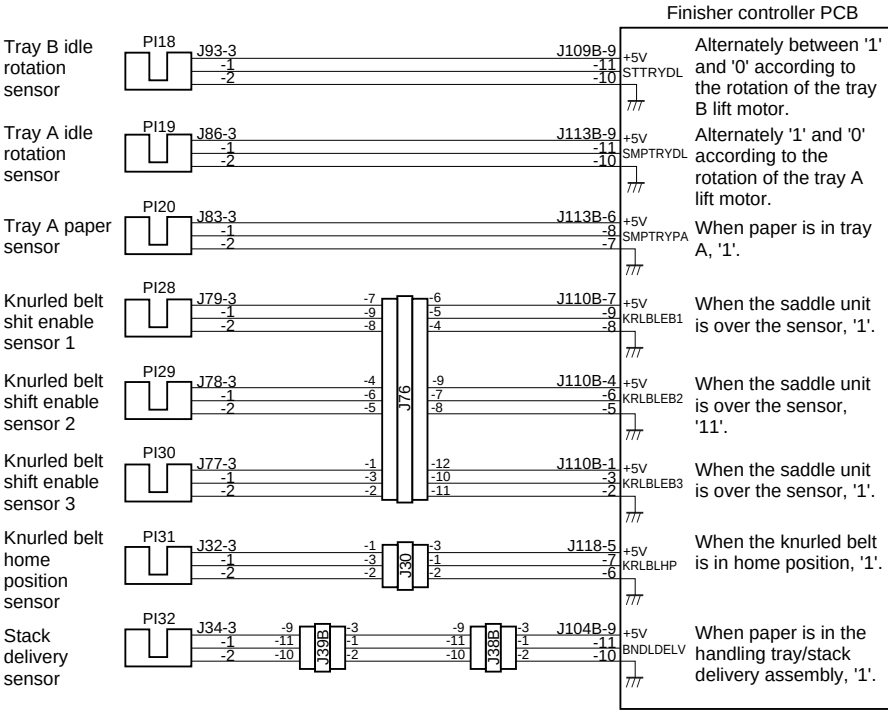
1.3.3 Inputs to the Finisher Controller PCB



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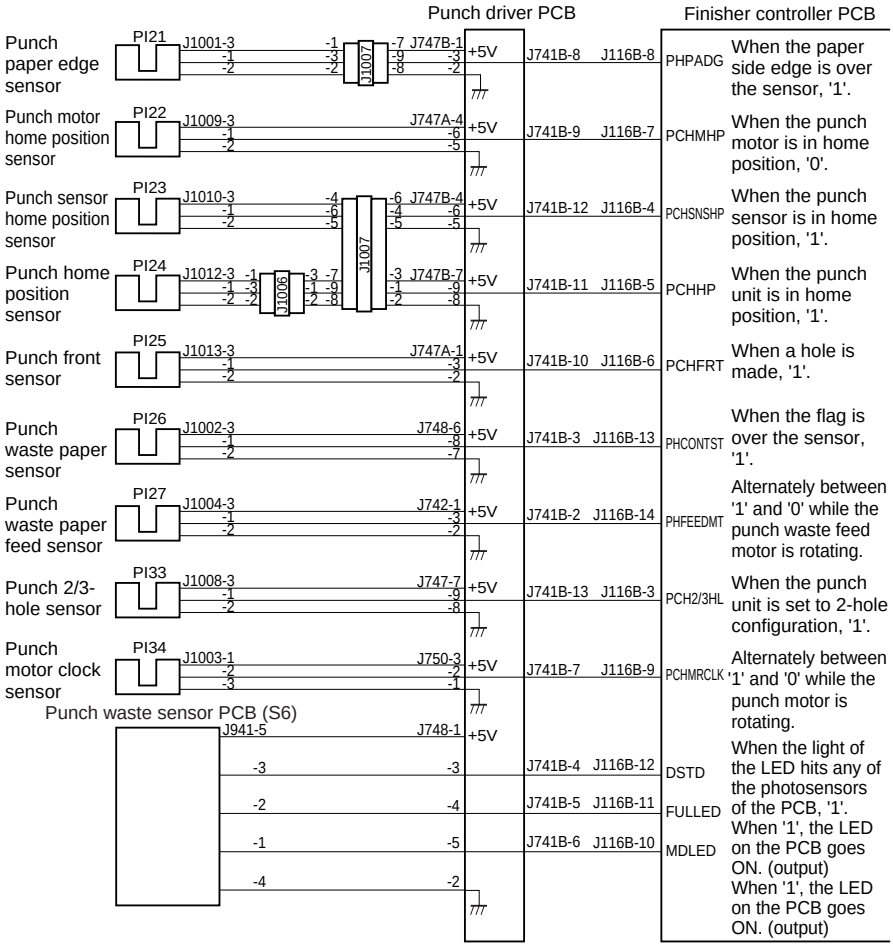
1.3.4 Inputs to the Finisher Controller PCB (punch-related)



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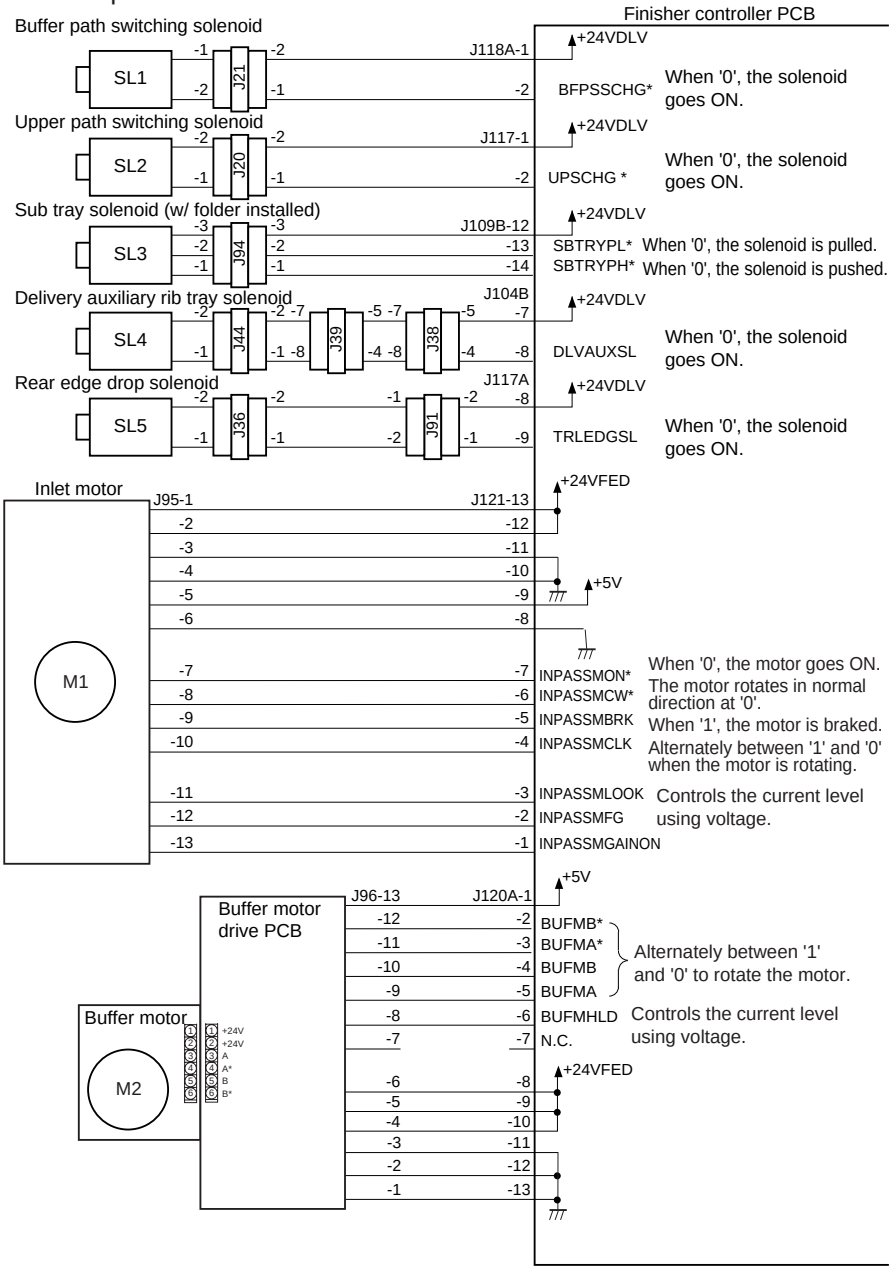
1.3.5 Outputs to the Finisher Controller PCB



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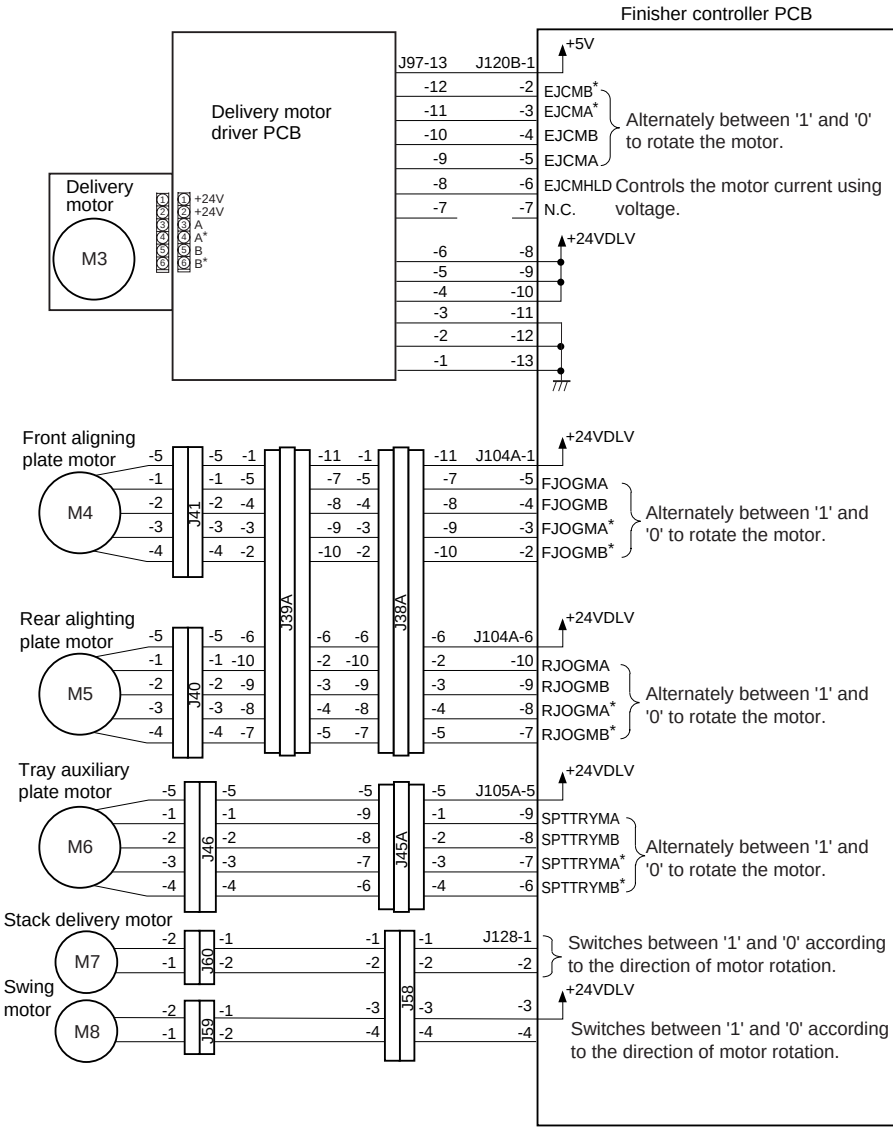
1.3.6 Outputs from the Finisher Controller PCB



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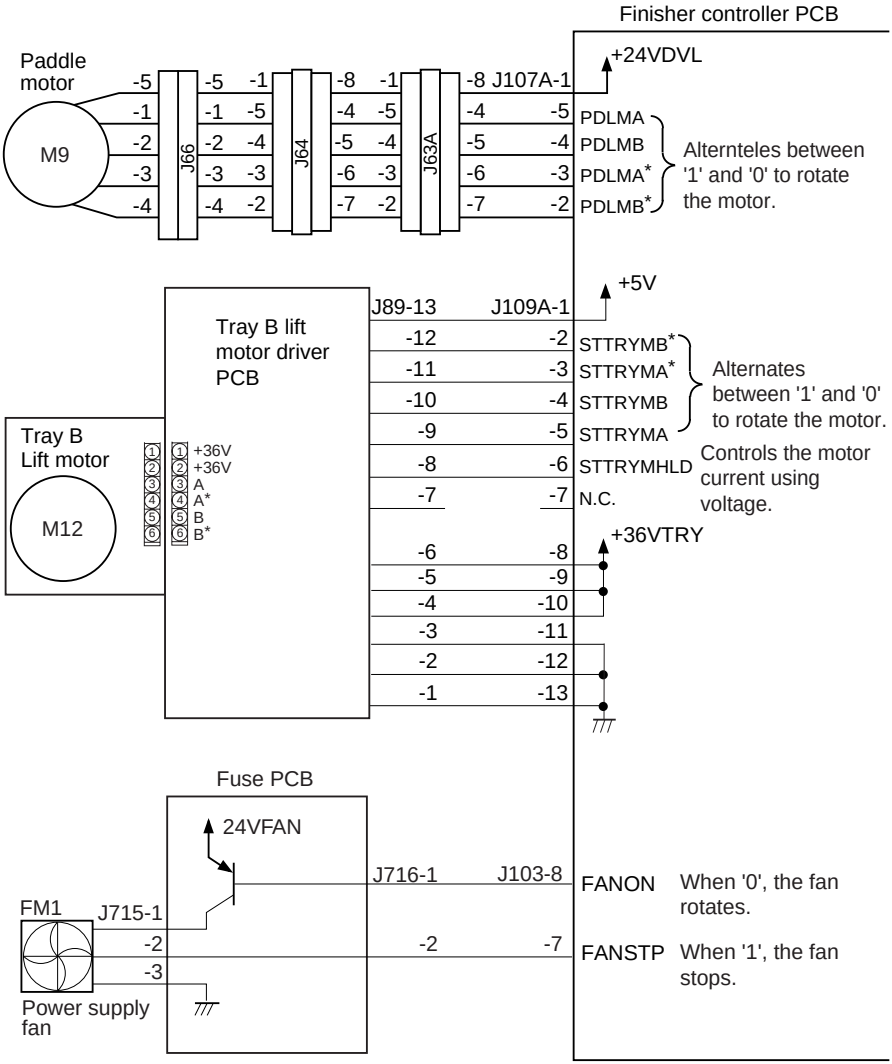
1.3.7 Outputs from the Finisher Controller PCB



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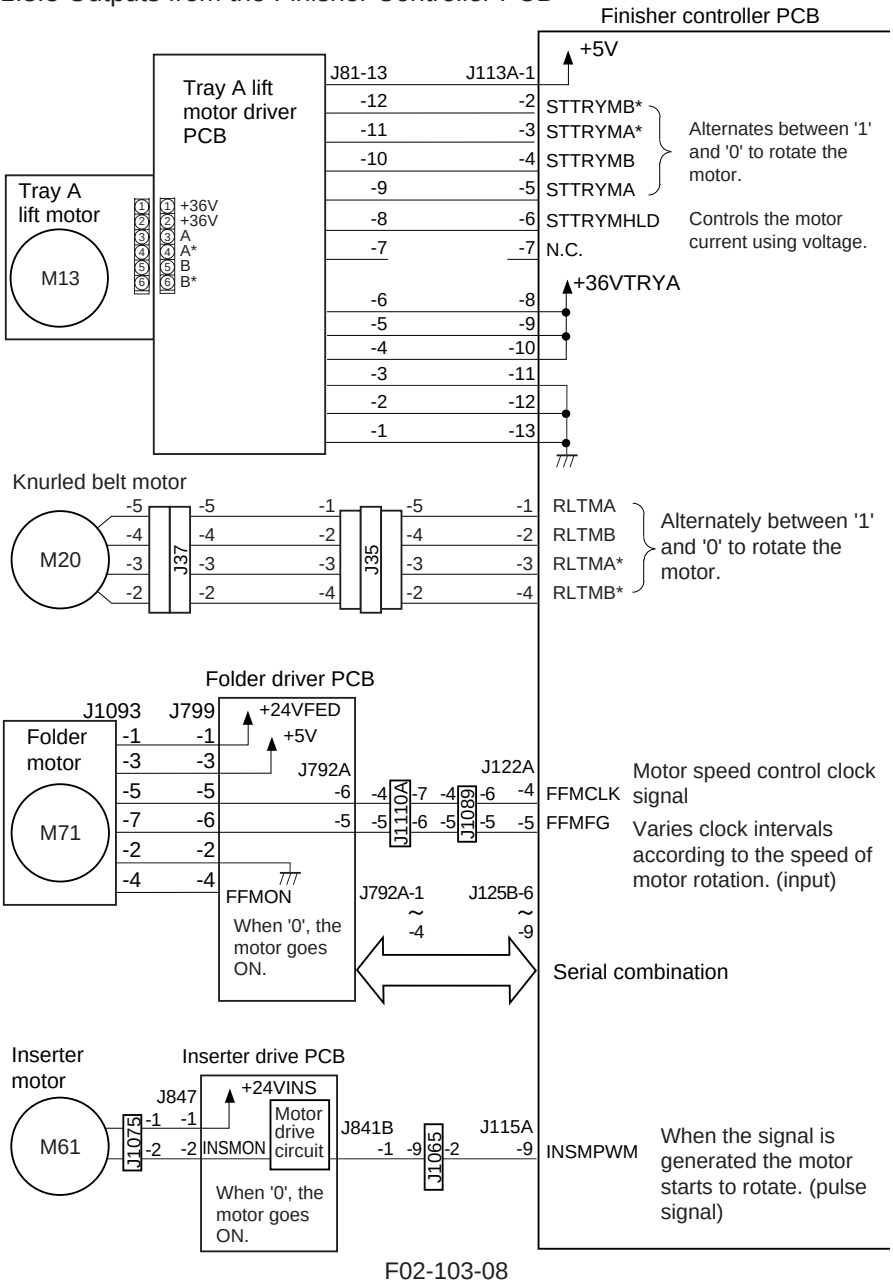
1.3.8 Outputs from the Finisher Controller PCB



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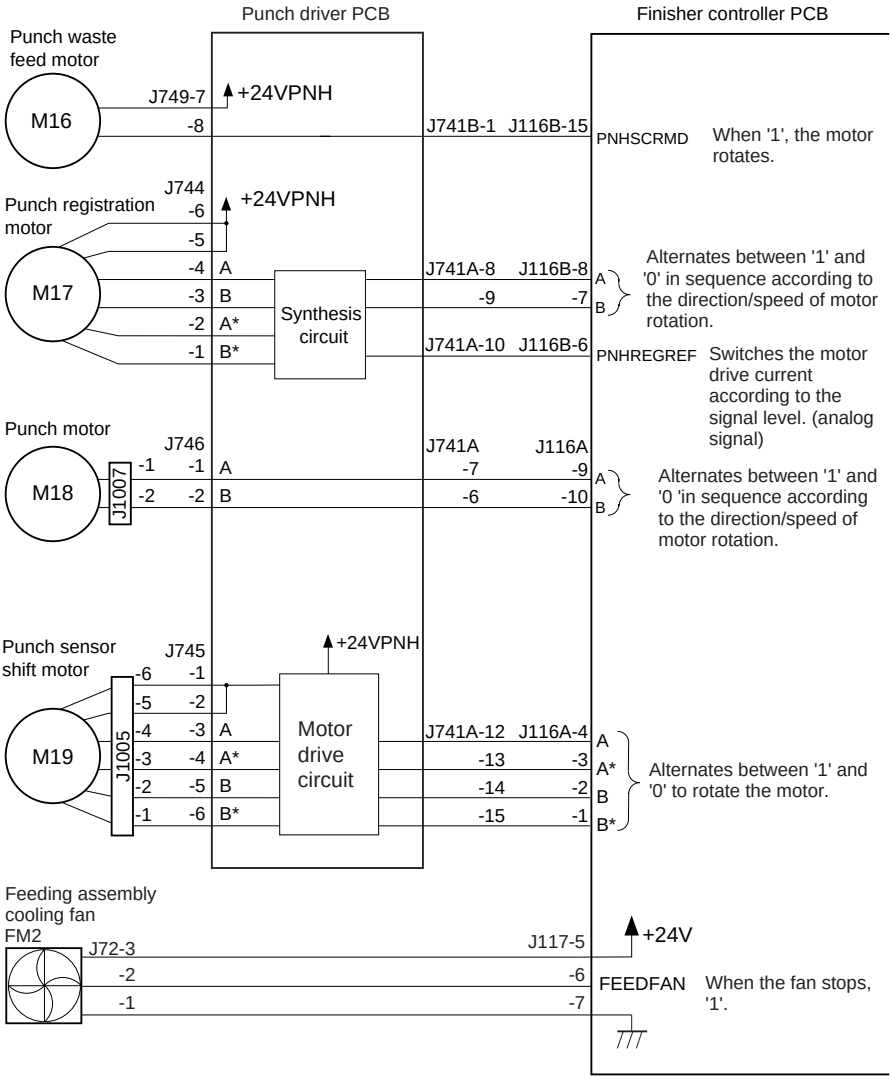
1.3.9 Outputs from the Finisher Controller PCB (punch-related)



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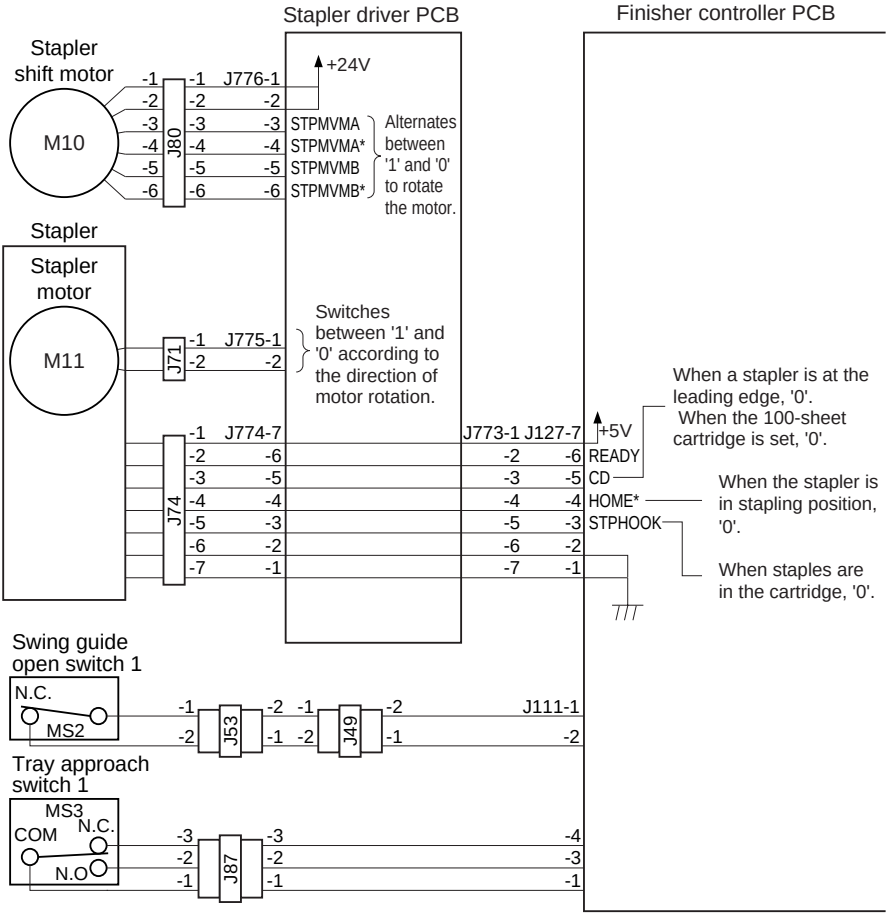
1.3.10 Inputs to and Outputs from the Finisher Controller PCB



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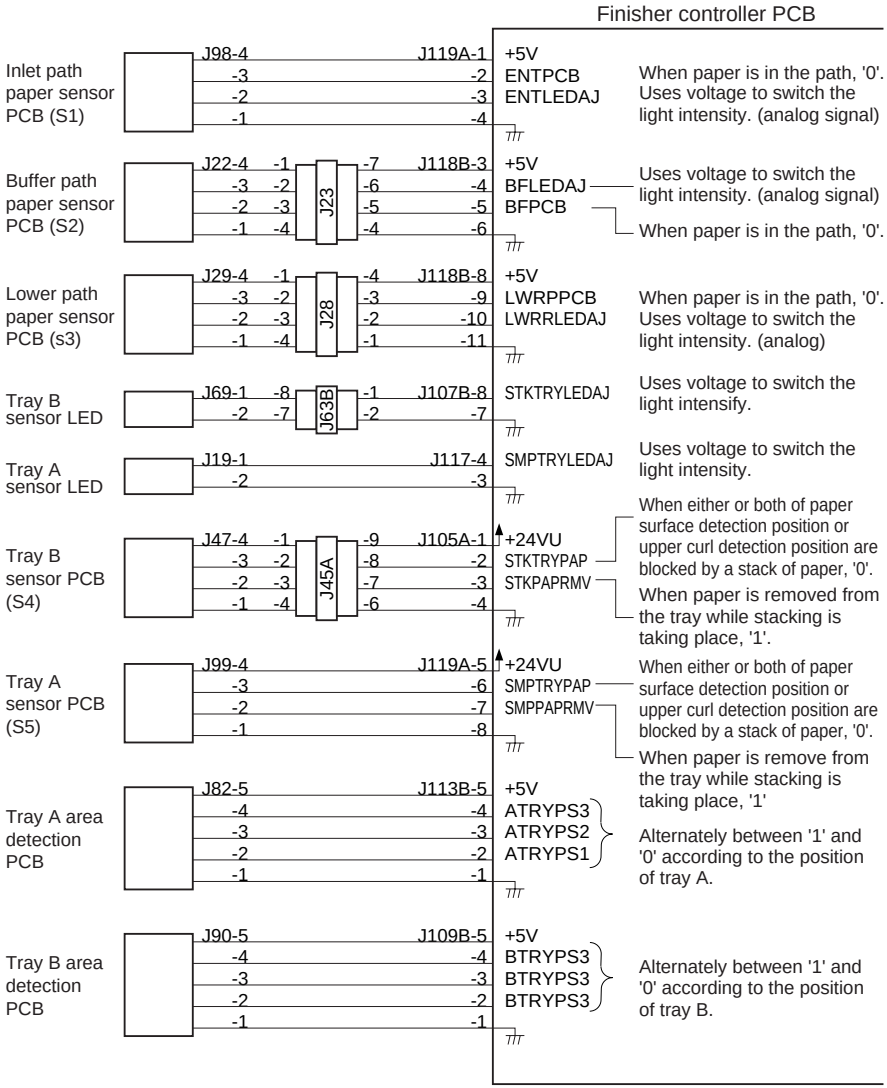
1.3.11 Inputs to and Outputs from the Finisher Controller PCB



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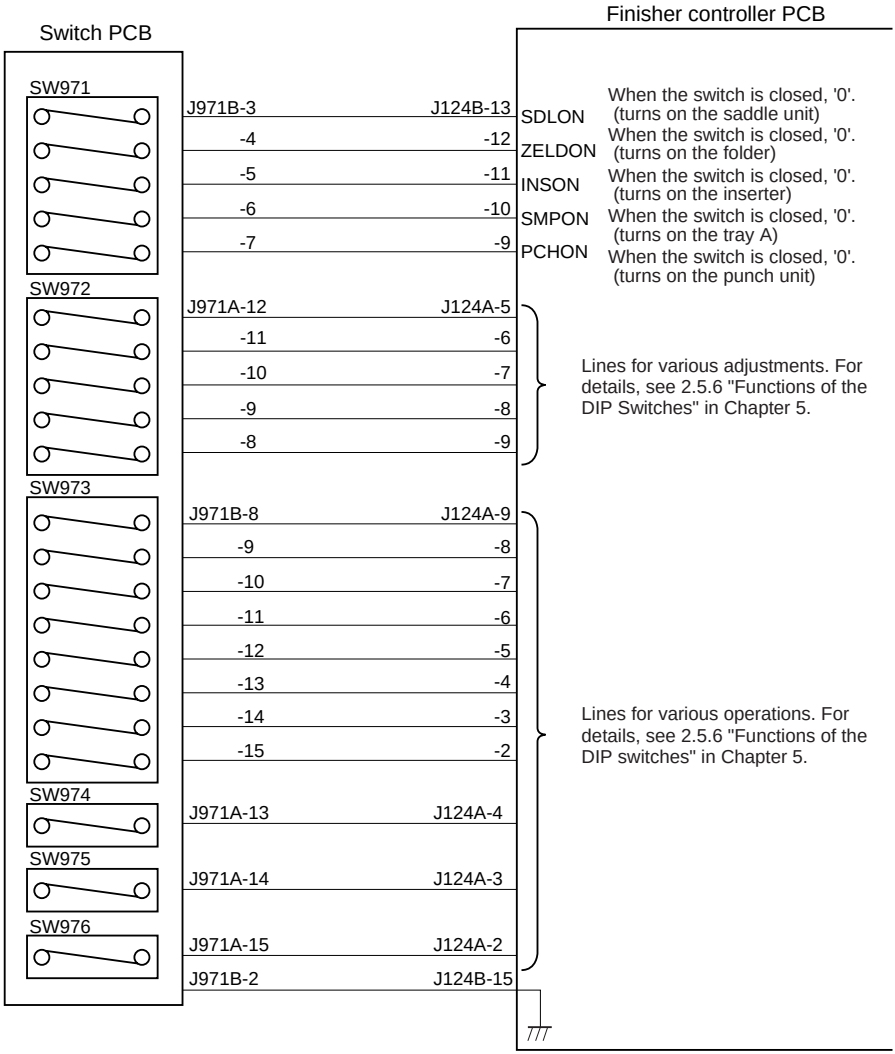
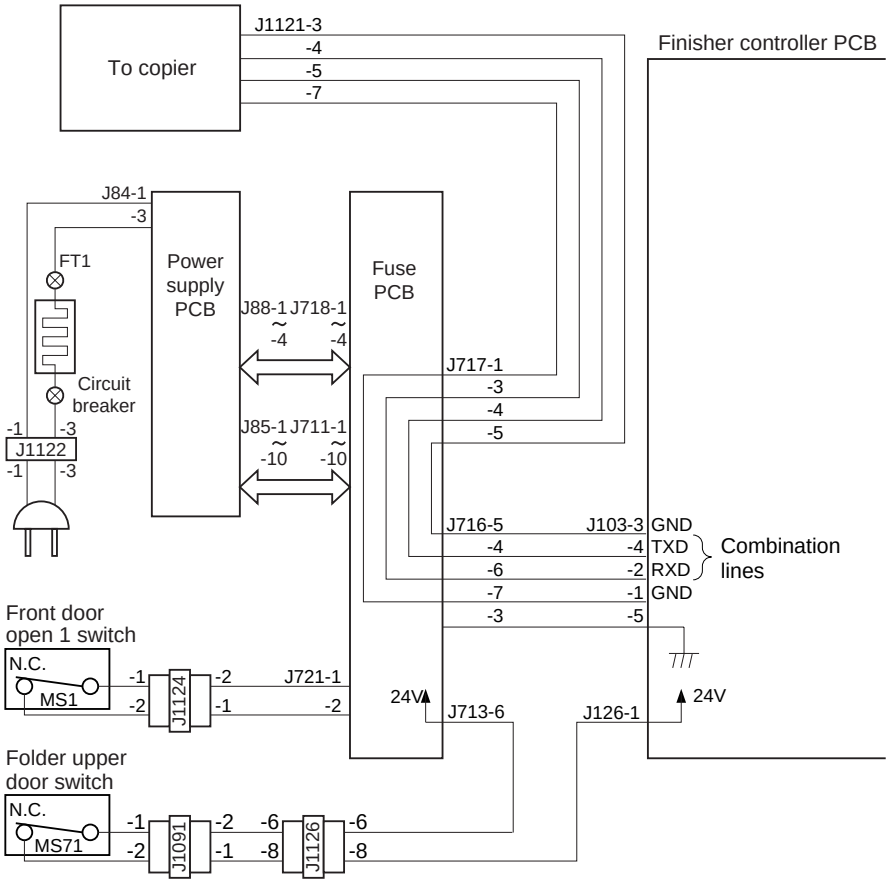
1.3.12 Inputs to and Outputs from the Finisher Controller PCB



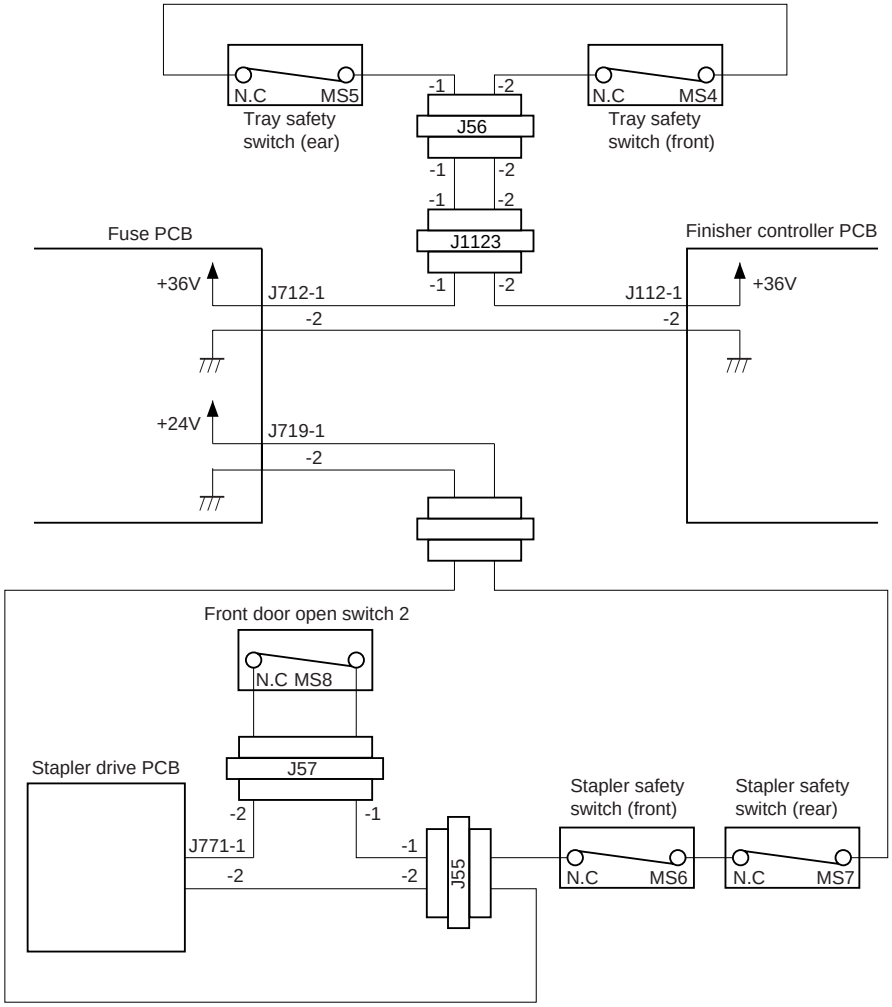
F02-103-12

1.3.13 Inputs to and Outputs from the Finisher Controller PCB



F02-103-13

1.3.14 Inputs to and Outputs from the Finisher Controller PCB



F02-103-14

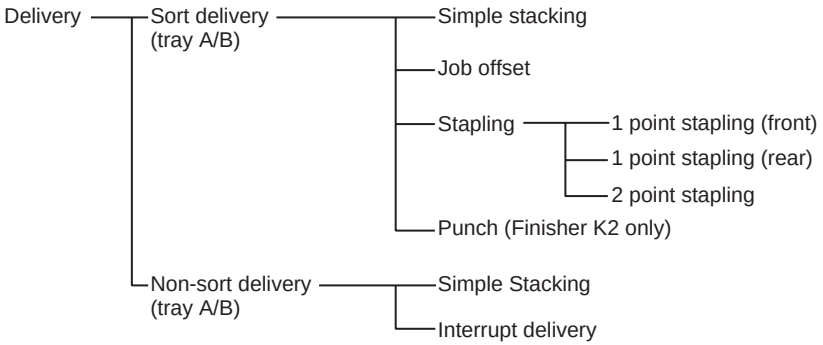
2 FEEDING/DRIVE SYSTEM

2.1 Overview

The machine operates in response to commands from its host copier to perform simple stacking, job offset, or stapling, and delivers the sheets to the delivery tray.

There are two delivery trays in the finisher section. The upper one is tray A; it mainly stacks the paper sheets. The lower one is tray B; its role as a sorting tray (or tray B) is to receive sheets which undergo stapling,or job-offset processing.

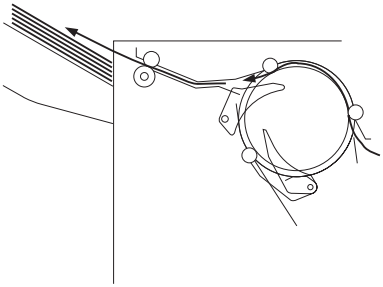
When tray B becomes filled up, tray A lowers to the position of tray B and performs the task of tray B. At that time, tray B moves to an even lower position.



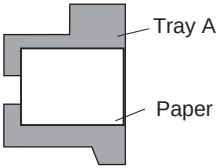
F02-201-01

2.1.1 Normal delivery

a. Simple stacking



Delivers sheets directly to tray A

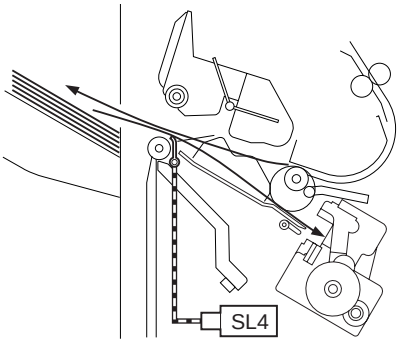


F02-201-02

b. Job offset

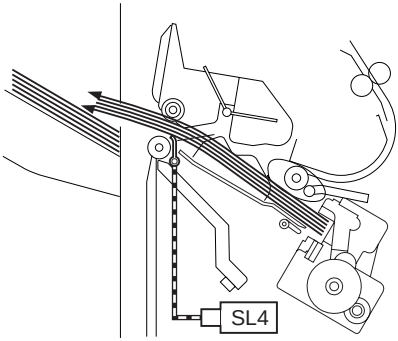
Before being delivered to tray B, a sheet is first drawn into the processing tray. The sheet is then moved to the front or rear by the jogging plate. The stack of sheets on the processing tray is delivered when it has collected a specific number of sheets.

Drawing in a sheet of paper



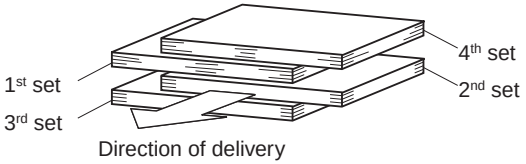
F02-201-03

Delivering a stack



F02-201-04

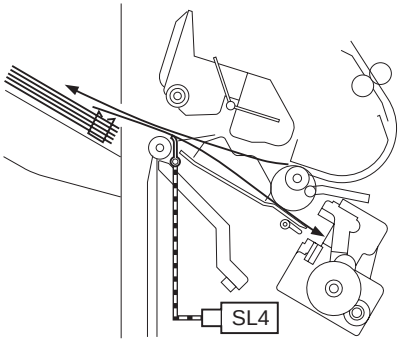
Results of delivery when handling 4 sets in job offset mode.



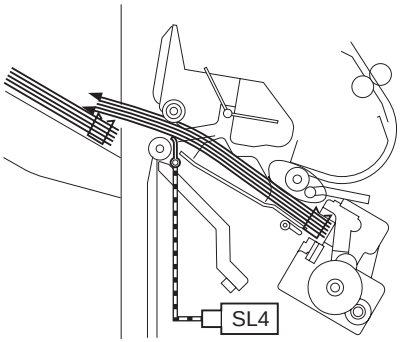
F02-201-05

c. Stapling

A sheet from the copier is deposited on the processing tray. When the stack has accumulated a specific number of sheets, the machine staples the stack and delivers it to the tray B.



F02-201-06

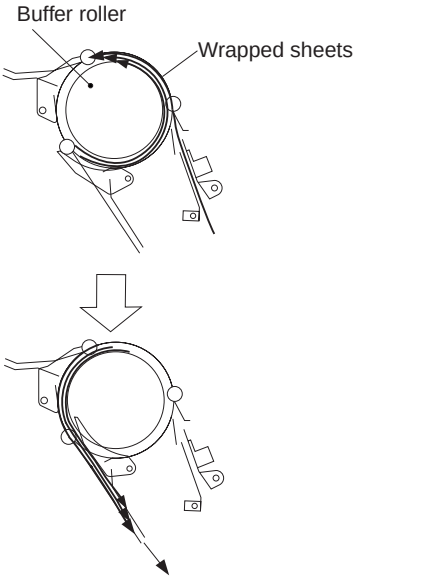


F02-201-07

d. Buffer path

The machine is designed to accept sheets from the copier while it is handling sheets on the processing tray, and so a buffer roller has been added.

The machine's buffer roller allows wrapping of a maximum of three sheets of paper, during which job offset and stapling are executed on the processing tray.



F02-201-08

2.2 Feeding/delivery

2.2.1 Overview

The machine sends sheets from the copier to tray A or tray B, according to the selected mode of delivery, and performs job offset, stapling or punching in accordance with commands from the copier.

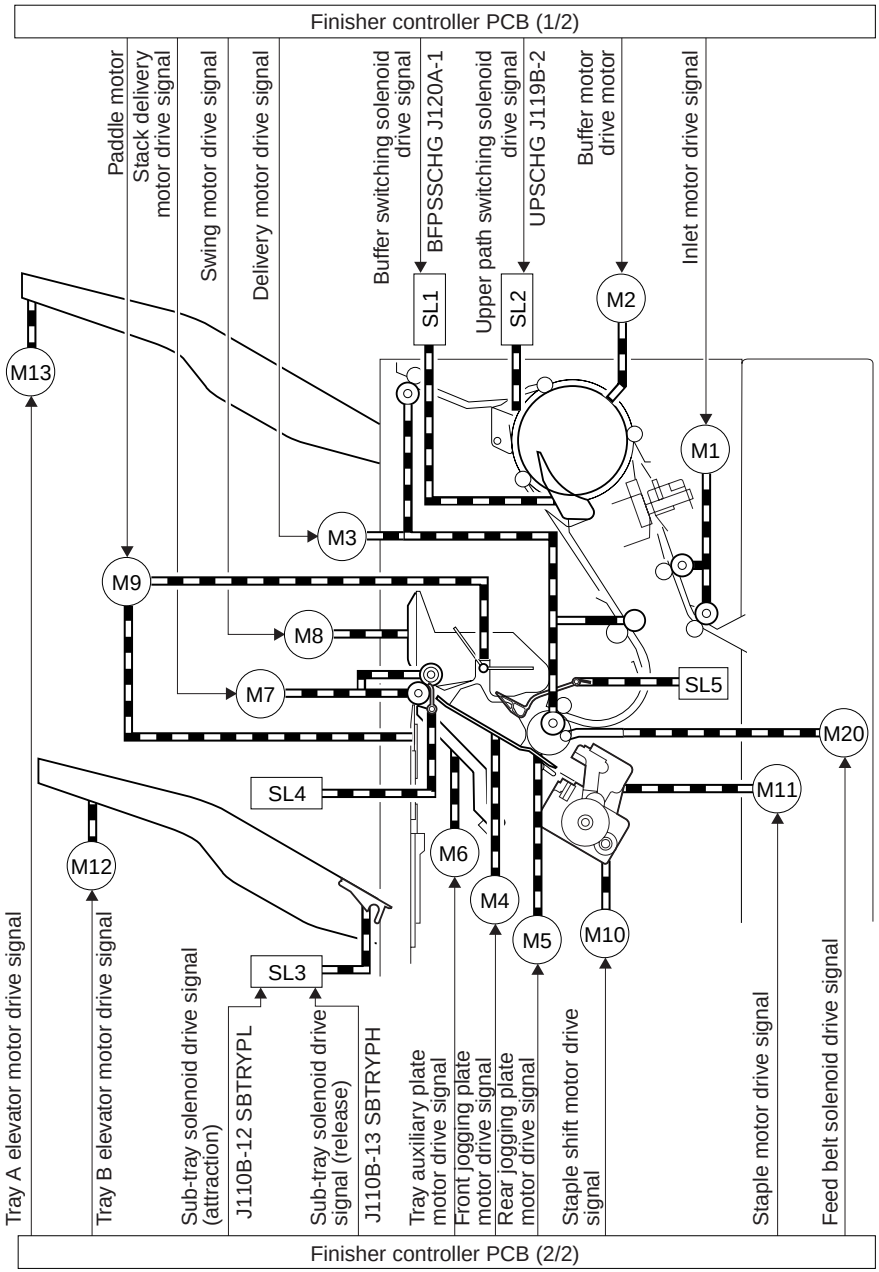
Table 2-201 shows the motors used to feed or align sheets. These motors are rotated forward or in reverse, as instructed by the finisher controller PCB.

The sensors shown in Table 2-202 monitor the arrival or passage of paper in the paper path.

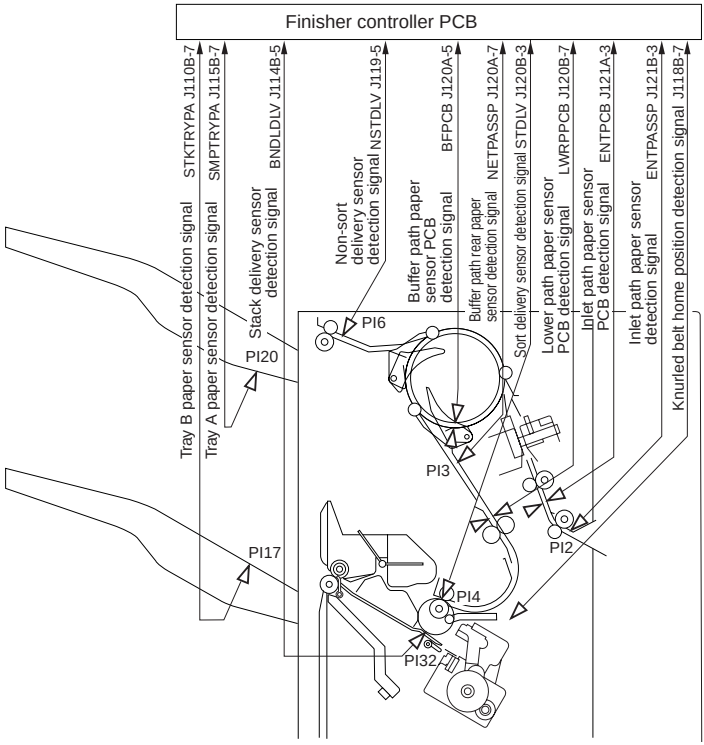
If paper fails to reach or clear a specific sensor within a specific period of time, the finisher controller PCB will identify the condition as a jam, stopping operation and informing the copier of the condition.

Notation	Name	Description	Connector on finisher controller PCB
M1	Inlet motor	DC brush-less motor	J121
M2	Buffer motor	4-phase stepping motor	J120A
M3	Delivery motor	4-phase stepping motor	J120B
M4	Front jog motor	4-phase stepping motor	J104A
M5	Rear jog motor	4-phase stepping motor	J104A
M6	Tray auxiliary plate motor	4-phase stepping motor	J105A
M7	Stack delivery motor	DC motor	J128
M8	Stack swing motor	DC motor	J128
M9	Paddle motor	4-phase stepping motor	J108B
M12	Tray B elevator motor	4-phase stepping motor	J109A
M13	Tray A elevator motor	4-phase stepping motor	J113A
M20	Knurled belt motor	4-phase stepping motor	J108

T02-202-01



F02-202-01



F02-202-02

Notation	Name	Description	Connector on finisher controller PCB
PI2	Inlet path sensor	Photo-interrupter	J199B-3
PI3	Buffer path rear sensor	Photo-interrupter	J118A-9
PI4	Sort delivery sensor	Photo-interrupter	J118B-4
PI6	Non-sort delivery sensor	Photo-interrupter	J118B-14
PI32	Stack delivery sensor	Photo-interrupter	J104B-11
PI17	Tray B paper present sensor	Photo-interrupter	J109B-8
PI20	Tray A paper present sensor	Photo-interrupter	J113B-8
PI31	Knurled belt home position sensor	Photo-interrupter	J118B-7
S1	Inlet path sensor	Reflector	J119A-3
S2	Buffer path sensor	Reflector	J118A-5
S3	Lower path paper sensor	Reflector	J118B-10

T02-202-02

2.3 Job offset

2.3.1 Overview

In job offset mode, stacks of sheets are moved to the front or rear for sorting purposes.

The stacks are moved to the front or rear by the front jogging plate and rear jogging plate. Sheets moving past the stack delivery roller are moved by the paddle in the direction of the stopper. The swing guide is in the up position while pulling a sheet into the processing tray or while the jogging plates are in operation; it is in the down position while the stack is being delivered.

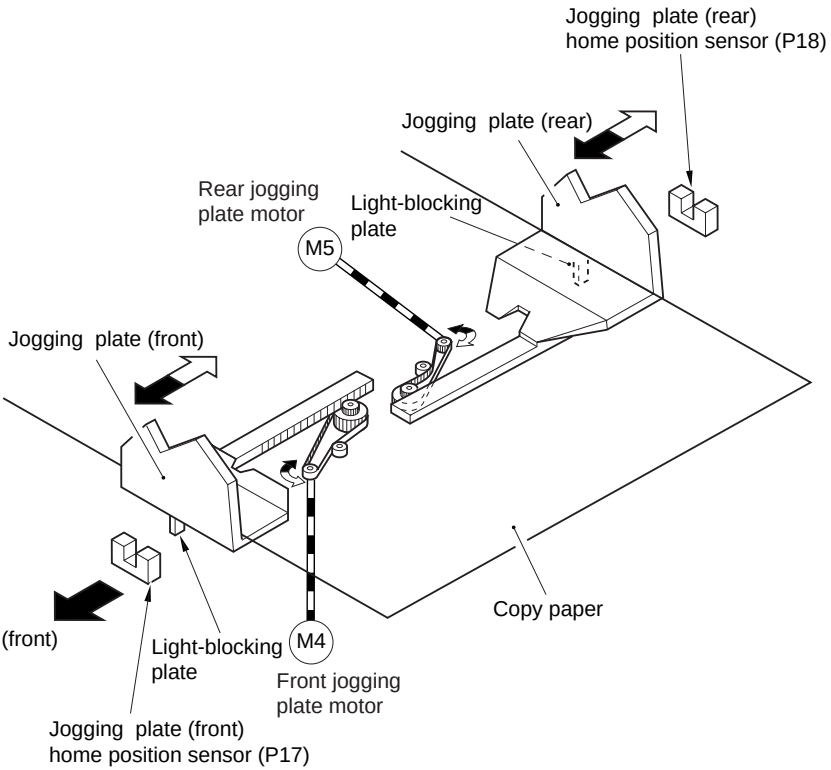
When the power is turned on, the finisher controller PCB drives the front jogging plate motor (M4) and the rear jogging plate motor (M5) to return the two jogging plates to their home positions.

Sensor	Notation	Connector
Front jogging plate home position sensor	P17	J104B-3
Rear jogging plate home position sensor	P18	J104B-6
Swing guide closed sensor	P114	J107B-2
Swing guide open sensor	P115	J107B-6
Paddle home position sensor	P113	J107A-8

T02-203-01

Function	Motor	Notation
Drives the front jogging plate	Front jogging plate motor	M4
Drives the rear jogging plate	Rear jogging plate motor	M5
Swing guide drive	Swing motor	M8
Drives the paddle (feeds paper)	Paddle motor	M9

T02-203-02


Jogging plate (rear)
home position sensor (P18)
Jogging plate (rear)
Rear jogging
plate motor
M5
Light-blocking
plate
Jogging plate (front)
(front)
Light-blocking
plate
M4
Front jogging
plate motor
Copy paper
Jogging plate (front)
home position sensor (P17)

F02-203-01

2.3.2 Stacking sheets on the processing tray

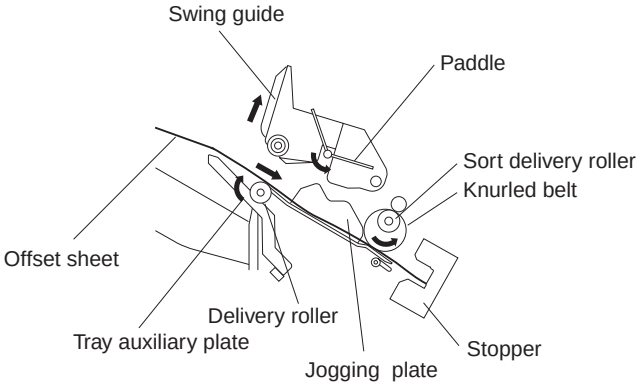
a. Handling the first sheet (other than A5R)

The tray auxiliary plate is outside the machine before the first sheet moves past the delivery roller. (It may, however, be inside the machine under certain conditions.)

The swing guide moves up when the trailing edge of the sheet moves past the sort delivery sensor (PI4), releasing the sheet from the stack delivery roller.

Then, the paddle taps on the top surface of the sheet, and butts the trailing edge of the sheet against the processing tray stopper. The paddle rotates in numbers determined by paper size, the number of sheets contained in the stack and the presence of staples. (Usually it rotates 0 to 2 times).

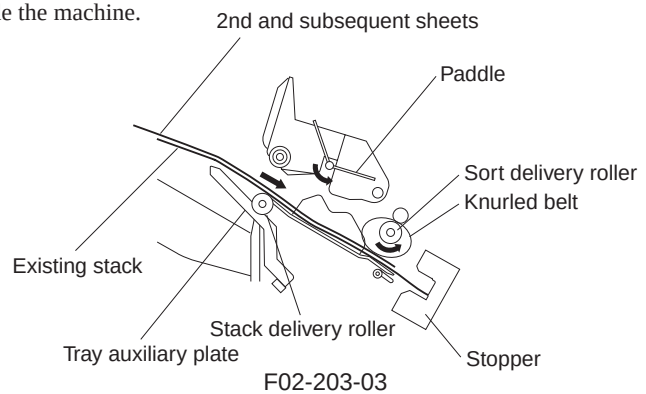
The stack delivery roller starts to rotate in reverse to assist butting the sheet against the stopper.



F02-203-02

b. Handling the second and subsequent sheets

When the trailing edge of the second and subsequent sheets moves past the delivery sensor, the paddle starts to tap the top surface of the sheet, butts its trailing edge against the processing tray stopper, and deposits it on top of the existing stack. The tray auxiliary plate remains outside the machine.



F02-203-03

c. Offset Operation

The front and rear jogging plates shift each sheet that arrives toward the front or rear. The direction will be:

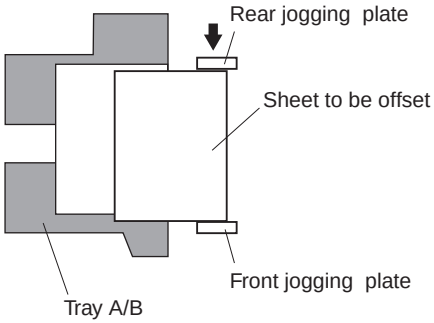
i. In the opposite direction of an existing stack in tray A/B.

ii. Different according to sheet size and mode when tray A/B is empty.

When offsetting to the front, the machine uses the front jogging plate as the reference for butting, while the rear jogging plate moves the sheet toward the front.

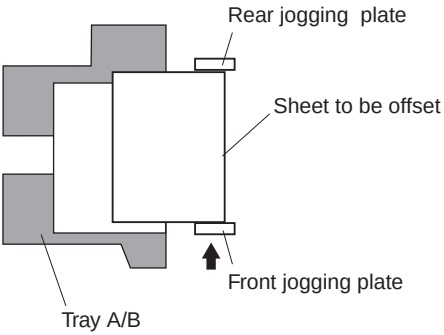
When offsetting to the rear, the machine uses the rear jogging plate as the reference for butting, while the front jogging plate moves the sheet toward the front.

The machine performs an offset operation each time a sheet is pulled onto the processing tray.



Shifting to the Front

F02-203-04



Shifting to the rear

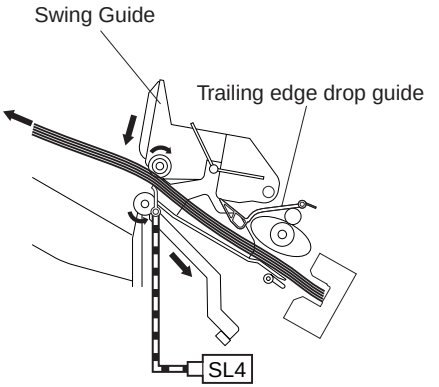
F02-203-05

d. Stack Delivery

A stack is delivered when as many as five sheets of paper (three in the case of large-size sheets) have been deposited on the processing tray.

The swing guide motor rotates to lower the swing guide. The upper and lower stack delivery rollers then hold the stack in between. When the stack delivery motor stars to rotate, the stack held between the delivery rollers is discharged; at the same time, the tray auxiliary plate is retracted inside the machine.

The following sheet coming from the copier to the finisher while the stack is being discharged is wrapped around the buffer roller. (The size of the following sheets is A4/B5/LTR.)



F02-203-06

2.3.3 Number of sheets for an offset job

A stack is discharged when it has collected five sheets or three sheets (large-size). If the number of sheets for a specific offset job cannot be divided by 5, the last stack falling short of the full count will be discharged. However, the final stack must not contain 1 sheet (e.g., if 5n+1, the last stack will contain one sheet.) In such a case, the second stack from the last will be discharged containing four sheets to avoid discharging a single sheet. In the example, the above stack will consist of two sheets.

E.g.

1. For eight small-size sheets, the combination will be a 5-sheet stack and a 3-sheet stack.
2. For ten small-size sheets, the combination will be a 5-sheet stack and a 5-sheet stack.
3. For 16 small-size sheets, the combination will be a 5-sheet stack, 5-sheet stack, 4-sheet stack, and a 2-sheet stack.

Why Avoid a Single-Sheet Stack?
A single sheet of paper will not follow a fixed trajectory from the stack delivery slot to the top of the existing stacks in the sort tray, resulting in cases where the stack jogging is disrupted. In order to prevent this from happening, stacks contain two or more sheets to stabilize the drop trajectory.

Large size sheets are delivered in stacks of three. If the last stack consists of 1 sheet, it will be combined with the previous stack, thus forming a 4-sheet stack.

Job offset sequences
Two 2-Sheet Stacks

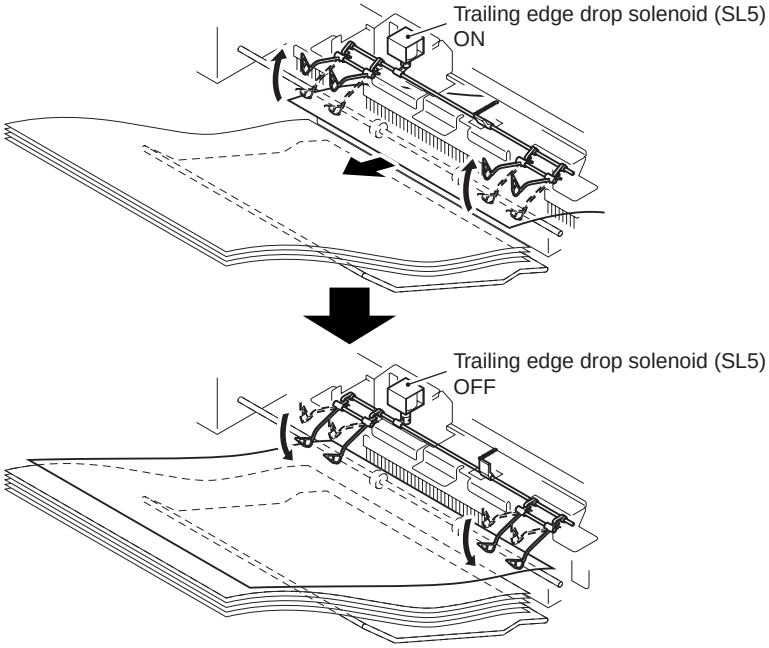
F02-203-07

2.4 Trailing edge drop function

2.4.1 Overview

The trailing edge drop restrains the trailing edge of the sheet delivered to the processing tray in order to bring it quickly to a resting state. The trailing edge drop is driven by the trailing edge drop solenoid (SL5).

When delivery to the processing tray begins, the trailing edge drop solenoid (S5) turns on, and the trailing edge drop moves above the sheet without touching it. The trailing edge drop solenoid (SL5) turns off just before the trailing edge of the sheet lands in the processing tray, restraining the trailing edge of the sheet.

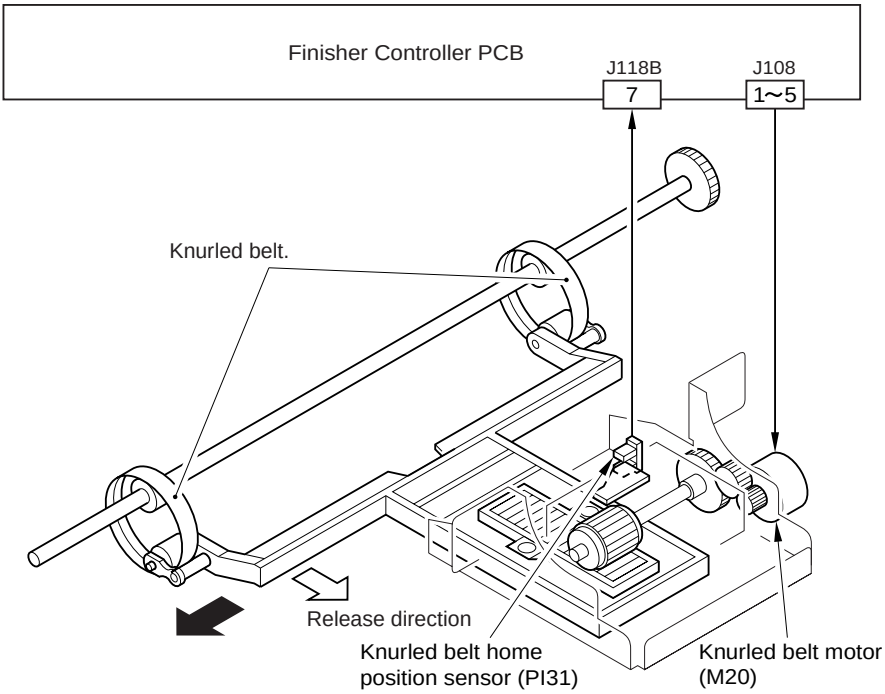


F02-204-01

2.5 Controlling the knurled belt

2.5.1 Overview

The primary function of the knurled belt is to ensure that sheets delivered to the processing tray are drawn all the way to the stopper. When the shape of the knurled belt is normal, the contact pressure the knurled belt applies to the stack varies according to the thickness of the stack in the processing tray. Changes in the contact pressure interfere with proper conveyance of the sheets. Therefore, in this machine, the contact pressure of the knurled belt does not affect the thickness of the stack, rather the normal pulling force on the belt alters the shape. The amount of pulling force on the belt is exerted by the pulse control of the knurled belt motor (M20).



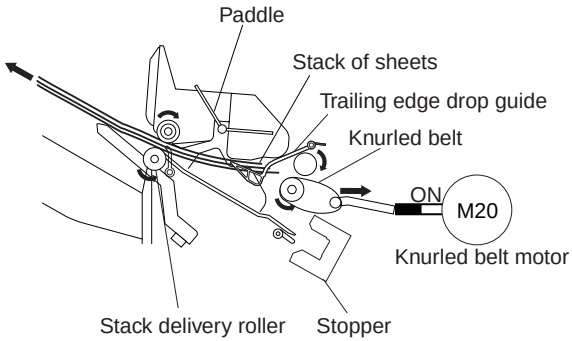
F02-205-01

2.5.2 Delivering three sheets

When three sheets have cleared the sort delivery roller from the buffer roller, the stack delivery roller will rotate in reverse to send the stack of three sheets in the direction of the processing tray.

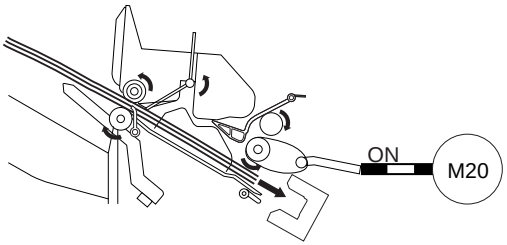
If the knurled belt moved the stack of three sheets at the same time, the feeding force would be too strong and the stack would bend against the stopper. To avoid such a problem, the knurled belt is released and the stack delivery roller and the paddle operate to move the 3-sheet stacks to the processing tray.

1) The stack moves past the sort delivery roller. At the same time, the knurled belt solenoid turns on to release the knurled belt.



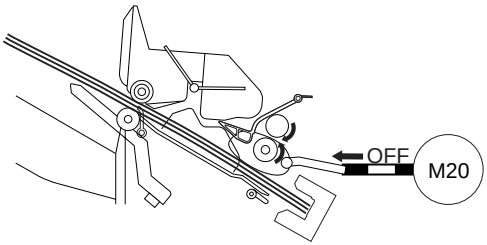
F02-205-02

2) The stack delivery roller starts to rotate in reverse and, at the same time, the paddle rotates to move the stack in the direction of the processing tray.



F02-205-03

3) The belt is locked once again as soon as the stack butts against the stopper.

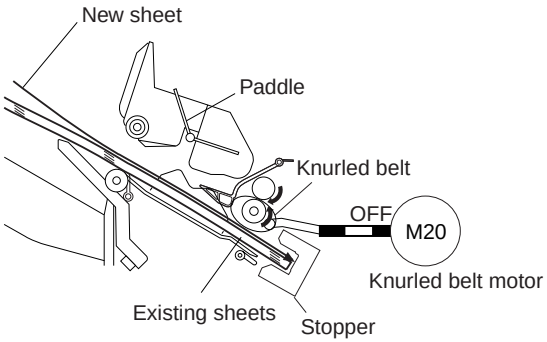


F02-205-04

2.5.3 Multiple sheets on the processing tray

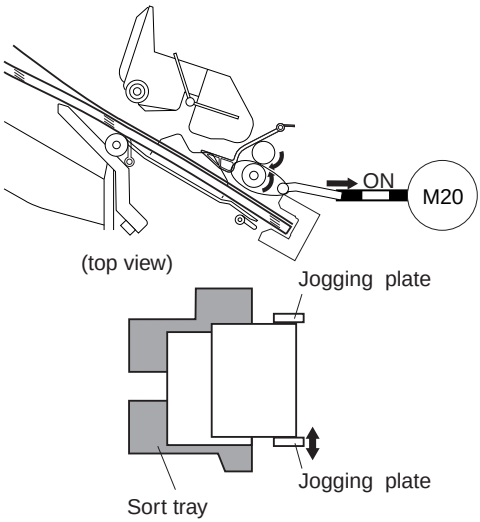
When the processing tray already holds multiple stacks, the knurled belt may inadvertently return the aligned sheets to their prior position. Excess sheets may also interfere with the rotation of the knurled belt. To avoid such a problem, the knurled belt is released if there are 40 or more sheets on the processing tray.

1) The trailing edge of the sheet moves past the delivery roller, and the sheet is butted against the stopper by the paddle and the knurled belt.



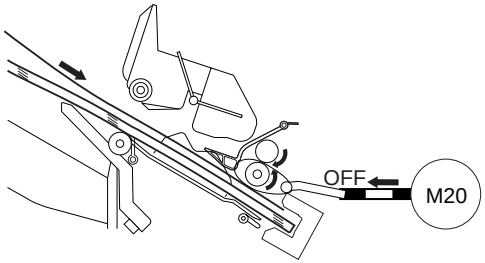
F02-205-05

2) The solenoid turns on in concert with the jogging of the sheet to release the knurled belt.



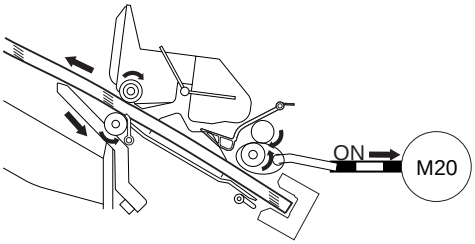
F02-205-06

3) After aligning the sheets, the solenoid turns off, and the knurled belt moves the sheet in the direction of the stopper.



F02-205-07

4) The solenoid turns on when delivery starts, moving the stack away from the knurled belt. The solenoid remains on if the next discharge is for a three-sheet stack.

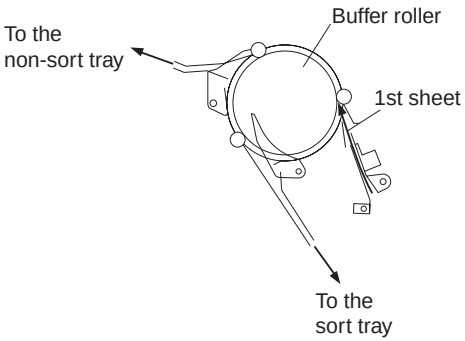


F02-205-08

2.6 Buffer path

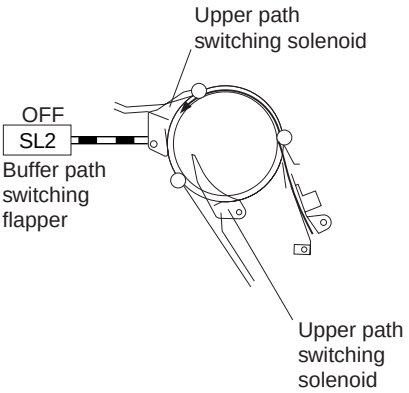
To accept sheets from the copier continuously while the machine handles sheets on the processing tray, the machine is equipped with a buffer roller, which operates as follows:

1) The first sheet is moved in the direction of the buffer roller.



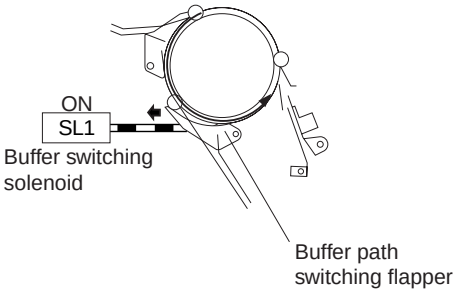
F02-206-01

2) Since the upper path switching flapper remains off, the leading edge of the sheet moves in the direction of the buffer path switching flapper.



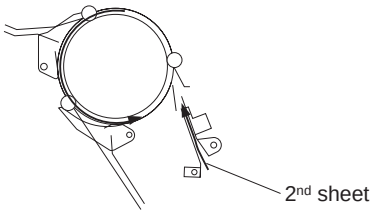
F02-206-02

3) The buffer path switching flapper operates, causing the leading edge of the sheet to wrap around the buffer roller.



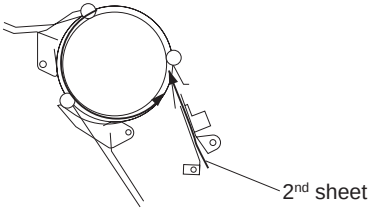
F02-206-03

4) The second sheet arrives from the copier.



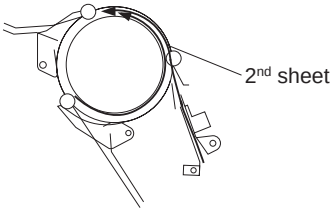
F02-206-04

5) The leading edge of the second sheet moves ahead of the leading edge of the 1st sheet.



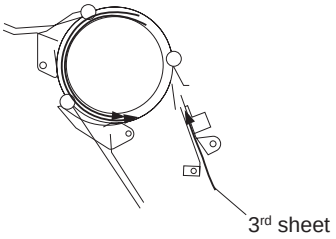
F02-206-05

6) The buffer roller continues to rotate, causing the second sheet to slide over the first sheet.



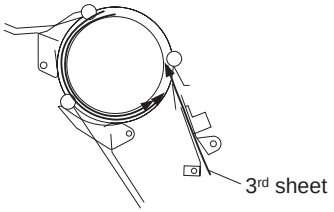
F02-206-06

7) The third sheet arrives from the copier.



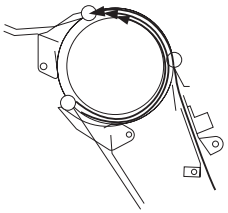
F02-206-07

8) The leading edge of the third sheet moves ahead of the leading edge of the second sheet.



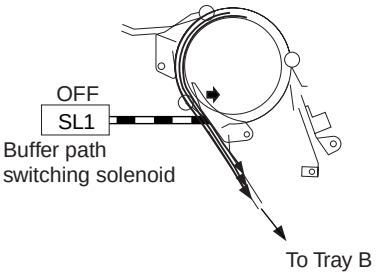
F02-206-08

9) The buffer roller continues to rotate, causing the third sheet to slide over the first and second sheets.



F02-206-09

10) The buffer path switching flapper turns off, causing the three sheets to move in the direction of the delivery roller together.



F02-206-10

3 CONTROLLING THE PADDLE

3.1.1 Overview

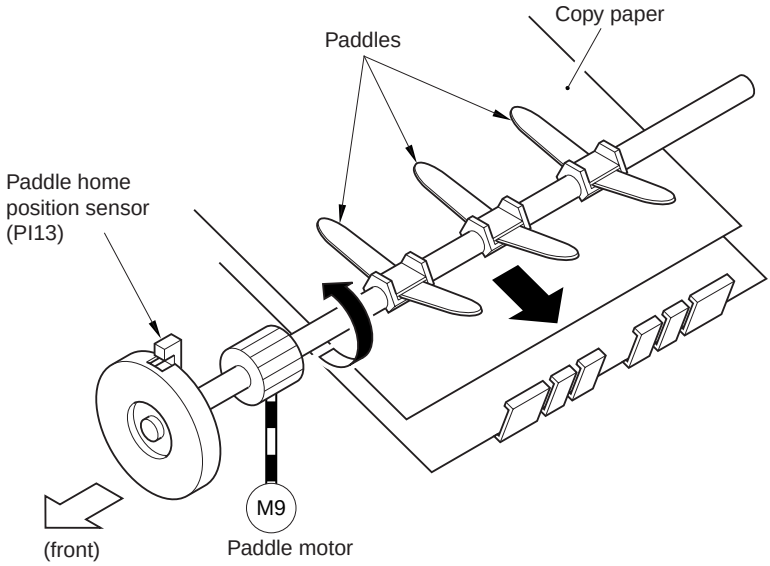
The paddle is provided to send sheets delivered to the processing tray toward the stopper.

Sensor	Notation	Connector
Paddle home position sensor	PI13	J107A-8

T02-301-01

Function	Motor	Notation
Drives the paddle	Paddle motor	M9

T02-301-02



F02-301-01

4 CONTROLLING THE TRAY AUXILIARY PLATE

4.1.1 Overview

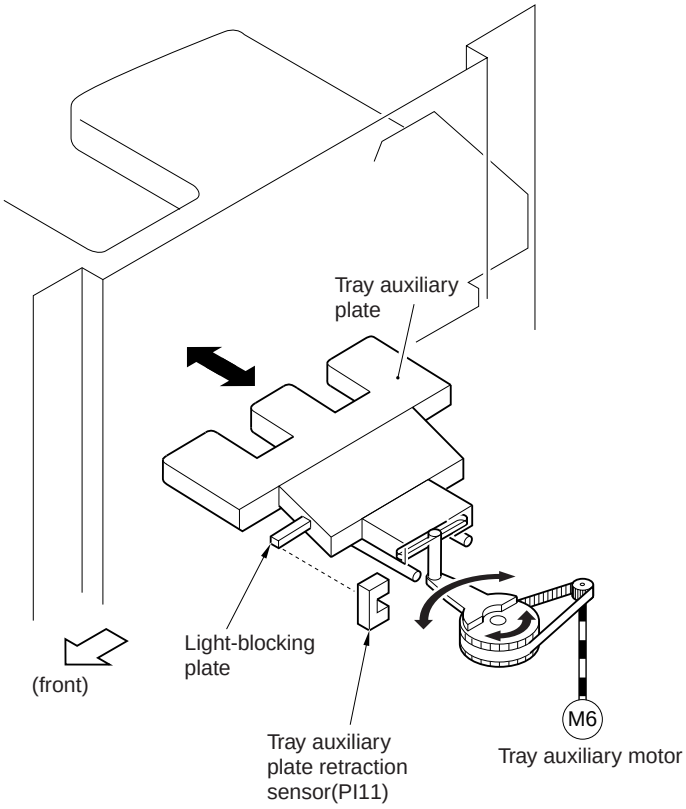
Half of sheets are pushed on to the sort tray before feeding when the machine performs stapling or offset operations at the processing tray. A tray auxiliary plate is provided to ensure the best placement of the leading edges of the sheets.

Sensor	Notation	Connector
Tray auxiliary plate retraction sensor	PI11	J105B-6

T02-401-01

Function	Motor	Notation
Drives the tray auxiliary plate	Tray auxiliary plate motor	M6

T02-401-02



F02-401-01

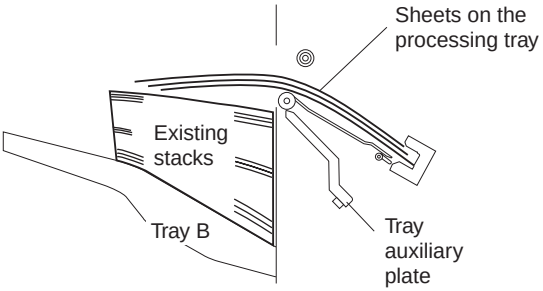
4.1.2 Operation

When multiple sheets are stacked on tray B, the leading edge of the stack tends to bend down. If the sheets were pushed out of the processing tray in this condition, the leading edge would sag. Therefore, even if the paddle strikes the face of the sheet, the sheet does not butt against the stopper, which results in the following:

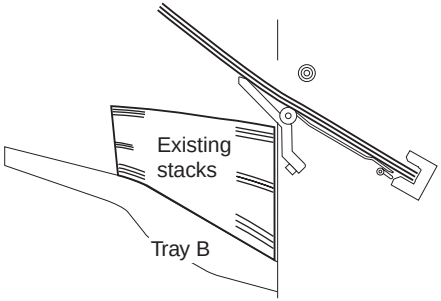
a. Poor alignment of the sheets in feeding direction when stapling.
b. Poor alignment of sheets in feeding direction during offset job processing (on tray B).

To prevent this from happening, the finisher controller PCB slides the tray auxiliary plate outside the machine while sheets are being placed on the processing tray. With the tray auxiliary plate support the sheets from below, the stack will lie straight, maintaining correct alignment.

Since the tray auxiliary plate is retracted when delivering stacks, it will not affect delivery. The plate is slid out again when the next sheet is placed on the processing tray (after detecting the paper surface to prevent interference with detection).



F02-401-02 (Tray Auxiliary Plate Retracted)



F02-401-03 (Tray Auxiliary Plate Out)

5 STAPLING

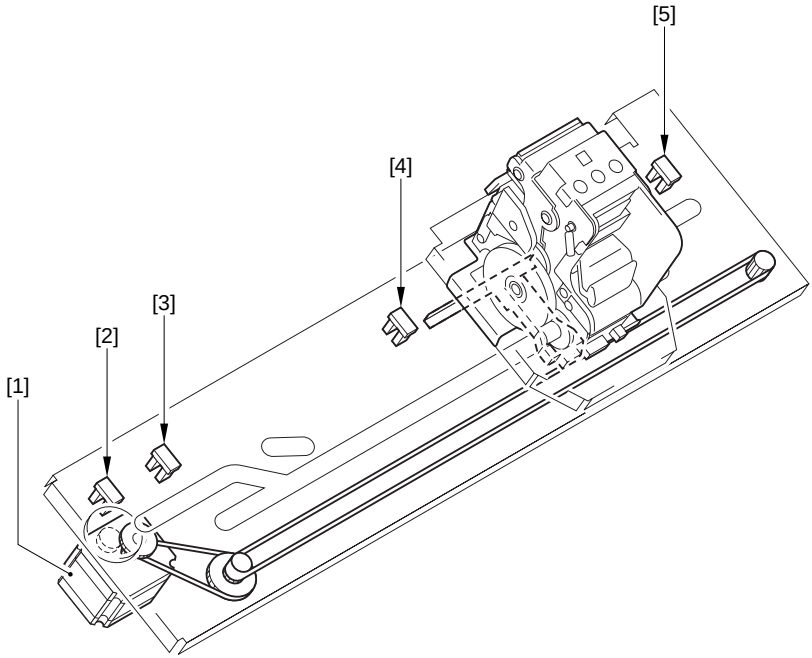
5.1.1 Overview

In the stapling operation, a specified number of sheets are stacked on the processing tray and then stapled and delivered.

The stapling position depends on the staple mode and the size of paper being used. When the operation starts after the power has been switched on, the finisher controller PCB drives the stapler drive motor (M10) to return the stapler to the home position. If the stapler is already in the home position, it is left as it is.

On the stapler's travel path, there are three sensors which indicate that the stapler's halt position is not obstructing the knurled belt's shunt action.

There are two types of staples, for 50 page stapling and for 100 page stapling. The stapler unit has a function for differentiating between the two types.



[1] Stapler shift motor (M10)
[2] Stapler shift home position sensor (PI16)
[3] Knurled belt shift permit sensor (PI28)
[4] Knurled belt shift permit sensor (PI29)
[5] Knurled belt shift permit sensor (PI30)

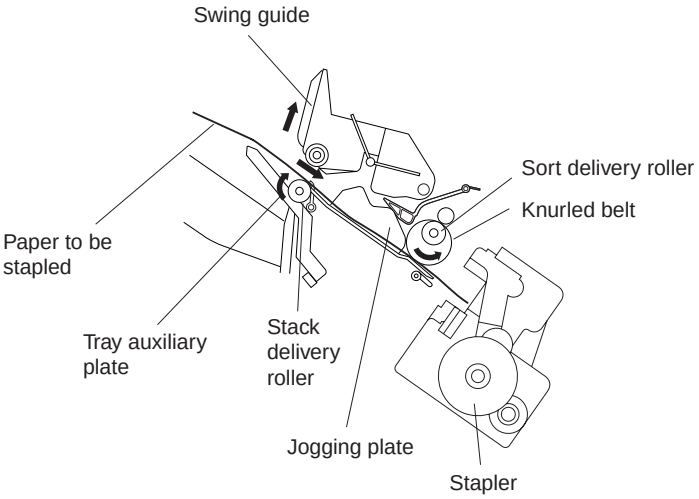
F02-501-01

5.1.2 Stapling of first sheet

As the trailing edge of the first sheet of paper passes the sort delivery roller, after it has been fed forward a specified distance, the stack delivery roller begins to rotate in reverse, moving forward a little more. Then, the swing guide rises and the stack delivery roller stops. The rising action of the swing guide is detected by the swing guide open sensor (PI16).

The sort delivery roller rotates the knurled belt, and feeds the paper into the processing tray. The swing guide remains elevated until the last sheet of paper has been stacked. The stack delivery sensor (PI18) detects the paper on the processing tray.

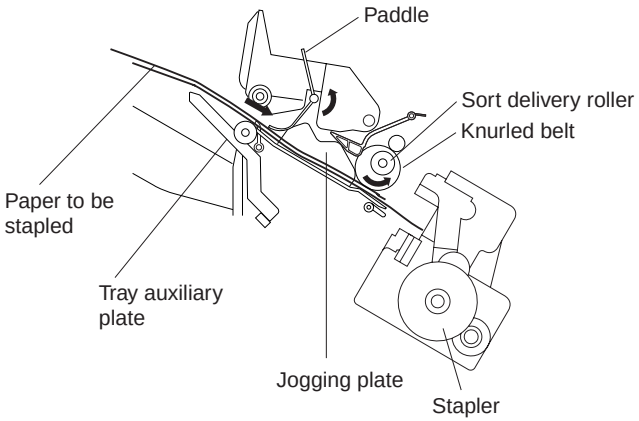
When the paper hits the processing tray stopper, the jogging plate moves to keep the edges of the paper flush. The front or rear jogging plate will be used, depending on which side the existing stack was aligned on.



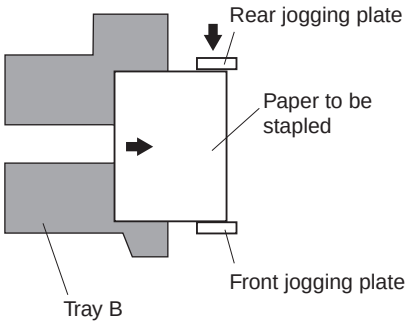
F02-501-02

5.1.3 Stapling of second and subsequent sheets

Once the second and subsequent sheet passes the sort delivery roller, the paddle motor comes ON and rotates the paddle. The paper is pushed down by the paddle and fed on to the processing tray. The paddle operation varies according to the size of the paper, but is usually between 0 and 2 times. When the paper enters the processing tray, it is aligned by the jogging plate. The direction of the alignment will be the same as the first stapled sheet.



F02-501-03



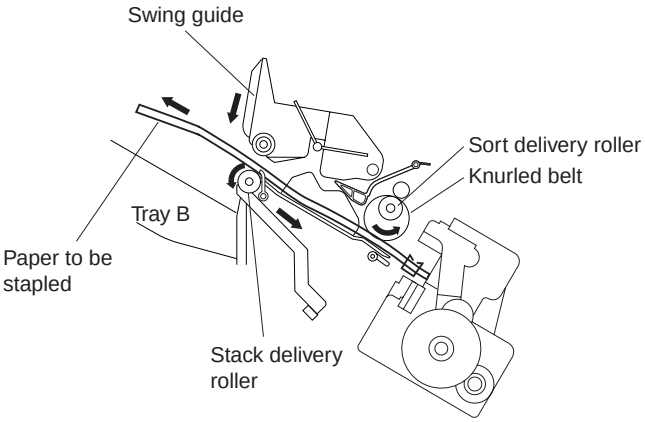
When closer to the front.

F02-501-04

5.1.4 Stapling of last sheet

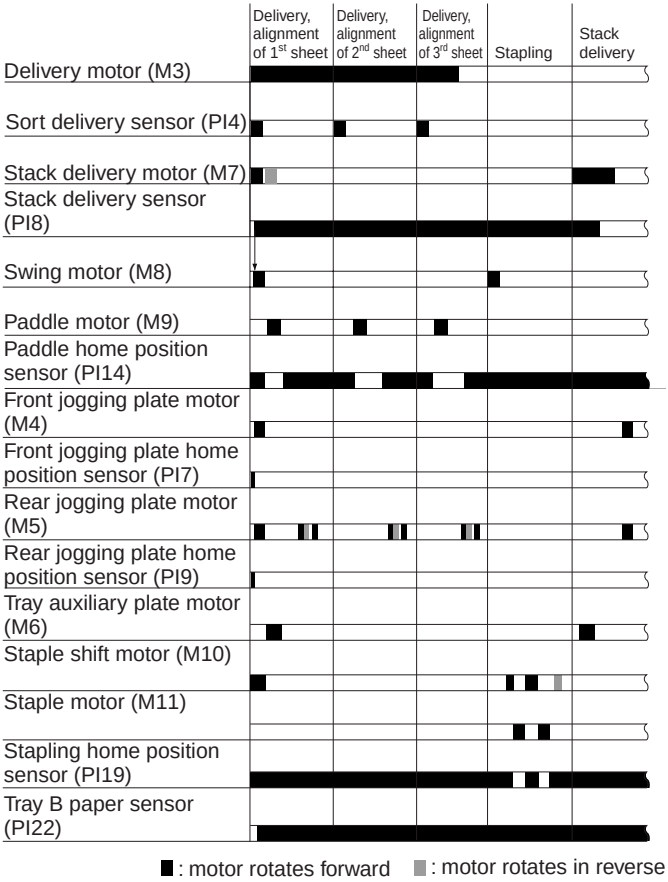
When the last sheet of paper has been aligned, the front and rear jogging plates move forward and hold the paper in place. Then, the swing guide motor begins to rotate to lower the swing guide. Now, the finisher controller PCB moves the stapler into the selected stapling position, and the paper is stapled.

Once the stapling is finished, the finisher controller PCB activates the jogging motor to move the jogging plates to a position 10mm behind the trailing edge of the paper. Then, the stack delivery motor (M7) rotates forward and the stack is ejected into tray B.



F02-501-05

Staple operation sequence
(for 2-point stapling of three sheets of paper)



F02-501-06

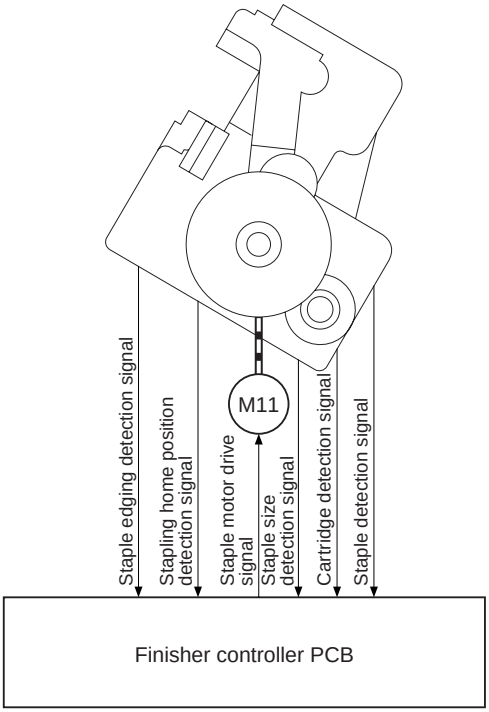
5.1.5 Stapler

Stapling is carried out by the staple motor (M11). Each time the motor rotates the cam, the cam's home position is detected by the stapling home position sensor (inside the stapling unit). The stapler motor rotates forward or in reverse, controlled by a microprocessor on the finisher controller PCB.

When the stapling home position sensor goes OFF, the finisher controller PCB makes the stapler motor rotate in reverse until the sensor comes ON again, and the staple cam returns to the initial position.

The presence of the staple cartridge is detected by the staple cartridge switch (inside the stapling unit). The presence of staples in the staple cartridge is detected by the staple cartridge switch (inside the stapling unit). The staple edging sensor (inside the stapling unit) detects whether the staples inside the staple cartridge have been pushed to the tip of the stapler.

The power supply line to the staple motor (M11) is connected and disconnected by the microswitches listed in Table 2-503. This function is used to guard against injuries, for example when an operator' fingers are inside the stapler.



F02-501-07

Microswitch	Notation	Status	Function
Front cover switch	MSW1	N.O.	Connects when front cover is closed.
Swing guide safety switch	MSW2	N.C.	Connects when swing guide is closed.
Staple safety switch (front)	MSW6	N.O.	Connects when the stacking wall (upper) is correctly mounted, and the stacking wall actuator is down.
Staple safety switch (rear)	MSW7	N.O.	

T02-501-01

5.1.6 Delivery auxiliary rib operation

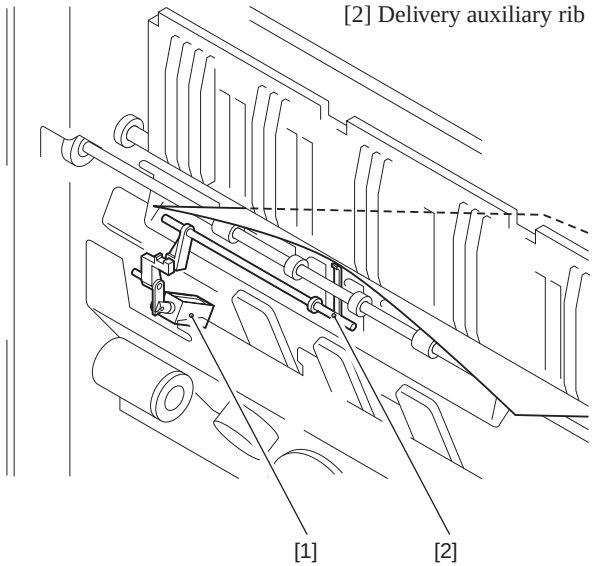
Whenever stapled paper (particularly, small amounts) is ejected into the delivery tray from the processing tray, the rigidity of the paper may affect how well the paper stacks. In order to lessen this effect, this machine is fitted with a delivery auxiliary rib.

The delivery auxiliary rib is driven by the delivery auxiliary rib solenoid (SL4). The delivery auxiliary rib solenoid comes ON just before a stack is ejected from the processing tray and bends the stack in order to give the paper rigidity.

The operation of the delivery auxiliary rib depends on the size and quantity of the ejected paper. The conditions under which the delivery auxiliary rib operates are described below.

Paper size	Ejected sheets
A3, B4, 279.4mm x 431.8mm (11 x 17), LGL, A4R, LTR	1 sheet/ stack
A5, A4, SMT, LTR (excl. B5)	5 sheets/ stacks or fewer

[1] Delivery auxiliary rib solenoid (SL4)
[2] Delivery auxiliary rib



F02-501-08

6 TRAY OPERATION

6.1.1 Overview

The finisher has two delivery trays. The upper tray is called tray A and the lower tray is called tray B. They are designed to be able to move up and down. There is a shutter which prevents paper stacked on the tray from entering the delivery assembly while tray A is passing through the swing unit. Tray B is equipped with a sub-tray to assist in the stacking of folded paper.

6.1.2 Trays

The sensors involved in driving trays A and B are as shown below.

Tray A

Sensor	Notation	Connector
Tray A idling sensor	PI19	J113B-11
Tray A paper sensor	PI20	J113B-8

T02-602-01

Function	Motor	Notation
Tray B lifting	Tray B lifting motor	M13

T02-602-02

Tray B

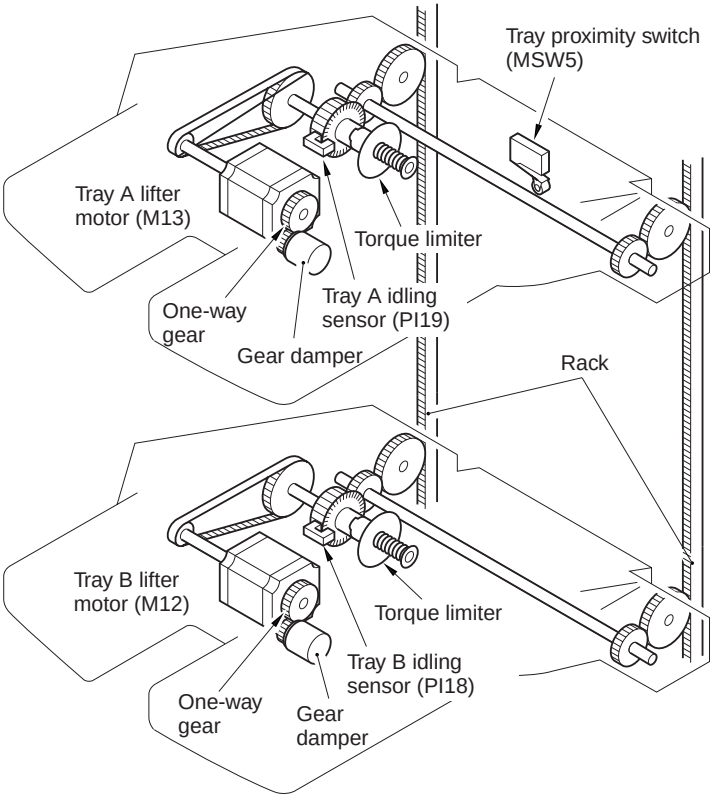
Sensor	Notation	Connector
Tray B idling sensor	PI18	J113B-11
Tray B paper sensor	PI17	J113B-8

T02-602-03

Function	Motor	Notation
Tray B lifting	Tray B lifting motor	M12
Sub-tray lifting	Sub-tray lifting motor	SL3

T02-602-04

If there is no change in the sensor status, despite drive signals having been sent to tray lifter motor A (M13) or tray lifter motor B (M12), due to motor being out of step, etc., the finisher controller PCB detects an abnormality and displays an error code on the copier's control panel.

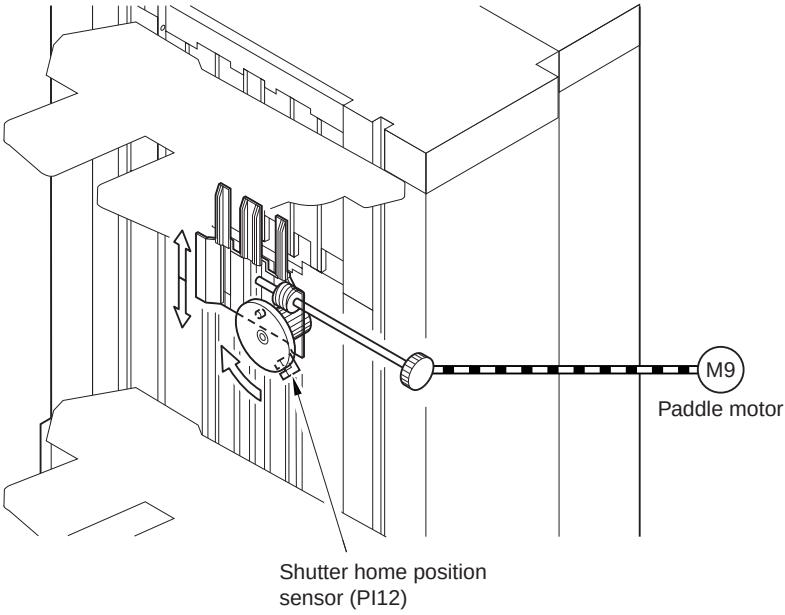


F02-601-01

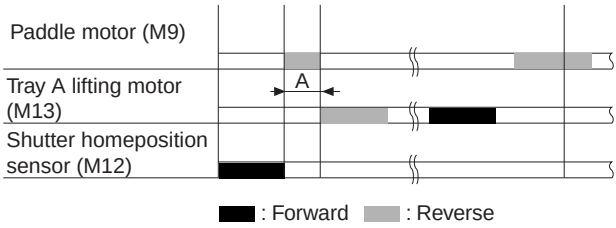
6.1.3 Shutter control

When there is paper stacked in tray A as it passes through the delivery assembly, the stacked paper may enter the delivery assembly. In order to prevent this, the delivery assembly is fitted with a shutter. The shutter closes when tray A passes through the delivery assembly. This action takes place even if there is no paper in the tray.

The shutter is driven by the paddle motor (M9). When the paddle motor rotates forward, it drives the paddle. When it rotates in reverse, it drives the shutter. The shutter open/close status is detected by the home position sensor (PI12).



F02-601-02

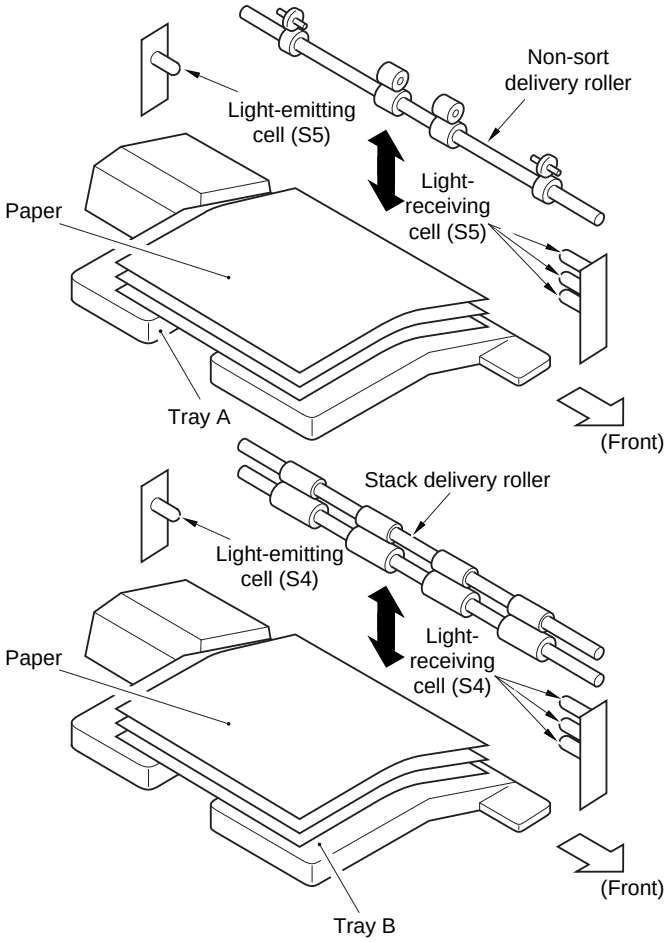


F02-601-03

6.1.4 Detecting topmost sheet of paper in tray

Tray A and tray B are equipped with sensors that detect the height of the topmost sheet of paper in the tray. The light-emitting sensors are tray paper sensor A and tray paper sensor B. The light-receiving sensors are tray A paper sensor A and tray B paper sensor B. The light-receiving sensors comprise three light-receiving cells.

The lowest cell is used to position the tray when there is no paper in it. The sensor output changes when either of the upper two cells is blocked. By detecting with either of these two cells, the tray can be held in the correct position, even if the trailing edge of the stacked paper is curled up, due to contact with the stacking wall.

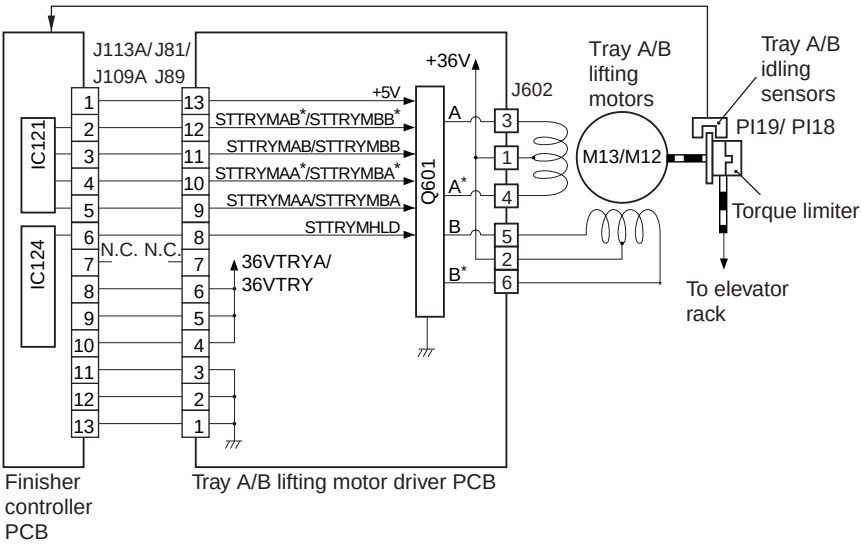


F02-601-04

6.1.5 Tray A/B lifting motor control

The diagram below illustrates how the tray A/B lifting motors (M12/M13) are driven. The tray A/B lifting motors are 4-phase stepping motors. The finisher controller PCB controls the output timing of the pulse signals A, B, A* and B*, to switch the motors ON/OFF and to switch the direction of rotation. In motor hold, the STTRYMHLD level is switch to a hold level.

The finisher control PCB monitors the status of the tray A/B idling sensors (PI19/ PI18) when generating pulse signals. If the sensors switch ON/OFF at the prescribed timing during pulse output, the motor rotation is judged normal. If the sensor output does not switch ON/OFF properly, a motor malfunction or drive mechanism malfunction is judged, and an error message is displayed on the copier control panel.

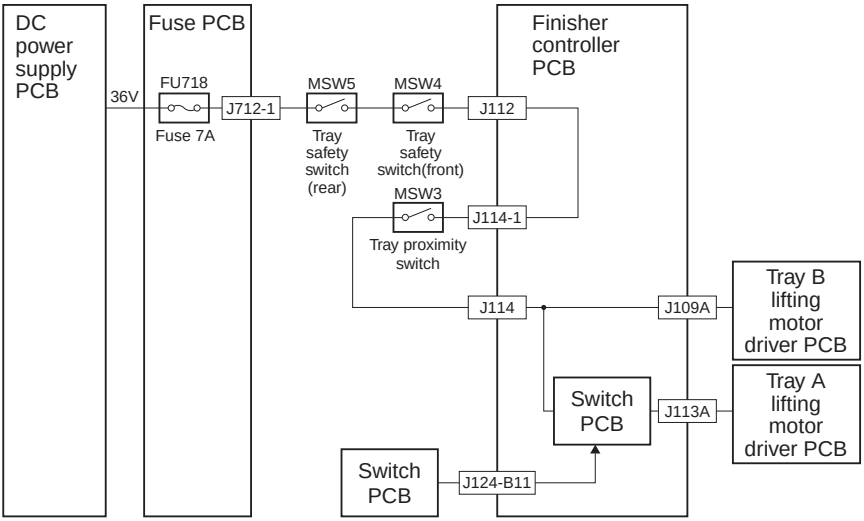


F02-601-05

6.1.6 Tray motor power supply

The power supply route for the tray motors is illustrated below.

Power is supplied from the tray A/B lifting motor PCB. 36VTRYA is switched ON/OFF by SW971-2. If the input is interrupted, the CPU judges tray A to be the fixed tray. Input can also be interrupted by the tray proximity switch (MSW3).



F02-601-06

7 PUNCH UNIT (Finisher K2 only)

7.1.1 Overview

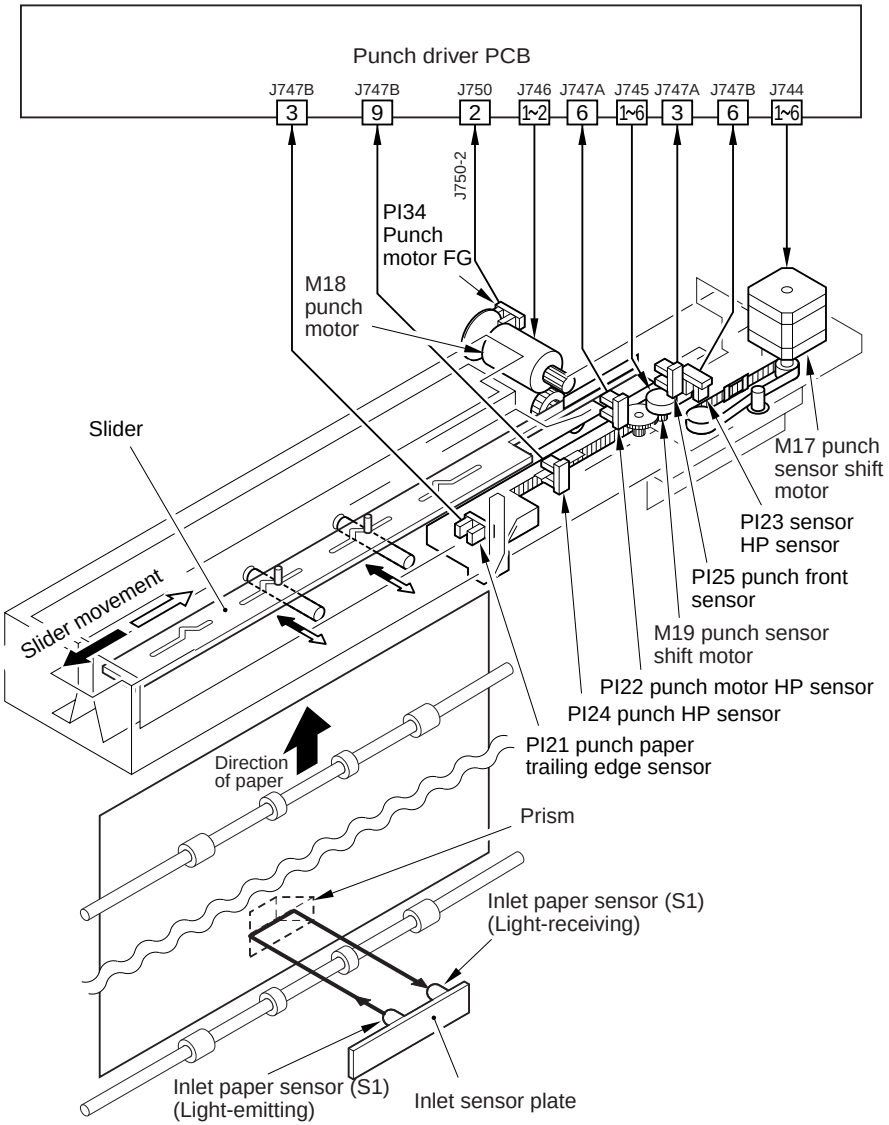
The punch unit is located in the paper feed path. Paper feed is momentarily stopped so that the paper can be punched. The punch motor (M18) drives a slider and the punch operation is carried out in alignment with the slits in the slider. Punching stops when the slider has travelled a certain distance. Lateral registration of the punch holes is adjusted every time the size of the paper being fed changes.

Waste paper generated by the punch is fed into the waste container by the punch waste feedscrew.

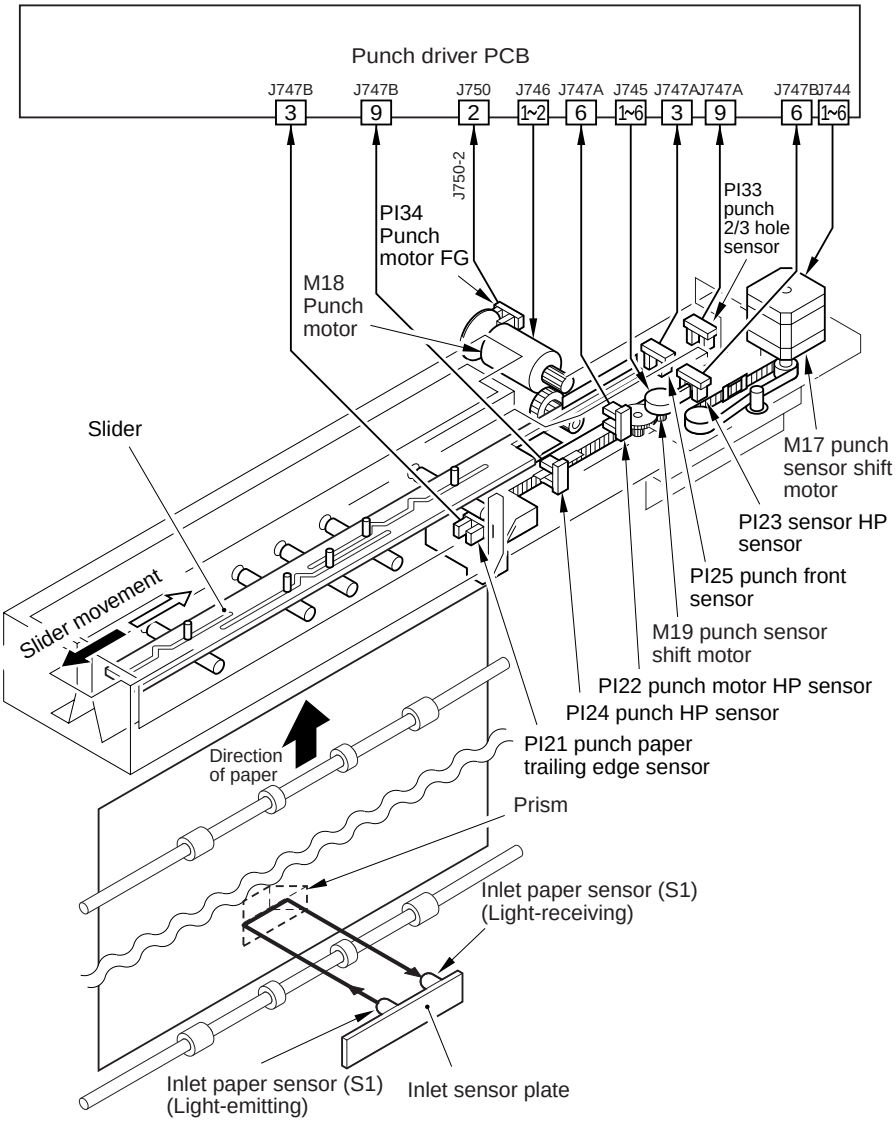
7.1.2 Punching Operation

The punch drive slider is powered by the punch motor (M18). Detection of the punch slider position is carried out by the slider home position sensor (PI22).

The drive-timing of the punch motor is calculated using the inlet paper sensor (S1). Once the inlet paper sensor (S1) detects the trailing edge of the paper, it stops the paper after it has travelled a certain distance. Then, the puncher activates and punches the paper.



F02-701-01a (Two-hole type)

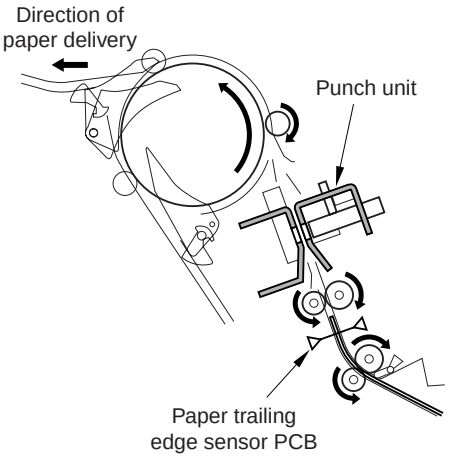


F02-701-02b (2/3-hole type)

7.1.3 Overview of Punching Operation

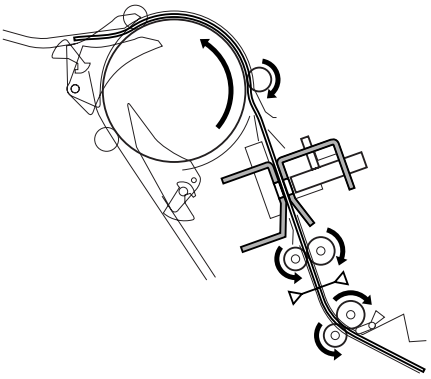
The sequence of the punching operation is shown below.

1) The paper is fed in by the copier or inserter. At this time the punch slider is on standby in the home position



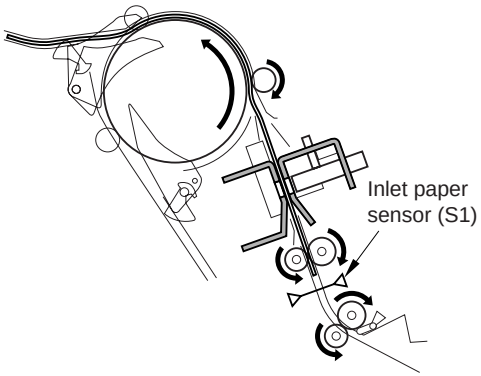
F02-701-02

2) The leading edge of the paper enters the punch unit. The slider is still stationary. The paper is fed in by the rollers at the front and rear of the punch unit.



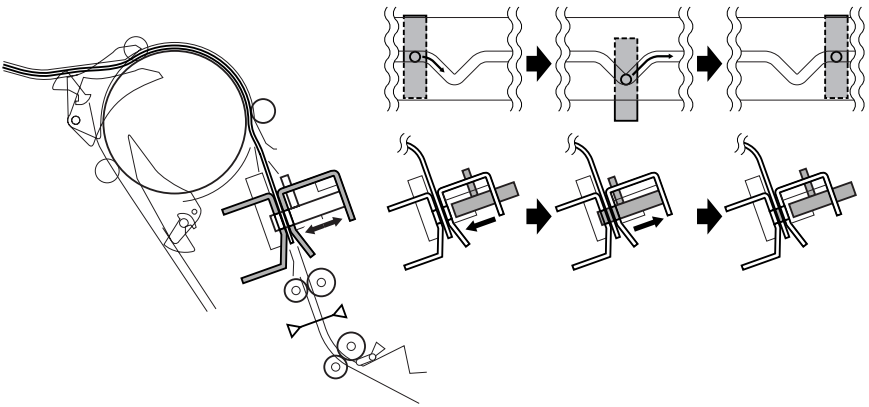
F02-701-03

3) When a fixed time has elapsed after the trailing edge of the paper has passed the inlet paper sensor (S1), the paper feed is stopped at a prescribed distance.



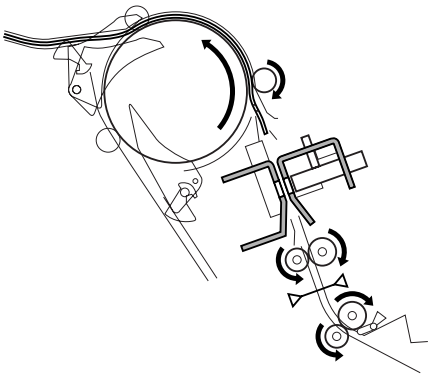
F02-701-04

4) As soon as the paper stops, the slider moves (one direction), driven by the punch motor, and the holes are punch in the paper.



F02-701-05

5) The punch slider stops and waits for the next punching operation. The buffer roller resumes feeding the punched paper.

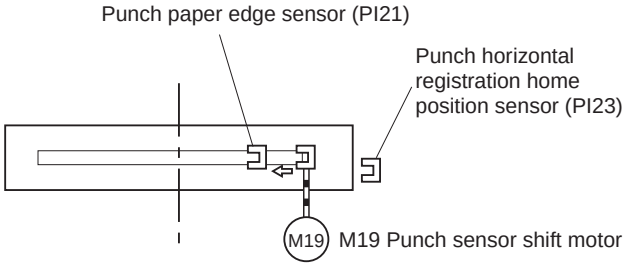


F02-701-06

7.1.4 Horizontal registration operation

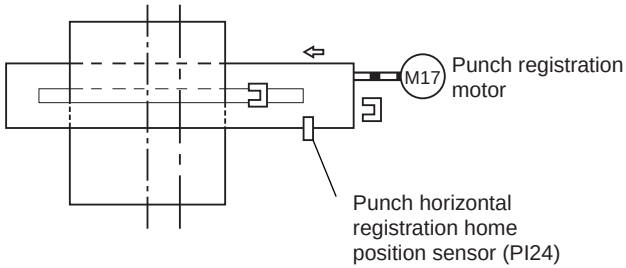
Side registration of the punch unit is driven by the punch registration motor (M17). The side registration home position of the punch unit is detected by the punch home position sensor (PI24). The punch unit shifts into position according to the edge of the paper that has been detected by the punch paper edge sensor (PI21) and punch paper edge sensor home position sensor (PI23).

1) A paper size signal is sent from the copier. The punch paper edge sensor moves into position according to the size of the paper.



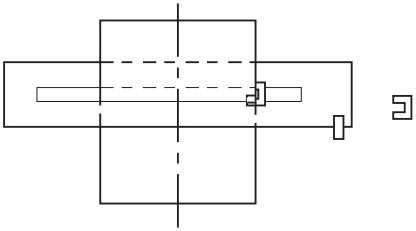
F02-701-07

2) The paper is fed into the punch unit. When the remaining length of paper from the punch unit is equivalent to size B5 (182mm), the punch registration motor starts to rotate forward.



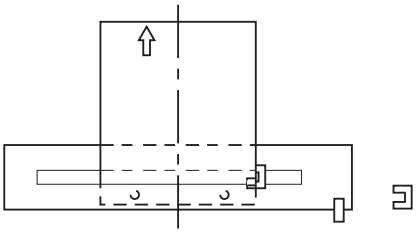
F02-701-08

3) When the punch paper edge sensor comes ON, the punch registration motor stops. This aligns the center of the punch unit with the center of the paper (horizontal registration direction).



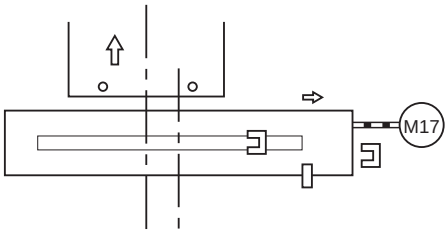
F02-701-09

4) Holes are punched in the paper by the punch motor (M18).



F02-701-10

5) When the punching completed sensor goes OFF, the punch registration motor rotates in reverse and the punch unit returns to its home position.



F02-701-11

6) If paper is fed in continuously for punching, steps 2 to 5 are repeated. Even when the last sheet of paper is punched, the punch paper edge sensor waits in the standby position.

7.1.5 Paper trailing edge detection control

The trailing edge of the paper is detected by the inlet path sensor (S1). The sensor consists of a light-emitting cell and a light-receiving cell. The light from the light-emitting cell is refracted by a prism and returned to the light-receiving cell. As paper passes the sensor, light from the light-emitting cell does not reach the light-receiving cell, so the finisher controller PCB judges that paper is present.

With paper that is highly transparent, such as OHP film, light from the light-emitting cell reaches the light-receiving cell even while the paper is passing the sensor and the sensor cannot judge that paper is present. Therefore, even if punching mode has been selected on the control panel, paper that is highly transparent will not be punched.

The voltage level of the light-receiving cell may be reduced by paper dust becoming attached to the cell. However, even at a reduced level, the light emission is sufficient for paper detection.

7.1.6 Punch Waste Feed Control

Punch waste is fed by rotation of the punch screw, which is powered by the punch waste feed motor (M16). The punch waste feed sensor (PI27) monitors the rotation of the punch screw. Feed timing is from when the registration signal for the first punched sheet is sent from the copier, until delivery of the last punched sheet. The encoder for the punch waste feed sensor (PI27) rotates while the punch waste feed motor (M16) is running. If there is no change in the status of the sensor within a fixed time period, while the motor is rotating, the finisher controller PCB assumes faulty punch waste feeding and displays an error code (E595) on the copier's control panel.

7.1.7 Punch waste "Full" sensor

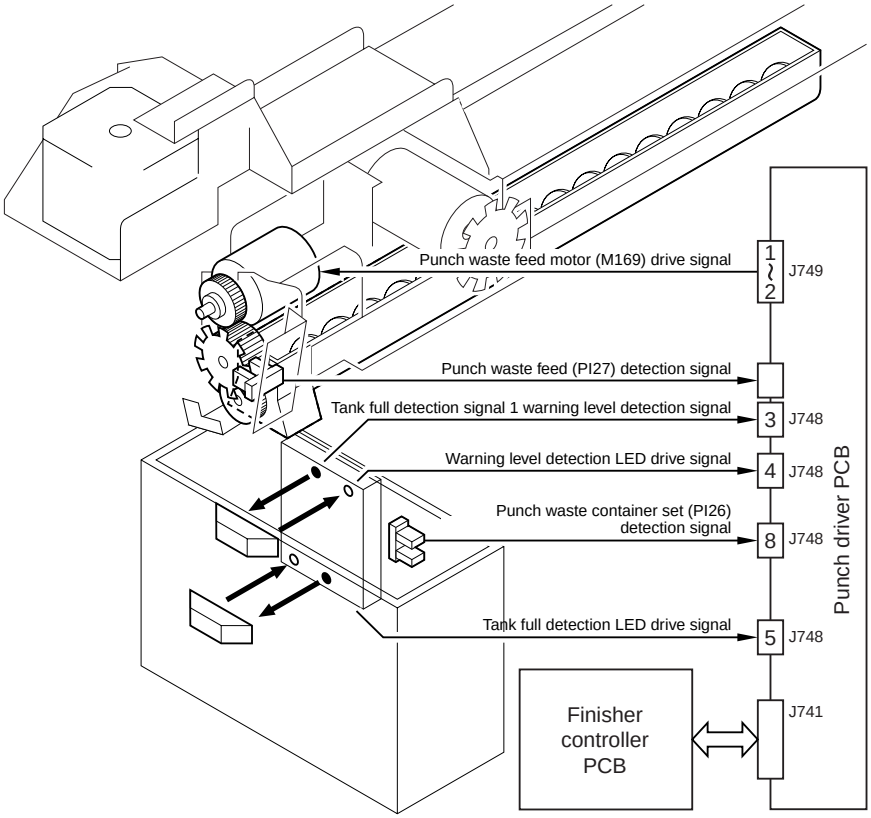
The punch waste "full" detection mechanism consists of a punch waste sensor located on the side of the punch waste container and prisms mounted inside the punch waste container. The punch waste container set sensor (PI53) detects when the punch waste container has been set by the finisher.

The punch waste sensor PCB (S6) consists of two light-emitting cells and two light-receiving cells for warning level detection and full level detection. When the punch waste set sensor (PI26) detects the container, the LED for warning level detection emits light. If the punch waste has not reached the warning level, the output from the light-receiving cell is ON and the finisher controller PCB judges that the warning level has not been reached. If waste has accumulated in the container and has reached the warning level, the light from the warning level detection LED for is interrupted and the finisher controller PCB judges that the warning level has been reached.

When the warning level has been reached, the full level detection LED comes on instead. If light emitted from the full level detection LED reaches the light-receiving cell, the finisher controller PCB judges that the full level has not been reached. If waste has accumulated in the container and has reached the full level, the light from the LED for full level detection is interrupted and the finisher controller PCB judges that the full level has been reached.

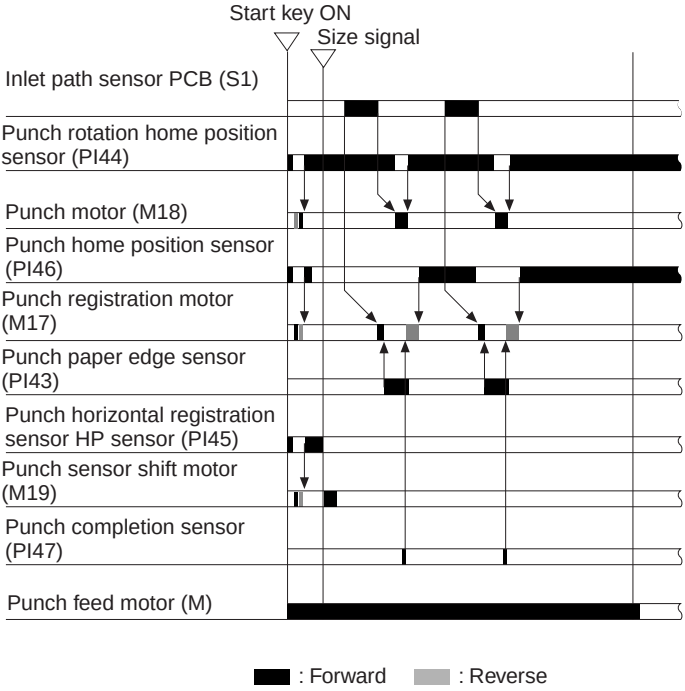
Warning level : The punch continues operation until completion, or until the full level is detected. New punching operation cannot be commenced.

Full level : The punch suspends activity mid-operation. Punching can be restarted when the punch waste has been disposed of and the waste container has been set in place.


Punch waste feed motor (M169) drive signal
1
2
J749
Punch waste feed (PI27) detection signal
Tank full detection signal 1 warning level detection signal
3
J748
Warning level detection LED drive signal
4
J748
Punch waste container set (PI26) detection signal
8
J748
Tank full detection LED drive signal
5
J748
Finisher controller PCB
J741
Punch driver PCB

F02-701-12

Operation sequence for punch rotation / side/ horizontal/ registration (2 sheets)



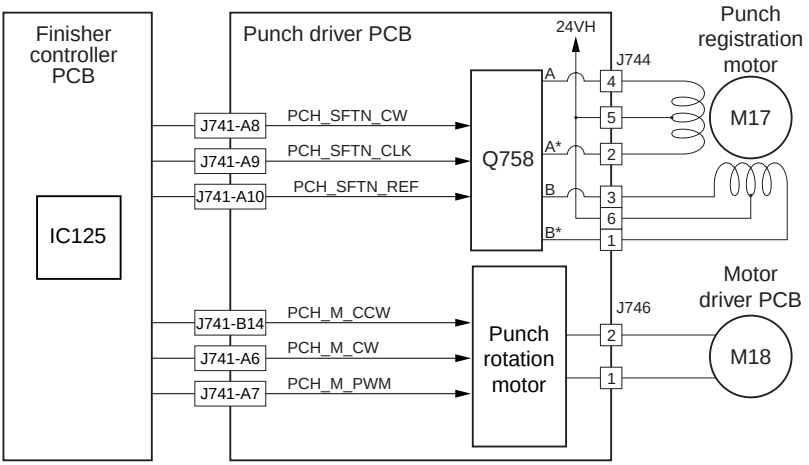
F02-701-13

7.1.8 Punch Registration Motor (M17) / Punch Motor (M18) Drive Control

An outline of the punch registration motor (M17) and punch rotating motor (M18) drive circuit is shown in the diagram below. M17 is a 4-phase stepping motor. Drive pulses are sent from IC121 on the finisher controller PCB.

M18 is a DC motor. IC125 sends signals which control the motor's rotation direction and speed.

The punch registration motor's PNHREGREF outputs signals to control the electrical current level switching while the motors are running and also while they are in hold mode. Each motor has three current levels for operating mode and one for hold mode.

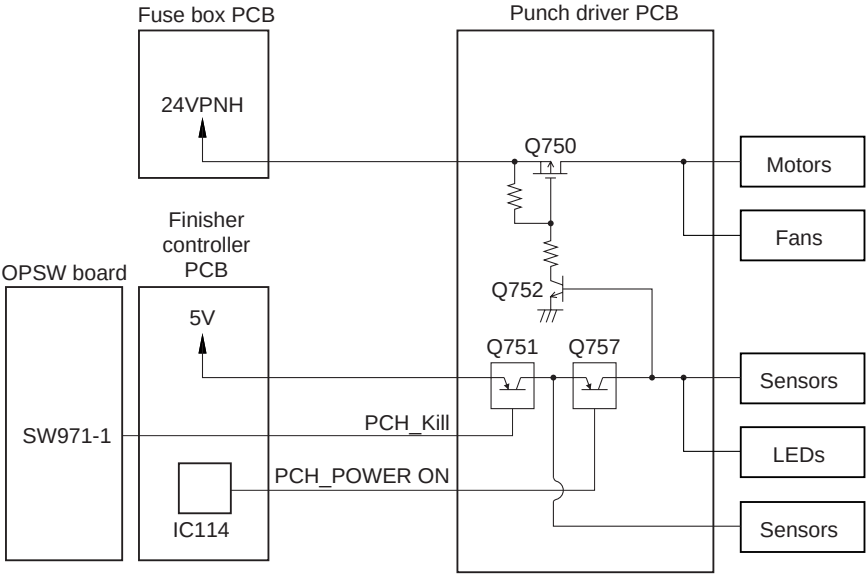


F02-701-14

7.1.9 Punch power supply

The power supply route for the punch is illustrated below. 36VPNH and 24VPNH, supplied by the punch driver PCB, are turned ON/OFF by the PC_POWER_ON signal and the PFANON signal from the finisher controller PCB. The PNHON signal can be turned ON/OFF by the user, using SW971-1 on the switch PCB.

The 5V power supply for sensor drive is turned ON/OFF by the PNHON signal PC_POWER_ON. 36VPNH, 24VPNH and 5V are supplied from the punch driver PCB to each load.



F02-701-15

8 FANS

8.1.1 Overview

The finisher is equipped with the two fans described in Table 2-801.

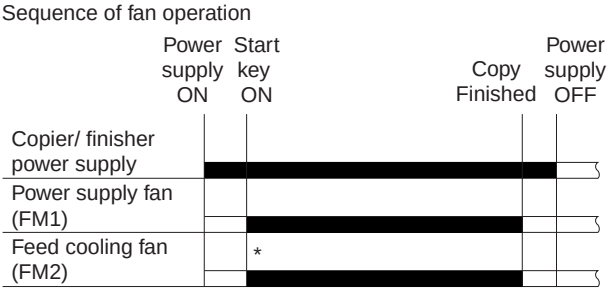
The power supply fan rotates when the drive signal (FANON) from the finisher controller PCB is "0". While rotating, the power supply fan sends the FANSTP signal to the finisher controller PCB. When the fan is not rotating, the signal changes to "1", causing the finisher controller PCB to judge that the fan has stopped and to display an error code on the copier's control panel.

The feed cooling fan rotates when the drive signal (PFANON) from the finisher controller PCB is "0". While rotating, the feed cooling fan sends the PFANSTP signal to the finisher controller PCB. When the fan is not rotating, the signal changes to "1", causing the finisher controller PCB to judge that the feed cooling fan has stopped and to display an error code on the copier's control panel. (E551, 01: power supply fan, 02: feed cooling fan)

Figure 2-802 shows the location of the fans and the flow of air. Figure 2-801 shows the timing with which the fans turn ON.

No.	Name	Direction	Filter	Purpose
FM1	Power supply fan	Blowing	None	Cools the switching regulator
FM2	Feed cooling fan	Blowing	None	Cools the feed path

T02-801-01



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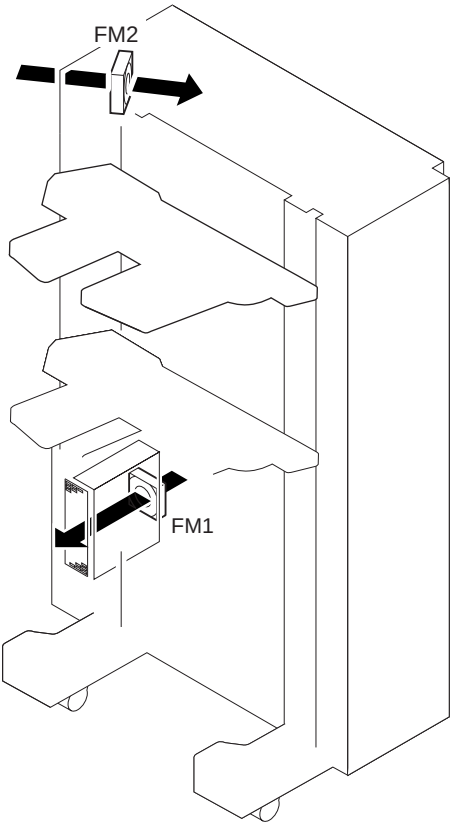


F02-801-02

9 POWER SUPPLY

9.1.1 AC Power supply

AC power comes from an external power supply through the machine's AC fuse PCB to reach the switching regulator (SWR1). The switching regulator is turned ON/OFF by the drive signal (REMTSWH) from the copier. When the switching regulator is ON, it supplies the fuse PCB with 36V, 24V and 5V D power.

9.1.2 DC Power Supply

The 36V, 24V and 5V power supplies are supplied from the switching regulator to the finisher controller PCB, saddle stitcher controller PCB and punch driver PCB, via the fuse PCB (PCB6).

i. Finisher controller PCB
The switching regulator supplies power to the finisher controller PCB via the following two micro-switches.

Notation	Switch name
MSW4	Tray safety switch (front)
MSW5	Tray safety switch (rear)

T02-901-01

Power is supplied to tray A lifter motor (M13) via the tray proximity switch (MSW5).

ii. Punch driver PCB
The 36V power supply for the punch rotating motor (M18) is supplied from the switching regulator to the punch driver PCB via the fuse PCB.

a. 24V Power Supply

i. Finisher controller PCB
The power supply for the stapler motor (M11) and stapler shift motor (M10) is supplied to the finisher controller PCB from the switching regulator via the four micro-switches described below.

Notation	Switch name
MSW1	Front cover switch
MSW7	Stapler safety switch (rear)
MSW2	Swing guide safety switch
MSW6	Stapler safety switch (rear)

T02-901-02

b. 5V Power Supply

Power is supplied directly by the switching regulator.

The output accuracy of the DC power supplies are as follows:
36V power supply → +11%, -5.5%
24V power supply → ±5%
5V power supply → 5.2V ±5%
Note that these figures apply when the AC input is between 85 and 132V (100/115V regions) or 187 and 264V (230V regions).

9.1.3 Protective functions

a. AC fuse PCB

The AC fuse PCB is equipped with two fuses (FU731, FU733), which shut off the circuit in the event of over-current.

The PCB is also equipped with a spare fuse (FU732).

b. Switching regulator

The switching regulator is equipped with a fuse (F001) which shorts in the event of over-current.

c. Fuse PCB

The fuse PCB and DC controller PCB are equipped with the fuses described in the table below, which short in the event of over-current in either power supply system. These fuses cannot be replaced in the field.

Power supply system	Fuse PCB	Finisher controller PCB
24VDLV	FU711	-
24VINS	FU711	FU103
24VZFLD	FU714, FU717	FU101
24VSTP	FU714	-
24VF	FU718	-
24VPNH	FU713	-
36VPNH	FU712	-
36VTRYA	-	FU105
36VTRYB	-	FU104
5V	FU716	-

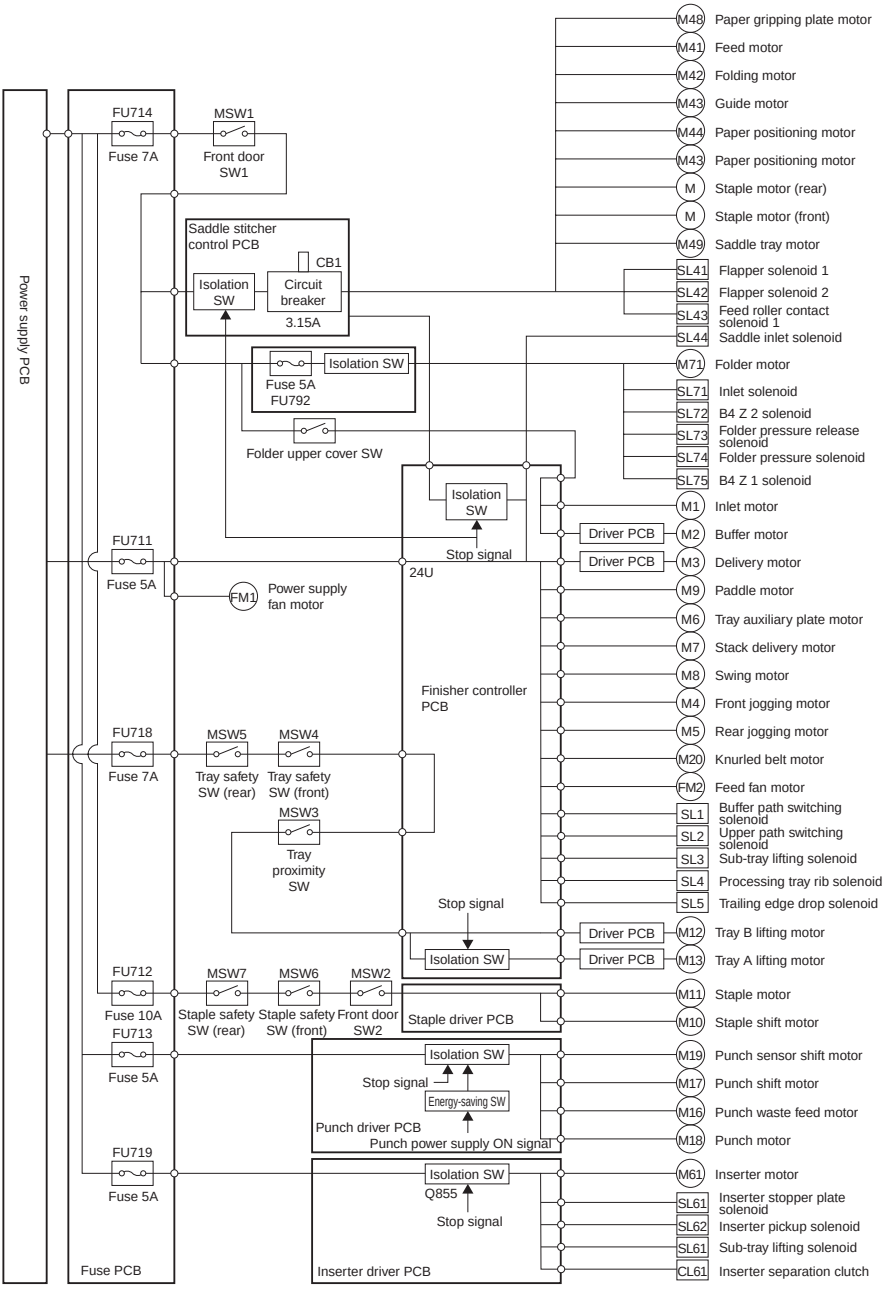
T02-901-03

9.1.4 Low Power Switch

The finisher controller PCB is equipped with a power-saving switch (Q185) which cuts off the 24VDLV and 24VU power supplies at a specified timing. Power is shut off when the power-saving key on the copier is pressed and when the copier is in low power mode.

9.1.5 Fan Interlocking Switch

The fuse PCB and punch driver PCB are equipped with fan interlocking switches (Q715/Q759) that are linked to the fan drive signal and cut off the power supply whenever the fans are not operating.



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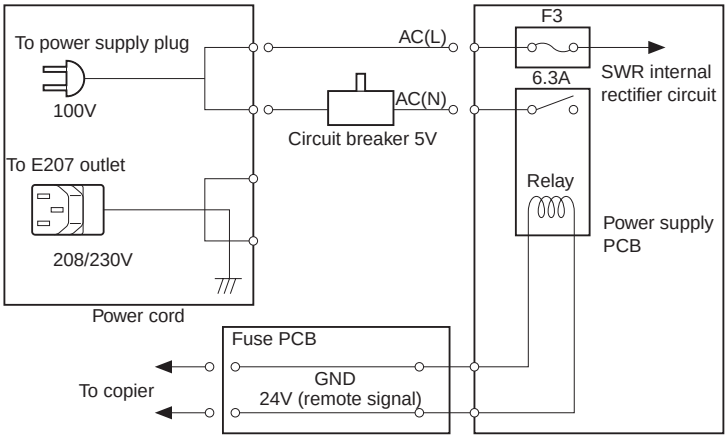
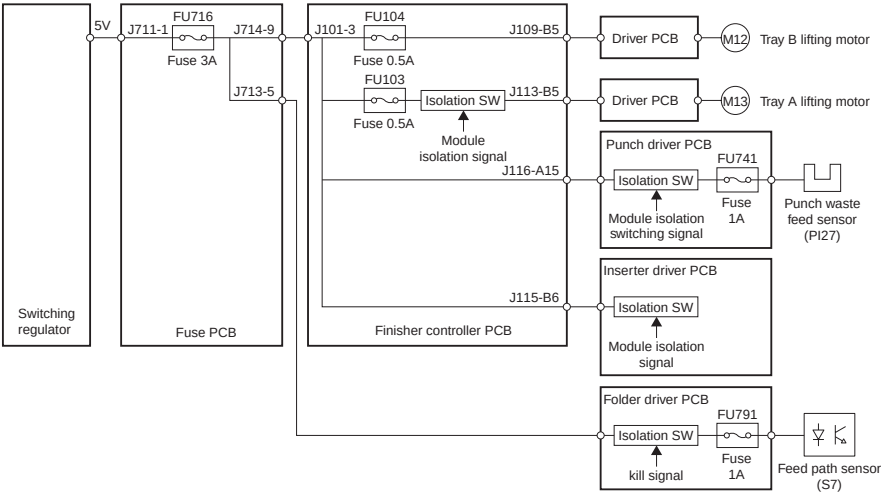


F02-901-01

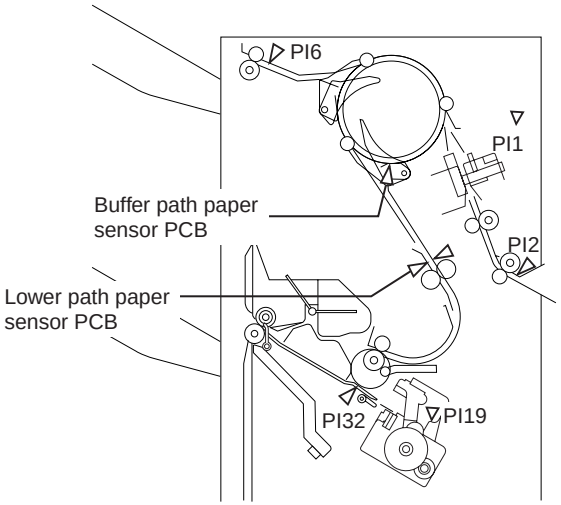


F02-901-03

10 DETECTION JAMS (FINISHER)

10.1.1 Overview

Check timing detects jams in the finisher section. It is stored in the ROM memory of the finisher controller PCB and uses timing to determine whether or not a jam has occurred through the presence or absence of a sheet in a sensor section. When a jam occurs, the finisher controller PCB informs the host copier of the details by code. The code can be confirmed in service mode in this machine. Also, the jam code may be confirmed with the LED101 on the finisher controller PCB.



PI1: Front door open sensor
PI2: Inlet path sensor
PI16: Non-sort delivery sensor
(S2): Buffer path paper sensor PCB
(S3): Lower path paper sensor PCB
P18: Stack sensor
PI19: Stapling home position sensor

F02-1001-01

Type of Jam	Sensor	Condition of Jam	Code
Inlet delay	PI2	The inlet path sensor fails to turn on within a specified time after delivery signal comes on or the horizontal residual paper sensor (PI33) comes on.	0016
Inlet stationary	PI2	The paper has not cleared the sensor after feeding equivalent to (length of sheet+60) mm from the time the sensor detects paper.	0026
Buffer path delay	Buffer path paper sensor (S2)	Buffer path paper sensor does not detect the sheet after feeding equivalent to (438+150) mm from the time the inlet path sensor turns on.	0017
Buffer path stationary	Buffer path paper sensor (S2)	The paper has not cleared the sensor after feeding equivalent to (length of sheet + 60) mm from the time the sensor detects paper.	0027
Non-sort delay	PI6	The non-sort paper sensor fails to detect paper after feeding equivalent to (348 + 150) mm from the time the inlet path sensor turns on.	0018
Non-sort stationary	PI6	The paper has not cleared the sensor after feeding equivalent to (length of sheet + 60) mm from the time the sensor detected it.	0028
Lower path delay	Lower path paper sensor (S3)	The lower path sensor fails to detect the sheet after feeding equivalent to (540 + 150) mm from the time the inlet path sensor detected paper.	0019
Lower path stationary	Lower path paper sensor (S3)	The sheet has not cleared the sensor after feeding the equivalent of (length of sheet + 60) mm from the time the sensor detected paper.	0029
Door open	PI1	Open door is detected while paper is being fed.	0008
Power on	PI2, PI6, buffer path paper sensor (S2), lower path paper sensor (S3)	Either of the sensors described at left detects paper when the power is turned on.	0007
Staple	Stapler home position sensor (inside stapler unit)	The sensor fails to come on 0.5 sec after going off when the stapler motor is rotating forward, and the sensor comes on within 0.5 sec when the motor is rotating in reverse. If the sensor remains off 0.5 seconds after a reverse rotation, an error is judged.	0006

Type of Jam	Sensor	Condition of Jam	Code
Saddle inlet delay	PI59	This occurs when the saddle inlet paper sensor (PI59) fails to turn on within 1.5 sec of the sensor coming ON, on the pick-up side of the saddle inlet paper sensor coming on.	0015
Saddle inlet stationary	PI59	This occurs when the saddle inlet sensor (PI59) fails to turn off after feeding for a specified time (equivalent to length of paper + 100). This jam is detected by the finisher controller PCB.	0025
Processing tray stationary	PI8 PI31	When the the stack delivery sensor (P18) detects a stack in the processing tray when the knurled belt motor (M20) fails operate for any reason.	0026

11 MODULE ISOLATION

11.1.1 Overview

If an error occurs in one of the modules, the finisher system enables the module concerned to be isolated and another to be operated. If an error related to a certain module occurs, the module concerned can be isolated by turning off the corresponding DIPswitch bit on the switch PCB provided in the saddle stitcher. The table below shows the units where the module isolation applies and the conditions when the module is isolated.

Units where module isolation applies

SW971 No.	Unit	Condition when cut off
SW971-1	Punch Unit	Power flow is stopped. Connection is detected, but operation is prohibited. The position of the punch unit must be initialized by the user.
-2	Tray A	Power flow is stopped. Position of tray A must be adjusted by user. Tray A is used as a fixed tray.
-3	Not used	
-4	Not used	
-5	Not used	
-6	Not used	

T02-1101-01

This table shows the errors for which the module can be isolated in each unit.

Unit	Error
Punch unit	E590, E593, E594
Tray A	E540

T02-1101-02

CHAPTER 3

MECHANICAL SYSTEMS

1 Finisher Unit

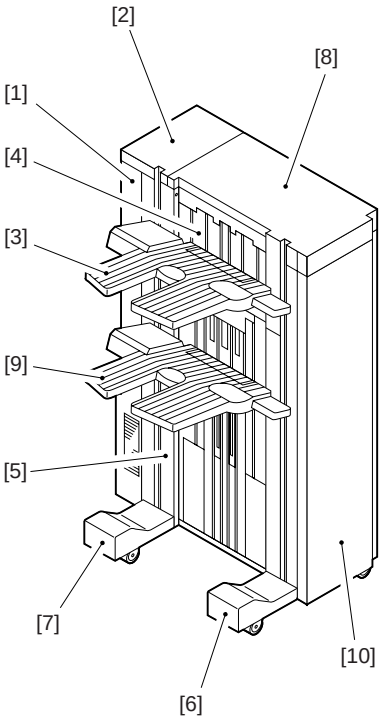
1.1 Externals and Controls

1.1.1 External Covers

Remove the covers as follows when cleaning, checking, or repairing the inside of the machine.

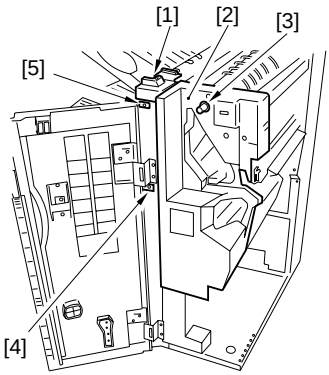
Those covers that can be detached by mere removal of their mounting screws are omitted from the discussions.

[1] Rear cover (8)
[2] Rear upper cover (2)
[3] Tray A (4)
[4] Stack wall (upper; 4)
[5] Stack wall (lower, 4)
[6] Foot cover (front; 2)
[7] Foot cover (rear; 2)
[8] Upper cover unit
[9] Tray B (4)
[10] Front door (0)



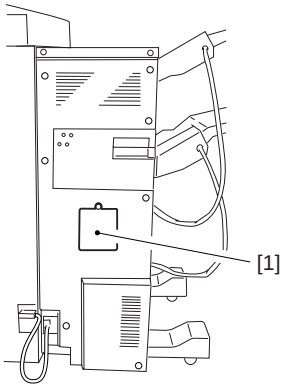
F03-101-01

[1] Support pole cover (1)
[2] Inside cover (4)
[3] Buffer roller knob (0)
[4] Stopper (lower; 1)
[5] Stopper (upper; 1)



F03-101-02

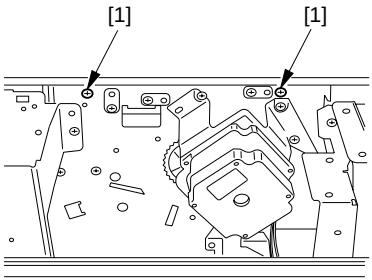
[1] PCB cover (1)



F03-101-03

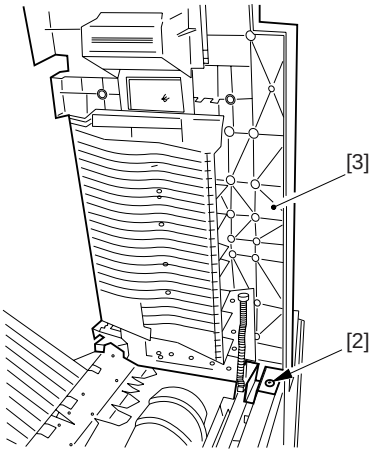
1.1.2 Removing the Upper Cover Unit

1) Remove the rear upper cover.
2) Remove the two screws [1] of the side plate.



F03-101-04

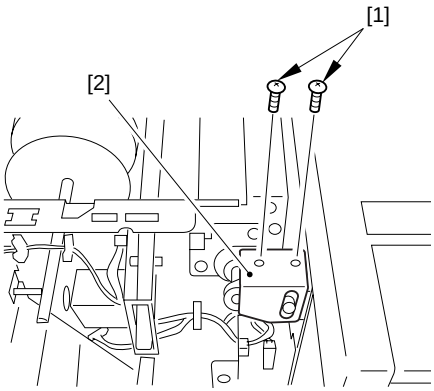
3) Remove the screw [2], and detach the paper cover unit [3].



F03-101-05

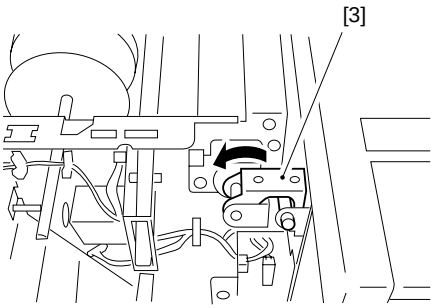
1.1.3 Disconnecting from the Copier (folder)

1) Remove the right upper cover.
2) Remove the rear cover and rear upper cover.
3) Remove the inside cover.
4) Remove the two screws [1], and detach the latch fixing plate (front; [2]).



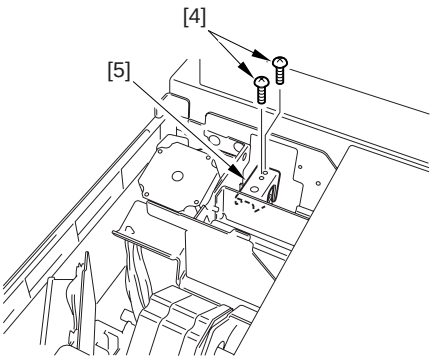
F03-101-06

5) Shift up the latch claw (front; [3]).



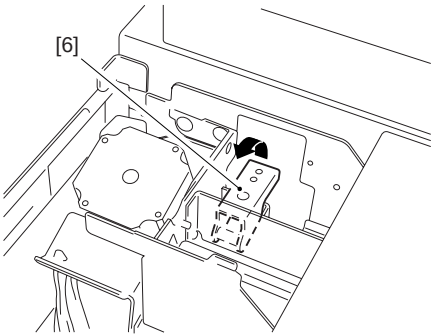
F03-101-07

6) Remove the two screws [4], and detach the latch fixing plate (rear; [5]).



F03-101-08

7) Shift up the latch claw (rear; [6]).



F03-101-09

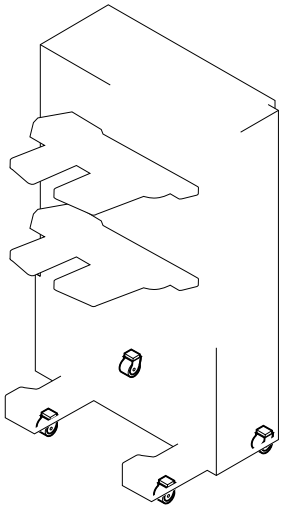
8) Disconnect the finisher from the copier.

1.1.4 Adjusting the Height

If the floor of the site of installation causes a discrepancy in terms of machine height, adjust the height of the machine as follows:

1.1.4-1 Checking the Height and Making Preparations

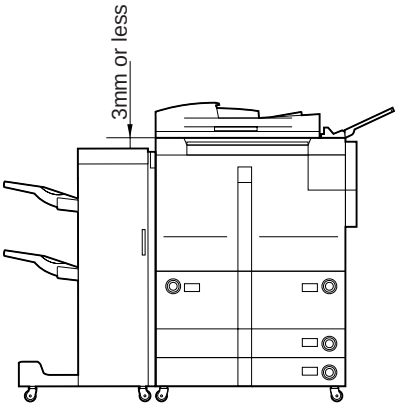
1) Compare the height of the top face of the finisher top cover or the folder front cover/rear cover and the top face of the copier left cover. If the difference in height is not as indicated in F03-101-11/12, make adjustments. If jams occur frequently in the finisher inlet, check to find out if the height must be adjusted. Change the height of the machine using the casters shown in F03-101-10.



F03-101-10

a. If the Top Face of the Copier Left Cover is Higher (3 mm or less)

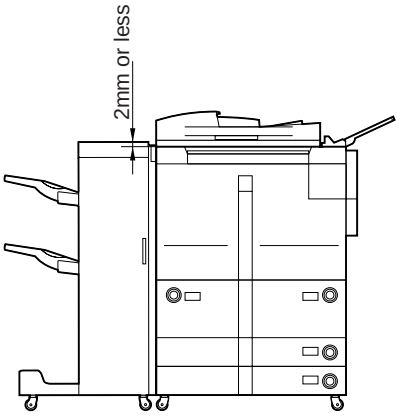
- If the difference is not as indicated, go to 4-2.



F03-101-11

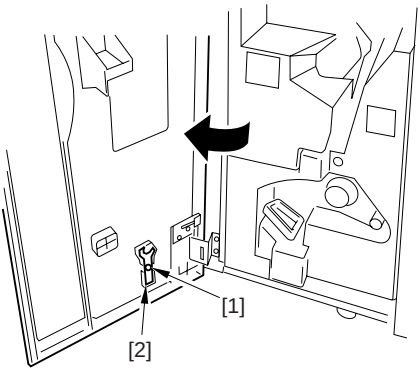
b. Top Face of the Finisher Upper Cover /Rear Cover

- 2 mm or less
  If not as indicated, go to 4-3.



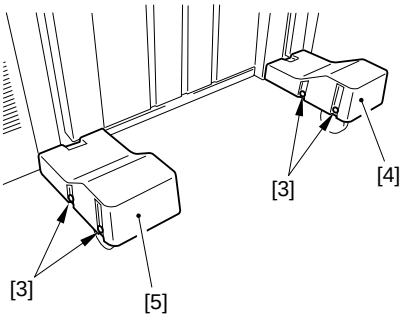
F03-101-12

2) Open the front cover. Remove the screw [1], and detach the spanner [2] from behind the front cover.



F03-101-13

3) Remove the four screws [3], and detach the foot cover (front; [4]) and the foot cover (rear; [5]).

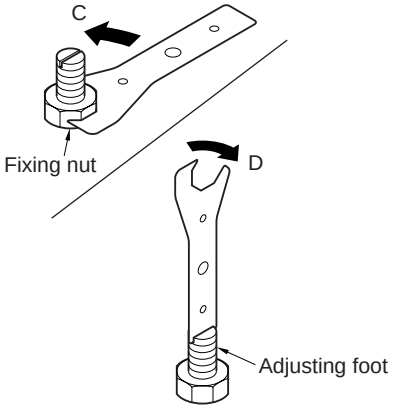


F03-101-14

4) Disconnect the finisher from the copier. (See 1.1.3)

1.1.4-2 If the Copier Is Higher

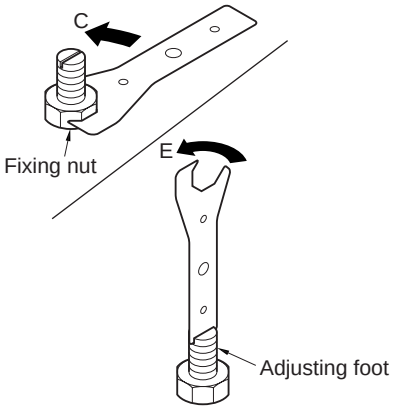
Loosen the fixing nut in the direction of arrow C in the figure. Turn the caster adjusting foot in the direction of arrow D. A full turn of the adjusting foot changes the height by about 1.75 mm. Turn the foot as many time as necessary. Perform this to the four feet.



F03-101-15

1.1.4-3 If the Finisher or the Folder Is Higher

Loosen the fixing nut in the direction of arrow C. Turn the caster adjusting foot in the direction of arrow D. A full turn changes the height by about 1.75 mm. Turn the foot as many times as necessary. Perform this for the four feet.



F03-101-16

1.1.4-4 Checking the Height

Connect the finisher to the copier, and check the height. If the height is not as indicated, make adjustments once again. If appropriate, tighten all fixing nuts, and fit the foot covers (front, rear).

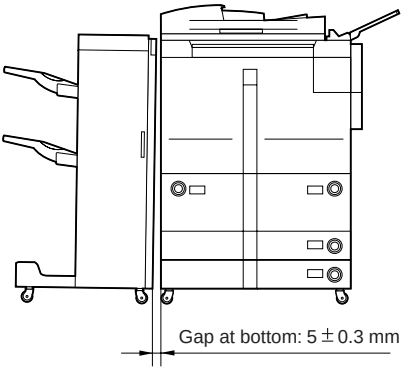
1.1.5 Correcting the Slope

If the floor tilts the finisher, correct the slope as follows; be sure to adjust the height of the machine before starting the work:

1.1.5-1 Checking the Slope and Making Preparations

1) Check to find out which way the machine tilts.

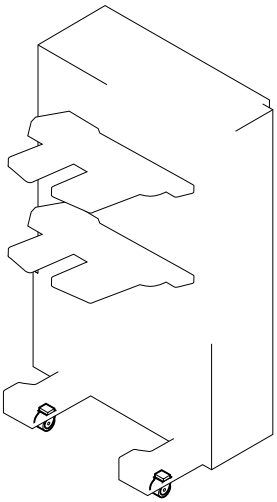
- The gap between the finisher and the copier is 5 ± 0.3 mm. If the gap is larger than this, assume slope A and perform step 5-2; if it is smaller, assume slope B and perform step 5-3.



F03-101-17

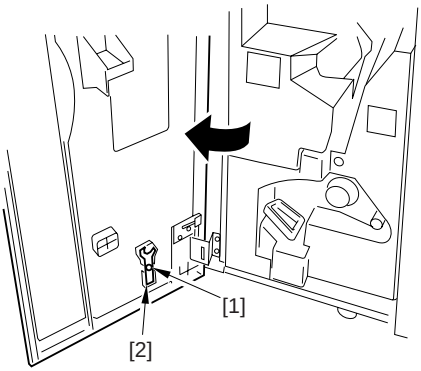
Memo

To adjust, turn the two casters shown in F03-101-18.



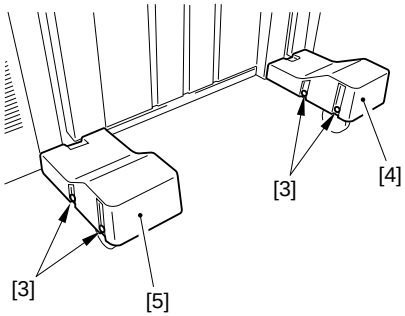
F03-101-18

2) Open the finisher front cover. Remove the screw [1], and detach the spanner [2] from behind the front cover.



F03-101-19

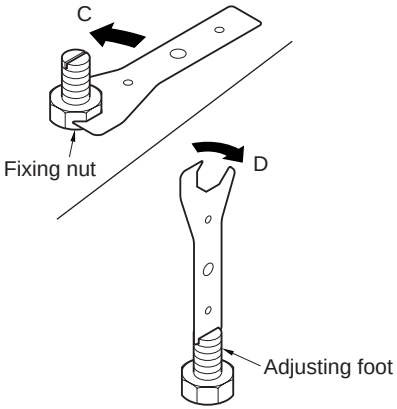
3) Remove the four screws [3], and detach the front foot cover [4] and the rear foot cover [5].



F03-101-20

1.1.5-2 Correcting Slope A

1) Loosen the fixing nut in the direction of arrow C in the figure. Turn the adjusting foot of the caster in the direction of arrow D several times. Perform this on both front and rear feet.

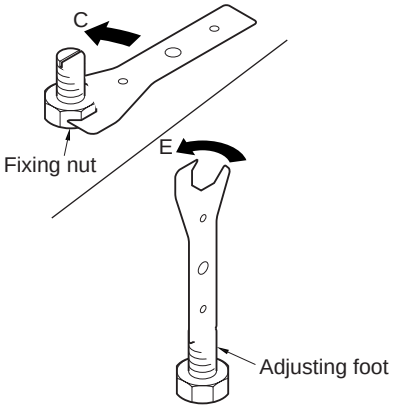


F03-101-21

2) Check the gap between the finisher and the copier. If the gap still has a discrepancy, turn the adjusting foot as needed. If it has been turned excessively, turn it back. Perform this on both front and rear feet until the gap is the same at the top and the bottom.
3) When the gap is even, tighten the front and rear fixing nuts.
4) Mount the foot cover (front, rear).
5) Attach the spanner.

1.1.5-3 Correcting Slope B

1) Loosen the fixing nut in the direction of arrow C in the figure. Turn the adjusting foot of the cater in the direction of E in the figure several times. Perform this on both front and the rear feet.

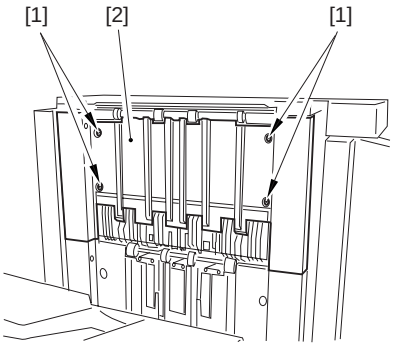


F03-101-22

2) Check the gap between the finisher and the copier. If the gap still has a discrepancy, turn the adjusting foot as needed. If it has been tightened excessively, turn it back. Perform this on both front and rear feet until the gap is the same at the top and the bottom.
3) When the gap is even, tighten the front and rear fixing nuts.
4) Mount the foot covers (front, rear).
5) Attach the spanner.

1.1.6 Removing the Stack Wall (upper)

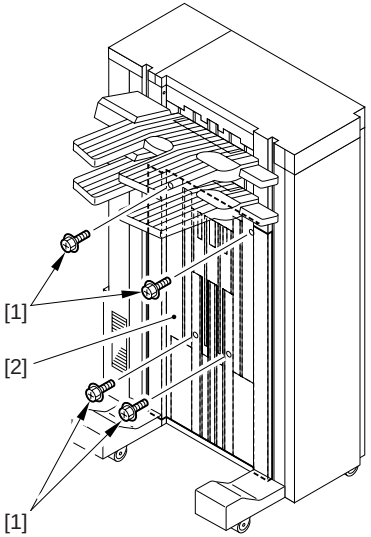
1) Move down the tray A below the stack wall (upper). (See 1.3.1.)
2) Remove the four screws [1], and detach the stack wall (upper ; [2]).



F03-101-23

1.1.7 Removing the Stack Wall (lower)

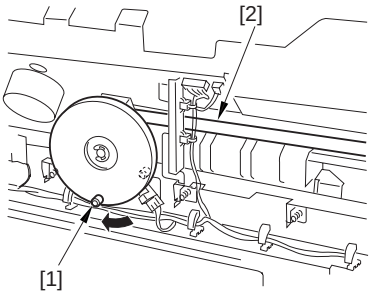
1) Detach the upper stack wall.
2) Open the front door, and remove the stopper (lower).
3) Remove the four screws [1], and detach the stack wall (lower; [2]).



F03-101-24

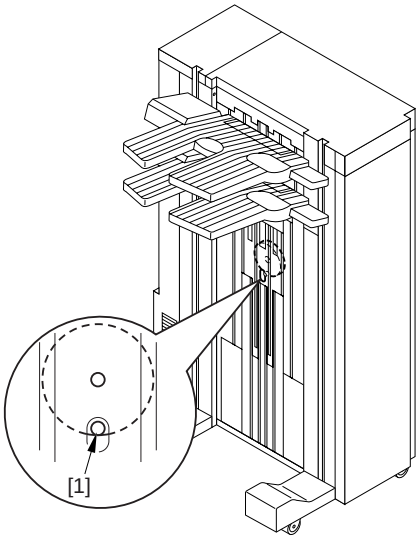
1.1.8 Mounting the Stack Wall (lower)

1) Turn the shutter drive shaft [2] so that the shutter drive member [1] is at the bottom.



F03-101-25

2) Mount the stack wall (lower) so that the member [1] is in view through the hole in the stack wall (lower).

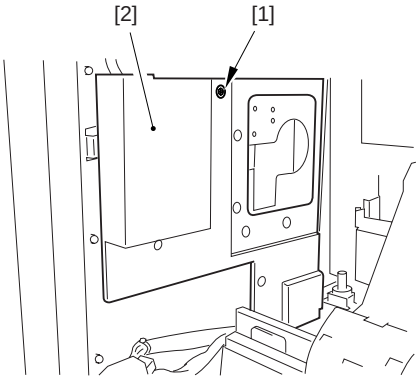


F03-101-26

1.2 Handling Tray Unit

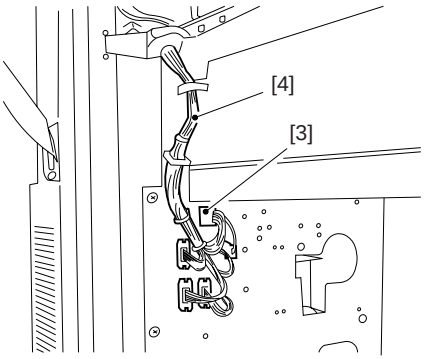
1.2.1 Removing the Handling Tray Unit

1) Remove the stack wall (upper).
2) Remove the stack wall (lower).
3) Remove the screw [1], and detach the connector cover [2].



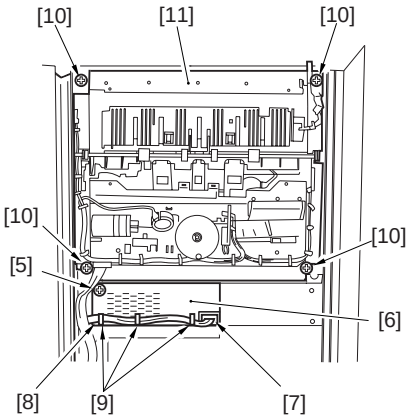
F03-102-01

4) Disconnect the eight connectors [3], and free the harness [4] from the cord clamp.



F03-102-02

5) Remove the screw [5], and detach the PCB cover [6].
6) Disconnect the connector [7], and free the harness [8] from the cord clamp [9].
7) Move up the tray A to the topmost position, and move down the tray B to the bottommost position.
8) Remove the four screws [10], and detach the holding tray unit. [11].



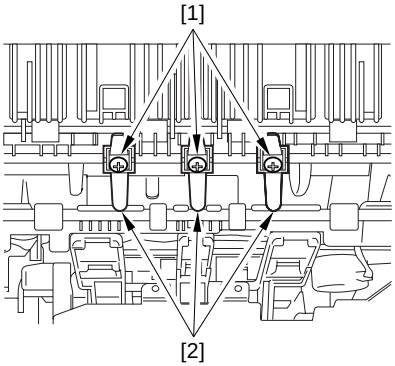
F03-102-03

1.2.2 Removing the Paddle Unit

1) While lifting the swing guide, remove the screw [1] to detach the paddle unit [2].

Memo

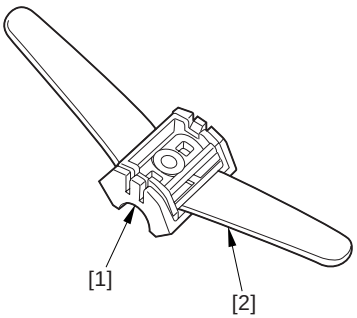
When you have removed the holding tray, you may detach the paddle unit from the handling tray unit.



F03-102-04

1.2.3 Removing the Paddle Unit

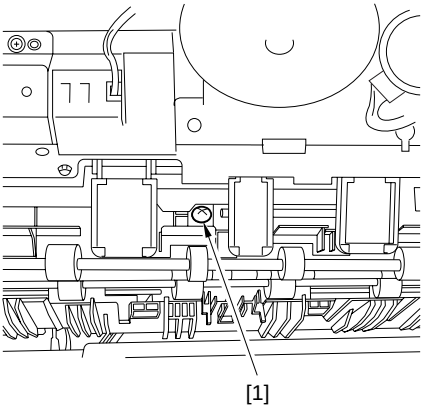
1) Remove the paddle unit. (See 1.2.2.)
2) Remove the retaining member [1], and detach the paddle [2].



F03-102-05

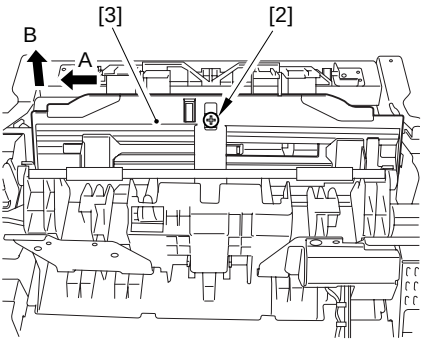
1.2.4 Removing the Handling Tray

1) Remove the handling tray unit. (See 1.2.1.)
2) Remove the screw [1] of the stack delivery roller lower.



F03-102-06

3) Remove the screw [2] of the holding tray.
4) Slide the handling tray [3] in the direction of arrow A, and then detach it in the direction of arrow B.



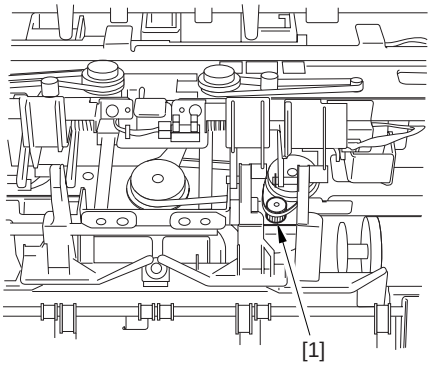
F03-102-07

1.2.5 Removing the Alignment Motor

Memo

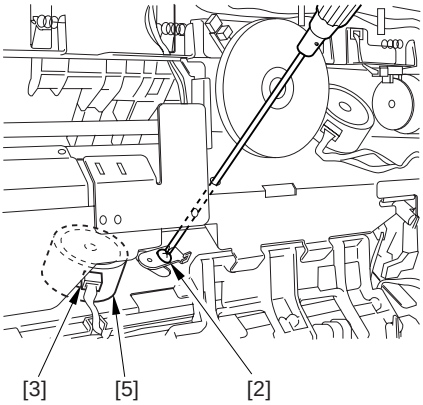
Here, the removal of the front alignment motor is discussed. The rear alignment motor is removed in the same way.

1) Remove the handling tray unit (1.2.1) together with the handling tray (1.2.4).
2) Turn the tray auxiliary plate motor [1] by hand to move the tray auxiliary plate away from home position.



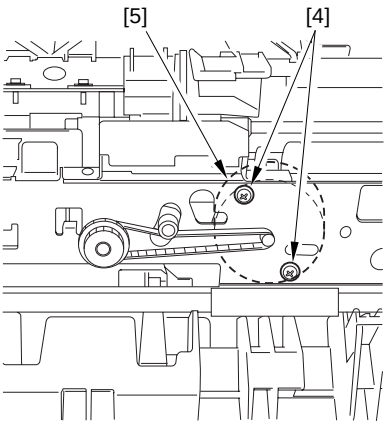
F03-102-08

3) Loosen the screw [2] to reduce the tension on the belt.
4) Disconnect the connector [3].



F03-102-09

5) Remove the two screws [4], and detach the alignment motor [5].

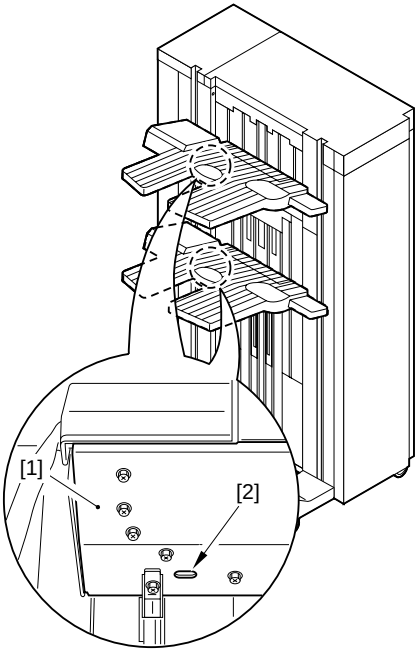


F03-102-10

1.3 Tray A Unit/Tray B Unit

1.3.1 Moving Down the Tray A/B Unit

1) While holding the tray frame [1] from below, insert a screwdriver into the long hole [2] in the rear of the body.



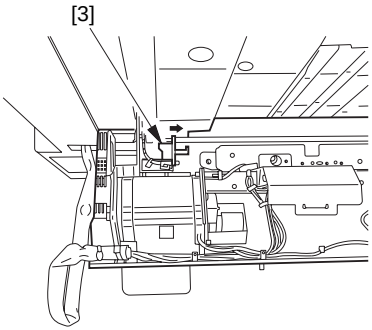
F03-103-01

2) While freeing the ratchet with a screwdriver or the like, move down the tray A/B unit.

Memo

The tray A/B may be detached to free the ratchet [3].

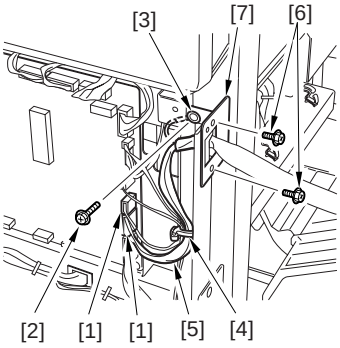
If the power is turned on while the latchet is not engaged, the locks of the tray lock sensor will not change, causing 'E540/E542'.



F03-103-02

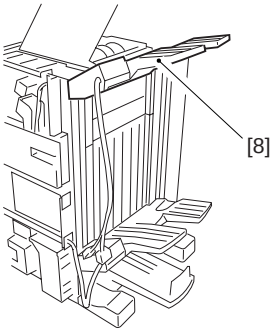
1.3.2 Removing the Tray A Unit

1) Open the upper cover, and detach the support pole cover.
2) Remove the rear cover and the rear upper cover.
3) Remove the stopper (upper).
4) Disconnect the two connectors [1], and remove the screw [2] to detach the grounding wire [3].
5) Free the harness [5] from the cord clamp [4]; then, remove the two screws [6], and detach the harness holder [7].



F03-103-03

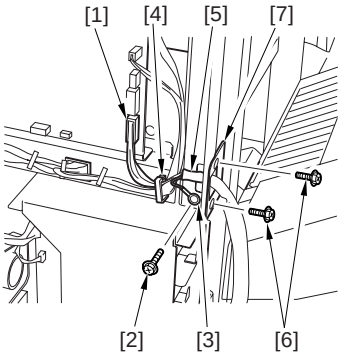
6) Pull off the tray A unit [8] upward.



F03-103-04

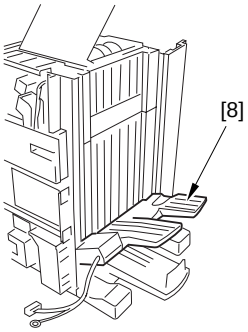
1.3.3 Removing the Tray B Unit

1) Remove the tray A unit.
2) Remove the stopper (lower).
3) Open the upper cover.
4) Disconnect the connector [1], and remove the screw [2] to detach the grounding wire [3]; then, free the sharpness [5] from the cord clamp [4].
5) Remove the two screws [6], and detach the harness holder [7].



F03-103-05

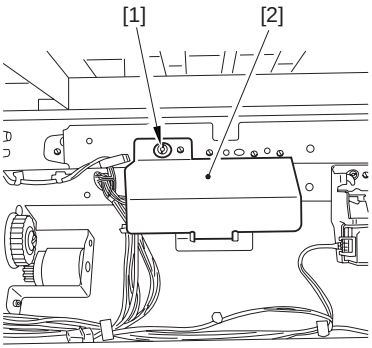
6) Pull of fate tray B unit [8] upward.



F03-103-06

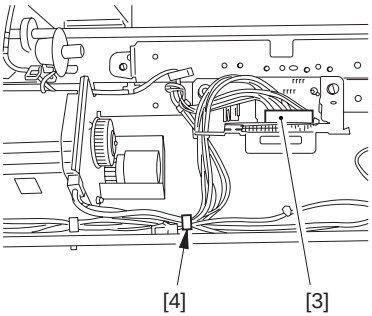
1.3.4 Removing the Try A/B Lift Motor (M13/M12)

1) Remove the tray A/B.
2) Move down the tray A/B unit to the bottommost position (1.3.1). Otherwise, the tray can drop along the rack when the motor is removed.
3) Remove the screw [1], and detach the motor driver PCB cover [2].



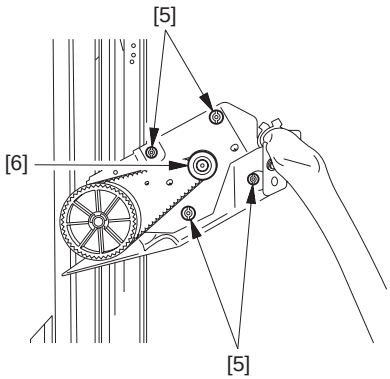
F03-103-07

4) Disconnect the connector [3], and free the harness from the cord clamp [4].



F03-103-08

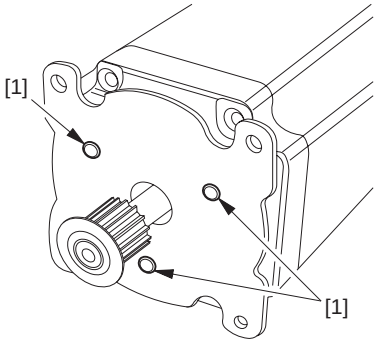
5) Remove the four screws [5], and detach the motor [6].



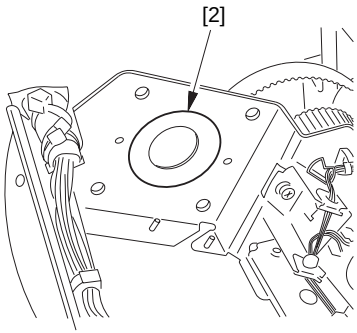
F03-103-09

1.3.5 Mounting the Tray A/B Lift Motor (M13/M12)

1) Mount the motor so that the circle connecting the protrusion [1] of the screw hole of the motor will match the round hole (large, [2]) of the motor mounting face.



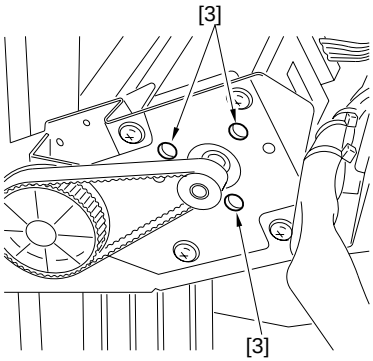
F03-103-10



F03-103-11

Memo

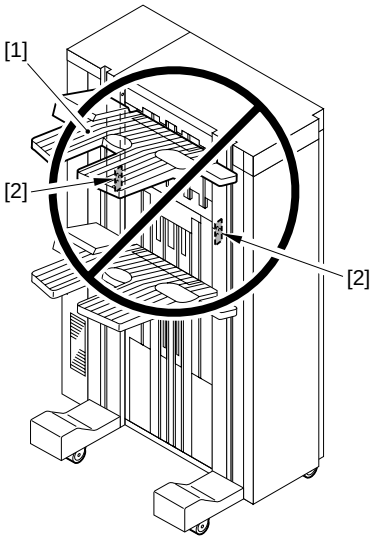
You can find out whether the protrusion is matched against the round hole (large) with reference to the small hole [3] on the drive belt side.



F03-103-12

1.3.6 Position of Tray B at Power-On

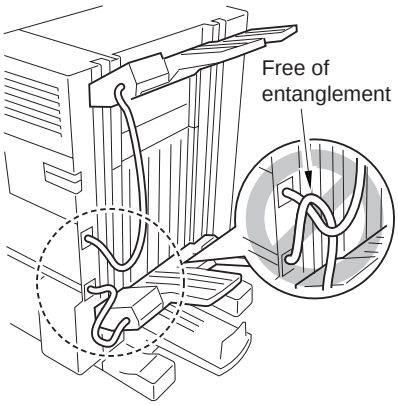
The tray B [1] must not be above the tray B paper sensor [2] at power on. If it is, an error will be issued when the position of the tray B is checked.



F03-103-13

1.3.7 Harness of the Tray A/B

After mounting the tray A/B, check to make user that the harnesses are not entwined.

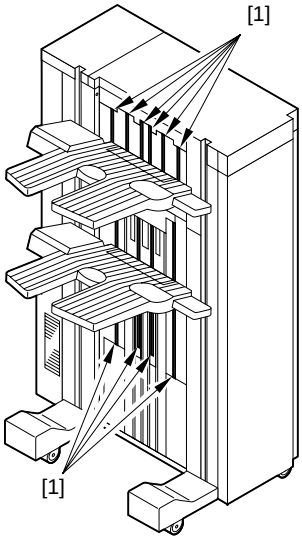


F03-103-14

1.3.8 Points to Note When Handling the Stack Wall Rail

Take care not to subject the stack wall rail [1] to scratches or dents, which can affect the stacking performance.

If dirt is excessive, use alcohol to clean.

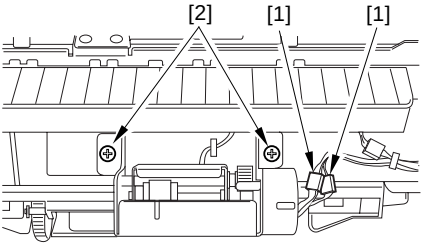


F03-103-15

1.4 Knurled Belt Releasing Unit

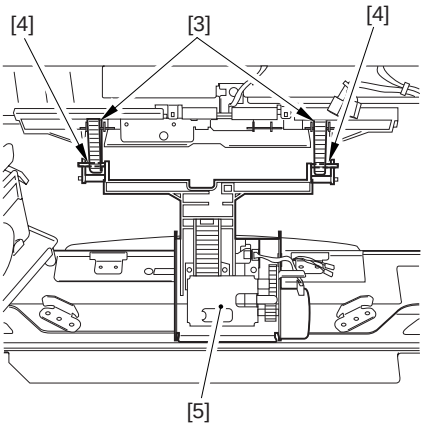
1.4.1 Removing the Knurled Belt Releasing Unit

1) Disconnect the finisher from the copier.
2) Disconnect the two connectors [1], and remove the two screws [2].



F03-104-01

3) While freeing the knurled belt [3] from the pulley [4], detach the knurled belt releasing unit [5].

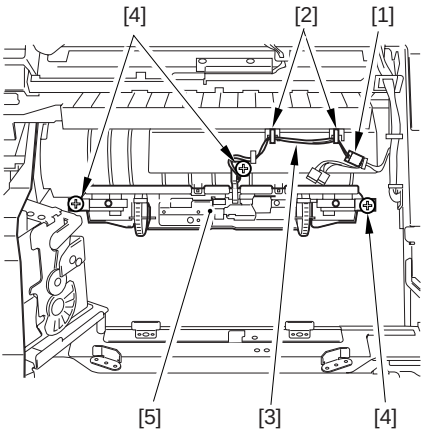


F03-104-02

1.5 Knurled Belt

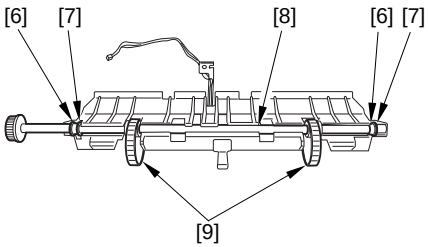
1.5.1 Remove the Knurled Belt

1) Remove the handling tray unit. (1.2.1)
2) Disconnect the finisher from the copier. (1.1.3)
3) Remove the rear over.
4) Disconnect the connector [1], and free the harness [3] from the cord clamp [2].
5) Remove the three screws [4], and detach the sort delivery guide [5].



F03-105-01

6) Remove the two E-rings [6] on both sides of the sort delivery roller and the bearing [7] from the front.
7) Detach the knurled belt [8] from the sort delivery roller shaft.

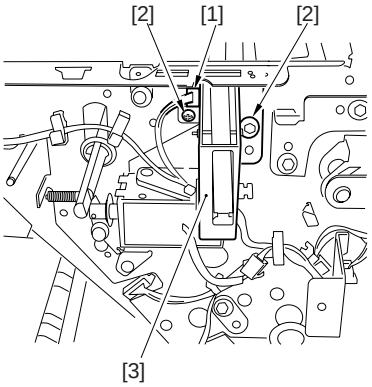


F03-105-02

1.6 Buffer Roller Unit

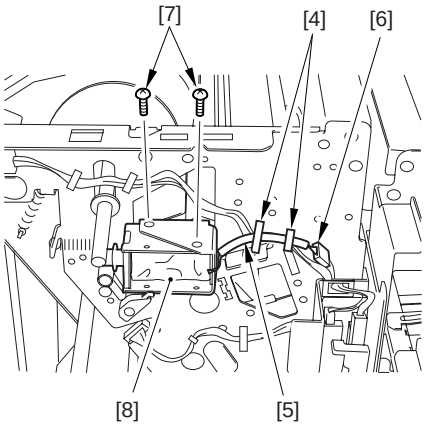
1.6.1 Removing the Buffer Roller Unit

1) Open the front cover and the upper cover.
2) Remove the buffer roller knob and the inside cover.
3) Disconnect the connector [1], and remove the two screws [2]; then, detach the upper cover sensor base [3].



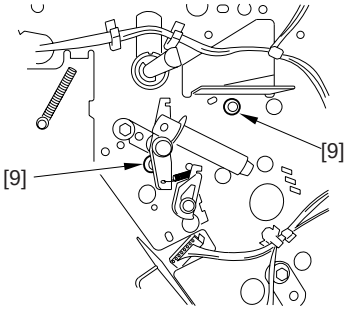
F03-106-01

4) Free the harness [5] from the cord clamp [4].
5) Disconnect the connector [6], and remove the two screws [7]; then, detach the buffer path switching solenoid (SL1; [8]).

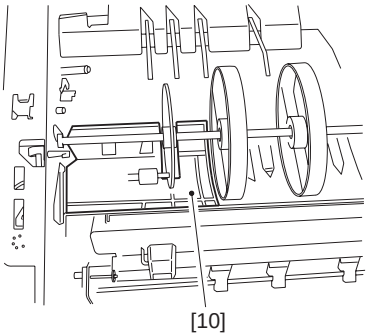


F03-106-02

6) Remove the two screws [9], and detach the prism support plate [10].

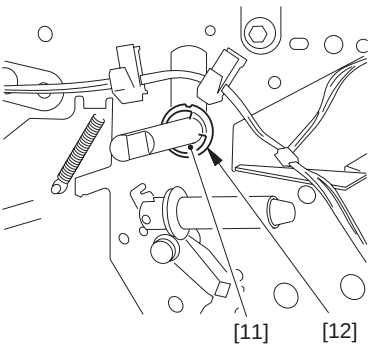


F03-106-03



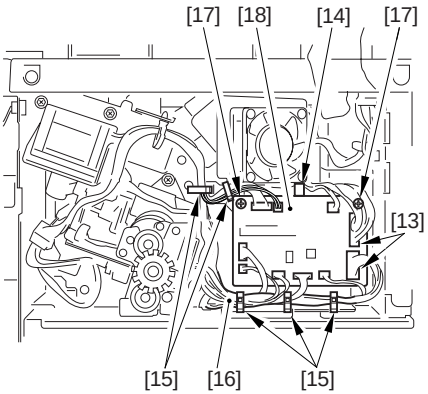
F03-106-04

7) Remove the E-ring [11] from the front end of the buffer roller shaft, and detach the bearing [12].



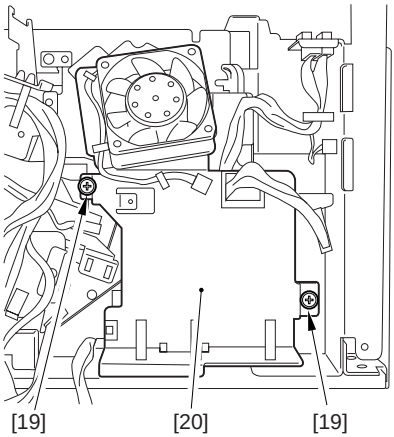
F03-106-05

8) Remove the rear upper cover and the rear cover.
9) Remove the punch waste case holder.
10) Disconnect the ten connectors [13] of the punch driver PCB and the connector [14] of the punch fan; then, free the harness [16] from the cord clamp.
11) Remove the two screws [17], and detach the punch driver PCB [18].



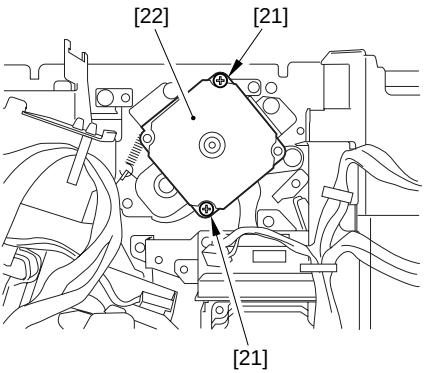
F03-106-06

12) Remove the two screws [19], and detach the punch fan [20] together with the base.



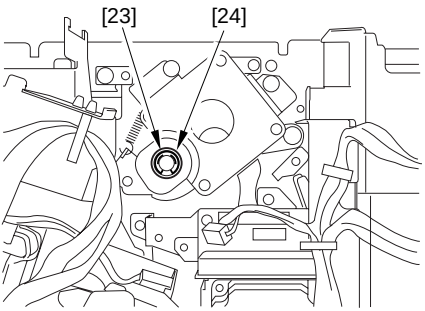
F03-106-07

13) Remove the two screws [21], and detach the buffer motor [22].



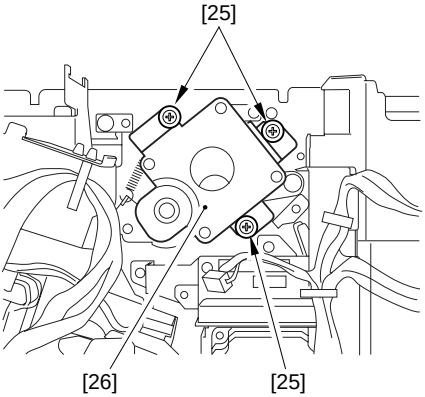
F03-106-08

14) Remove the E-ring [23] at the rear end of the buffer shaft, and detach the bearing [24].



F03-106-09

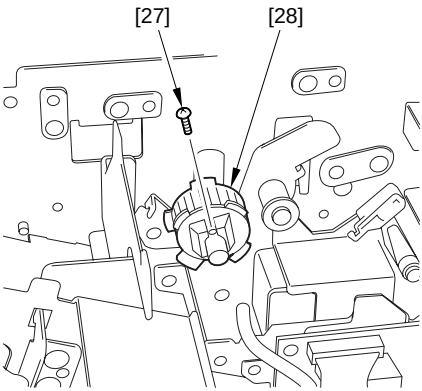
15) Remove the three screws [25], and detach the buffer motor base [26].



F03-106-10

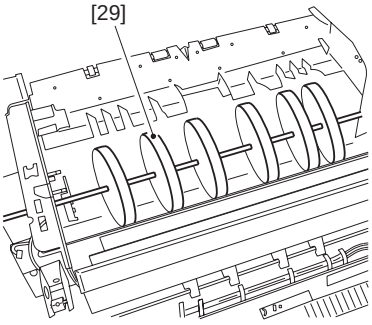
16) Remove the screw [27], and remove the gear [28] of the buffer roller shaft.

Take care not to drop the pin in the gear.



F03-106-11

17) Remove the buffer roller unit [29].

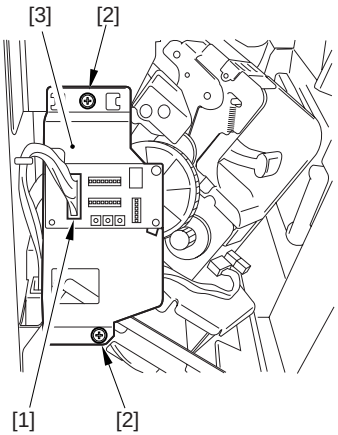


F03-106-12

1.7 Stapler Unit

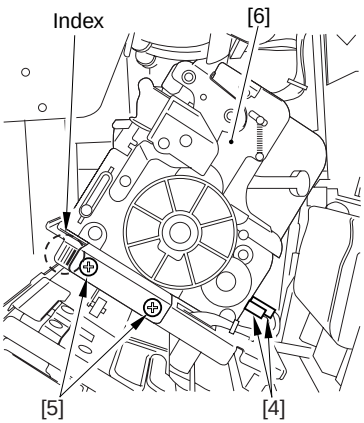
1.7.1 Removing the Stapler

1) Open the front cover, and remove the inside cover.
2) Disconnect the connector [1], and remove the two screws [2]; then, detach the switch PCB [3] together with the base.



F03-107-01

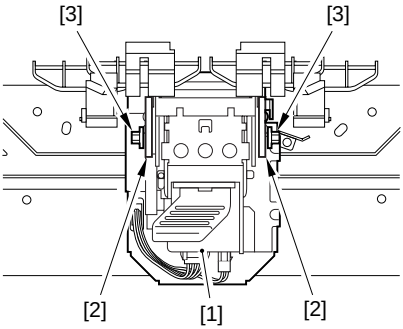
3) Disconnect the two connectors [4], and remove the two screws [5]; then, detach the stapler [7]. Before removing, be sure to take note of the stapler positioning index.



F03-107-0-2

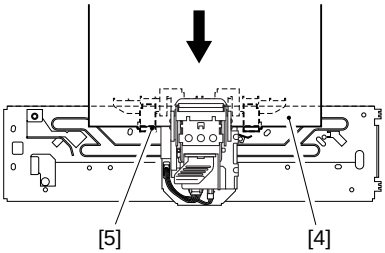
1.7.2 Adjusting the Position of the Stapler Paper Stopper

1) Disconnect the finisher from the copier.
2) Move the stapler unit [1] to the middle of the rail.
3) Loosen the screws ([3], 2 each) on the stapler paper stopper (left, right; [2]).



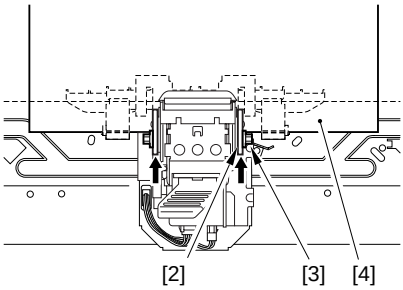
F03-107-03

4) While lifting the swing guide, insert a stack of several sheets [4], and butt it against the rear end stopper [5].



F03-107-04

5) While butting the stapler paper stopper (left, right; [2]) against the stack of sheets [4], tighten the screw [3].

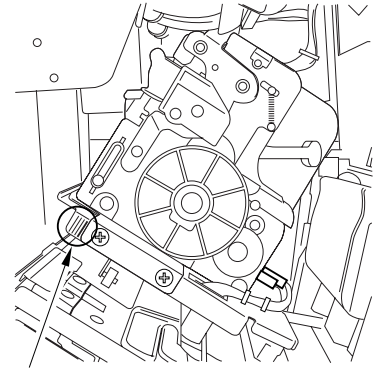


F03-107-05

1.7.3 Positioning the Stapler

1.7.3-1 Using the Index

Mount the stapler holder with reference to the index taken note of before removing it. (Normally, match it against the middle index to position it correctly).

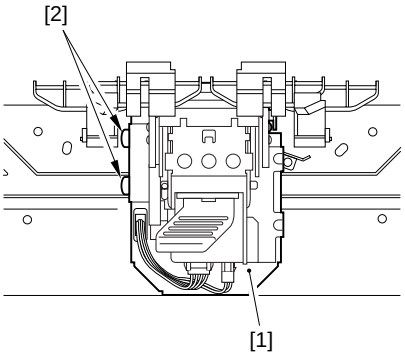


F03-107-06

1.7.3-2 Using the Stopper

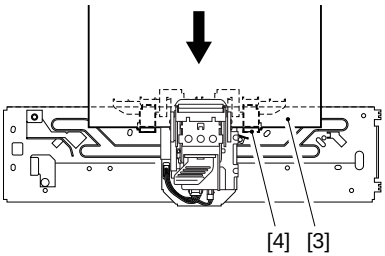
If the index is not clear, perform the following; this method is useful when the stapler paper stopper has not been moved:

1) Move the stapler unit [1] to the middle of the rail.
2) Loosen the two stapler holder fixing screws [2].



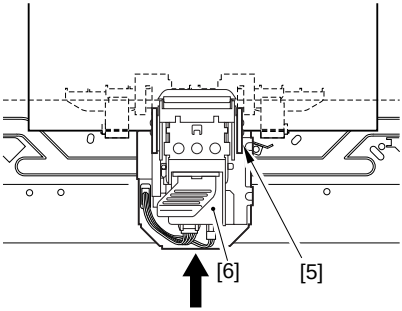
F03-107-07

3) Lifting the swing guide, insert a stack of several sheets [3], and butt it against the rear end stopper [4].



F03-107-08

4) Slide the stapler holder [6] until the stapler paper stopper [5] butts against the stack of sheets; then, tighten the screw.

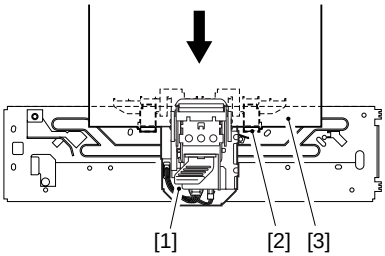


F03-107-09

1.7.3-3 Positioning by Stapling

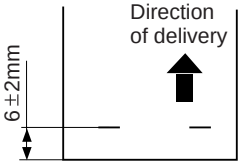
If the index is not clear upon replacement of the stapler holder and, in addition, the stapler has moved, perform the following:

1) Disconnect the finisher from the copier.
2) Fix the stapler holder to the base temporarily. At this time, try to position it somewhat toward the rear.
3) Move the stapler [1] to the middle of the rail.
4) Loosen the screws (2 each) of the stapler paper stopper (left, right).
5) While lifting the swing guide, insert a stack of several sheets [2], and butt it again the rear edge stopper [3].



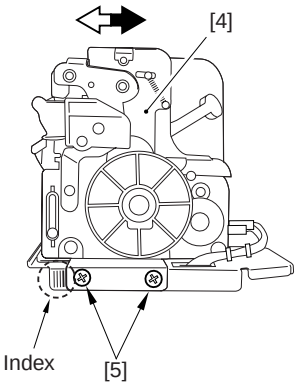
F03-107-10

6) Perform manual stapling.
7) Check the position of the staple against the standards.



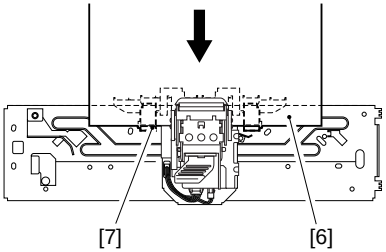
F03-107-11

8) According to the result of comparison, move the stopper holder [4] with reference to the index (2 screws [5]).



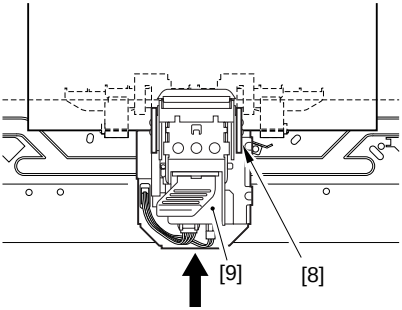
F03-107-12

9) While lifting the swing guide, insert a stack of several sheets [6], and butt it against the rear edge stopper [7].



F03-107-13

10) Slide the stapler holder [9] unit the stapler paper stopper [8] butts against the paper sack, and tighten the screw.

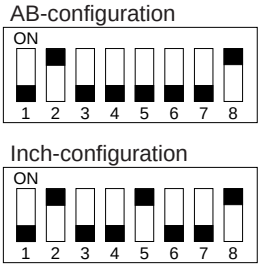


F03-107-14

1.7.4 Adjusting the Position of the Stapler (front, 1-point)

If you have replaced the EEPROM (IC108) of the finisher controller PCB, perform the following:

1) Set SW973 on the switch PCB as follows:

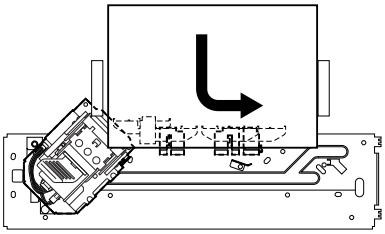


F03-107-15A

2) Press SW976.

- The swing guide of the finisher opens and, at the same time, the front aligning plate and the rear aligning plate move to home position. Then, the front/rear aligning plate moves to the front 1-point stapling position. The stapler also moves to the front 1-position stapling position. The latest setting is indicated by DSP971 on the switch PCB; between '-12' and '+12'.

3) Place several sheets of A4 or LTR sheets, and insert them into the holding tray. At this time, butt the trailing edge of the stack against the rear aligning plate.



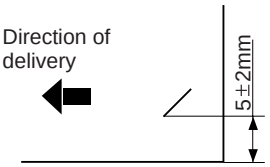
F03-107-15B

- If the gap between the front aligning plate and the paper front edge is 1 mm or more, turn off the power; then, shift all bits of SW973 to OFF, and stop the adjustment. Then, adjust the alignment width, and then perform the adjustment of the stapling position.

4) Press SW976 of the switch PCB.

- In response, the stapler performs stapling. The indication of DSP971 will be '0'.

5) Remove the stack of sheets, and check the staple position against the standard. If it is correct, end the adjustment. Turn off the power, and shift all bits of SW973 to OFF, and turn on the power once again. If the stapling position must still be adjusted, go to the next step.



F03-107-15C

6) Press SW976 once so that a new setting may be entered.
- The stapler moves to home position once, and then moves back to stapling position. DSP971 indicates the latest setting.

7) According to the result of comparison, press SW975 (+) or SW974 (-) on the finisher controller PCB.
- Each press on SW975 (+) shifts the stapling position to the front by about 0.42 mm, and the indication of DSP971 advances in the direction of '+' by '1',
- Each press on SW974 (-) moves the stapling position toward the rear by about 0.42 mm. The indication of DSP971 advances in the direction of '-' by 1.

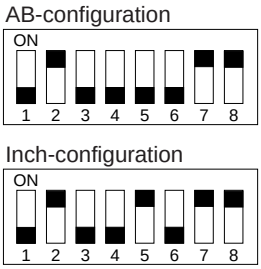
8) As in step 3), insert a stack of several A4 or LTR sheets into the handling tray.
9) Press SW976 once so that the new setting will be accepted.
- Manual stapling will take place automatically so that you can check the stapling position. The indication of DSP971 will be '0'.

10) Turn off the power.
11) Shift all bits of SW973 to OFF.
12) Turn off the power, and move down the swing guide.

1.7.5 Adjusting the Stapling Position (rear, 1-point)

If you have replaced the EEPROM (IC108) of the finisher controller PCB or replaced the stapler, perform the following:

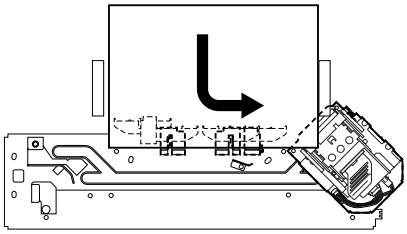
1) Set SW973 of the switch PCB as follows:



F03-107-15D

2) Press SW976 of the switch PCB.
- The swing guide of the finisher opens and, at the same time, the front aligning plate and the rear aligning plate move to home position. Then, the front aligning plate and the rear aligning plate move to the rear 1-point stapling position. The stapler also moves to the rear 1-point stapling position. DSP971 on the switch PCB indicates the latest setting; between '-12' and '+12'.

3) Holding a stack of several A4 or LTR sheets, insert it into the handing tray. At this time, butt the trailing edge of the stack against the rear aligning plate.

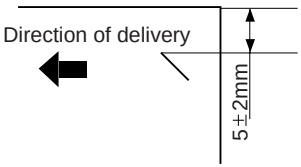


F03-17-15E

- If the gap between the front aligning plate and the paper front edge is 1 mm or more, turn off the power; then, shift all bits of SW973 to OFF to stop adjustment. Thereafter, adjust the alignment width, and then adjust the stapling position once again.

4) Press SW973 on the stitch PCB.
- In response, the stapler will execute stapling operation. The indication of DSP971 will be '0'.

5) Remove the stack of sheets, and check the stapling position against the standard. If the stapling position is correct, end the adjustment. Turn off the power, and shift all bits of SW973 to OFF, and turn on the power once again. If the stapling position must still be adjusted, go to the net step.



F03-107-15F

6) Press SW976 once so that a new setting may be entered.
- The stapler will move to home position once and then back to the stapling position. DSP971 indicates the latest setting.

7) According to the result of comparison, press SW975 (+) or SW974 (-) on the finisher controller PCB.
- Each press on SW975 (+) shifts the stapling position toward the front by about 0.42 mm. The setting of DSP971 advances in the direction of '+' by '1'.
- Each press on SW974 (-) shifts the stapling position toward the rear by about 0.42 mm. The setting of DSP971 moves in the direction of '-' by '1'.

8) As in step 3), insert several sheets of A4 or LTR paper into the handling tray.

9) Press SW976 once so that the new setting will be accepted.
- Automatic stapling will take place so that you can check the stapling position. The indication of DSP971 will be '0'.

10) Turn off the power.

11) Shift all bits of SW973 to OFF.

12) Turn on the power, and move down the swing guide.

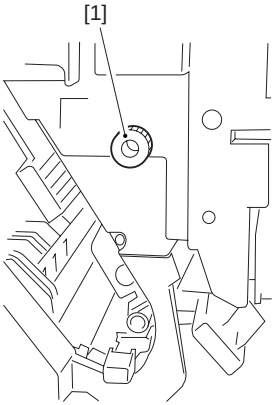
1.8 Punch Unit

Before removing the punch unit, perform the following so that the punch waste is moved to the waste case.

1) Shift bits 1, 6, 7, and 8 of DIP SW973 on the switch PCB to ON.
2) Press SW976 on the switch PCB to turn on the punch waste feed motor.
3) Keep the motor ON for 5 min.
4) Press SW976 to stop the motor.

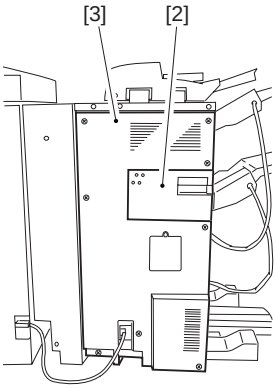
1.8.1 Removing the Punch Slide Unit

1) Open the front cover, and remove the punch knob [1].



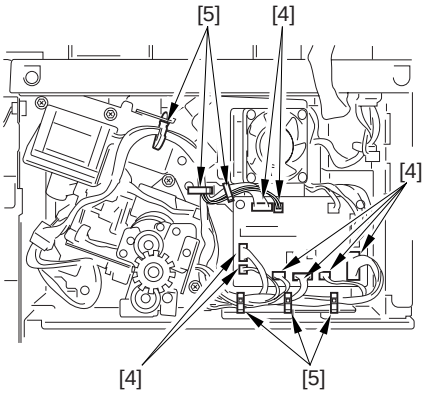
F03-108-01

2) Remove the inside cover. (4 screws)
3) Remove the punch waste case [2] and the rear cover [3].



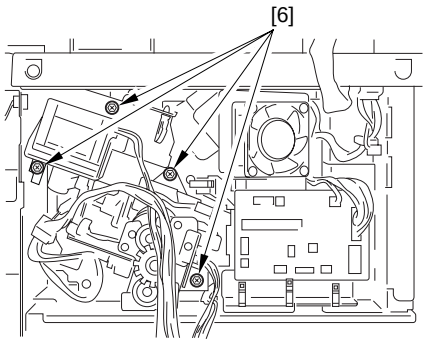
F03-108-02

4) Disconnect the eight connectors [4], and free the harness from the five cord clamps [5].

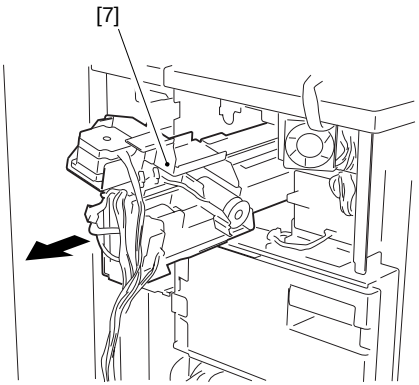


F03-108-03

5) Remove the four screws [6], and slide out the punch slide unit [7] to the front.

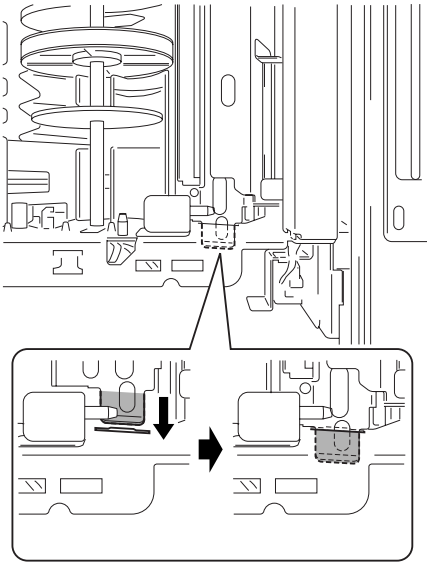


F03-108-04



F03-108-05

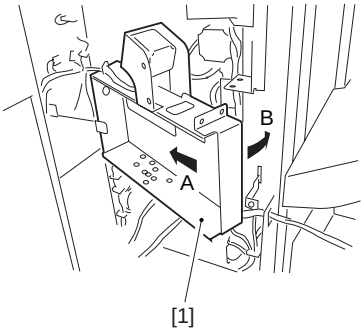
When mounting, be sure that the tip of the punch slide unit is fully in the slit as shown.



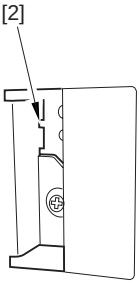
F03-108-06

1.8.2 Mounting the Punch Waste Case Holder

1) Mount the waste case holder [1] to the finisher frame in the sequence indicated by arrows: arrow A, and then arrow B. When fitting the holder in the direction of arrow B, match the hole in the waste case holder and the protrusion [2] of the finisher.

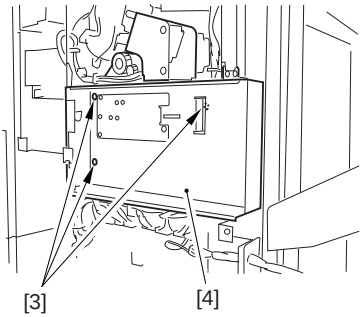


F03-108-07



F03-108-08

2) Secure the waste case holder [4] with three screws [3].

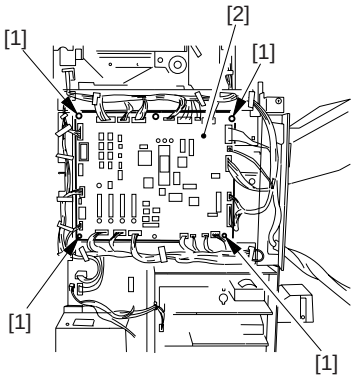


F03-108-09

1.9 PCBs

1.9.1 Removing the Finisher Controller PCB

1) Remove the rear cover.
2) Disconnect the 26 connectors, and remove the four screws [1] to detach the finisher controller PCB [2].



F03-109-01

CHAPTER 4

MAINTENANCE AND INSPECTION

1 Periodically Replaced Parts

1.1 Finisher Unit

The finisher unit does not have parts that require periodical replacement.

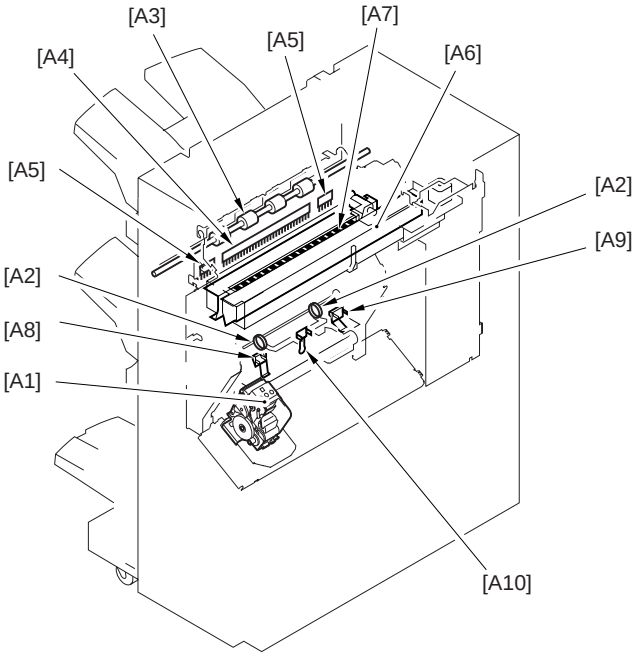
2 Guide to Durables

Some of the parts of the machine may require replacement once or more over the product warranty because of deterioration or damage. Replace them as needed.

As of February 2001

2.1 Finisher Unit

No.	Part name	Part No.	Q'ty	Life	Remarks
A1	Stapler	FB5-9308	1	500,000 stapling operations	About 5000 per cartridge
A2	Knurled belt	FB5-9103	2	To tray B; 1 million prints	
A3	Upper stack delivery roller	FB4-8363	1		
A4	Sort static eliminator	FB5-9128	1		
A5	Sort static eliminator 2	FB5-9006	2		
A6	Puncher unit	FG6-7548 (2-hole) FG6-7549 (2/3-hole) FG6-7550 (4-hole, France) FG6-7551 (4-hole, Sweden)	1	1 million punching operations	If 200 g/m^2 paper at 5% image, 100,000 times
A7	Punch static eliminator	FB5-8684	1		
A8	Staple guide F	FF6-1191	1		
A9	Staple guide R	FF6-1192	1		
A10	Staple guide C	FF6-1193	1		



F04-204-01

3 Scheduled Maintenance

As of February 2001

3.1 Finisher Unit

Item	Intervals	Work	Remarks
Paper surface sensor	Every 250,000 prints of copier delivery	Cleaning	Blower brush
Inlet path sensor			
Buffer path paper sensor			
Lower path paper sensor			
Punch waste sensor prism			Dry wiping
Photosensor around punch unit (Note 1)	Upon replacement of puncher unit		Using blower brush

Note 1: punch paper edge sensor (P21), punch motor home position sensor (PI22), punch sensor home position sensor (PI23), punch home position sensor (PI24), punch front sensor (PI25)

CHAPTER 5

TROUBLESHOOTING

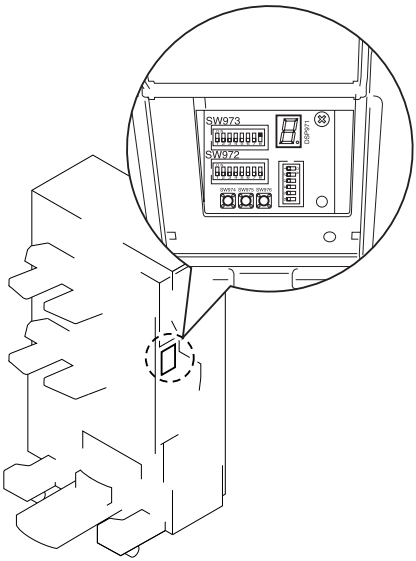
1 Making Adjustments

1.1 Electrical System

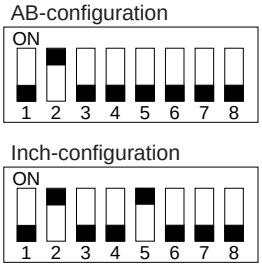
1.1.1 Adjusting the Alignment Width

If you have replaced the EEPROM (IC102) of the finisher controller PCB, front aligning plate motor (M4), or rear aligning plate motor (M5), make the following adjustments:

1) Using the door switch actuator, turn on the two door switches. Set SW973 on the switch PCB as indicated.



F05-101-01



F05-101-02

2) Press SW976 on the switch PCB.

- The swing guide of the finisher opens and, at the same time, the front aligning plate and the rear aligning plate move to home position. Thereafter the rear aligning plate moves to the rear aligning position, while the front aligning plate moves from the rear aligning plate to a point 'A4 width or LTR width + $'. DSP971 of the switch PCB indicates '-4', which is the initial offset value.

3) Keep several sheets of A4 or LTR paper together, and insert it into the handling tray. (Be sure that the leading edge of the stack butts against the rear aligning plate.)
4) Butt the trailing edge of the stack against the rear aligning plate.
5) Press SW975. Each press shifts the front aligning plate toward the rear by about 0.42 mm. Each press, further, advances the offset reading of DSP971 on the switch PCB up to '+4'. Repeat this until there is no gap between the front edge of the stack and the front aligning plate.

- You cannot enter a value higher than '+4'.

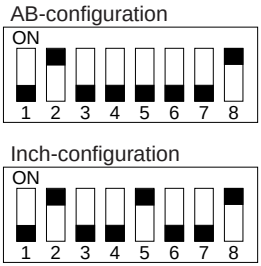
6) Press SW976 on the switch PCB.
- The setting will be stored, and the front/rear aligning plate return to home position.
- If you happen to have pressed SW975 too many times and the front aligning plate has moved too far, press SW974. The front aligning plate will stop once, returns to home position, and then moves back to adjustment start position. Go back to step 5), and start over.

7) Turn off the power.
8) Shift all bits of SW973 of the finisher PCB to OFF.
9) Turn on the power.
- The swing guide will move down.

1.1.2 Adjusting the Stapling Position (front, 1-position)

If you have replaced the EEPROM of the finisher controller PCB or the stapler, make the following adjustments:

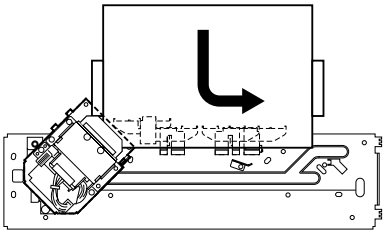
1) Using the door switch actuator, turn on the two door switches. Set SW973 of the switch PCB as indicated:



F05-101-03

2) Press SW976 on h switch PCB.
- The swing guide of the finisher opens and, at the same time, the front aligning plate and the rear aligning plate return to home position. Then, the front aligning plate and the rear aligning plate move to the front 1-point stapling position. The stapler also moves to the front 1-point stapling position. DSP771 on the switch PCB indicates the latest setting, which is between '-12' and '12'.

3) Keep several sheets of A4 or LTR paper together, and insert the stack into the handling tray. At this time, be sure to butt the trailing edge of the stack against the rear aligning plate.

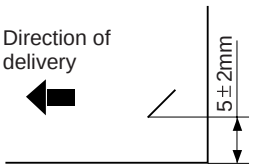


F05-101-04

- If the gap between the front aligning plate and the front edge of the stack is 1 mm or more, turn off the power, and shift all bits of SW973 to OFF to stop adjustment. Then, adjust the alignment range width, and then start over.

4) Press SW976 on the switch PCB.
- The stapler performs stapling.

5) Take out the stack, and check the stapling position against the standard. If the stapling position is as indicated, end the adjustment.
   Turn off the power, and shift all bits of SW973 to OFF, and then turn on the power once again. If you need to adjust the stapling position, go to the following step:



F05-101-05

6) Press SW976 once so that the machine is ready to accept a new setting.
- The stapler moves to home position once, and then returns to the stapling position once again. LED 101 indicates the latest setting.

7) Press SW975 or SW974 on the switch PCB according to the result of comparison.
- Each press on SW975 shifts the stapling position toward the front by about 0.42 mm. The reading of DSP971, on the other hand, advances in the direction of '+'.
- Each press on the SW974 shits the stapling position toward the rear by about 0.42 mm. The reading of DSP971, on the other hand, advances in the direction of '-'.

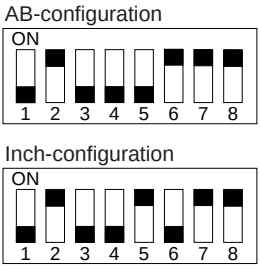
8) As in step 3), insert several sheets of A4 or LTR paper into the handling tray.
9) Press SW976 once so that the machine accepts the new setting.
- The machine executes stapling automatically so that you can check the stapling position.

10) Turn off the power.
11) Shift all bits of SW973 to OFF.
12) Turn on the power to move down the swing guide.

1.1.3 Adjusting the Stapling Position (rear 1-point)

If you have replaced the EEPROM (IC102) on the finisher controller PCB or the stapler, make the following adjustments:

1) Using the door switch actuator, turn on the two door switches. Set SW973 on the SW973 as follows:

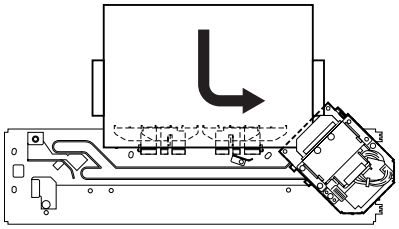


F05-101-06

2) Press SW976 on the switch PCB.

- The swing guide of the finisher opens and, at the same time, the front aligning plate and the rear aligning plate return to home position. Then, the front aligning plate and the rear aligning plate move to the rear 1-point stapling position. The stapler also moves to the rear 1-point stapling position. The setting of DSP971 on the switch PCB indicates the latest setting, which is between '-12' and '12'.

3) Keep several sheets of A4 or LTR paper together, and insert the stack into the holding tray. At this time, be sure to butt the trailing edge of the stack again the rear aligning plate.



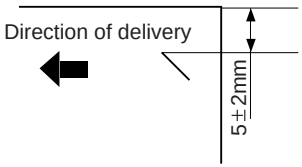
F05-101-07

- If the gap between the front aligning plate and the paper front edge is 1 mm or more, turn off the power, and shift all bits of SW973 to OFF to stop the adjustment. Then, adjust the alignment width, and then start over.

4) Press SW976 note switch PCB.

- The stapler executes stapling.

5) Take out the stack of sheets, and check the stapling position against the standard. If the stapling position is correct, end the adjustment. Turn off the power, shift all bits of SW973 to OFF, and turn on the power once again. If you need to correct the stapling position, go to the following step:



F05-101-08

6) Press SW976 once so that the machine is ready to accept a new setting.
- The stapler returns to home position and then moves back to the stapling position once again. LED101 indicates the latest setting.

7) Press SW975 or SW974 on the switch PCB according to the result of comparison.
- Each press on SW975 shift the stapling position toward the front by about 0.35 mm. The reading of DSP971 advances in the direction of '+' by '1'.
- Each press on SW974 shifts the stapling position toward the rear by about 0.35 mm. The reading of DSP971 advances in the direction of '-' by '1'.

8) As in step 3), insert a stack of several sheets of A4 or LTR paper into the handling tray.
9) Press SW976 so that the new setting will be stored.
- The machine executes stapling automatically so that you can check the stapling position.

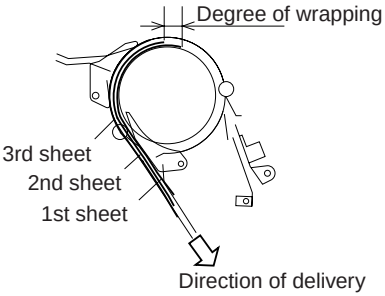
10) Turn off the power.
11) Shift all bits of SW973 to OFF.
12) Turn off the power to move down the swing guide.

1.1.4 Adjusting the Wrapping on the Buffer Roller

Perform the adjustments that follow for the following:

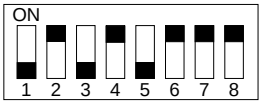
a. If you have replaced the EEPROM (IC102) on the finisher controller PCB.
b. If the degree of wrapping has changed for some reason.

The degree of wrapping refers to the displacement between the first and second sheets or between the second and third sheets.



F05-101-09

1) Using the door switch actuator, turn on the two door switches. Set SW973 on the switch PCB as indicated:



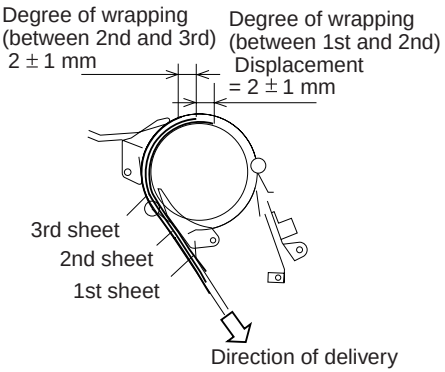
F05-101-10

2) Set '2' to as the copy count on the copier, select sort mode, and place three originals.

3) Press the Start key.
- The machine starts to operate, and stops as soon as paper wraps around the buffer roller.

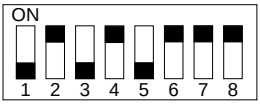
4) Open the front cover and the upper cover, and measure the displacement between the sheets of paper wrapping around the buffer roller (between 1st and 2nd sheets, between 2nd and 3rd sheets).
- After taking measurements, remove the stack of sheets.

5) Compare the degree of wrapping (displacement) against the standards.



F05-101-11

6) Turn off the power, and set SW973 on the switch PCB as indicated:



F05-101-12

The finisher may fail to operate hereafter if the upper cover is not closed.

7) Press the switch (SW976) on the switch PCB.
DSP971 (LED) indicates '1' or '2' (degree of wrapping for 1st and 2nd sheets), and then indicates the latest setting.

8) Press SW975 (+) or SW974 (-) as many times as necessary to adjust the degree of wrapping between 1st and 2nd sheets, thereby entering a new setting.
- ■ Each press on SW975 (+) or SW974 (-) changes the degree of wrapping by about 1.74 mm.
- ■ Each press on SW975 (+) increases the degree of wrapping.
- ■ Each press on SW974 (-) decreases the degree of wrapping.

9) After entering the setting, press the switch (SW976) so that the machine accepts the new setting.
DSP971 (LED) indicates '2' and '3' (between 2nd and 3rd sheets), and indicates the latest setting.

10) Press SW975 (+) and SW974 (-) as many times as necessary to adjust the degree of wrapping between 2nd and 3rd sheets, thereby entering a new setting.
- ■ Each press on SW975 (+) or SW974 (-) changes the degree of wrapping by about 1.74 mm.
- ■ Each press on SW975 (+) increases the degree of wrapping.
- ■ Each press on SW974 (-) decreases the degree of wrapping.

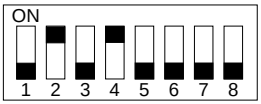
11) After entering the new setting, press the switch (SW976) so that the the machine accepts the new setting.
DSP971 (LE) reads '0' to indicate the end of operation.

1.1.5 Sensor Initial Adjustment

If y have replaced any of the sensors or the EEPROM (IC102), perform the following adjustments:

- Inlet path paper sensor (S1)
- Buffer path paper sensor (S2)
- Lower path paper sensor (S3)
- Tray B paper sensor (S4)
- Tray A power sensor (S5)
- Punch waste sensor (S6)

1) Check to make sure that there is no paper in the paper path and the sort tray. Close the upper cover and the front cover.
2) Dispose of the punch waste inside the punch waste case, and fit the case in the finisher.
3) Set SW973 on the switch PCB as indicated:



F05-101-13

4) Press SW976 on the switch PCB.
- The machine starts adjustment mode. The tray A/B also moves to the 1000-sheet stacking position (to avoid blocking the tray A/B paper sensor (S4/S5)).

5) Monitor DSP971 on the switch PCB while the machine executes automatic adjustment if to see which sensor is being adjusted. (Table 5-101)

No.	Sensor
1	Inlet path paper sensor (S1)
2	Buffer path paper sensor (S2)
3	Lower path paper sensor (S3)
4	Tray B paper sensor (S4)
5	Tray A power sensor (S5)
6	Punch waste sensor, advance warning (S6)
7	Punch waste sensor, full (S6)

T05-101-01

6) When the adjustment ends, check DSP973 to find out the result.
- If DSP971 indicates '0', all sensors are normal.
- If DSP971 indicates 'F', the output level of any of the sensors is not normal.

7) Press SW975 or SW974 on the switch PCB so that details of the result of the adjustment is indicated.
- After the sensor number (Table 5-102), details are indicated for that particular sensor (Table 5-103).
- A press on SW975 moves to the next sensor, while a press on SW974 moves to the previous sensor.

No.	Sensor
1	Inlet path paper sensor (S1)
2	Buffer path paper sensor (S2)
3	Lower path paper sensor (S3)
4	Tray B paper sensor (S4)
5	Tray A paper sensor (S5)
6	Punch waste sensor, advance warning (S6)
7	Punch waste sensor, full (S6)

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Level 3	Level 2	Level 1	Level 0
			
Indicates that the sensor output level is good.	Indicates that the sensor output level is starting to drop.	Indicates that the sensor output level is near the lower limit for use.	Indicates that the sensor output level is below the lower limit for use (faulty sensor).

T05-101-03

- If the detail of the result is level 2, level 1, or level 0, clean the sensor and check how the sensor is mounted.
- After cleaning and checking the sensor, try the adjustment once gain; if still level 1, be ready for replacement.
- After cleaning and checking the sensor, try the adjustment once again; if still level 0, replace the sensor.

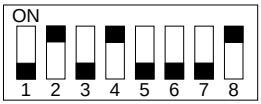
8) Press SW976 on the switch PCB.
- The result will be stored.
- The tray A/B will move up to initial position.

9) Turn off the power, and shit all bits of SW973 to OFF.

1.1.6 Adjusting the Speed of the Swing Guide

If you have replaced the EEPROM (ICS107) on the finisher controller PCB or the swing motor (M8) or disassembled/reassembled parts associated with the swing mechanism, make the following adjustments:

1) Set SW973 on the switch PCB as indicated:



F05-101-14

2) Press SW976 on the switch PCB.
- The machine starts automatic adjustment, and the swing guide makes several swinging movements.
- The machine automatically adjusts the output voltage to the swing motor drive circuit so that the time period (T1) from when the swing motor starts to when the swing guide closed sensor (PI15) goes OFF is as specified.

3) Check DSP971 to find out the result of automatic adjustments:
- OK if 'A'.
- NG if F, F11, F1, F2, F4, F5, or F6.

4) If the result is 'A' (OK), press SW976 on the switch PCB.
- The machine accepts the new setting.
- If T1 is too long or too short, the output voltage of the default will be stored.

5) Turn off the power.
6) Shift all bits of SW103 to OFF.

7) If the result is 'NG', press SW976 on the switch PCB to execute the adjustment once gain.
8) If 'NG' is indicted after several attempts, check the following:

- Belt of the swing guide motor for tension.
- Swing guide closed sensor (PI5) for mounting condition.

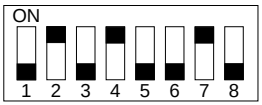
Memo

If the swing guide has started to wear and, as a result, the noise of the guide increases when it moves up/down, execute this adjustment to correct the motor drive speed; the noise may decrease.

1.1.7 Indication for the Swing Guide Speed

You can measure, evaluate, and indicate the time it takes the swing guide to move up or down using this mode. If jams occur often near the swing guide, check the time length:

1) Set SW973 on the finisher controller PCB as indicate:



F05-101-15

2) Press SW976 on the PCB.

- The switch guide performs several swinging operations, and the machine automatically measures the time it takes the guide to move up/down.

3) When the up/down movement of the swing guide ends, check DSP971 the PCB for the result.

- If the reading of DSP971 is '0', the result is within standards.
- If the reading of DSP971 is 'F', on the other hand, the result is outside the standard.

4) Press SW975 or SW974 on the PCB.

- DSP971 indicates the time length of ascent and the time length of descent.
- A press on SW75 brings up the ascent time length, while a press on SW974 indicates the descent time length.
- In the case of ascent time length, the indication will be 'a', 'b', and 'c' in sequence.
- In the case of descent time, the indication will be 'a', 'b', and 'c' in sequence.

'a' represents the 100s; 'b' represents the 10s; and 'c' represents the 1s; all in units of 'msec'

Memo

The standard ascent time length is 250 ± 15 ms, while the standard descent time length is 250 ± 15 msec.

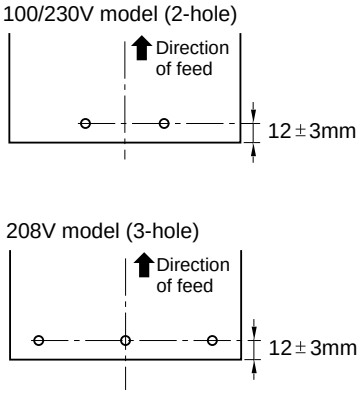
5) Turn off the power.
6) Shift all bits of SW973 to OFF.

Memo

If the ascent/descent time length is too long, suspect a mechanical fault.

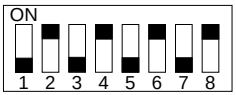
1.1.8 Adjusting the Position of Punch Holes (feed direction)

1) Make a copy in punch mode, and check the position of the punch holes.



F05-101-16

2) Set SW973 on the switch PCB as follows:

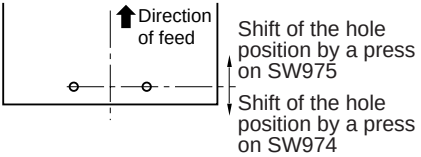


F05-101-17

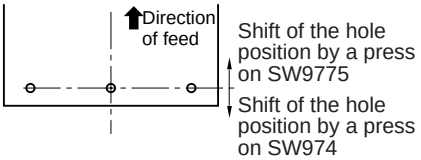
3) Press SW976 on the switch PCB.
- DSP971 on the switch PCB indicates the latest setting.

4) Press SW975 or SW974 on the switch PCB as many times as necessary in reference to the position of the punch holes checked in step 1. Each press on the switch shifts the position of holes by 0.5 mm. DSP971 on the finisher controller PCB indicates the new setting.

100/230V model (2-hole)



208V (3-hole)



F05-101-18

5) Press SW976 on the switch PCB.
- The machine will accept the new setting.

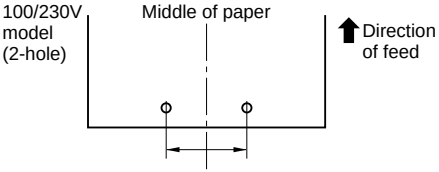
6) Turn off the power.
7) Shift all bits of SW973 to OFF.

Memo

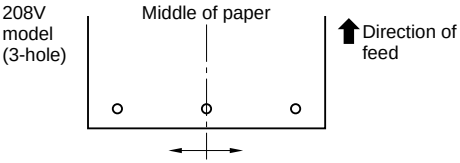
The setting may be changed in the copier's service mode: SORTER>PNCH-HLE.

1.1.9 Adjusting the Punch Hole Position (in direction of horizontal registration)

1) Make a copy in punch mode, and check the position of the punch holes.



Vertical displacement (in left/right direction in figure) of the two hole in relation to the middle of paper is ± 1 mm.



Vertical displacement (in left/right direction) of the middle hole in relation to the middle of paper is ± 1 mm.

F05-101-19

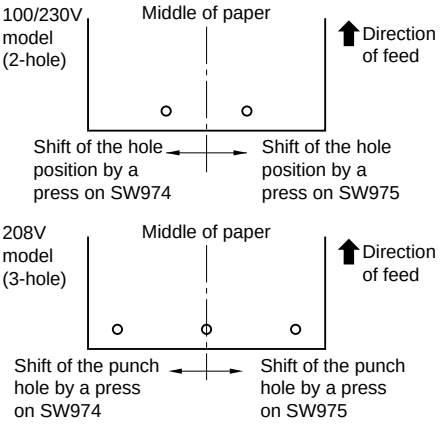
Regardless of the mode of delivery (face up or face down), make a check with the top face of the sheet delivered in the tray as the top face.

2) Set SW973 of the switch PCB as indicated:

F05-101-20

3) Press SW976 on the switch PCB.
- DSP971 on the switch PCB indicates the current setting.

4) Press SW975 or SW974 on the PCB as necessary according to the position of the punch holes checked in step 1). Each press shifts the punch hole position by 0.33 mm. The reading of DPS971 on the PCB also changes.

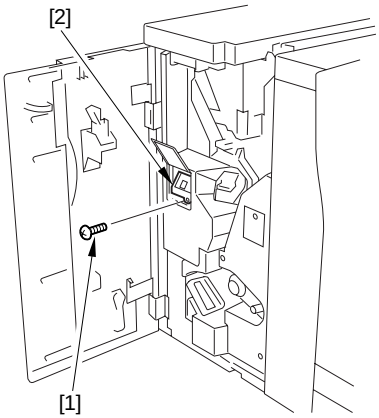


F05-101-21

1.1.10 Adjusting the Sensitivity of the Sensors

If you have replaced any of the following sensors, make the adjustments that follow:
- Punch paper edge sensor (PI21)
- Punch driver PC
- Also, make the adjustments if when installing the punch unit (accessory).

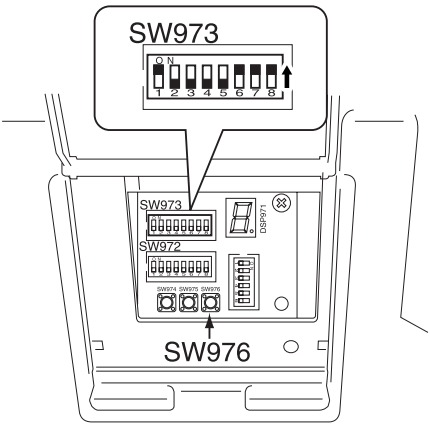
1) Turn on the copier's power switch so that the copier is in standby.
2) Open the front door of the finisher, and remove the screw [1] to detach the switch PCB cover [2].



F05-101-22

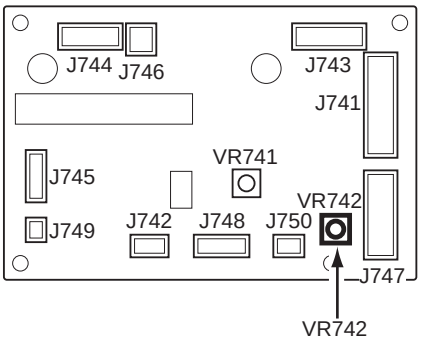
3) Turn on the two front door switches of the finisher using the door switch actuators.

4) Set DIP SW973 as shown (bits 1, 6, 7, and 8 at ON), and turn on the push switch (SW976):
   - ■ The punch waste feed motor rotates.
   - ■ LED741 goes ON.



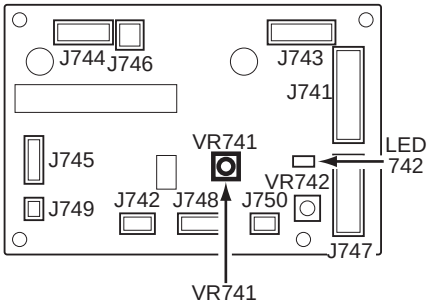
F05-101-23

5) Turn the variable resistor (VR742) on the punch driver PCB fully counter-clockwise.



F05-101-24

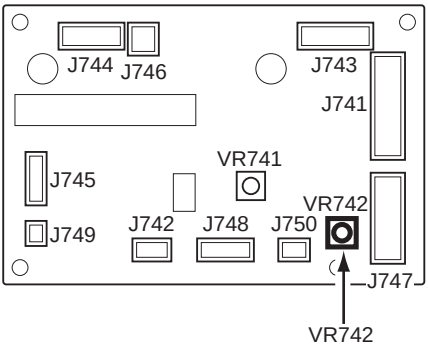
6) Turn the variable resistor (VR741) on the punch driver PCB fully clockwise, and check to make sure that LED742 goes OFF.



F05-101-25

7) Turn the variable resistor (VR741) on the punch driver PCB fully counter-clockwise, and check to make sure that LED742 goes ON.
8) Turn the variable resistor (VR741) on the punch driver clockwise, and check to make sure that LED742 starts to flash.

9) If LED742 does not flash while the variable resistor (VR741) is turned, give the variable resistor (VR742) a 1/2 turn in clockwise direction, and start over with step 5).
If LED742 still does not flash, give the variable resistor (VR742) another 1/2 half turn in clockwise direction, and start over with step 5).



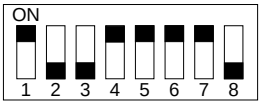
F05-101-26

Then, go over the following:
- Check the punch paper edge sensor (PI21) for mounting condition.
- Try replacing the punch paper edge sensor (PI21).

10) Shift all bits of DIP SW973 to OFF (normal operation), and turn off and then on the copier.

1.1.11 After Replacing the EEPROM (IC102)

1) Turn off the copier.
2) Set SW973 on the switch PCB as indicated.



F05-101-27

3) Turn on the copier.
4) Hold down SW976 and SW975 on the stitch PCB at the same time for 3 sec or more.
- The machine initializes the EEPROM.

5) Make the adjustments indicated in Table 5-104.

• Alignment with • Stapling position (front, 1-point) • Stapling position (rear, 1-point) • Degree of wrapping on buffer roller • Sensor initial level • Swing guide speed • Punch hole position (in direction of feed) • Punch hole position (in direction of horizontal registration)

T05-101-04

1.1.12 Replacing the Finisher Controller (in response to E505)

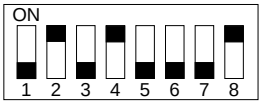
1) Turn off the copier.
2) Remove the EEPROM (IC102) from the new PCB. (Do not dispose of the ROM as yet.)
3) Remove the EEPROM from the old PCB, and mount it to the socket of the new PCB (ICS102).
4) Remove the old PCB from the finisher, and mount the new PCB to the finisher .
5) Turn on the copier. If the copier does not indicate 'E055', end the work. (The contents of the old PCB are backed up on the new PCB.)
   If 'E505' is indicated, go to the following step:

→ If 'E505' occurs once again, the EEPROM is faulty. You cannot back up the memory using the old EEPROM.

6) Turn off the copier, and replace the EEPROM mounted to the new PCB with the EEPROM removed and put aside from the new PCB.
7) Perform the work under 11. "After Replacing the EEPROM."

1.1.13 Initializing the RAM

1) Set SW973 on the switch PCB as indicated:



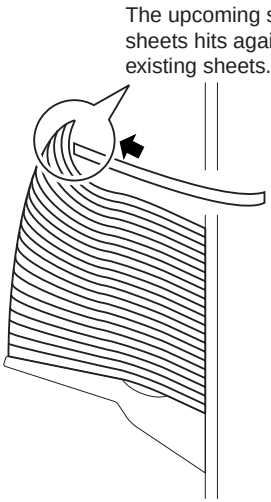
F05-101-28

2) To clear the counter only,
   Hold down SW976 and SW974 on the switch PCB at the same time for 3 sec or more.
   To clear all data,
   Hold down SW976 and SW975 on the switch PCB at the same time for 3 sec or more.
3) Turn off the power, and shift all bits of SW973 to OFF.

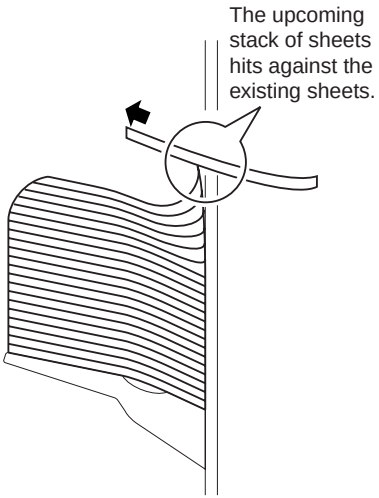
1.1.14 Selecting Upward Curl Paper Mode

a. Outline

At times, sheets in tray B can show appreciable curling, preventing correct depositing of subsequent sheets. See the diagrams that follows:



F05-101-29



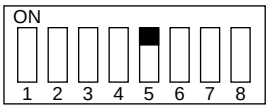
F05-101-30

As needed, perform the following:

1) Turn over the sheets in the source of paper (cassette).
   If the upward curling increases, turn over the sheets in the cassette once again.
   If the curling still is appreciable and the sheets fail to be stacked correctly, select 'finisher stack enhancement mode' in the copier's service mode:
   COPIER>OPTION>BODY>FTMP-DOWN.
   0: OFF, 1: lower by 5°C, 2: lower by 10°C, 3: lower by 15°C
   If this fails to show good results, select 'upward curl paper mode.'

b. Selecting Upward Curl Paper Mode

1) Turn off the power.
2) Set SW972 of the circuit as indicated.

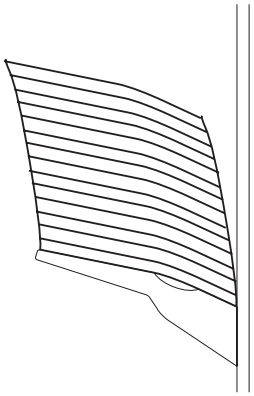


The bits other than bit 5 must be set according to the mode and model in question.

F05-101-31

3) Turn on the power.

- When this mode starts, the speed of delivery will increase; as a result, the sheet will be delivred without its trailing edge being trapped even when its leading edge hits the existing sheets. The increase in speed depends on the number of sheets in the stack.
- If stacks of sheets with little curl or with downward curl are delivered after selecting this mode, the increase in speed can cause the stacks to be deposited away from the stacking wall (F05-101-32), making it very important to check the type of paper the user uses before selecting this mode.

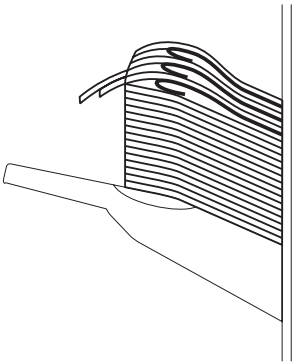


F05-101-32

1.1.15 Selecting Downward Curl Paper Mode

a. Outline

At times, sheets stacked in the handling tray can develop downward curl. A subsequent stack of sheets will then tend to slide beyond the existing stack, adversely affecting the overall stacking performance. (for small-size paper, 5-131a)



F05-101-33

b. Service Work

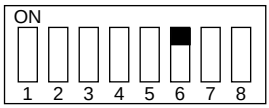
As necessary, turn over the sheets inside the cassette, and make copies.

- If the copies are stacked properly, end the work.
- Select 'finisher stack enhancement mode' in the copier's service mode: COPIER>OPTION>BODY>FTMP-DOWN.
  0: OFF, 1: lower by 5°C, 2: lower by 10°C, 3: lower by 15°C

- If the curl is more appreciable than before turning over the paper, turn over the paper, and select 'downward curl paper mode'.
- If the curl is less appreciable but a stacking fault as shown in F05-101-33 still occurs, select 'downward curl paper mode'.

c. Selecting Downward Curl Mode

1) Turn off the copier.
2) Remove the PCB cover (1 screw), and shift bit 6 of SW972 of the circuit to ON. (F05-101-34)
3) Mount the PCB cover (1 screw), and turn on the copier.



The bits other than bit 6 must be set according to the mode and model in question.

F05-101-34

d. Operating in Downward Curl Paper Mode

[1] Retracting the Tray Auxiliary Plate
The mode is not selected, a stack is delivered after retracting the tray auxiliary plate; when the mode is selected, a stack is delivered as the tray auxiliary plate is retracted.

[2] Detecting the Height of the Tray B
The remedial operation for the height is not expected even when paper has been added (by the user) to the tray B while the holding tray is in operation.

[3] Operation of the Sub Tray
The sub tray is moved down while a stack is delivered.

[4] Operation of the Paddle
The paddle is operated intermittently.

[5] Number of Alignment Operations
The alignment operation is expected twice (excludes the last sheet of a stack).

[6] Starting Alignment Operation
The alignment operation is started in sync with the operation of the paddle.

[7] Moving Up the Tray on Delivery
If no Z-fold sheet exits, the tray is moved up when the stack consists of 6 sheets instead of 11 sheets.

e. Conditions of Operation

If a stack of two sheets or more is stacked, the foregoing operations will be as follows:

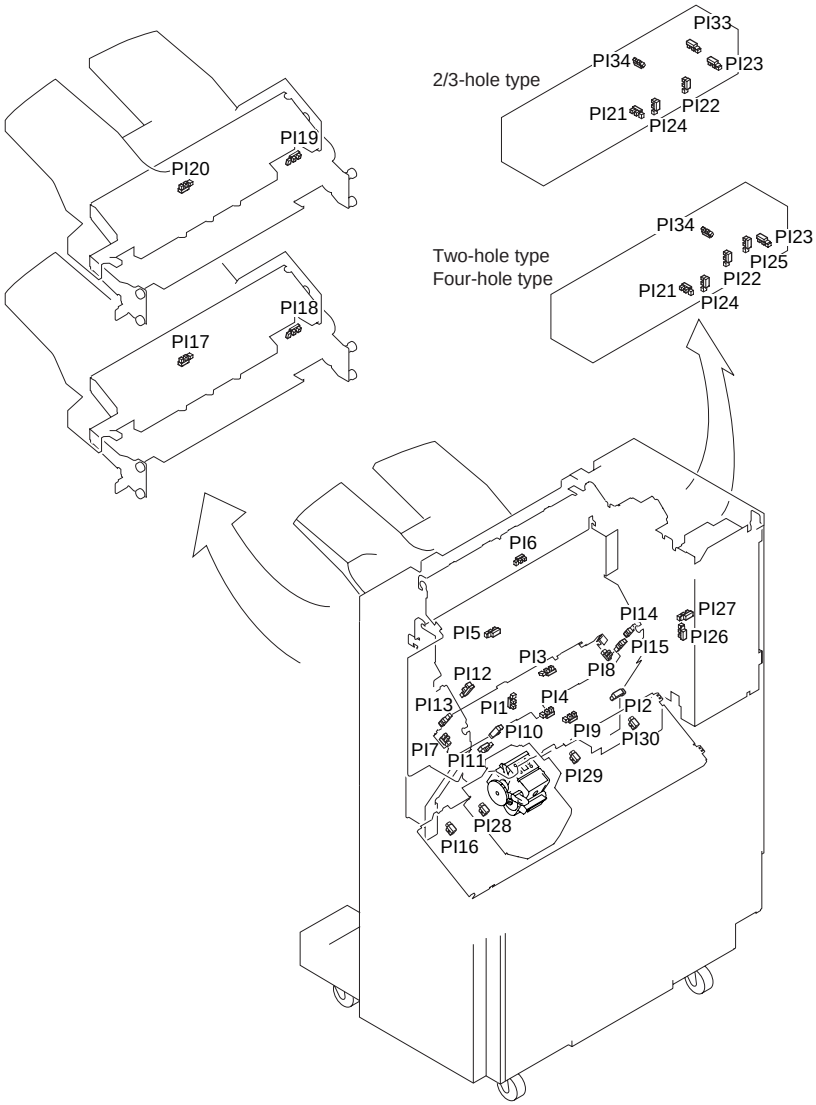
	Small-size paper	Large-size paper	Z-fold paper
Operation [1]	Applicable	Not applicable	Not applicable
Operation [2]	Applicable	Applicable	Applicable
Operation [3]	Applicable	Not applicable	Applicable
Operation [4]	Not applicable	Not applicable	Applicable
Operation [5]	Not applicable	Not applicable	Applicable
Operation [6]	Not applicable	Not applicable	Applicable
Operation [7]	Applicable	Not applicable	Not applicable

T05-101-05

2 Arrangement of Electrical Parts

2.1 Finisher Unit

2.1.1 Sensors

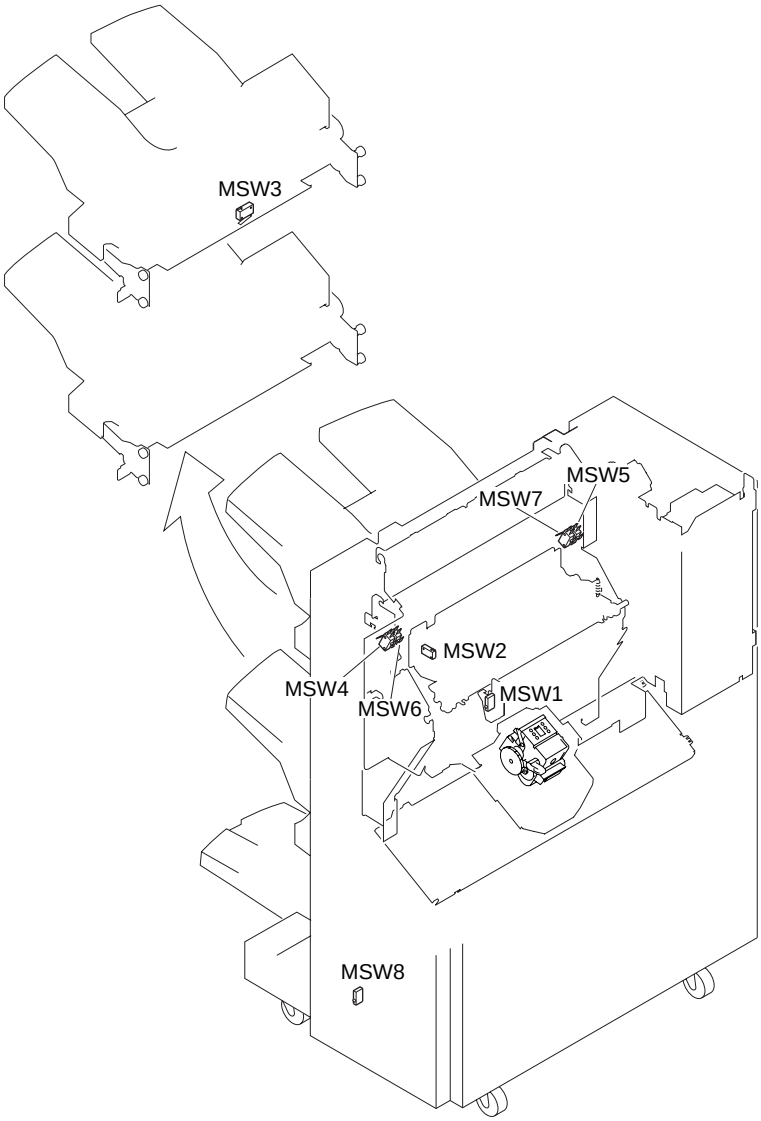


F05-201-01

Name	Notation	Function
Photointerrupter	PI1	Front door detection
	PI2	Inlet path paper detection
	PI3	Post-buffer path paper detection
	PI4	Sort delivery detection
	PI5	Upper cover open detection
	PI6	Non-sort delivery detection
	PI7	Front aligning plate home position detection
	PI8	Rear aligning plate home position sensor
	PI9	Swing motor clock detection
	PI10	Tray auxiliary plate retraction detection
	PI11	Stack feed motor clock detection
	PI12	Shutter home position sensor
	PI13	Paddle home position detection
	PI14	Swing guide closed detection
	PI15	Swing guide open detection
	PI16	Stapler shift home position detection
	PI17	Tray B paper detection
	PI18	Tray B idle rotation detection
	PI19	Tray A idle rotation detection
	PI20	Tray A paper detection
	PI21	Punch paper edge detection
	PI22	Punch motor home position detection
	PI23	Punch sensor home position detection
	PI24	Punch home position detection
	PI25	Punch front detection
	PI26	Punch waste feed detection
	PI27	Punch waste paper feed detection
	PI28	Knurled belt shift enable detection 1
	PI29	Knurled belt shift enable detection 2
	PI30	Knurled belt shift enable detection 3
	PI31	Knurled belt home position detection
	PI32	Stack delivery detection
	PI33	Punch 2/3-hole detection
	PI34	Punch motor clock detection

T05-201-01

2.1.2 Microswitches

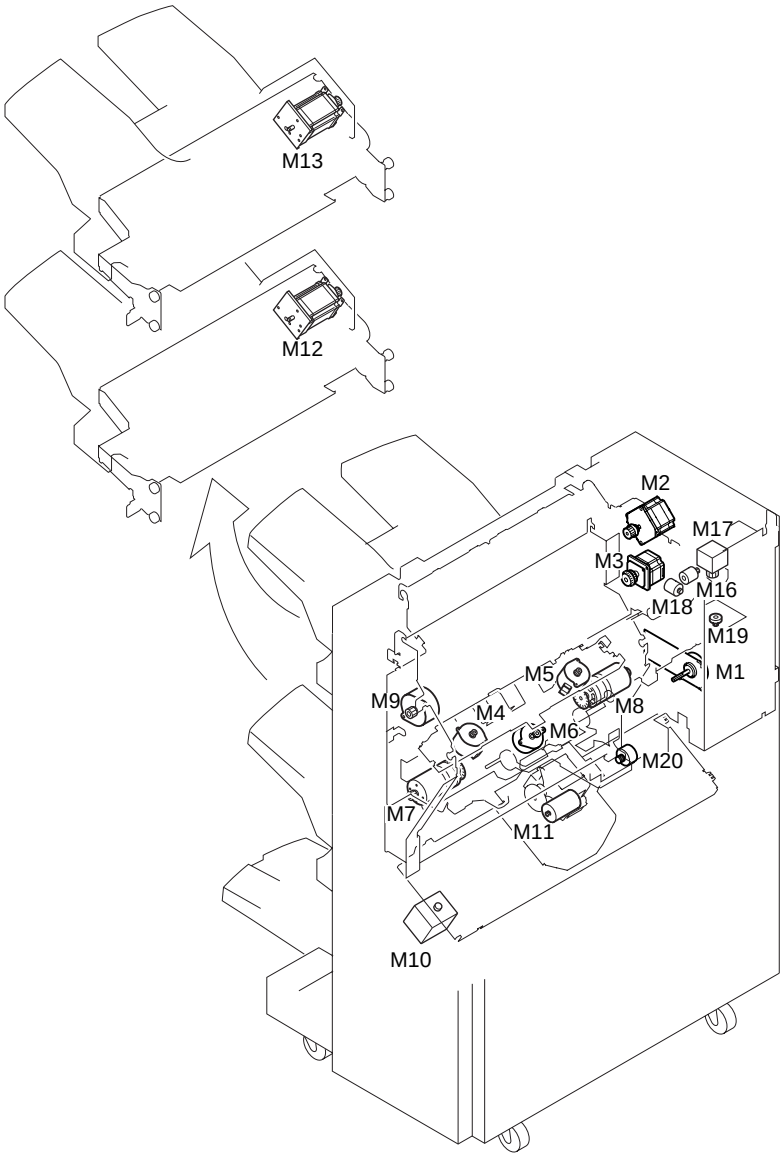


F05-201-02

Name	Notation	Function
Microswitch	MSW1	Front door open detection 1
	MSW2	Swing guide open detection
	MSW3	Tray approach switch
	MSW4	Tray safety detection (front)
	MSW5	Tray safety detection (rear)
	MSW6	Stapler safety detection (front)
	MSW7	Stapler safety detection (rear)
	MSW8	Front door open detection 2

T05-201-02

2.1.3 Motors

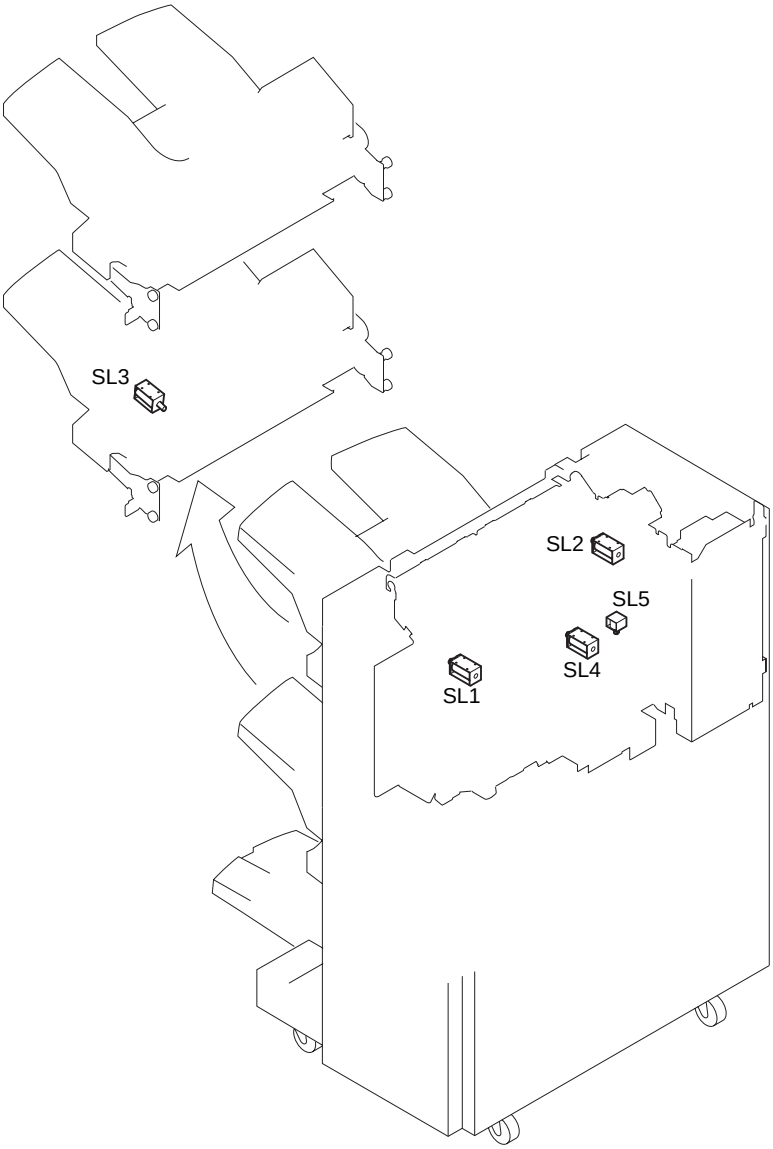


F05-201-03

Name	Notation	Function
Motor	M1	Inlet motor
	M2	Buffer motor
	M3	Delivery motor
	M4	Front aligning plate motor
	M5	Rear aligning plate motor
	M6	Tray auxiliary plate motor
	M7	Stack delivery motor
	M8	Swing motor
	M9	Paddle motor
	M10	Stapler shift motor
	M11	Stapler motor (inside stapler)
	M12	Tray B lift motor
	M13	Tray A lift motor
	M16	Punch waste feed motor
	M17	Punch registration motor
	M18	Punch motor
	M19	Punch sensor shift motor
	M20	Knurled belt motor

T05-201-03

2.1.4 Solenoids

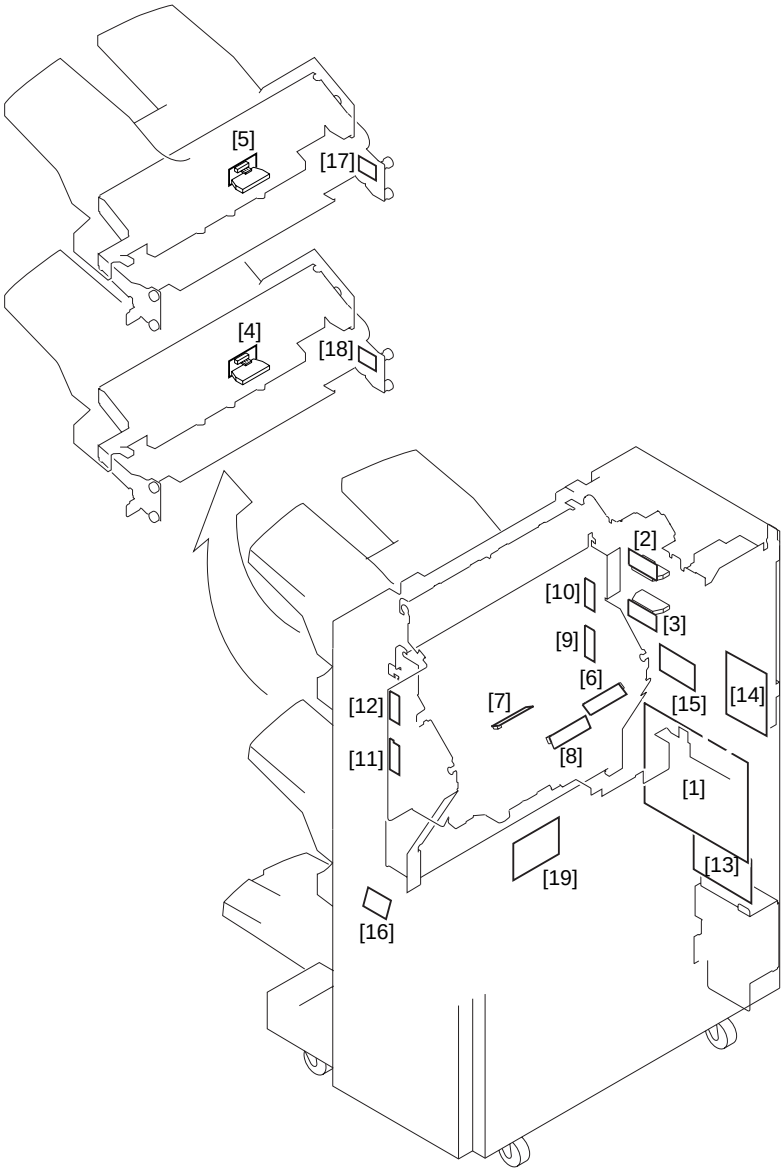


F05-201-04

Name	Notation	Function
Solenoid	SL1	Buffer path switching solenoid
	SL2	Upper path switching solenoid
	SL3	Sub tray solenoid (w/ folder installed)
	SL4	Delivery auxiliary rib solenoid
	SL5	Rear edge drop solenoid

T05-201-04

2.1.5 PCBs

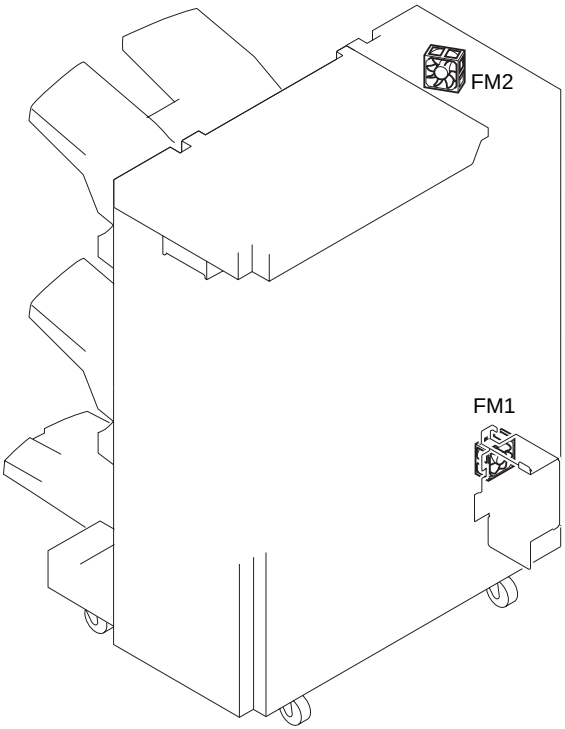


F05-201-05

Notation	Name
[1]	Finisher controller PCB
[2]	Buffer motor driver PCB
[3]	Delivery motor driver PCB
[4]	Tray B lifter motor driver PCB
[5]	Tray A lifter motor driver PCB
[6]	Inlet path paper detection (S1)
[7]	Buffer path paper detection (S2)
[8]	Lower path paper detection (S3)
[9]	Tray B sensor LED
[10]	Tray A sensor LED
[11]	Tray B sensor PCB (S4)
[12]	Tray A sensor PCB (S5)
[13]	Fuse PCB
[14]	Punch driver PCB
[15]	Punch waste sensor PCB
[16]	Switch PCB
[17]	Tray A area detection PCB
[18]	Tray B area detection PCB
[19]	Stapler driver PCB

T05-201-05

2.1.6 Fans



F05-201-06

Notation	Description
FM1	Power supply fan
FM2	Feeder cooling fan

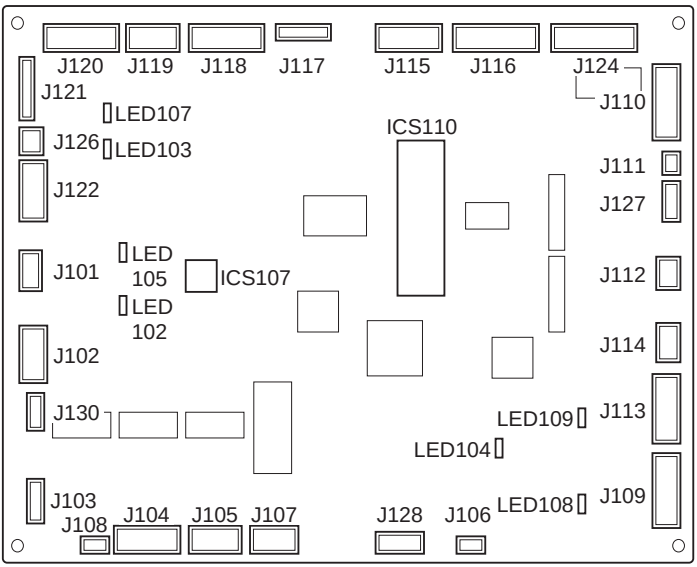
T05-201-06

2.2 LEDs and Check Pins by PCB

Of the LEDs and check pins used in the machine, those needed in the field are discussed.

Do not touch VRs and check pins not indicated herein. They are for use at the factory, and require special tools and accuracy.

2.2.1 Finisher Controller PCB

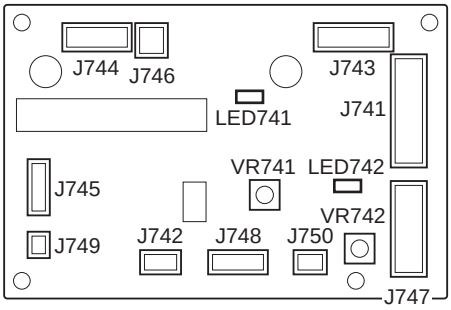


F05-202-01

LED	Description
LED102	Goes ON in response to 5 V (J101-3).
LED103	Goes ON in response to 24 VR (J126-1). Goes OFF when the front cover switch (MSW1) is opened.
LED104	Remains ON when the stack delivery motor (M7) rotates normally (in response to clocks from the stack delivery motor clock sensor (PI12)).
LED105	Goes ON in response to 24 VU (J101-1). Goes OFF in response to a press on the Power Save switch on the copier or to a shift to low-power mode.
LED106	Flashes while downloading takes place.
LED107	Remains ON while the inlet motor (M1) rotates normally (in response to clocks from the inlet motor).
LED108	Goes ON in response to 36 VTRY (J112-1).
LED109	Goes ON in response to 36 V (J113A-8, 9, 10). Goes OFF if separated by the module disconnecting switch. Goes OFF when the tray approach switch (MSW3) is pressed.
LED110	Goes ON when the stapler is not inside the range of knurled belt interference.
LED111	Remains ON when the stapler current limiter is under way or when the stapler signal connector (J774, J772) is disconnected.

T05-202-01

2.2.2 Punch Drive PCB



F05-202-02

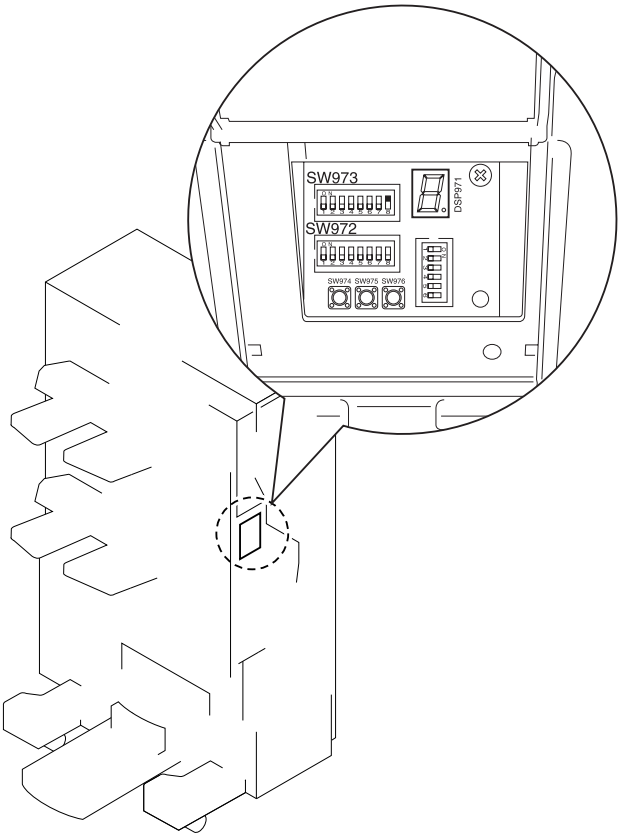
LED	Description
LED741	Goes ON in response to 24 V. Goes OFF when disconnected by the module disconnecting switch.
LED742	State of the Paper Edge Sensor (PI21; adjustment) If good, flashes (standby). If poor, OFF/ON (standby).

T05-202-02

2.2.3 Functions of the DIP Switch

The three DIP switches on the switch PCB have the following functions:

- SW971: enable/disables the unit.
- SW972: sets operating mode.
- SW973: checks operation and makes adjustments.



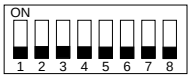
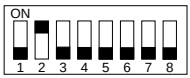
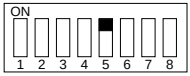
F05-202-03

a. SW971

bit	ON	OFF
1	Punch unit enabled	Punch unit disabled
2	Tray A enabled	Tray A disabled
3	Not used	
4	Not used	
5	Not used	
6	Not used	

T05-202-03

b. SW972

Setting	Operating mode
	Assumes that the punch unit is not used.
	Assumes that the 2-hole punch unit is used.
	Assumes that the 2/3-hole punch unit is used.
	Assumes that the 4-hole punch unit (Swedish) is used.
	Assumes that the 4-hole punch unit (French) is used.
	Corrects upward curl paper. Note: Except bit 5, the setting depends on the presence/absence of the punch unit or the specifications of the punch unit.
	Corrects lower curl paper Note: Except bit 6, the setting depends on the presence/absence of the puncher unit or the specifications of the punch unit.

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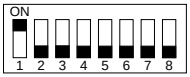
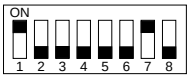
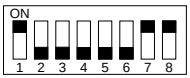
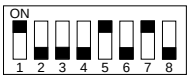
c. SW973

Setting	Item	Description
	Inlet motor operation	A press on SW976 rotates the motor. Another press stops it.
	Buffer motor operation	
	Delivery motor operation	
	Stack delivery motor operation	
	Swing operation	A press on SW976 opens the swing guide. Another press closes it.
	Auxiliary tray operation	A press on SW976 causes the auxiliary tray to move outside the machine. Another press causes it to move back inside the machine.
	Paddle operation	A press on SW976 causes the paddle to rotate for a specific period of time. To rotate it thereafter, turn off and then on the power and press SW976.
	Solenoid, clutch operation	Each press on SW976 turns ON the following in sequence: buffer path switch, upper path switch, knurled belt, sub tray, saddle inlet, inserter pickup, inserter stopper and inserter separation solenoids, clutch. This is invalid if no option is installed.
	Finisher stapling operation	Each press on SW976 causes stapling operation.
	Stapler slide operation	Each press on SW104 moves the stapler from home position, to front binding position, to rear binding position, and then to 2-position binding position.

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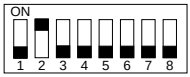
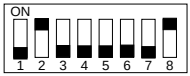
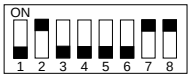
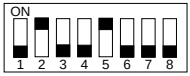
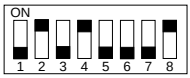
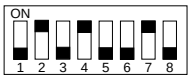
Setting	Item	Size	Description
	Alignment width adjustment		See the descriptions for their respective items.
	Stapling position adjustment (front, 1-point)	A4	
	Stapling position (rear, 1-point)		
	Alignment width adjustment		
	Stapling position (front, 1-point)	LTR	
	Stapling position (front, 1-point)		
	Sensor initial adjustment		See the descriptions for their respective items.
	Swing guide speed adjustment	-	
	Swing guide speed indication		A press on SW976 indicates the swing guide speed.

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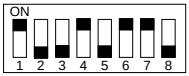
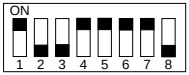
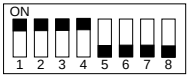
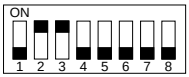
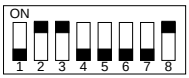
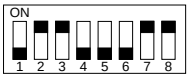
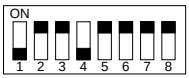
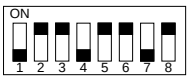
Setting	Name	Description
	Buffer roller wrapping adjustment (feeding operation)	See the descriptions for their respective items.
	Buffer roller wrapping adjustment (adjustment input)	
	Punch motor rotation	A press on SW976 executes punching operation.
	Punch registration motor rotation	Each press on SW976 causes the punch unit to move from the home position, or to home position.
	Punch sensor shift motor rotation	Each press no SW976 causes the punch paper edge sensor to move from home position, or to home position.
	Punch waste feed motor rotation	Each press on SW976 causes the punch waste feed motor to rotate. Another press stops it. This operation requires that the punch waste case be set in position.
	Shutter separation	Each press on SW976 repeats opening and closing the shutter.
	Inserter roller, belt cleaning	Each press on SW976 turns ON the inserter motor and the separation clutch. Another press turns them OFF.
	RAM initialization	When both SW976 and SW975 are held down for 3 sec or more, the RAM will be initialized.
		When both SW976 and SW974 are held down for 3 sec or more, all counter items will be initialized.
	E505 setting	In 10 sec after power-on, E505 is reset.

T05-202-07

Setting	Name	Operation
	50-sheet stapler counter*1	A press on SW976 indicates the counter readings starting with the top digit (decimal).
	100-sheet stapler counter*1	When both SW974 and SW975 are held down for 3 sec or more, the counter readings are initialized individually.
	Punch waste counter*2	
	Punch operation counter	
	Finisher unit stapling operation counter	

*1: Cleared when the absence of a staple is detected.

*2: Cleared when the punch waste case is detached and then attached.

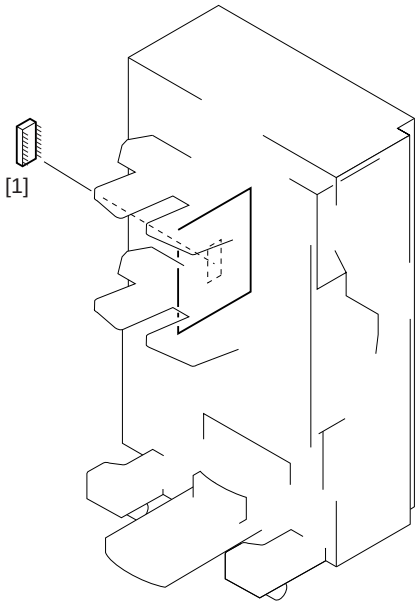
T05-202-08

2.3 Upgrading

The machine can be upgraded as follows:

Function	Upgrading	Remarks
Finisher unit	ROM replacement [1]	Requires downloading from master to slave.

T05-203-01



F05-203-01

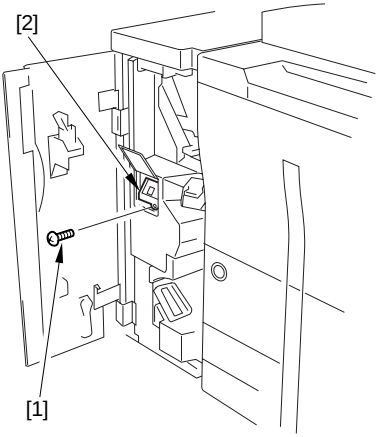
Upgrading the Finisher Unit

Upgrading the finisher unit consists of the following:

- Replacing the ROM on the finisher controller PCB.
- Downloading from master to slave.

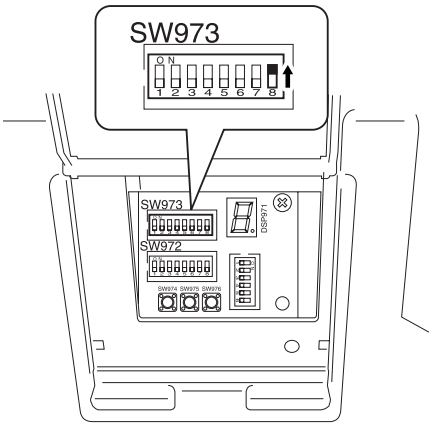
To download from master to slave, perform the following:

1) Turn off the copier.
2) Replace the ROM on the finisher controller PCB.
3) Open the front cover of the finisher; then, remove the screw [1], and detach the switch cover [2].



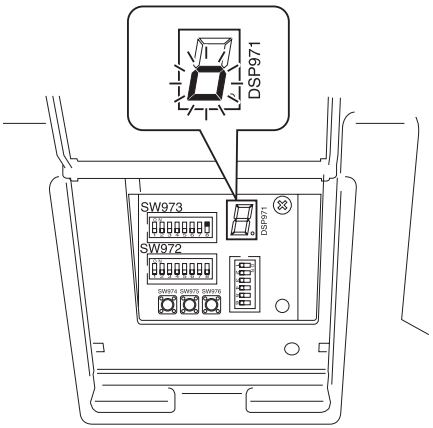
F05-203-02

4) Shift only bit 8 of DIP switch (SW973) to ON.



F05-203-03

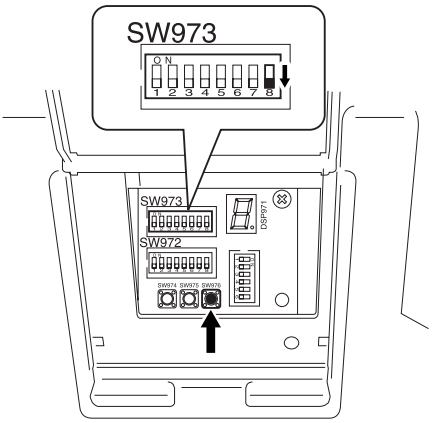
5) Turn on the copier.
The LED (DSP971) operates as follows to indicate that the machine has started download mode.



F05-203-04

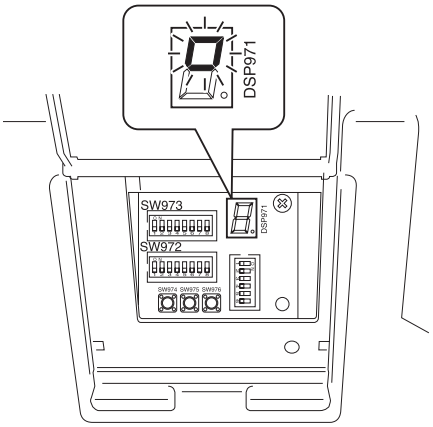
6) Check the indication of the LED (DSP971), and shift bit 8 of the DIP switch (SW973) to OFF; then, press the switch (SW976).
   ■ The LED (DSP971) flashes its segments in turns to indicate the downloading is taking place.

If downloading does not start for about 3 min, the copier's control panel indicates 'E506'.



F05-203-05

7) When downloading ends normally, the LED (DSP971) starts to flash all its segments at the same time.
   If an error occurs during downloading, the copier's control panel indicates 'E506'.
   ■ Download time: about 90 sec



F05-203-06

8) Check the indication of the LED (DSP971); thereafter, turn off and then on the copier's power switch.
9) Upgrade the finisher using the copier's service mode.

3 Troubleshooting Malfunctions

3.1 Finisher Unit

3.1.1 E500 (communication with copier)

Finisher controller PCB, Cover DC controller PCB	**1) Turn off and then on the copier's power switch. Is the problem corrected?** YES: End.
Fuse PCB	**2) Are the communication line of the fuse PCB and the grounding wire normal?** **J716-7 and J717-1** **J716-6 and J717-3** **J716-4 and J717-4** **J716-5 and J717-5** NO: Replace the fuse PCB.
Switching regulator	**3) Is the voltage between J85-1 (+) and J85-2 (-) on the stitching regulator 5 V?** NO: Replace the switching regulator.
Wiring	**4) Is the wiring between the finisher controller PCB and the switching regulator normal?** **5) Is the wiring between the copier DC controller PCB and the fuse PCB normal?** NO: Correct the wiring.
Finisher controller PCB, Copier DC controller PCB	**6) Replace the finisher controller PCB. Is the problem corrected?** YES: End. NO: Replace the copier DC controller PCB.

3.1.2 E503 (communication with saddle stitcher unit)

Finisher controller PCB, Saddle stitcher controller PCB	**1) Turn off and then on the copier's power stitch. Is the problem corrected?** YES: End.
Wiring	**2) Is the wiring between the finisher controller PCB and the saddle stitcher controller PCB normal?** NO: Correct the wiring.
Power supply, Saddle stitcher controller PCB	**3) Is 24 VDC present between J1-1 (+) and -2 (-) of the saddle stitcher controller PCB?** NO: Check the wiring between the fuse PCB and the finisher controller PCB. YES: Replace the saddle stitcher controller PCB.

3.1.3 E505 (checksum fault)

Finisher controller PCB	**1) Turn off and then on the copier's power switch. Is the problem corrected?** YES: End. **2) Turn off the power, and shift bits 1, 2, 3, and 4 of SW103 of the finisher controller PCB to ON. Turn on the power, and wait for about 10 sec. Turn off the power, and shift all bits of SW103 to OFF. Is the problem corrected when the power is turned on once again?** YES: End. NO: Replace the finisher controller PCB.

3.1.4 E506

Slave program download (error)	**1) Try downloading in download move several times. Is the problem corrected?** YES: End. NO: Replace the finisher controller PCB.

3.1.5 E510 (inlet motor M1 fault)

-	**1) Does LED103 on the finisher controller PCB go ON when the power is turned on?** NO: Go to step 2. YES: Go to step 7.
Switching regulator	**2) Is the voltage between J85-3, 4 (+) and J85-5, 6 (-) on the switching regulator 24 V?** NO: Replace the switching regulator.
Wiring	**3) Is the voltage between J711-7, 8 (+) and J711-5, 6 (-) on the fuse PCB 36 V?** NO: Correct the wiring between J85 and J711.
Front cover switch (MSW1)	**4) Disconnect J721 on the fuse PCB. Check the length between J721-1 and J721-3 on the harness side for electrical continuity. Does continuity exit when the front cover is closed but not when the cover is opened?** NO: Check to see that the actuator on the front cover is pushing the switch correctly. If yes, replace the switch or correct the wiring between the PCB and the switch.
Fuse PCB	**5) Is the voltage at J714-5 (+) on the fuse PCB 24 V?** NO: Replace the fuse PCB.
Wiring	**6) Is the voltage at J101-1 (+) on the finisher controller PCB 24 V?** NO: Correct the wiring between J714 on the fuse PCB and J101 on the finisher controller PCB.

Shorting connector	**7) Is the shorting connector between J1090-6 and -8 of the folder joint normal?** NO: Connect the shorting connector correctly (not when the folder is installed).
Folder upper door switch (MSW10)	**8) Is the folder upper door switch normal?** NO: Correct the switch.
Finisher controller PCB	**9) Is the voltage between J124-12, 13 (+) and -10, 11 (-) on the finisher controller PCB 24 V?** **10) Is the voltage between J121-9 (+) and -8 (-) on the finisher controller PCB 5 V?** NO: Replace the finisher controller PCB.
Wiring, Inlet motor (M1)	**11) Is the wiring between J121 on the finisher controller PCB and J95 of the inlet motor normal?** NO: Correct the wiring. YES: Replace the inlet motor.

3.1.6 E514 (stack delivery motor M7 fault)

-	**1) Does the stack delivery motor rotate in keeping with delivery of stacks?** YES: Go to step 2. NO: Go to step 4.
Wiring	**2) Is the wiring between the finisher controller PCB and the sensor normal?** NO: Correct the wring.
Sensor power supply, Stack delivery motor clock sensor (PI10)	**3) Measure the voltage between J105B-8 (+) and J105B-7 (-) on the finisher controller PCB. Is it 5 VDC?** NO: Replace the finisher controller PCB. YES: Replace the sensor.
Power supply, Finisher controller PCB	**4) Is the voltage at J101-1 (+) on the finisher controller PCB 24 V?** NO: Check the switching regulator and the fuse PCB. YES: Replace the finisher controller PCB.

3.1.7 E530 (rear aligning plate motor M5)

-	**1) Does the rear aligning plate operate in keeping with alignment operation?** NO: Go to step 2. YES: Go to step 4.
Finisher controller PCB, Wiring	**2) Is the voltage at J104A-6 (+) on the finisher controller PCB 24 V?** NO: Check the supply of 24 VU to the finisher controller PCB. If good, replace the finisher controller PCB. If not good, correct the power supply system.
Wiring	**3) Check the wiring from J104A-6 to -10 of the finisher controller PCB and to the rear alignment plate motor. Is it normal?** NO: Correct the wiring. YES: Replace the rear alinging plate motor.
Rear aligning plate home position sensor (PI8), Finisher controller PCB	**4) Is the voltage between J104B-6 (+) and J104B-7 (-) on the finisher controller PCB 5 V?** YES: Replace the sensor. NO: Replace the finisher controller PCB.

3.1.8 E531 (stapler motor M11)

-	**1) Does the stapler operate in keeping with stapling operation?** YES: Go to step 2. NO: Go to step 3
Stapling home position sensor (PI19), Finisher controller PCB	**2) Try moving the stapler by hand. Does the state of J127-3 (+) on the finisher controller PCB change?** NO: Check the power to the sensor. If good, replace the stapler. If not, replace the finisher controller PCB.
Finisher controller PCB	**3) Is 24 VSTP supplied to J771-1 (+) on the finisher controller PCB?** YES: Replace the finisher controller.
Stapler safety stitcher (front; MSW8), Stapler safety switch (rear; MSW9), Swing guide switch (MSW2)	**4) Are the three microswitches in the power route to the stapler normal?** NO: Correct or replace the faulty sensor.
Wiring	**5) Is 24 VSTP supplied by J719-1 (+) on the fuse PCB?** YES: Correct the wiring.
Switching regulator, Wiring	**6) Is 24 VSTP supplied by J719-1 (+) of the switching regulator?** NO: Replace the switching regulator. YES: Correct the wiring from the switching regulator to the fuse PCB; if normal, replace the stapler.

3.1.9 E532 (stapler shift motor M10)

-	**1) Does the stapler shift at the correct timing?** YES: Go to step 2. NO: Go to step 3.
Stapler shift home position sensor (PI16), Finisher controller PCB	**2) Try shifting the stapler by hand. Does the state of J110B-12 (+) of the finisher controller PCB change?** NO: Check the power to the sensor; if good, replace the sensor. If not good, replace the finisher controller PCB.
Finisher controller PCB	**3) Is 24 VSTP supplied to J113-1 (+) of the finisher controller PCB?** YES: Replace the finisher controller PCB.
Wiring	**4) Is 24 VSTP supplied by J719-1 (+) of the fuse PCB?** YES: Correct the wiring.
Stapler safety switch (front; MSW6), Stapler safety switch (rear; MSW7), Front door switch (MSW2)	**5) Are the three microswitches in the power route to the stapler normal?** NO: Corer the wiring.
Switching regulator, Wiring	**6) Is 2 VSTP present at J719 (+) of the switching regulator?** NO: Replace the switching regulator. YES: Check the wiring from the switching regulator to the fuse PCB; if normal, replace the motor.

3.1.10 E535 (swing motor M8 fault; detail code 62)

-	**1) Does the swing guide operate at the correct timing?** YES: Go to step 2. NO: Go to step 3.
Swing guide open sensor (PI15), Finisher controller PCB	**2) Try operating the swing guide by hand. Does the state of J107B-6 (+) on the finisher controller PCB change?** NO: Check the power to the sensor. If good, replace the sensor. If not good, replace the finisher controller PCB.
Finisher controller PCB	**3) Is 24 VU supplied to J101-1 (+) on the finisher controller PCB?** YES: Replace the finisher controller PCB.
Wiring	**4) Is 24 VU present at J714-5 (+) on the fuse PCB?** YES: Correct the wiring.
Switching regulator, Wiring	**5) Is 24 VU present at J85-3 (+) on the switching regulator?** NO: Replace the switching regulator. YES: Check the wiring from the switching regulator to the fuse PCB; if normal, replace the motor.

3.1.11 E535 (swing motor M8; detail code 01)

-	**1) Does the swing guide operate at the correct timing?** YES: Go to step 2. NO: Go to step 3.
Swing guide closed sensor (PI15), Finisher controller PCB	**2) Try operating the swing guide by hand. Does the state of J107B-6 (+) on the finisher controller PCB change?** NO: Check the power to the sensor. If good, replace the sensor. If not good, replace the finisher controller PCB.
Finisher controller PCB	**3) Is 24 VU supplied to J101-1 (+) on the finisher controller?** YES: Replace the finisher controller PCB.
Wiring	**4) Is 24 VU present at J714-5 (+) on the fuse PCB?** YES: Correct the wiring.
Switching regulator, Wiring	**5) Is 24 VU present at J85-3 (+) of the switching regulator?** NO: Replace the switching regulator. YES: Check the wiring from the switching regulator to the fuse PCB; if normal, replace the motor.

3.1.12 E537 (front aligning plate motor M4)

-	**1) Does the front aligning plate operate in keeping with alignment operation?** NO: Go to step 2. YES: Go to step 4.
Finisher controller PCB, Power supply	**3) Is the voltage at J104A-1 (+) of the finisher controller PCB 24 V?** NO: Check the supply of 24 VU to the finisher controller PCB. If good, replace the finisher controller PCB. If not, correct the power supply system.
Wiring	**3) Is the wiring from J104A-1 to -5 of the finisher controller PCB and to the rear aligning plate motor normal?** NO: Correct the wiring. YES: Replace the front aligning plate motor.
Front aligning plate home position sensor (PI7), Finisher controller PCB	**4) Is the voltage between J104B-3 (+) and J104B-2 (-) on the finisher controller PCB 5 V?** YES: Replace the sensor. NO: Replace the finisher controller PCB.

3.1.13 E540 (tray A lifter motor M13)

36 VDC	**1) Is 36 VDC present at J113-8, -9, -10 of the finisher controller PCB?** NO: Check the supply route of 36 VDC; correct any fault, if found. Check the tray safety switch (front, rear; MSW6, 7) and the tray approach switch (MSW5).
Tray lifter mechanism	**2) Is there a fault or an obstacle to the tray lifter mechanism?** YES: Remove the fault or the obstacle.
Tray A lifter motor (M13)	**3) Does the tray lifter motor rotate at the correct timing?** NO: Replace the motor and the tray lifter motor drive PCB.
Tray A lock sensor (PI19)	**4) Is the tray A lock sensor normal?** NO: Replace the sensor.

3.1.14 E542 (tray B lift motor M12; during operation)

36 VDC	**1) Is 36 VDC present at J109A-8, -9, and -10 of the finisher controller PCB?** NO: Check the power route of 36 VDC, and correct any fault. Check the tray safety switch (front, rear: MSW6, 7).
Tray lifter mechanism	**2) Is there a fault or an obstacle in the tray lifter mechanism?** YES: Remove the fault and the obstacle, if any.
Tray B lifter motor (M12)	**3) Does the tray lifter motor rotate at the correct timing?** NO: Replace the motor and the tray B lifter motor driver PCB.
Tray B lock sensor (PI18)	**4) Is the tray B lock sensor normal?** NO: Replace the sensor.

3.1.15 E551 (activation power supply fan FM1; detail code 01)

Finisher controller PCB	**1) Is the level of J103-7 on the finisher controller PCB 0?** NO: Replace the finisher controller PCB.
Fuse PCB	**2) Is the voltage of J715-1 of the fuse PCB 24 VDC?** NO: Replace the fuse PCB.
Power supply fan (FM1)	**3) Does the power supply fan rotate?** NO: Replace the power supply fan.
Finisher controller PCB	**4) Is the level of J103-6 of the finisher controller PCB 1?** NO: Replace the power supply fan. YES: Replace the finisher controller PCB.

3.1.16 E551 (activation feeder cooling fan FM2; detail code 02)

Feeder cooling fan (FM2)	**1) Does the punch fan rotate (during punching operation)?** NO: Replace the punch fan.
Finisher controller PCB	**2) Is the level of J118B-12 on the finisher controller PCB 1?** NO: Replace the punch fan. YES: Replace the finisher controller PCB.

3.1.17 E577 (paddle motor M9)

Paddle home position sensor (PI13)

1) Is the paddle home position sensor normal?

NO: Replace the sensor.

Paddle motor (M9), Finisher controller PCB

2) Does the paddle rotate at the correct timing?

NO: Replace the motor and the finisher controller PCB.

3.1.18 E583 (tray auxiliary plate motor M6)

Tray auxiliary plate home position sensor (PI10)

1) Is the tray auxiliary plate home position sensor normal?

NO: Replace the sensor.

Tray auxiliary plate motor (M6), Finisher controller PCB

2) Does the tray auxliary plate motor rotate at the correct timing?

NO: Replace the motor and the finisher controller PCB.

3.1.19 E584 (shutter)

Shutter drive mechanism

1) Is the drive mechanism from the paddle motor to the shutter normal?

NO:

Paddle motor (M9)

2) Does the paddle motor rotate?

NO: Replace the paddle motor.

Shutter home position sensor (PI12)

3) Is the shutter home position sensor normal?

NO: Replace the sensor.

YES: Replace the finisher controller PCB.

3.1.20 E590 (punch rotation)

Punch motor home position sensor (PI22)	**1) Is the punch motor home position sensor normal?** NO: Replace the sensor.
Wiring	**2) Is the wiring between the punch motor home position sensor and the finisher controller PCB normal?** NO: Correct the wiring.
Punch rotation motor (M18)	**3) Try rotating the punch motor (using the DIP switch). Is it normal?** NO: Replace the punch motor.
Punch unit	**4) Remove the punch unit, and try rotating it by hand. Does it rotate smoothly?** NO: Replace the punch unit.
Punch driver PCB	**5) Try replacing the punch drive PCB. Is the problem corrected?** NO: Replace the finisher controller PCB. YES: End.

3.1.21 E593 (punch registration)

Punch horizontal registration home position sensor (PI24)	**1) Is the punch horizontal registration home position sensor normal?** NO: Replace the sensor.
Horizontal registration mechanism	**2) Try sliding the punch unit by hand. Is there any physical resistance?** YES: Correct it to remove any physical resistance.
Punch horizontal registration motor (M17)	**3) Is the punch horizontal registration motor normal?** NO: Replace the motor.
Finisher controller PCB, Punch driver PCB	**4) Try replacing the punch driver PCB. Is the problem corrected?** NO: Replace the finisher controller PCB. YES: End.

3.1.22 E594 (punch paper edge sensor horizontal registration)

Punch paper edge sensor home position sensor (PI21)	**1) Is the punch paper edge sensor home position sensor normal?** NO: Replace the sensor.
Wiring	**2) Is the wiring between the punch paper edge sensor home position sensor and the finisher controller PCB normal?** NO: Correct the wiring.
Punch sensor shift motor (M19)	**3) Try rotating the punch sensor shift motor (using the DIP switch). Is it normal?** NO: Replace the punch sensor shift motor.
Punch slide unit	**4) Try moving the punch paper edge sensor home position sensor by hand. Does it move smoothly?** NO: Correct the mechanical system so that it moves smoothly.
Punch drive PCB	**5) Try replacing the punch drive PCB. Is the problem corrected?** NO: Replace the finisher controller PCB. YES: End.

3.1.23 E595 (punch waste feeder)

Punch waste feed sensor (PI27)	**1) Is the punch water feed sensor normal?** NO: Replace the sensor.
Wiring	**2) Is the wiring between the punch waste feed sensor and the finisher controller PCB Normal?** NO: Correct the wiring.
Punch waste feed motor (M16)	**3) Try rotating the punch waste feed motor (using DIP switch). Is it normal?** NO: Replace the punch waste feed motor.
Punch driver PCB	**4) Try replacing the punch driver PCB. Is the problem corrected?** NO: Replace the finisher controller PCB. YES: End.

4 Self Diagnosis

The CPU (IC101Z) on the finisher controller PCB is equipped with a self diagnostic mechanism which runs a check as needed and communicates the presence of a fault, if found, to the copier in the form of a code and a detail code.

The CPU (Q1) on the saddle stitcher unit is also equipped with a self diagnostic mechanism which runs a check as needed and communicates the presence of a fault, if found, to the finisher controller PCB.

In response, the copier indicates the received code in its control panel. (The detail code may be checked in its service mode or with reference to LED101 on the finisher controller PCB.)

4.1 Self Diagnosis

4.1.1 Finisher Unit

E500	
Main cause	Data communication (with copier)
Detection	The communication between the copier and the finisher is disrupted and, in addition, it is not resumed after an attempt at transmission for 5 sec. The communication is disrupted under the foregoing condition and resumed three times within 5 sec.
E501	
Main cause	Data communication (with slave CPU)
Detection	The communication between the master CPU (IC101) and the slave CPU (IC121) is disrupted.
E503	
Main cause	Data communication (with saddle stitcher unit)
Detection	The communication with the saddle stitcher unit is disrupted.
E505	
Main cause	Backup RAM (EEPROM)
Detection	The checksum at power-on has a fault.
E506	
Main cause	Download error
Detection	The following detail codes are used: 01 serial communication error 02 write error 03 user program transfer error 04 slave program transfer error 05 download time-out

E510

Main cause	Inlet motor (M1)
Detection	The clocks from the inlet motor is 50 mm/sec or less for 1 sec or more while the motor is in operation.

E514

Main cause	Stack delivery motor (M7) Stack motor clock sensor (PI12) Front aligning plate motor (M4)
Detection	The clocks from the stack delivery motor clock sensor is 50 mm/sc or less for 1 sec or more when the motor is in operation.

E537

Main cause	Front aligning plate motor (M4) Front aligning plate home position sensor (PI7)
Detection	The front aligning plate does not leave the front aligning plate home position sensor when the front aligning plate motor is driven for 4 sec. The front aligning plate does not return to front aligning plate home position sensor when the front aligning plate motor is driven for 4 sec.

E530

Main cause	Rear aligning plate motor (M5) Rear aligning plate home position sensor (PI9)
Detection	The rear aligning plate does not leave rear aligning plate home position sensor when the rear aligning plate motor is driven for 4 sec. The rear aligning plate does not return to rear aligning plate home position sensor when the rear aligning plate motor is driven for 4 sec.

E531

Main cause	Stapler motor (M6) Stapler home position detecting switch (inside stapler)
Detection	The stapler does not leave stapler home position when the stapler motor is driven or 0. 5 sec. The stapler does not return to stapler home position when the stapler motor is driven for 0.5 sec.

E532

Main cause	Stapler shift motor (M10) Stapler shift home position sensor (P16)
Detection	The stapler shift home position sensor does not go OFF when the stapler shift motor is driven for 4 sec. The stapler shift home position is not detected when the stapler shift motor is driven for 4 sec.

E535-FF

Main cause	Swing motor (M8) Swing guide open sensor (PI15)
Detection	The swing guide closed sensor does not detect the swing guide when the swing motor is driven for 2 sec.

E535-01

Main cause	Swing motor (M8) Swing guide open sensor (PI14)
Detection	The swing guide closed sensor does not detect the swing guide when the swing motor is driven fro 2 sec.

E540

Main cause	Tray A lifter motor (M13) Tray A lock sensor (PI19) Tray A UP position sensor Tray A DOWN position sensor
Detection	The up/down movement does not end within 25 sec after the tray lifter motor is driven. The clocks from the tray idle rotation sensor is disrupted for 250 msec while the motor is rotating. The tray A is located below the tray B range.

E542

Main cause	Tray B lifter motor (M12) Tray B lock sensor (PI18) Tray B lower limit sensor Tray B UP position sensor Tray DOWN position sensor
Detection	The up/down movement does not end within 25 sec after the tray lifter motor is driven. The clocks from the tray idle rotation sensor is disrupted for 250 msec while the sensor is rotating. The input from the tray B UP position sensor is '0' at power-on (i.e., the tray B is above the tray paper sensor PCB).

E551-01

Main cause	Power supply fan (FM1)
Detection	The power supply fan is at rest for 2 sec or more.

E551-02

Main cause	Feeder cooling fan (FM2)
Detection	The feeder cooling fan is at reset for 2 sec or more.

E577

Main cause	Paddle motor (M9) Paddle home position sensor (PI13)
Detection	The paddle home position sensor does not detect the paddle within 5 sec after the motor is started.

E583

Main cause	Tray auxiliary plate motor (M6) Tray auxiliary plate housing sensor (PI10)
Detection	The tray auxiliary plate housing sensor does not go ON within 2 sec after the motor is started when the tray auxiliary plate is retracted.

E584

Main cause	Paddle motor (M9) Shutter home position sensor (PI12)
Detection	The shutter home position sensor does not go ON within 5 sc after the paddle motor is driven (while returning to home position).

E590

Main cause	Punch rotation motor (M18) Punch motor home position sensor (PI22)
Detection	The punch motor home position sensor does not detect punch motor home position when the punch motor is driven for 0.3 (at time of initialization) or 0.2 (at time of punching). The punch motor home position sensor detects the punch motor home position, or the sensor does not go OFF when the punch motor is driven for 0.3 sec (at time of initialization) or 0.2 sec (at time of punching).

E593	
Main cause	Punch registration motor (M17) Punch home position sensor (PI24)
Detection	The punch home position sensor detects home position when pulses equivalent of the shift of the punch registration motor over a specific distance (about 42 mm) are generated. The punch home position sensor detects home position, or when the sensor does not go OFF when the punch registration motor is driven for pulses equivalent of the shift over a specific distance (about 42 mm).
E594	
Main cause	Punch sensor home position sensor (PI23) Punch sensor shift motor (M19)
Detection	The punch paper edge sensor home position sensor does not detect home position when the punch sensor shift motor is driven for 5 sec. While the punch home position sensor detects home position, the sensor does not go OFF when the punch sensor shift motor is driven for 5 sec.
E595	
Main cause	Punch waste feed motor (M16) Punch waste feed sensor (PI27)
Detection	The output of the punch waste feed sensor does not change when the punch waste feed motor is rotated for $ sec or more.

4.2 Alarm

4.2.1 Finisher Unit

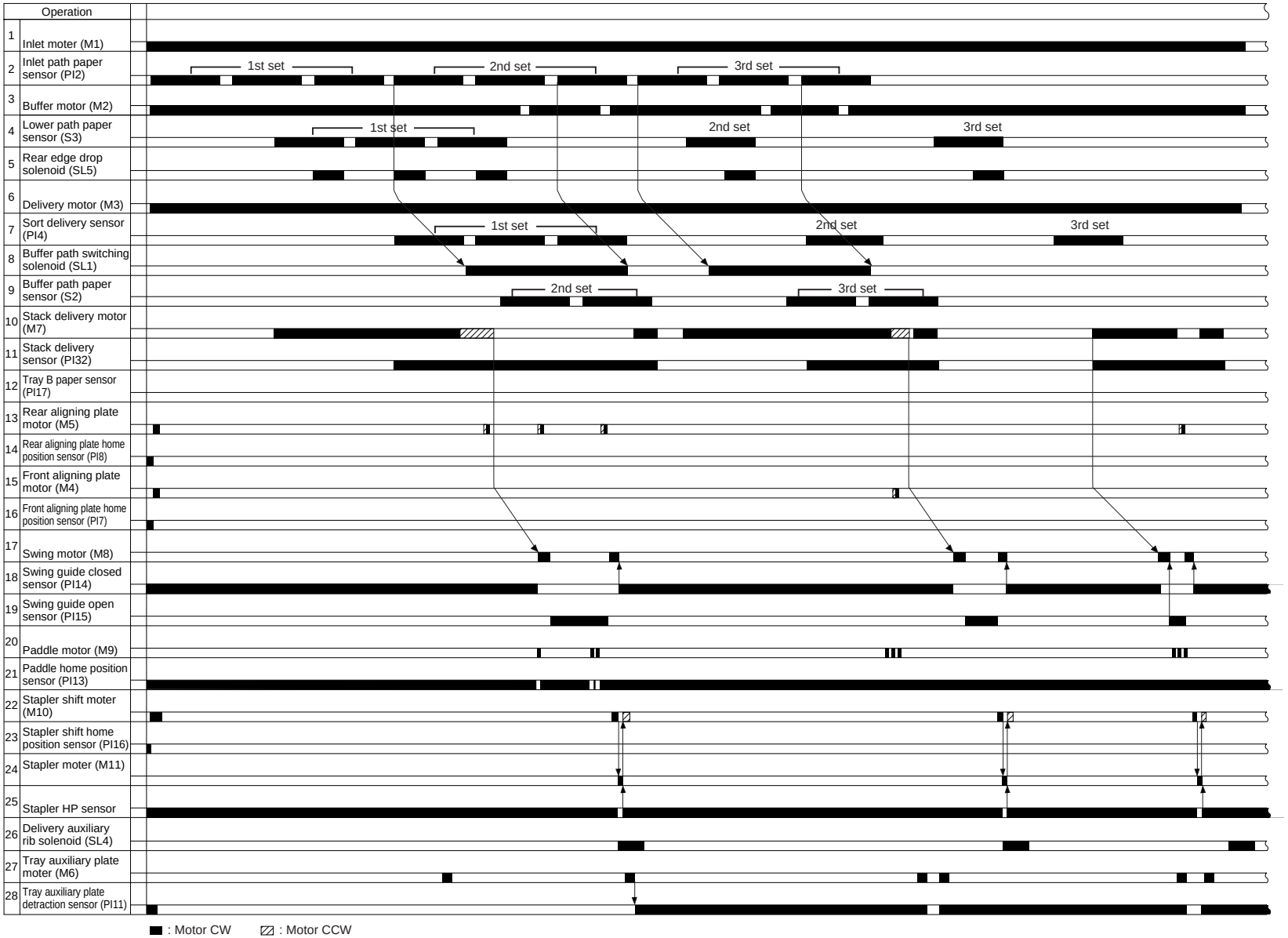
Error	Condition	Detection	Machine operation	Resetting
Stapler absent	• The stapler is not fitted.	• At all times	• The operation of the stapler motor (M6) and the stapler shift motor (M4) is prohibited.	• Fit the stapler.
Stapler absent	• The stapler cartridge has run out of staples.	• At all times.	• Normal operation is possible; however, operation depends on instructions from the copier.	• Replace the staple cartridge or fit it correctly.
Tray A stack excess	• The number of sheets in the tray is in excess of a specific value.	• At all times.	• Normal operation may be continued.	• The absence of paper in the tray is detected while at rest.
Tray B stack excess	• The number of sheets in the tray is in excess of a specific value.	• Normal monitoring.	• Normal operation may be continued.	• The absence of paper in the tray is detected.

APPENDIX

1 GENERAL TIMING CHART

1.1 Finisher Unit

A4, 3copies, 1-point, Front Stapling



2 LIST OF SIGNALS/ABBREVIASTIONS

The following is a list of signals and abbreviations used in this document and the circuit diagrams:


Memo

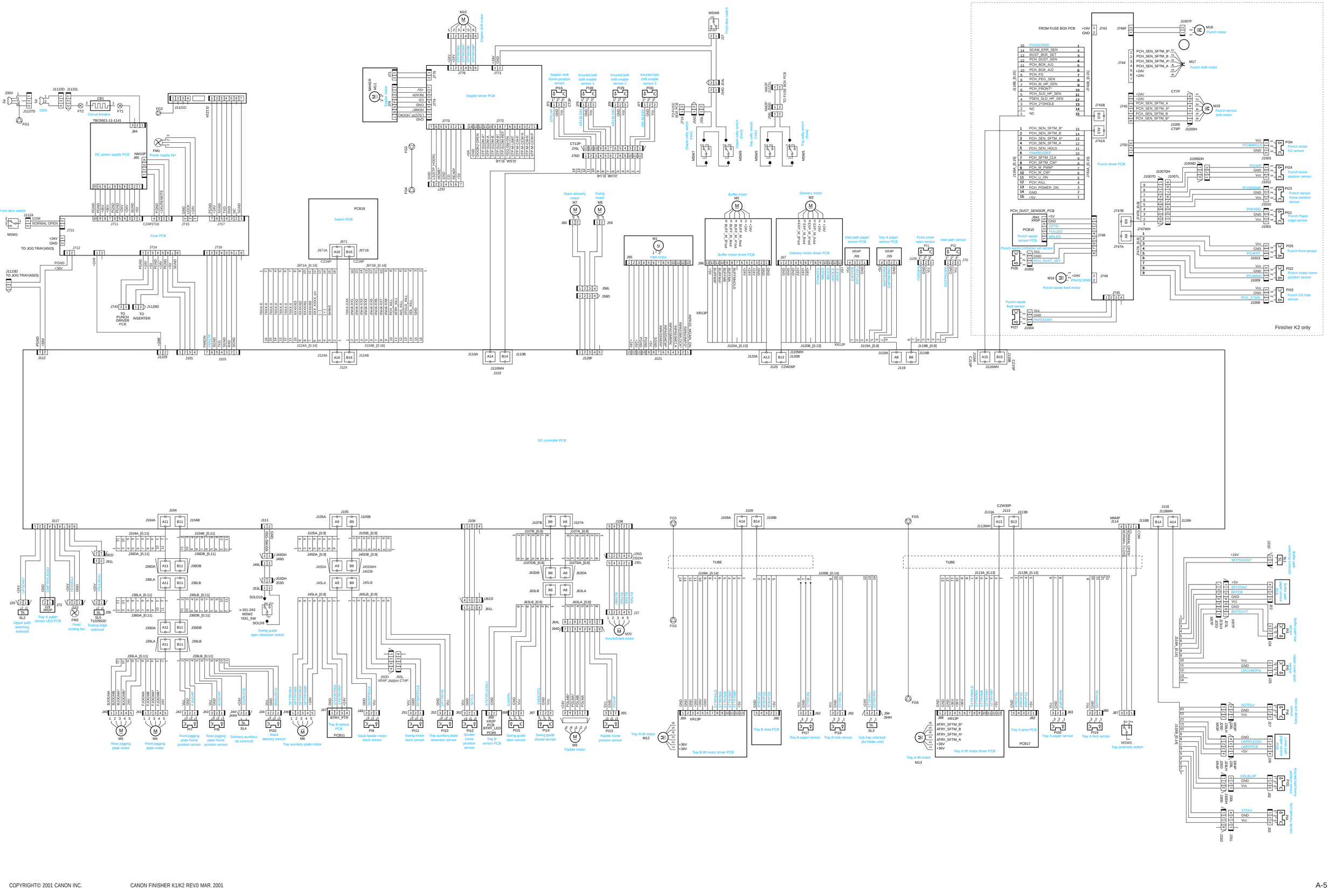
The abbreviations in parentheses are electrical signals but are analog, which cannot be expressed in terms of '1' and '0'. Others are digital signals, which can be expressed as being either '1' or '0'.

2.1.1 Finisher

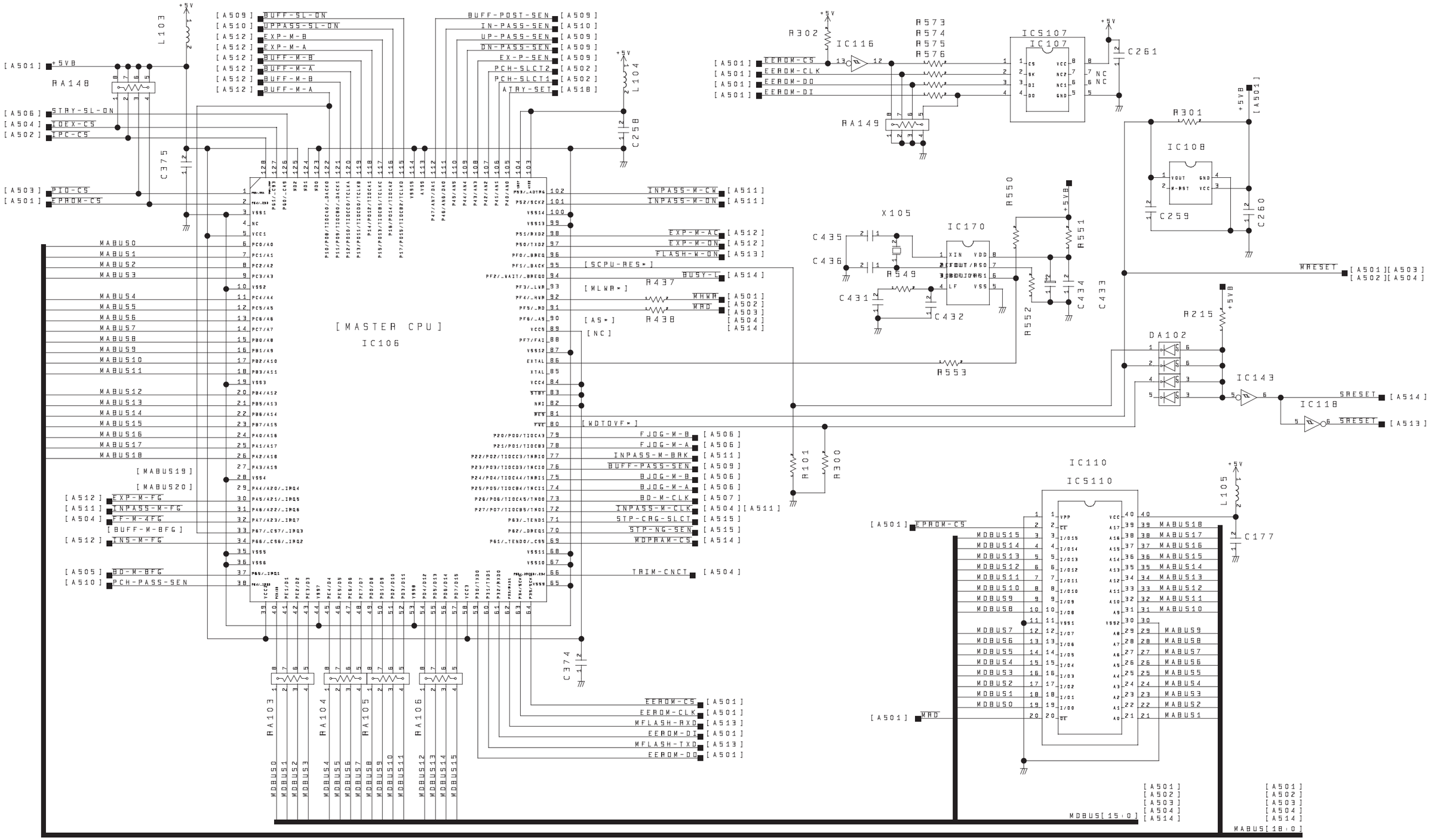
BFDMTRCLK	BUFFER MOTOR CLOCK DETECTION Signal
[BFLEDAJ]	BUFFER PASS LED ADJUST Command
BFPCB	BUFFER PAPER PCB PAPER DETECTION Signal
BFPSSCHG	BUFFER PASS CHANGE SOLENOID DRIVE Command
BFPSSXIT	BUFFER PASS EXIT PAPER DETECTION Signal
BNDLDELV	BUNDLE DELIVERY PAPER DETECTION Signal
CD	CARTRIDGE SIZE DETECTION Signal
CRTSET	STAPLE CARTRIDGE SET Signal
DLVAUXSL	DELIVERY AUXILIARY RIB SOLENOID DRIVE Command
DSTD	DUST DETECTION Signal
[ENTLEDAJ]	ENTRANCE PASS LED ADJUST Command
ENTPASSPA	ENTRANCE PASS PAPER DETECTION Signal
ENTPCB	ENTRANCE PASS PCB PAPER DETECTION Signal
FANON	FAN ON Command
FANSTP	FAN STOP Signal
FDBLT	FEED BELT SOLENOID DRIVE Command
FDROPN	FRONT COVER OPEN Signal
FEEDFAN	FEED FAN ON Command
FJOGHP	FRONT JOG PLATE HOME POSITION DETECTION Signal
FULLED	FULL DETECTIION LED DRIVE Command
HOOKEMP	HOOK EMPTY Signal
KRLBLHP	KNURLED BELT HP Signal
KRLBLEB1	KNURLED BELT SHIFT ENABLE Signal 1
KRLBLEB2	KNURLED BELT SHIFT ENABLE Signal 2
KRLBLEB3	KNURLED BELT SHIFT ENABLE Signal 3
[LWRPLEDADJ]	LOWER PASS LED ADJUST Command
LWRPPCB	LOWER PASS PCB PAPER DETECTION Signal
MDLED	PRE-NOTICE LED DRIVE Command
NSTDLV	NON-SORT DELIVERY PAPER DETECTION Signal
PCH2/3HL	PUNCH UNIT 2/3 HOLE DETECTION Signal
PDLHP	PADDLE HOME POSITION Signal
PFANON	PUNCH FAN DRIVE Command

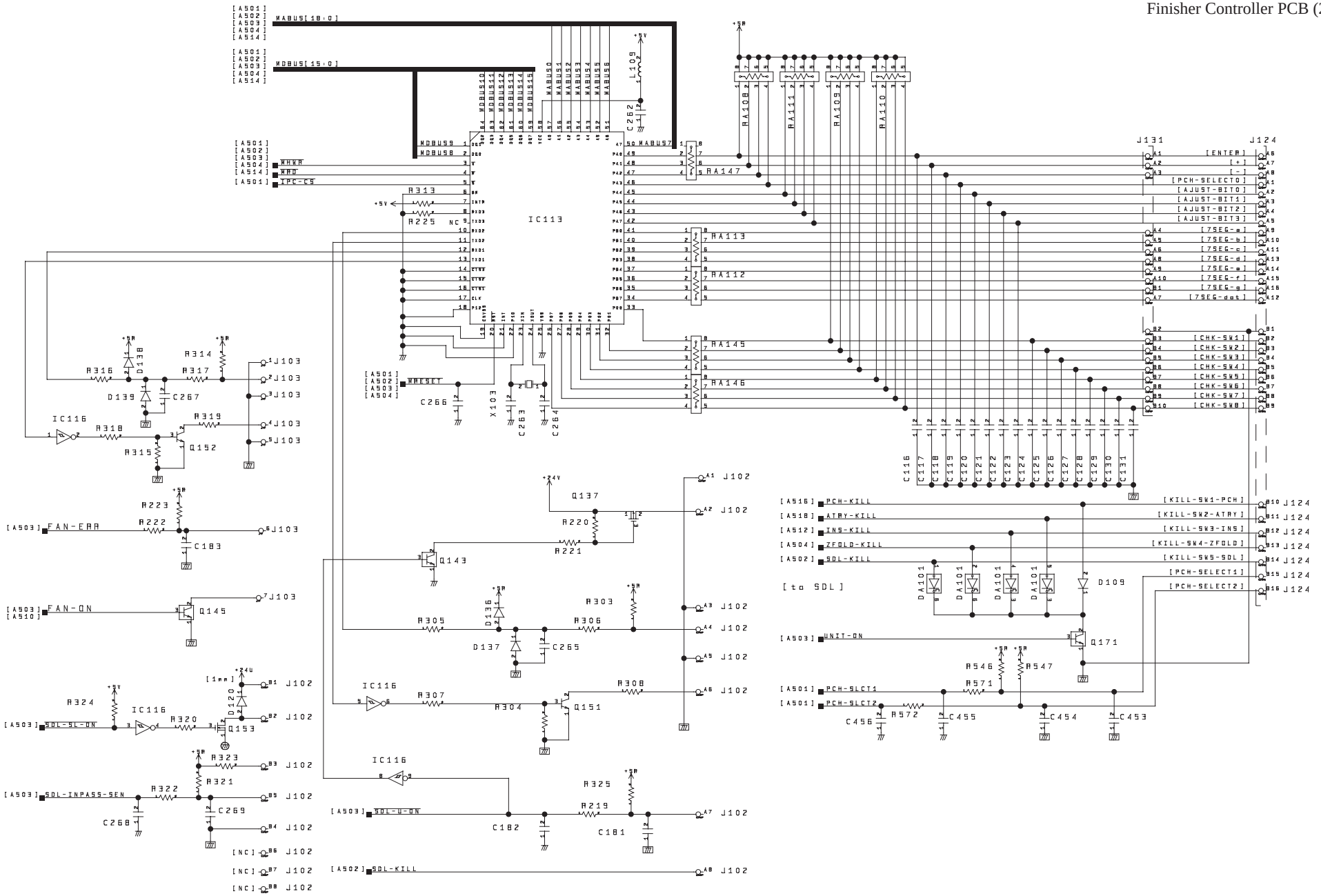
PFANSTP	PUNCH FAN STOP DETECTION Signal
PHCMPL	PUNCH COMPLETE DETECTION Signal
PHCONTST	PUNCH CONTAINER SET DETECTION Signal
PHFEEDMT	PUNCH DUST FEED DETECTION Signal
PHHP	PUNCH UNIT HOME POSITION DETECTION Signal
PHPADG	PUNCH PAPER EDGE DETECTION Signal
PHROTHP	PUNCH ROTATION HOME POSITION DETECTION Signal
PHSNRHP	PUNCH EDGE SENSOR HOME POSITION DETECTION Signal
PNHMREF	PUNCH ROTATION MOTOR REFERENCE Signal
PNHREGREF	PUNCH REGIST REGISTRATION MOTOR REFERENCE Signal
PNHSCRMD	PUNCH DUST FEED MOTOR DRIVE Command
PNSNRHOLD	PUNCH SENSOR SLIDE MOTOER HOLD Command
READY	STAPLER READY Signal
SBTRYPH	SUB-TRAY SOLENOID PUSH DRIVE Command
SBTRYPL	SUB-TRAY SOLENOID RELEASE DRIVE Command
SLFPRIM	SELF PRIMING Signal
SMPPAPRMV	NON-SORT TRAY PAPER REMOVAL DETECTION Signal
SMPTRYDL	SAMPLE TRAY LOCK DETECTION Signal
SMPTRYLEDAJ	NON-SORT TRAY PAPER SENSOR LED ADJUST Command
SMPTRYLWPO	SAMPLE TRAY LOWER POSITION DETECTION Signal
SMPTRYPA	SAMPLE TRAY PAPER DETECTION Signal
SMPTRYPAP	NON-SORT TRAY PAPER SENSOR PAPER DETECTI0N Signal
SMPTRYUPPO	SAMPLE TRAY UP POSITION DETECTION Signal
SOPAPRMV	SORT TRAY PAPER REMOVAL DETECTION Signal
SOTRYLEDAJ	SORT TRAY PAPER SENSOR LED ADJUST Command
SOTRYPAP	SORT TRAY PAPER SENSOR PAPER DETECTI0N Signal
SPTTRYIN	SUPPORT TRAY IN DETECTION Signal
STCLS	SHUTTER CLOSED DETECTION Signal
STDLV	SORT DELIVERY PAPER DETECTION Signal
STPDRHP	STAPLER DRIVE HOME POSITION Signal
STPLHP	STAPLER UNIT HOME POSITION Signal
STTRYDL	SORT TRAY LOCK DETECTION Signal
STTRYLW	SORT TRAY LOWER LIMIT DETECTION Signal
STTRYLWPO	SORT TRAY LOWER POSITION DETECTION Signal
STTRYPA	SORT TRAY PAPER DETECTION Signal
STTRYUPPO	SORT TRAY UP POSITION DETECTION Signal
SWDGDCL	SWING GUIDE CLOSED Signal
SWGMTRCLK	SWING MOTOR CLOCK DETECTION Signal
SWGOPN	SWING GUIDE OPEN Signal
UPCVROPN	UPPER COVER OPEN DETECTION Signal
UPSCHG	UPPER PASS CHANGE SOLENOID DRIVE Command

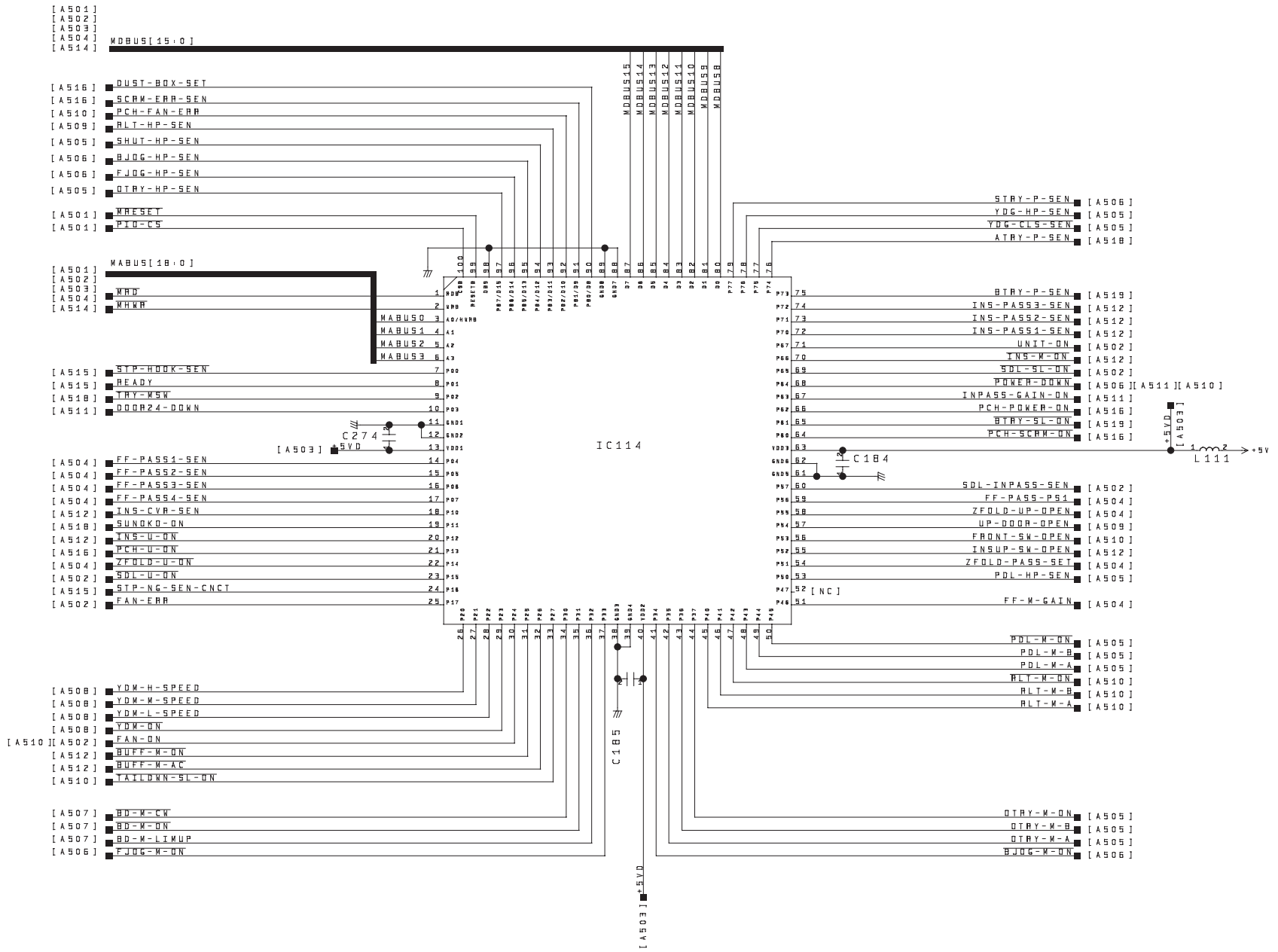
3 FINISHER GENERAL CIRCUIT DIAGRAM

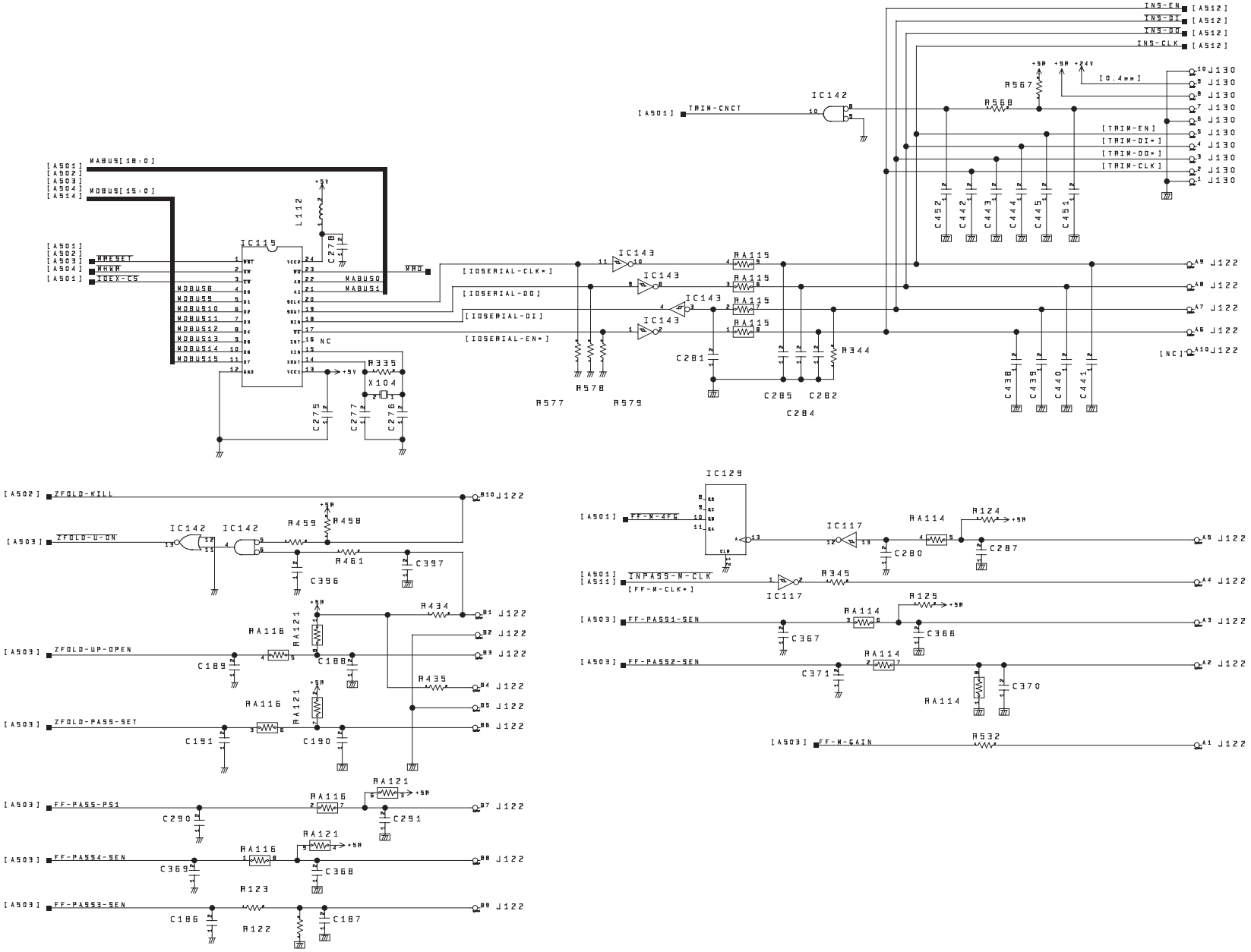


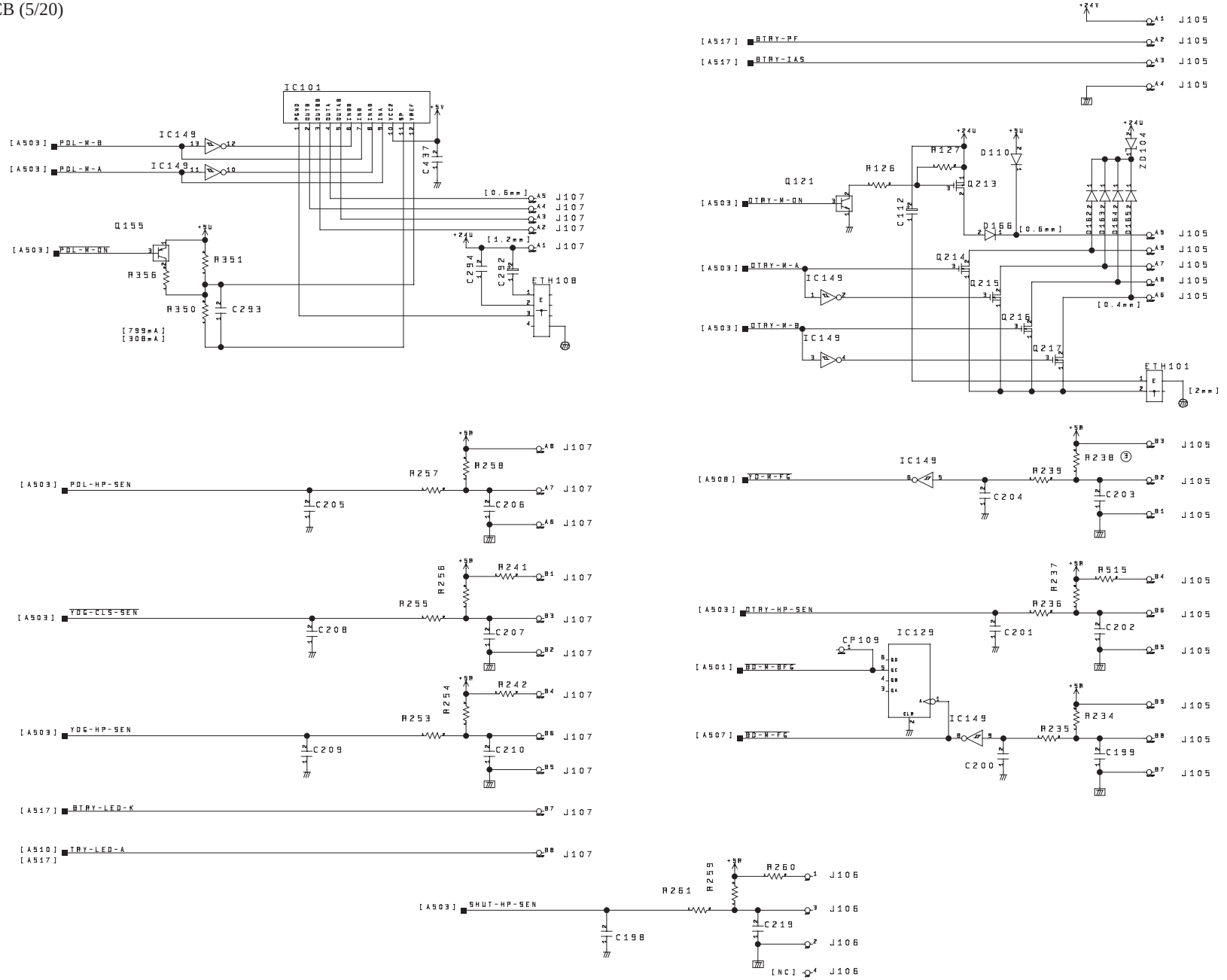
Finisher Controller PCB (1/20)

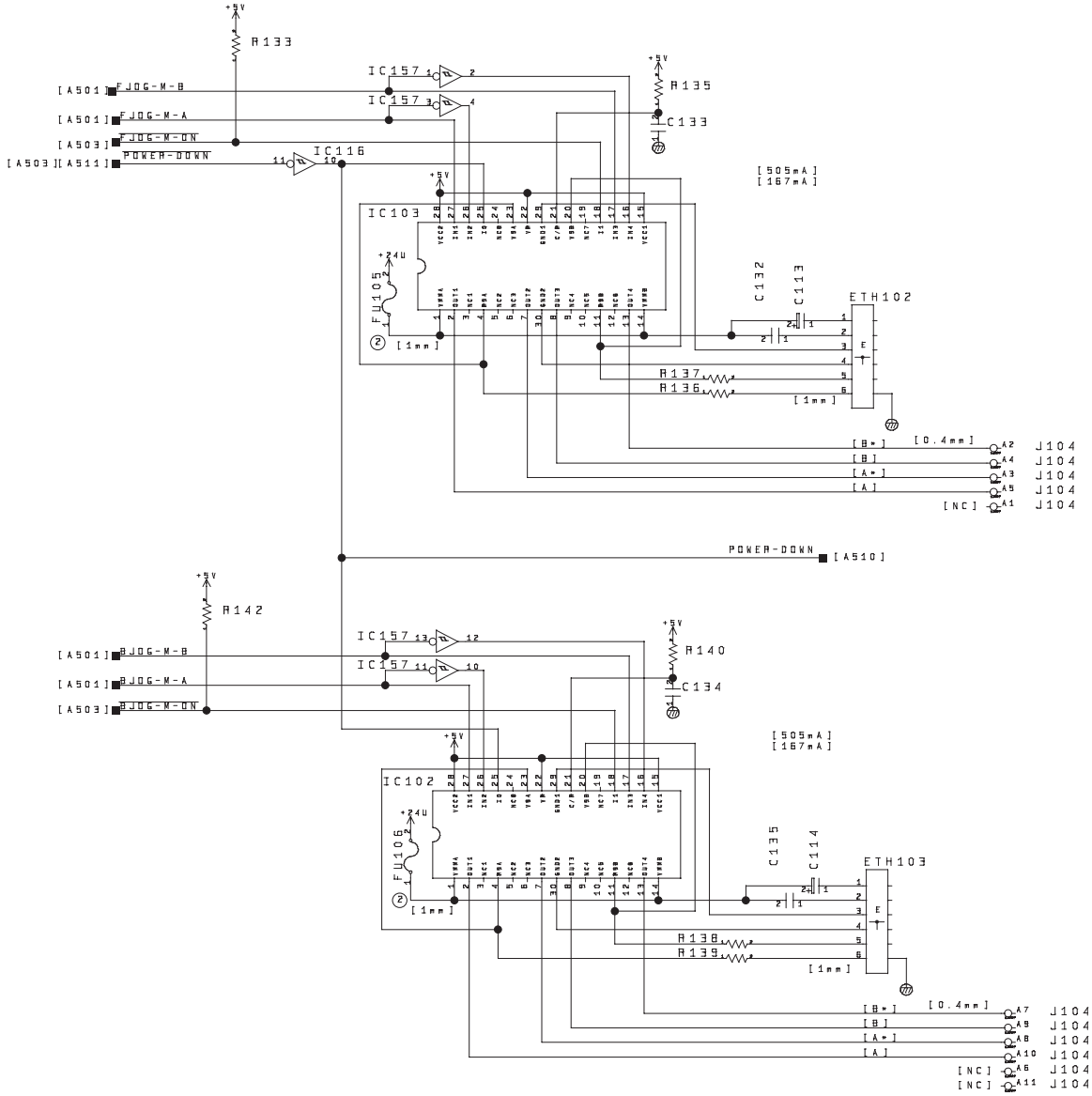


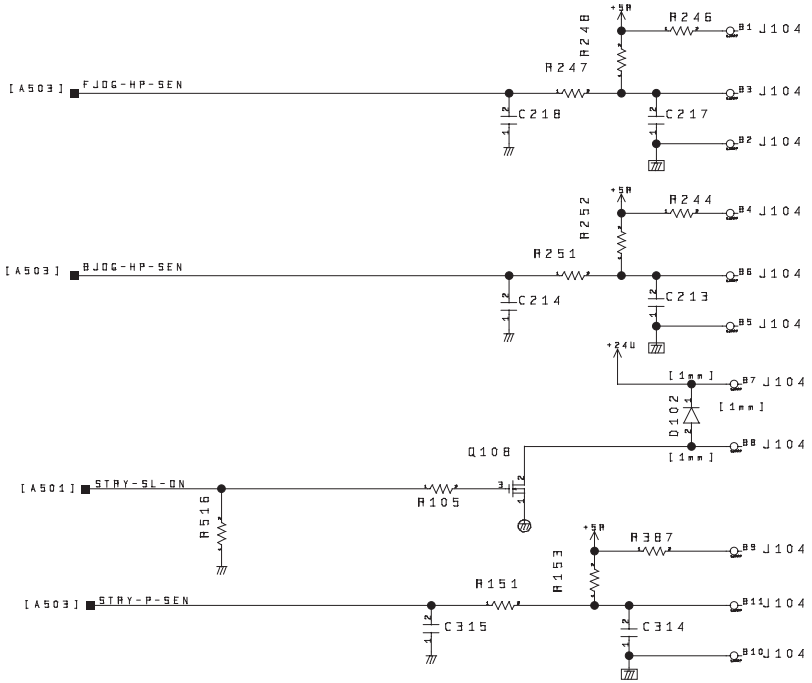

IC113
IC116
MRESET
FAN-ERR
FAN-ON
SDL-SL-ON
SDL-INPASS-SEN
SDL-U-ON
SDL-KILL
PCH-KILL
ATRY-KILL
INS-KILL
ZFOLD-KILL
SDL-KILL
[to SDL]
UNIT-ON
PCH-SLCT1
PCH-SLCT2
[ENTER]
[+]
[-]
[PCH-SELECT0]
[ADJUST-BIT0]
[ADJUST-BIT1]
[ADJUST-BIT2]
[ADJUST-BIT3]
[7SEG-a]
[7SEG-b]
[7SEG-c]
[7SEG-d]
[7SEG-e]
[7SEG-f]
[7SEG-g]
[7SEG-dot]
[CHK-SW1]
[CHK-SW2]
[CHK-SW3]
[CHK-SW4]
[CHK-SW5]
[CHK-SW6]
[CHK-SW7]
[CHK-SW8]
[KILL-SW1-PCH]
[KILL-SW2-ATRY]
[KILL-SW3-INS]
[KILL-SW4-ZFOLD]
[KILL-SW5-SDL]
[PCH-SELECT1]
[PCH-SELECT2]



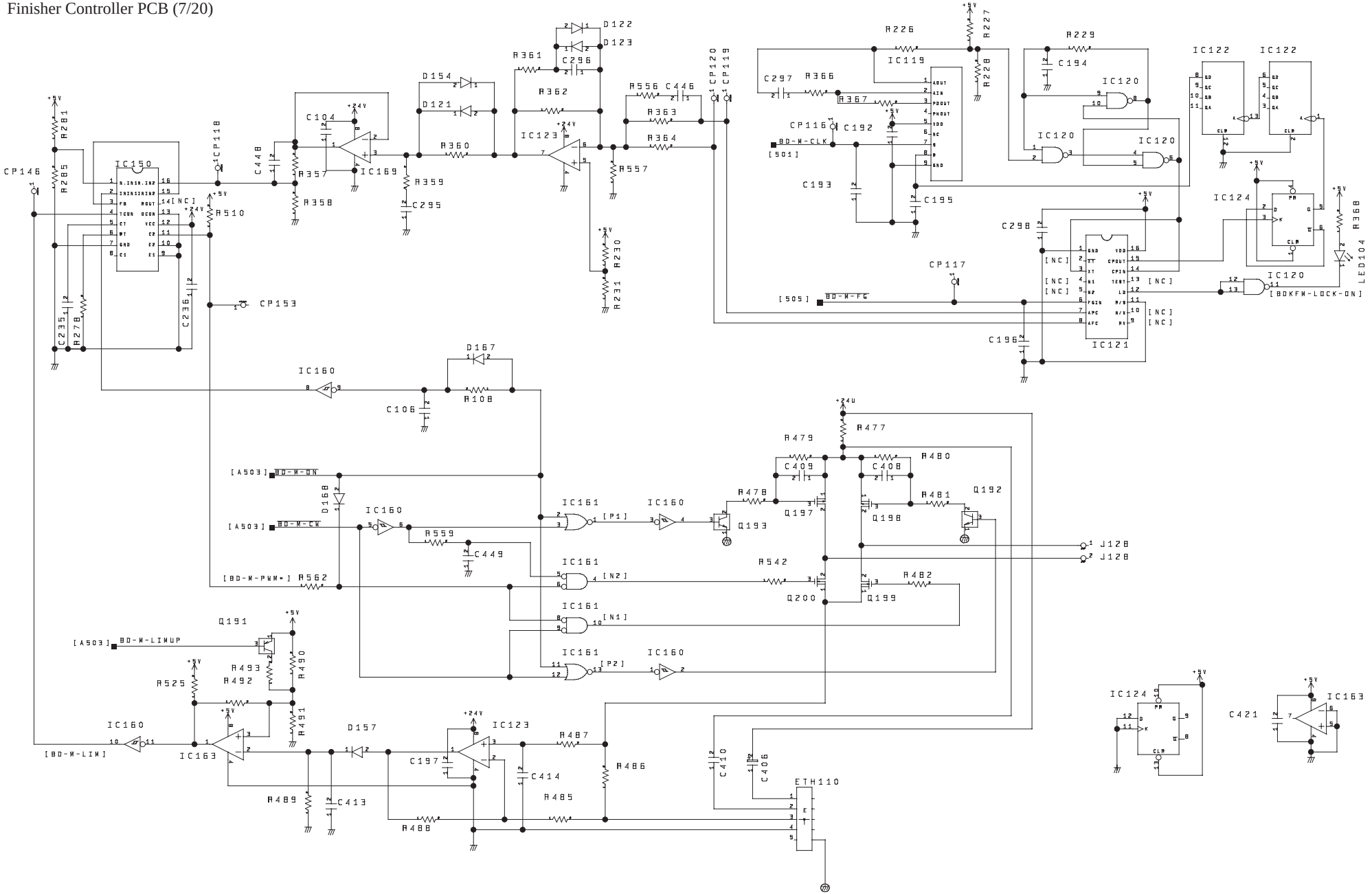

IC115
IC142
IC143
IC129
IC117
X104
L112
J122
J130
[A501]
[A502]
[A503]
[A504]
[A511]
[A512]
MABUS[18:0]
MDBUS[15:0]
WRESET
WHKM
IOEX-CS
WRD
MABUS0
MABUS1
NC
[IOSERIAL-CLK*]
[IOSERIAL-DO]
[IOSERIAL-DI]
[IOSERIAL-EN*]
TRIM-CNCT
INS-EN
INS-DI
INS-DO
INS-CLK
[TRIM-EN]
[TRIM-DI*]
[TRIM-DO*]
[TRIM-CLK]
[0.4mm]
ZFOLD-KILL
ZFOLD-U-DN
ZFOLD-UP-OPEN
ZFOLD-PASS-SET
FF-PASS1-PS1
FF-PASS4-SEN
FF-PASS3-SEN
FF-M-ATG
INPASS-M-CLK
[FF-M-CLK*]
FF-PASS1-SEN
FF-PASS2-SEN
FF-M-GAIN
[NC]

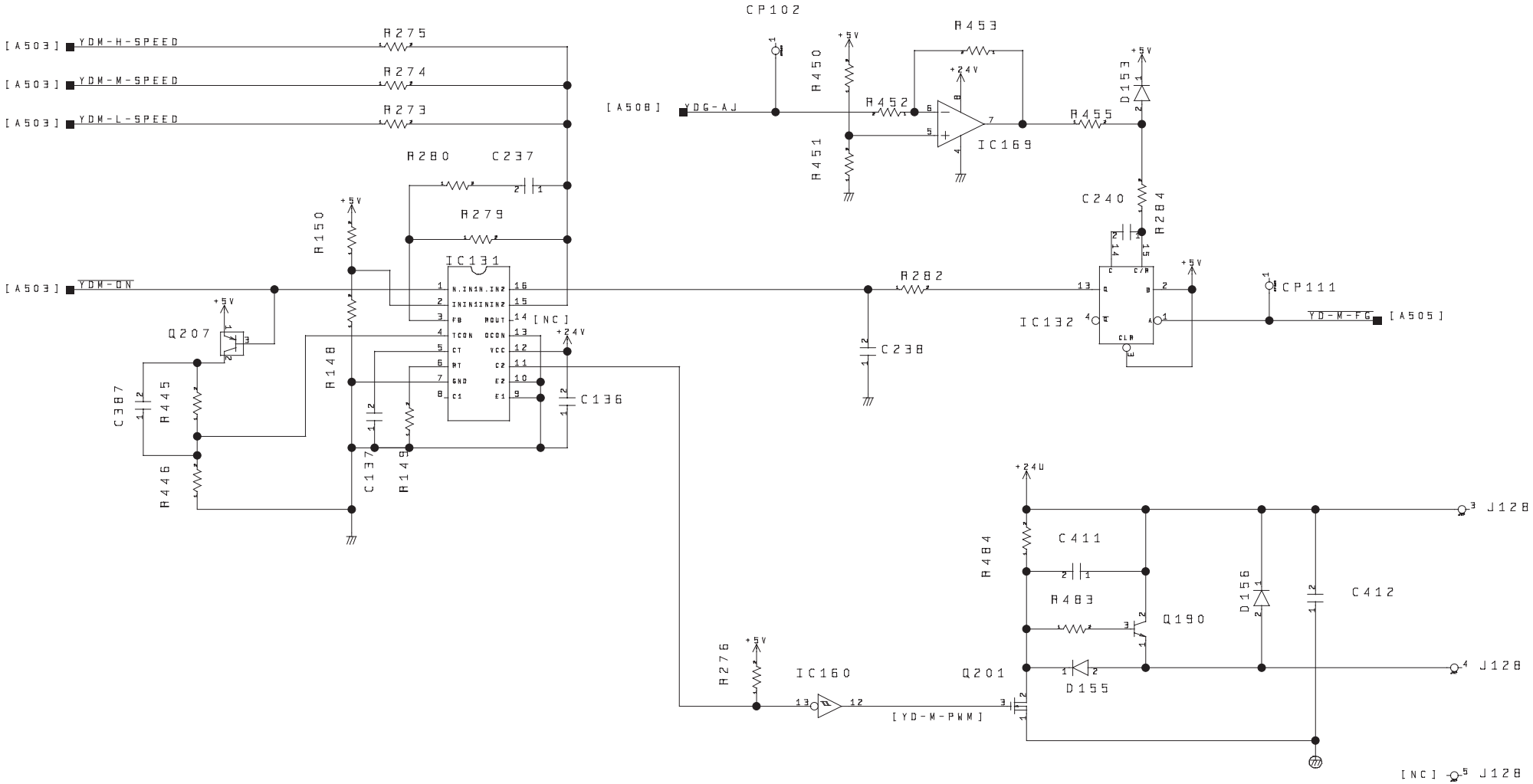



[A501] FJOG-M-B
[A501] FJOG-M-A
[A503] FJOG-M-ON
[A503][A511] POWER-DOWN
IC157
IC116
IC103
IC102
R133
R135
R142
R140
C133
C134
C132
C113
C135
C114
ETH102
ETH103
FU105
FU106
R137
R136
R138
R139
[505mA]
[167mA]
[1mm]
[0.4mm]
[B*]
[B]
[A*]
[A]
[NC]
POWER-DOWN [A510]
[A501] BJOG-M-B
[A501] BJOG-M-A
[A503] BJOG-M-ON
J104

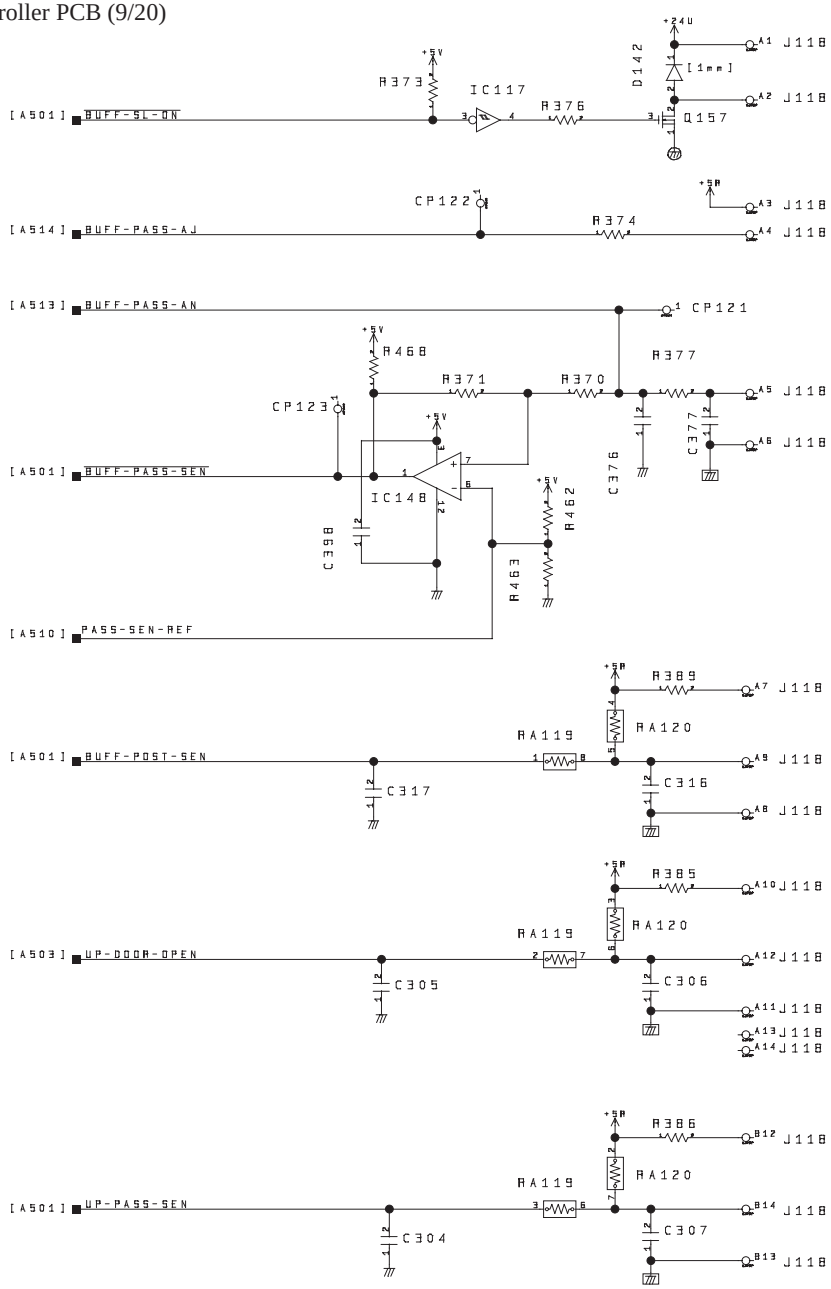

[A503] FJOG-HP-SEN
[A503] BJOG-HP-SEN
[A501] STRY-SL-ON
[A503] STRY-P-SEN
R246
R247
R248
R244
R251
R252
R105
R516
R387
R151
R153
C218
C217
C214
C213
C315
C314
D102
Q108
[1mm]
J104

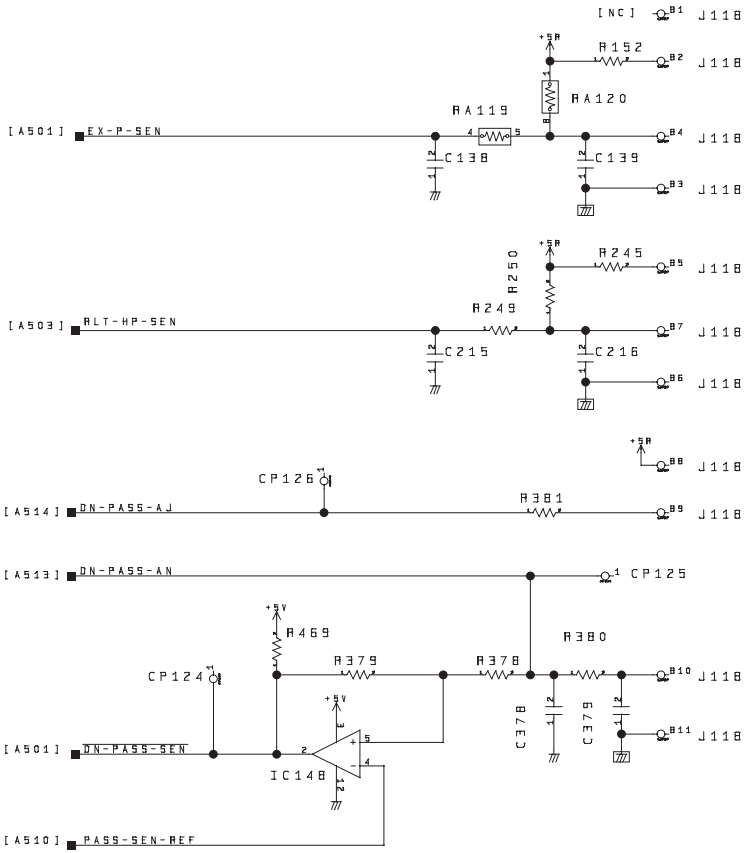
Finisher Controller PCB (7/20)

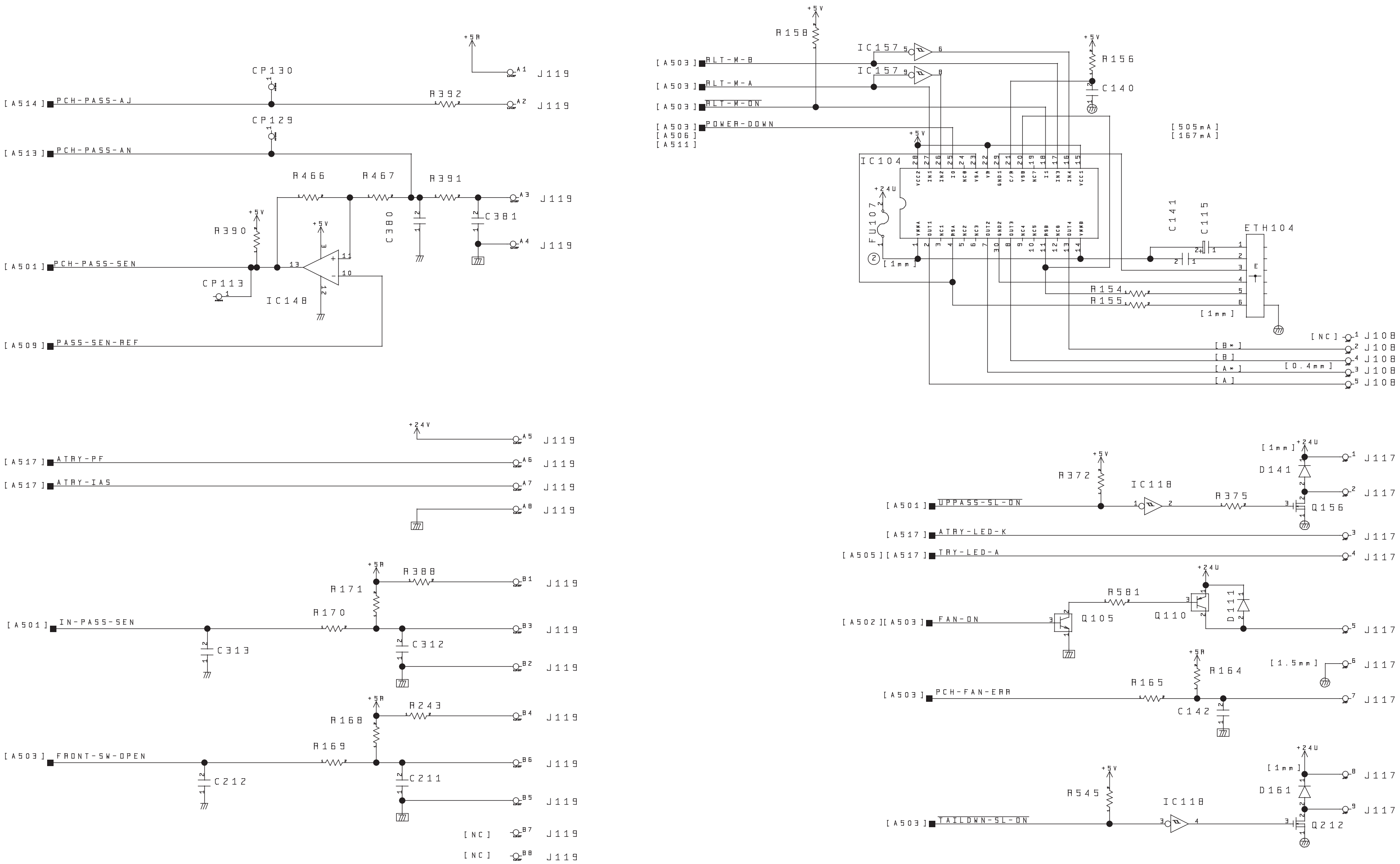



[A503] YDM-H-SPEED
[A503] YDM-M-SPEED
[A503] YDM-L-SPEED
[A503] YDM-ON
[A508] YDG-AJ
[A505] YD-M-FG
[YD-M-PWM]
[NC]
R275
R274
R273
R280
C237
R279
R150
IC131
R282
C238
C240
R284
CP102
R450
R451
R452
R453
R455
IC169
D153
IC132
CP111
Q207
C387
R445
R446
R148
C137
R149
C136
R276
IC160
Q201
D155
R484
C411
R483
Q190
D156
C412
J128
J128
J128

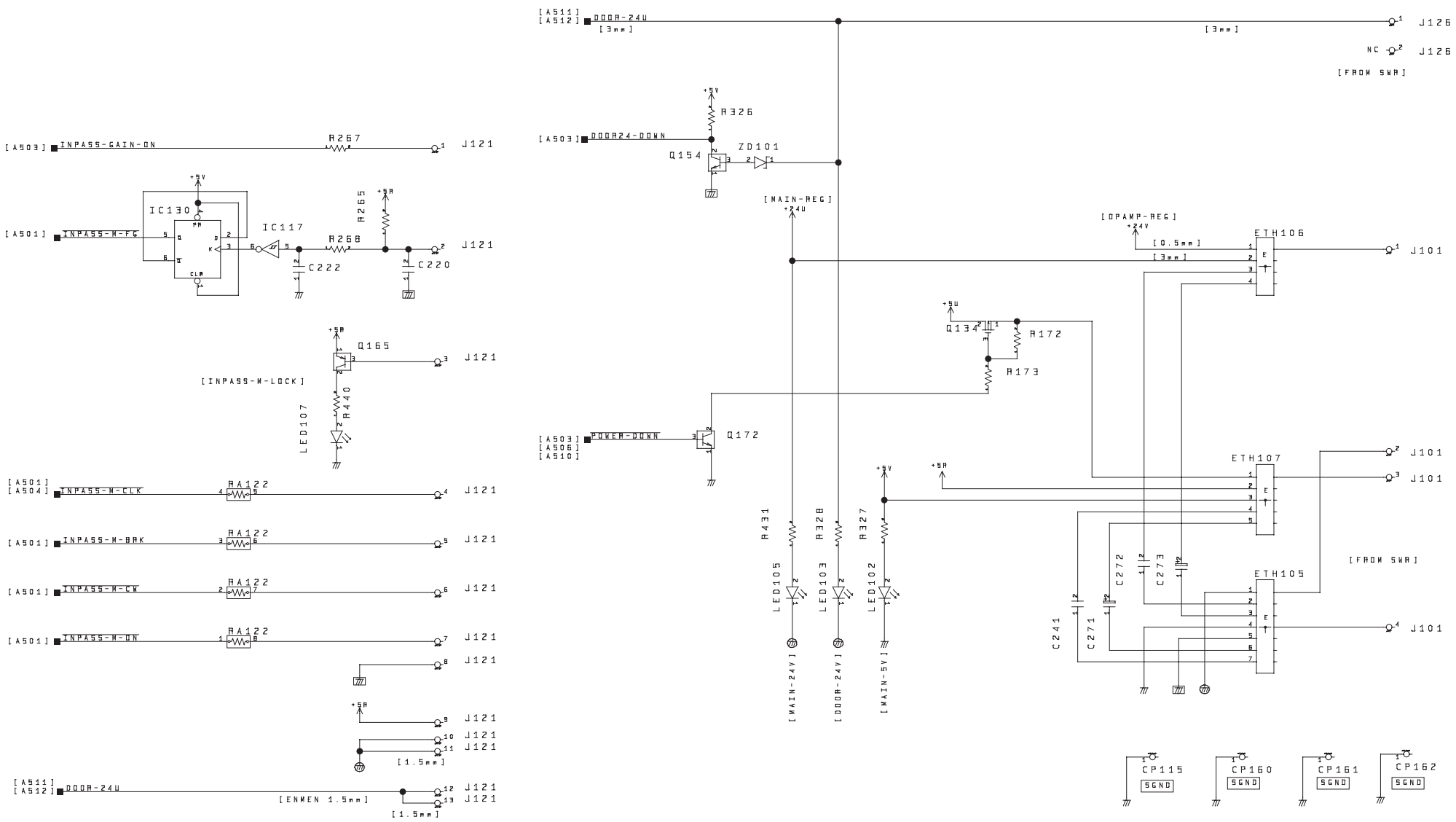
Finisher Controller PCB (9/20)

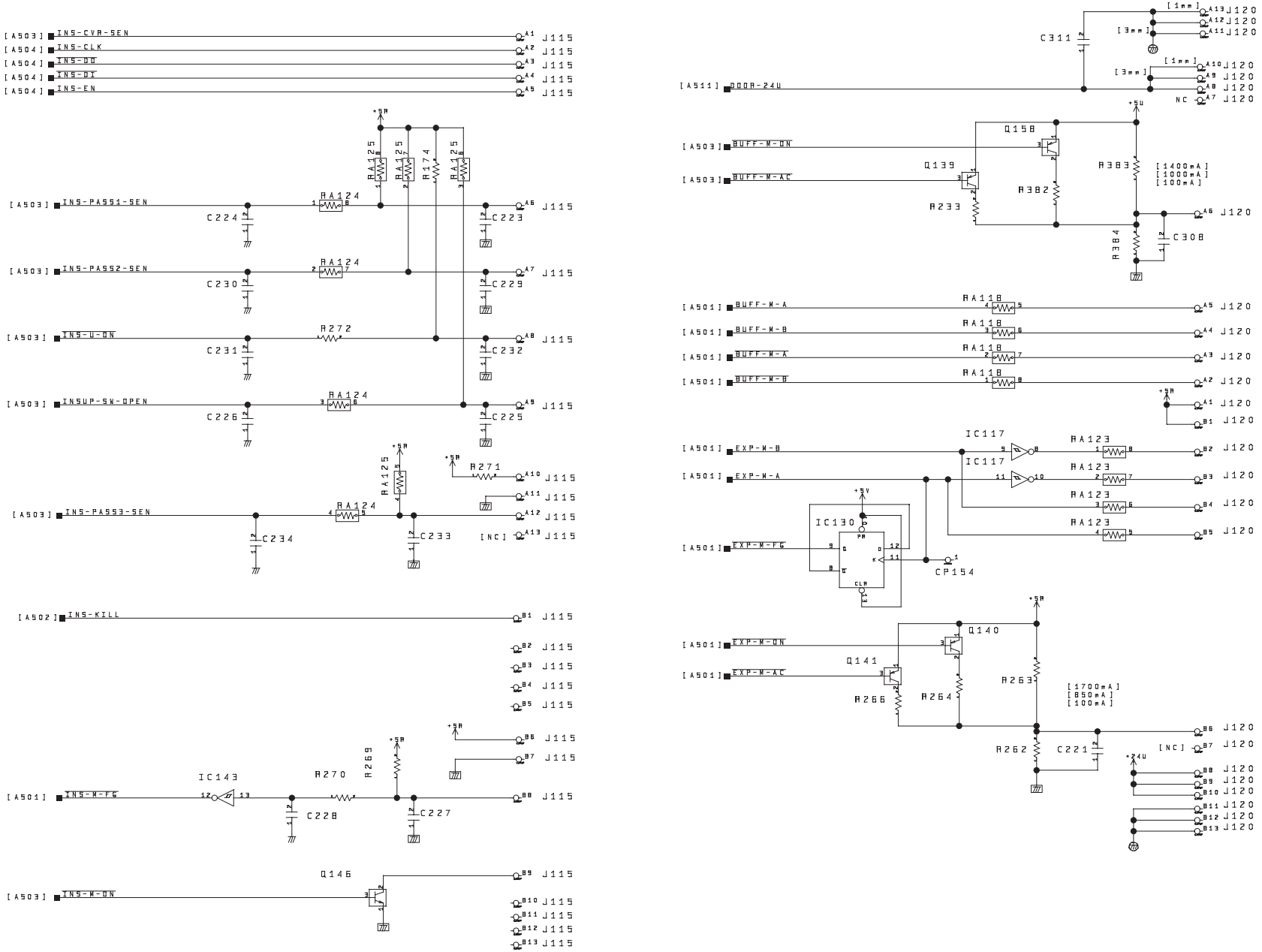


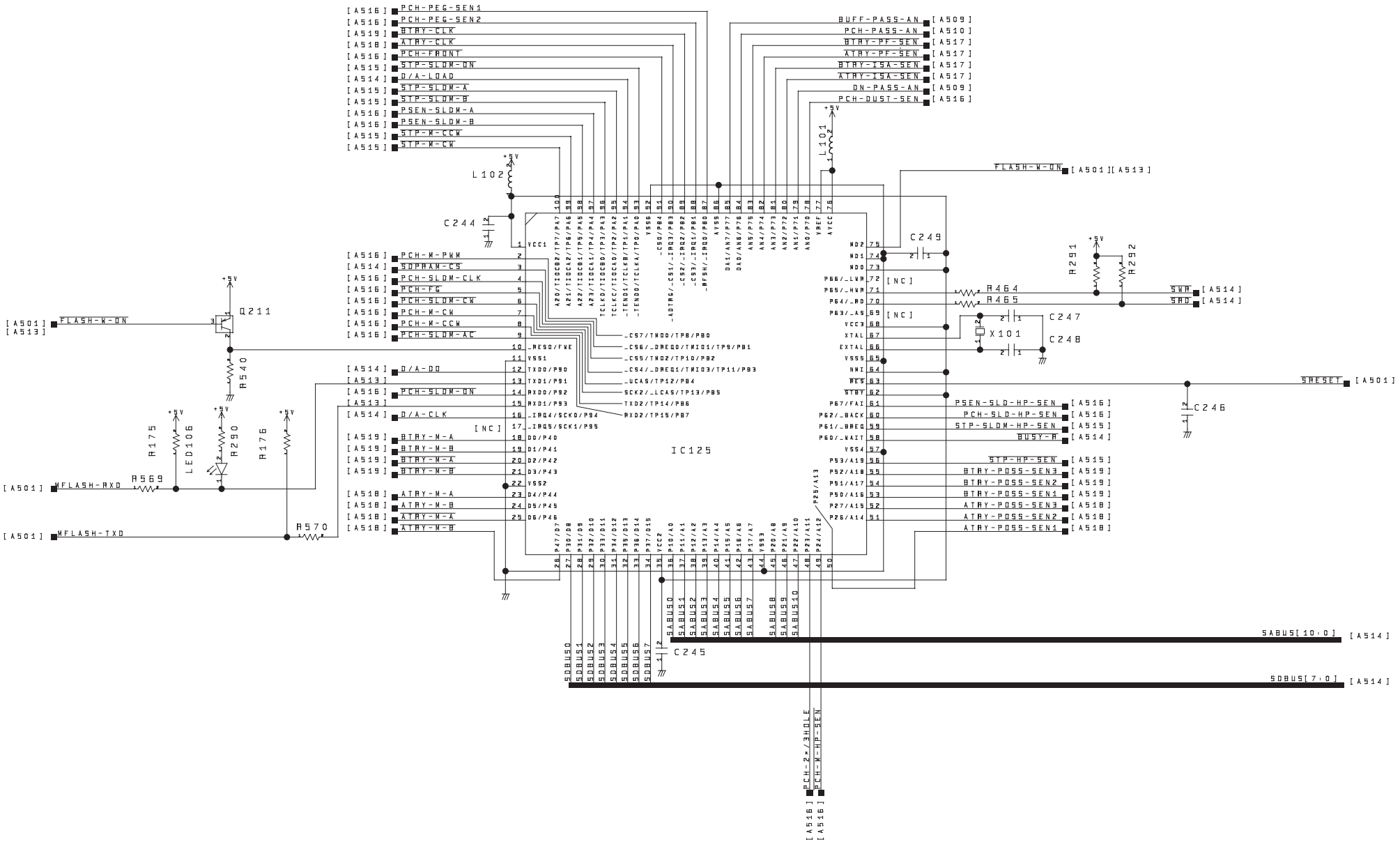


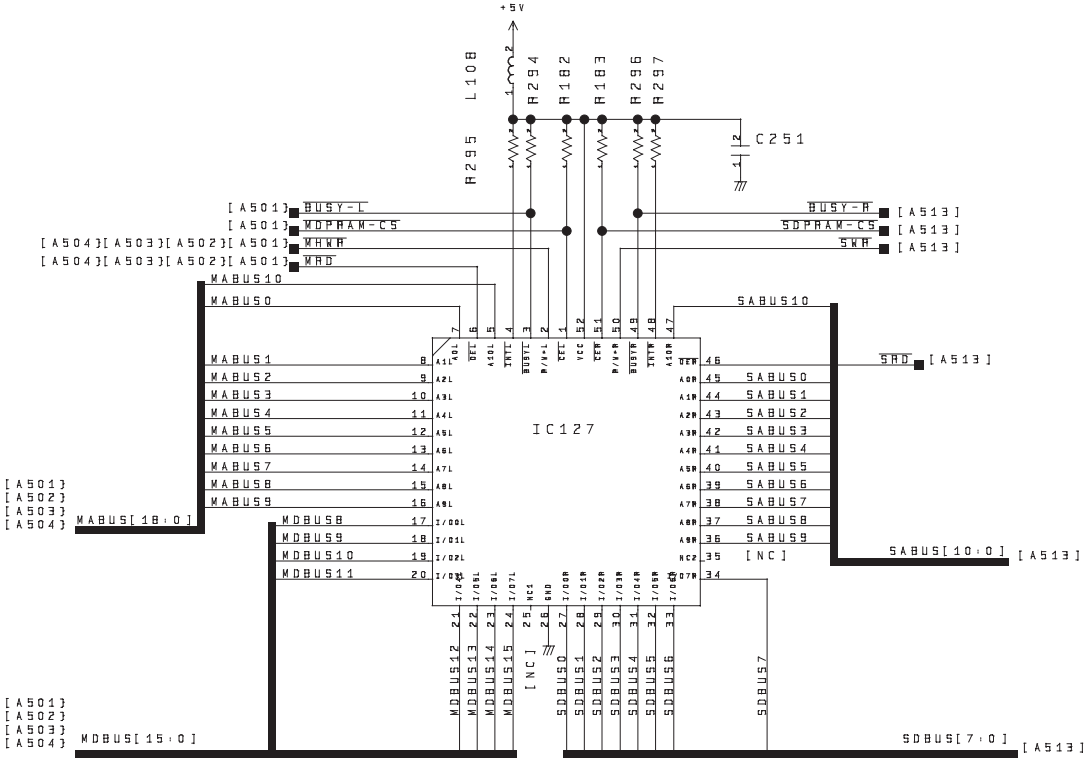


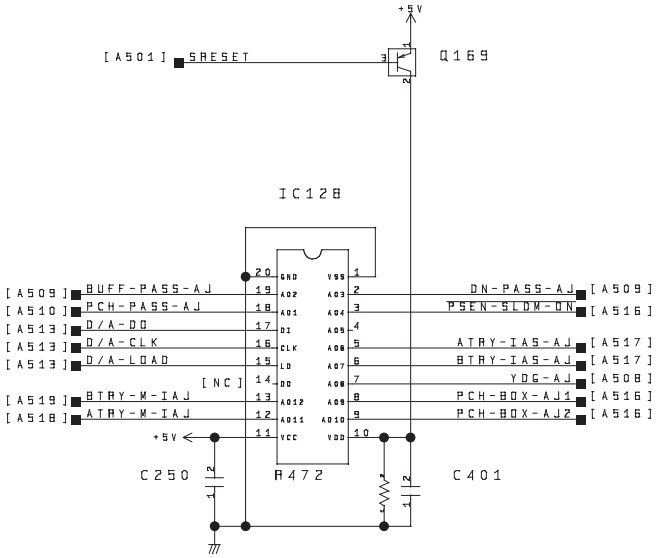
[A514] PCH-PASS-AJ
[A513] PCH-PASS-AN
[A501] PCH-PASS-SEN
[A509] PASS-SEN-REF
CP130
CP129
CP113
R392
R466
R467
R391
R390
C380
C381
IC148
J119
[A517] ATRY-PF
[A517] ATRY-IAS
[A501] IN-PASS-SEN
R171
R170
R388
C313
C312
[A503] FRONT-SW-OPEN
R168
R169
R243
C212
C211
[NC]
[A503] ALT-M-B
[A503] ALT-M-A
[A503] ALT-M-ON
[A503] [A506] [A511] POWER-DOWN
R158
IC157
R156
C140
IC104
FU107
[505mA]
[167mA]
C141
C115
ETH104
R154
R155
[1mm]
[B*]
[B]
[A*]
[A]
[0.4mm]
J108
[A501] UPPASS-SL-ON
[A517] ATRY-LED-K
[A505][A517] TRY-LED-A
[A502][A503] FAN-ON
[A503] PCH-FAN-ERR
[A503] TAILDWN-SL-ON
R372
IC118
R375
Q156
D141
R581
Q105
Q110
D111
R165
R164
C142
[1.5mm]
R545
D161
Q212
J117

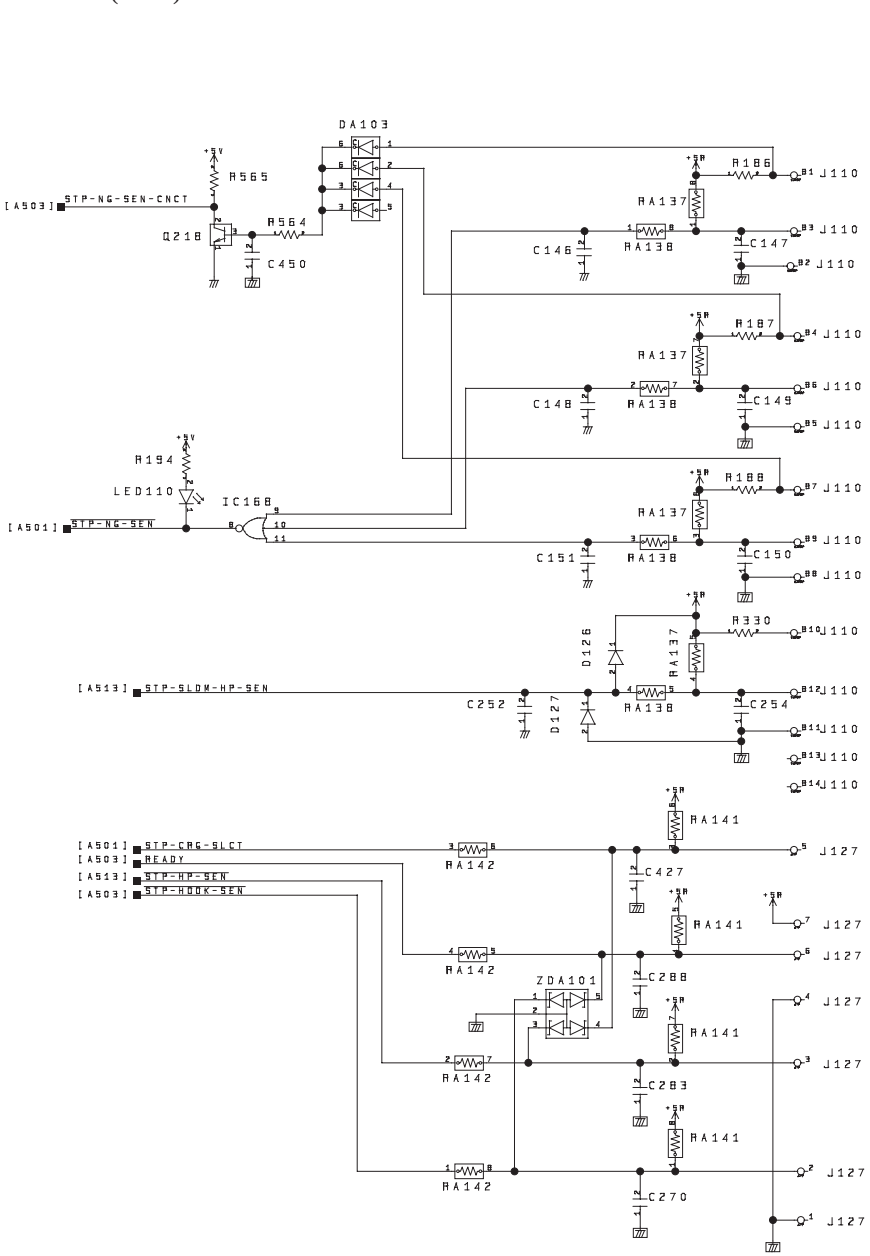


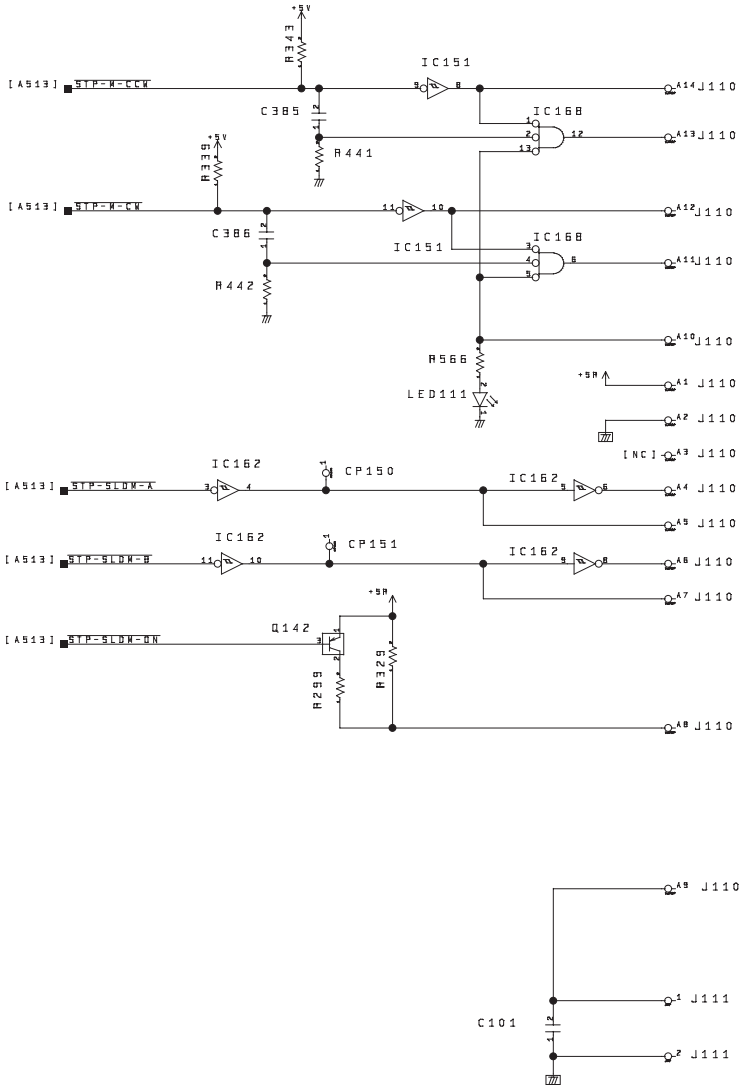

[A503] INS-CVR-SEN
[A504] INS-CLK
[A504] INS-DO
[A504] INS-DI
[A504] INS-EN
[A503] INS-PASS1-SEN
[A503] INS-PASS2-SEN
[A503] INS-U-ON
[A503] INSUP-SW-OPEN
[A503] INS-PASS3-SEN
[A502] INS-KILL
[A501] INS-M-FG
[A503] INS-M-ON
[A511] DOOR-24U
[A503] BUFF-M-ON
[A503] BUFF-M-AC
[A501] BUFF-M-A
[A501] BUFF-M-B
[A501] EXP-M-B
[A501] EXP-M-A
[A501] EXP-M-FG
[A501] EXP-M-ON
[A501] EXP-M-AC
J115
J120
RA124
RA125
RA118
RA123
R174
R270
R271
R272
R269
R263
R264
R266
R262
R382
R383
R384
C221
C223
C224
C225
C226
C227
C228
C229
C230
C231
C232
C233
C234
C308
C311
IC117
IC130
IC143
Q139
Q140
Q141
Q146
Q158
CP154
[1mm]
[3mm]
[1400mA]
[1000mA]
[100mA]
[1700mA]
[850mA]
[100mA]
[NC]
NC
+5R
+5U
+24U
+5V

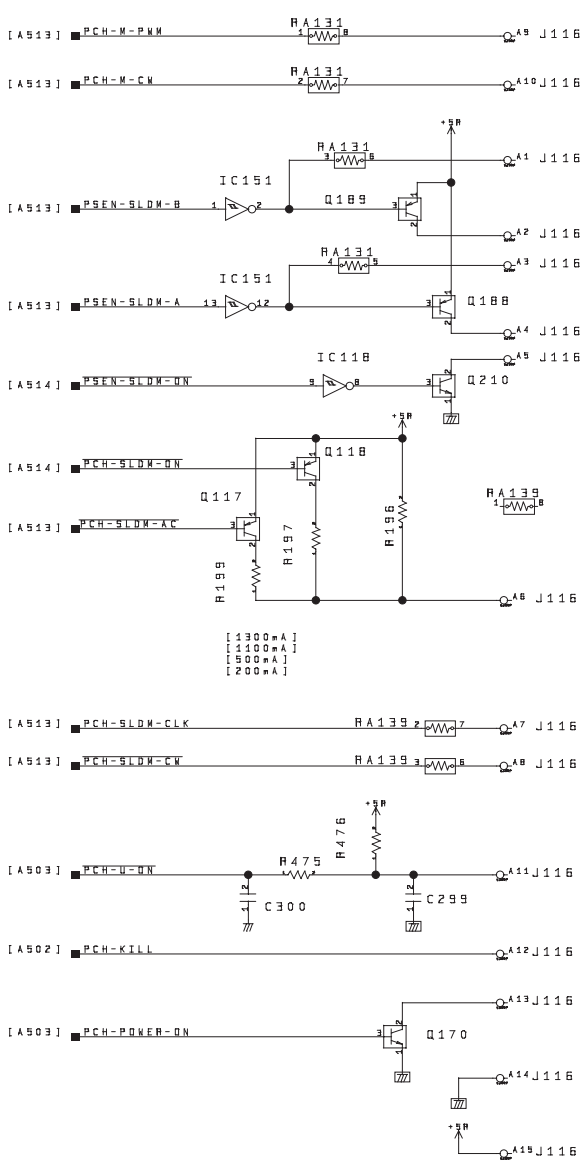


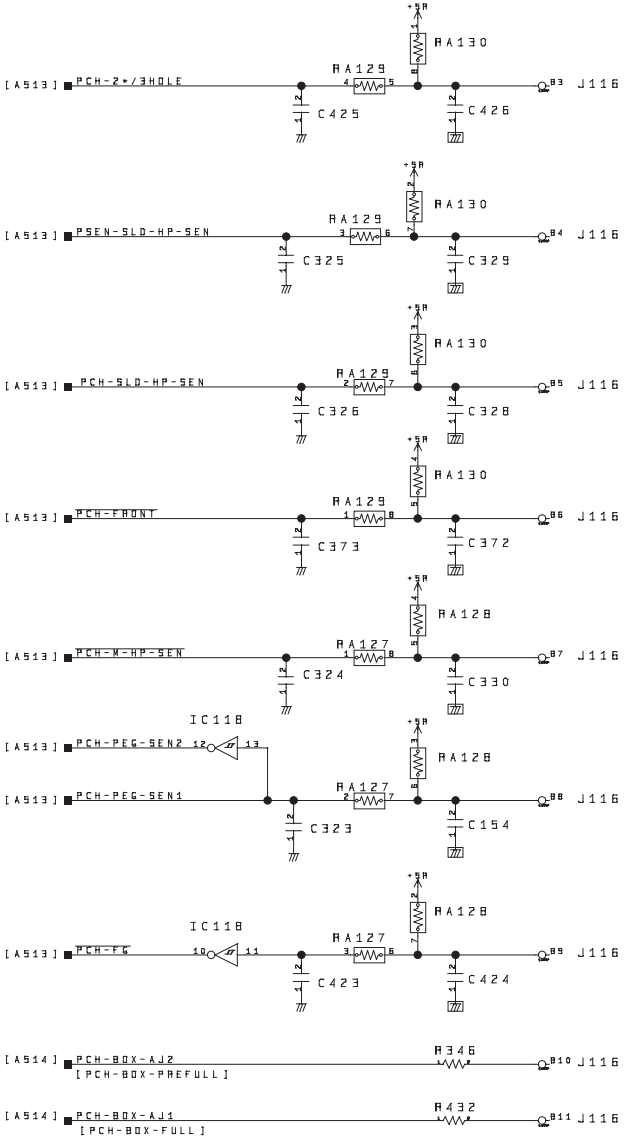

+5V
L108
R294
R182
R183
R296
R297
R295
C251
[A501] BUSY-L
[A501] MDPRAM-CS
[A504][A503][A502][A501] MWWR
[A504][A503][A502][A501] MRD
BUSY-R [A513]
SDPRAM-CS [A513]
SWR [A513]
MABUS10
MABUS0
MABUS1
MABUS2
MABUS3
MABUS4
MABUS5
MABUS6
MABUS7
MABUS8
MABUS9
[A501] [A502] [A503] [A504] MABUS[18:0]
MDBUS8
MDBUS9
MDBUS10
MDBUS11
IC127
SABUS10
SABUS50
SABUS51
SABUS52
SABUS53
SABUS54
SABUS55
SABUS56
SABUS57
SABUS58
SABUS59
[NC]
SRD [A513]
SABUS[10:0] [A513]
MDBUS12
MDBUS13
MDBUS14
MDBUS15
[NC]
SDBUS0
SDBUS1
SDBUS2
SDBUS3
SDBUS4
SDBUS5
SDBUS6
SDBUS7
[A501] [A502] [A503] [A504] MDBUS[15:0]
SDBUS[7:0] [A513]

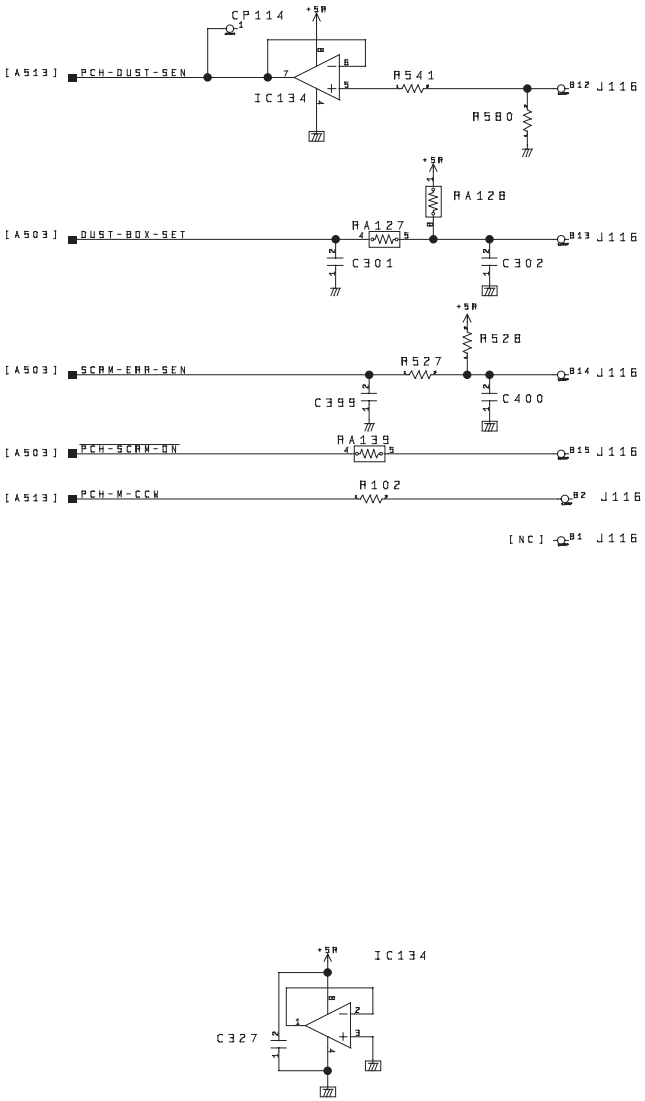

+5V
[A501] SRESET
Q169
IC128
[A509] BUFF-PASS-AJ
[A510] PCH-PASS-AJ
[A513] D/A-DO
[A513] D/A-CLK
[A513] D/A-LOAD
[NC]
[A519] BTRY-M-IAJ
[A518] ATRY-M-IAJ
DN-PASS-AJ [A509]
PSEN-SLDM-ON [A516]
ATRY-IAS-AJ [A517]
BTRY-IAS-AJ [A517]
YDG-AJ [A508]
PCH-BOX-AJ1 [A516]
PCH-BOX-AJ2 [A516]
+5V
C250
R472
C401

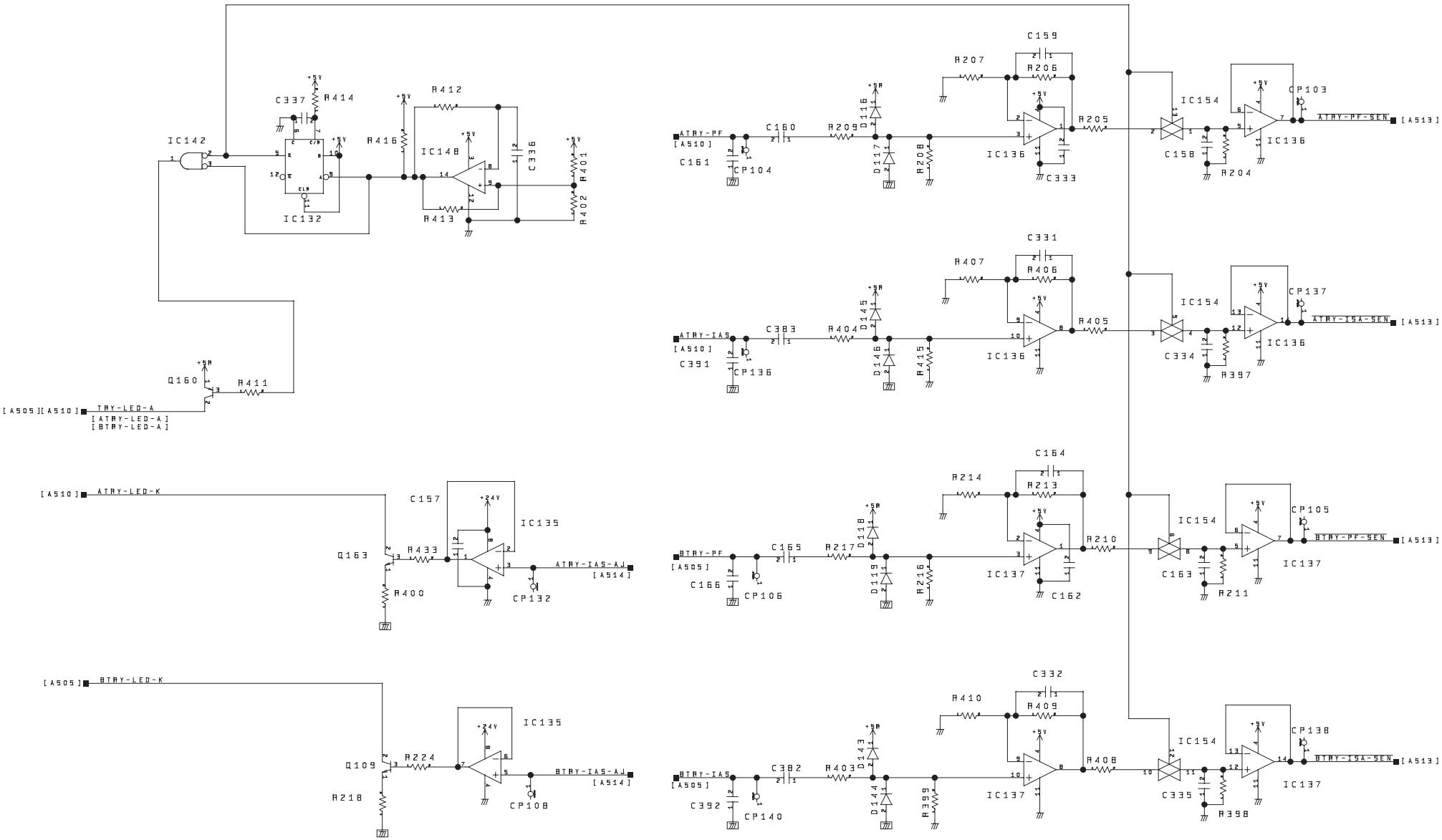


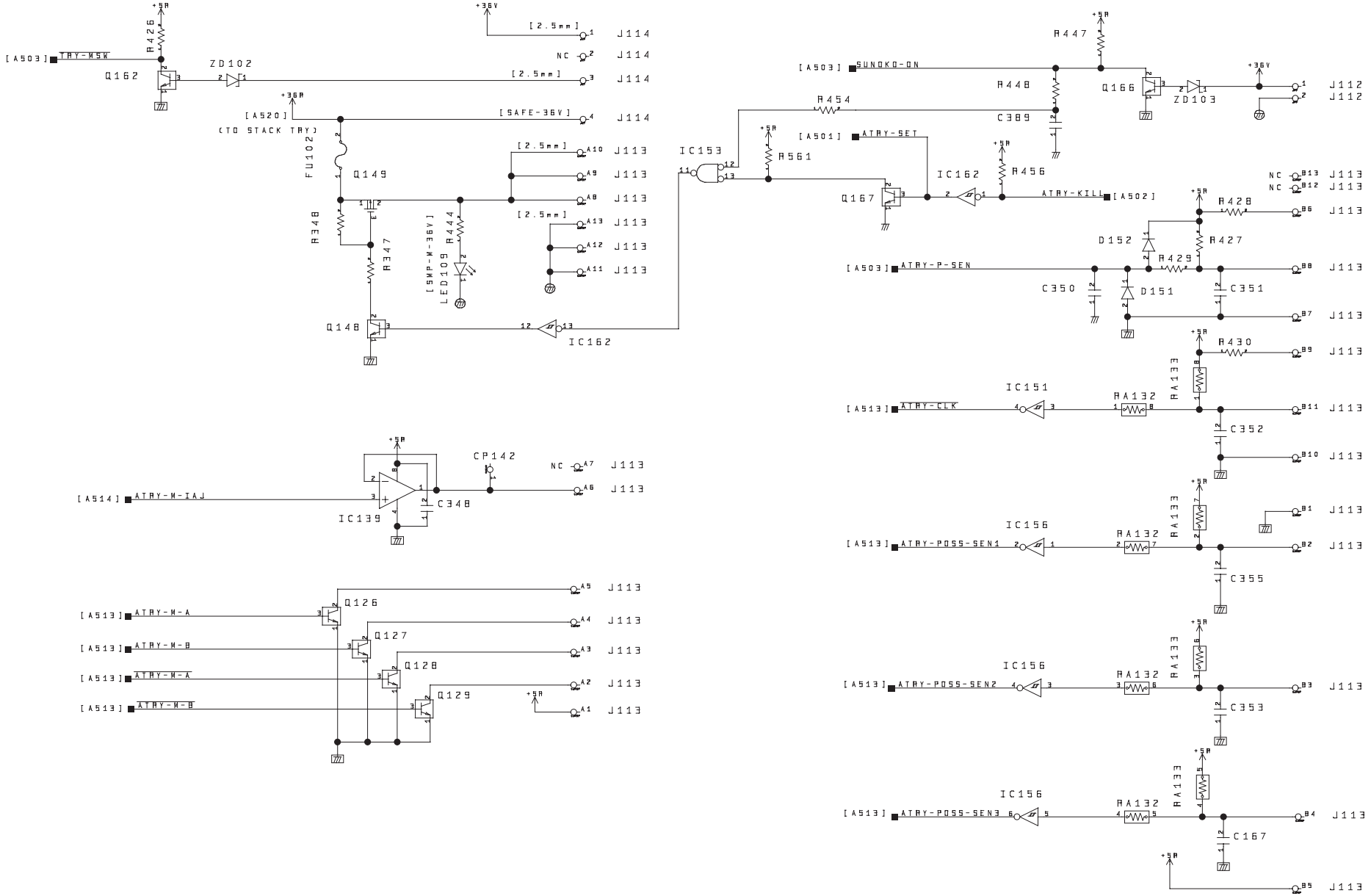



[A513] PCH-M-PWM
[A513] PCH-M-CW
[A513] PSEN-SLDM-B
[A513] PSEN-SLDM-A
[A514] PSEN-SLDM-ON
[A514] PCH-SLDM-ON
[A513] PCH-SLDM-AC
[A513] PCH-SLDM-CLK
[A513] PCH-SLDM-CW
[A503] PCH-U-ON
[A502] PCH-KILL
[A503] PCH-POWER-ON
IC151
IC118
Q189
Q188
Q210
Q118
Q117
Q170
R475
R476
R197
R196
R199
C300
C299
[1300mA]
[1100mA]
[500mA]
[200mA]
J116

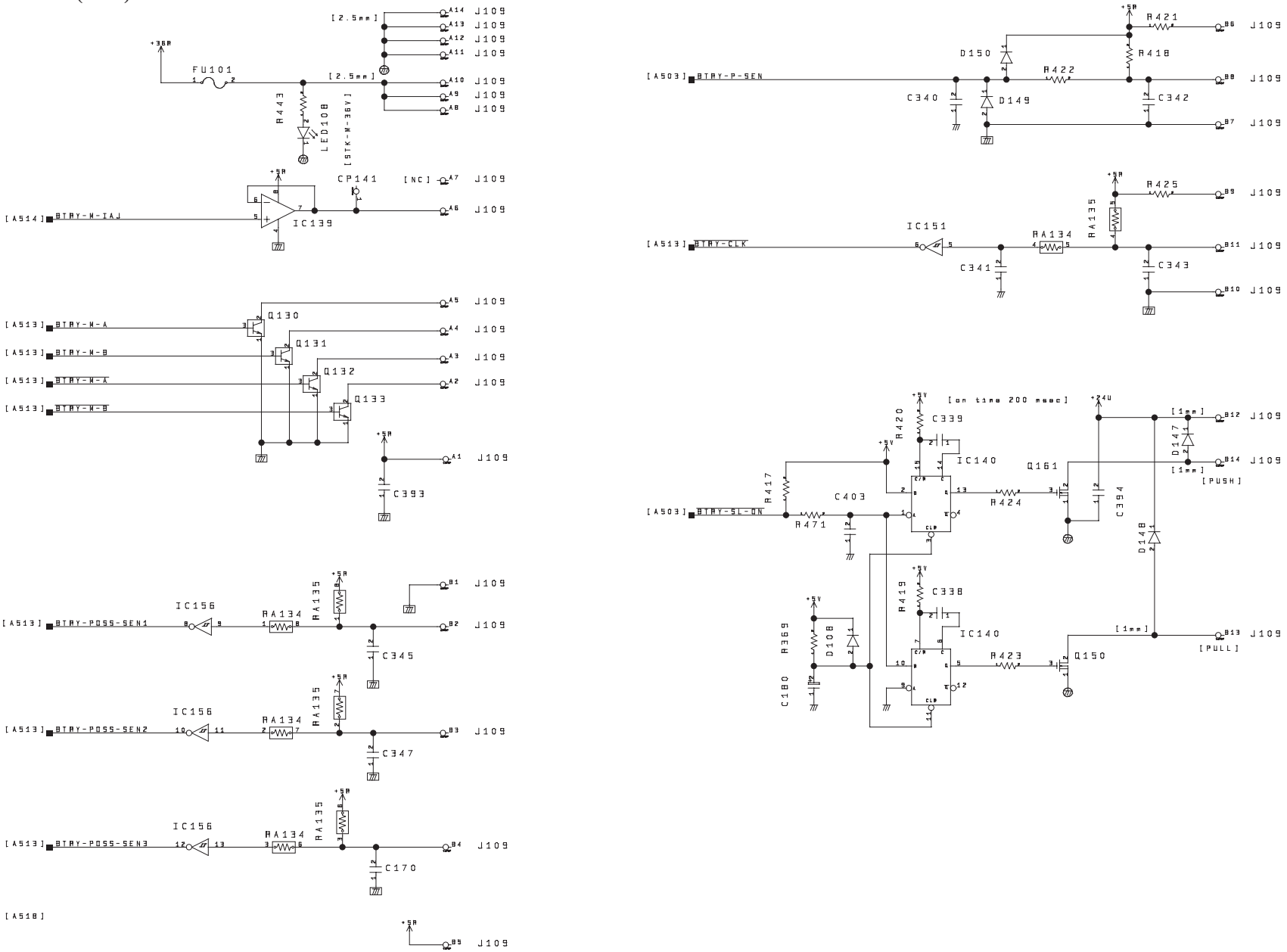

[A513] PCH-2ND/3RDHOLE
[A513] PSEN-SLD-HP-SEN
[A513] PCH-SLD-HP-SEN
[A513] PCH-FRONT
[A513] PCH-M-HP-SEN
[A513] PCH-PEG-SEN2
[A513] PCH-PEG-SEN1
[A513] PCH-FG
[A514] PCH-BOX-AJ2
[PCH-BOX-PREFULL]
[A514] PCH-BOX-AJ1
[PCH-BOX-FULL]
IC118
R346
R432
C425
C426
C325
C329
C326
C328
C373
C372
C324
C330
C323
C154
C423
C424
J116

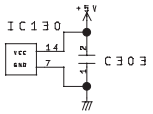

[A513] PCH-DUST-SEN
[A503] DUST-BOX-SET
[A503] SCAM-ERR-SEN
[A503] PCH-SCAM-ON
[A513] PCH-M-CCW
[NC]
CP114
IC134
R541
R580
R528
R527
R102
C301
C302
C399
C400
C327
J116

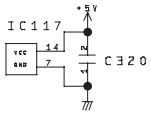


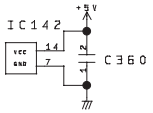


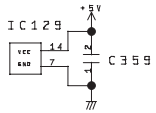
Finisher Controller PCB (19/20)

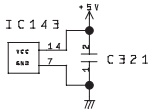


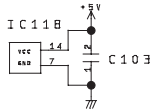


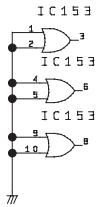


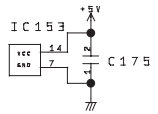


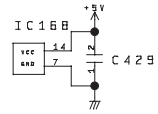


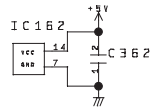


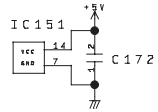


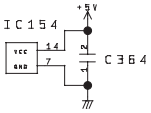


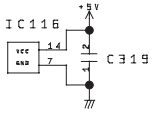


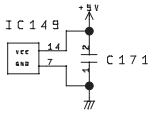


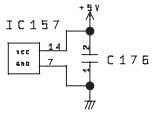


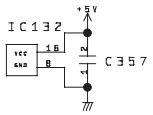


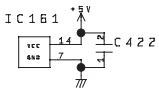


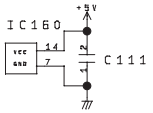


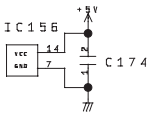


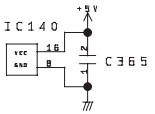


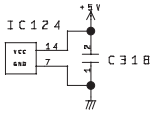


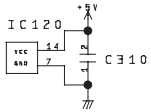


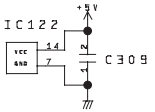




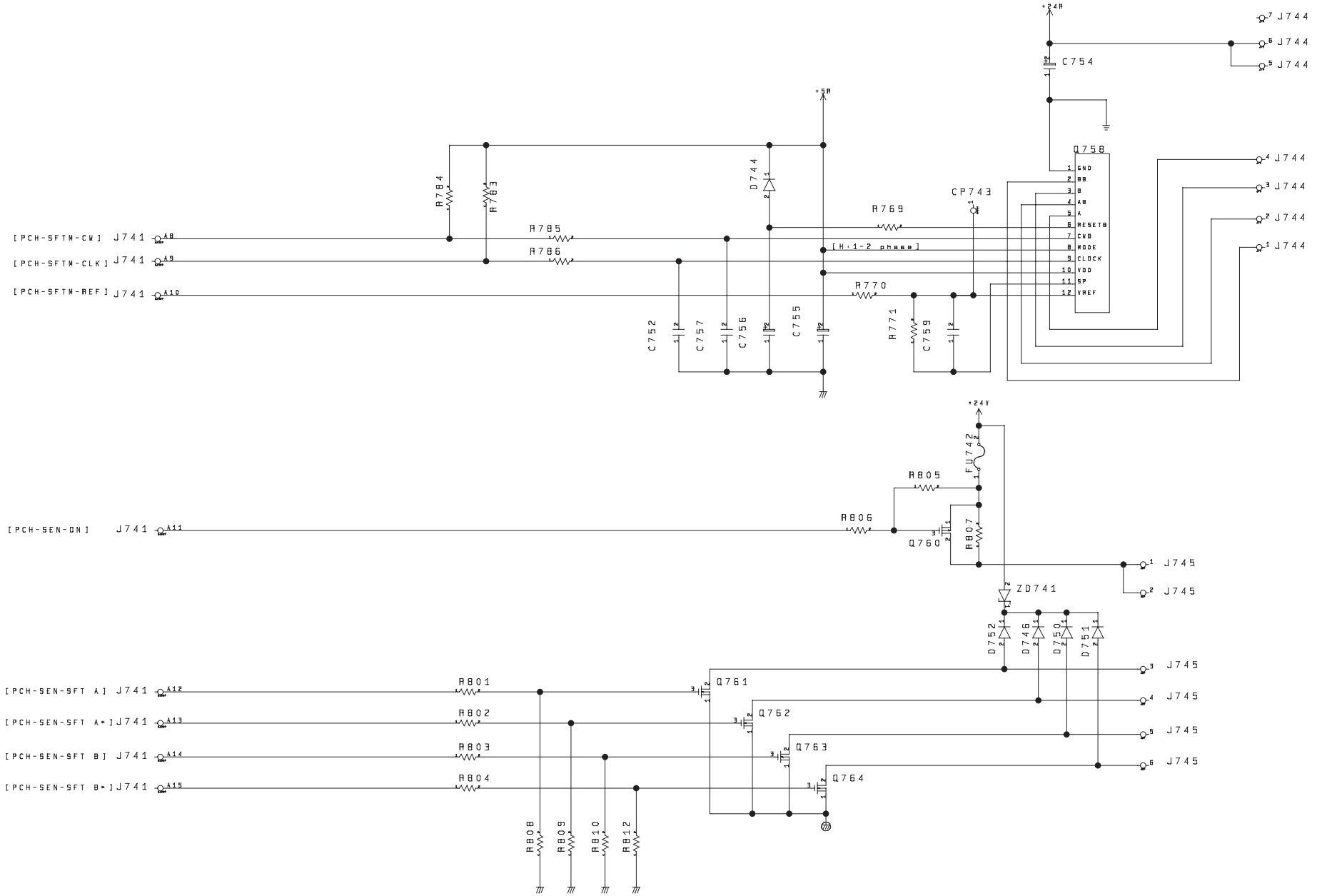




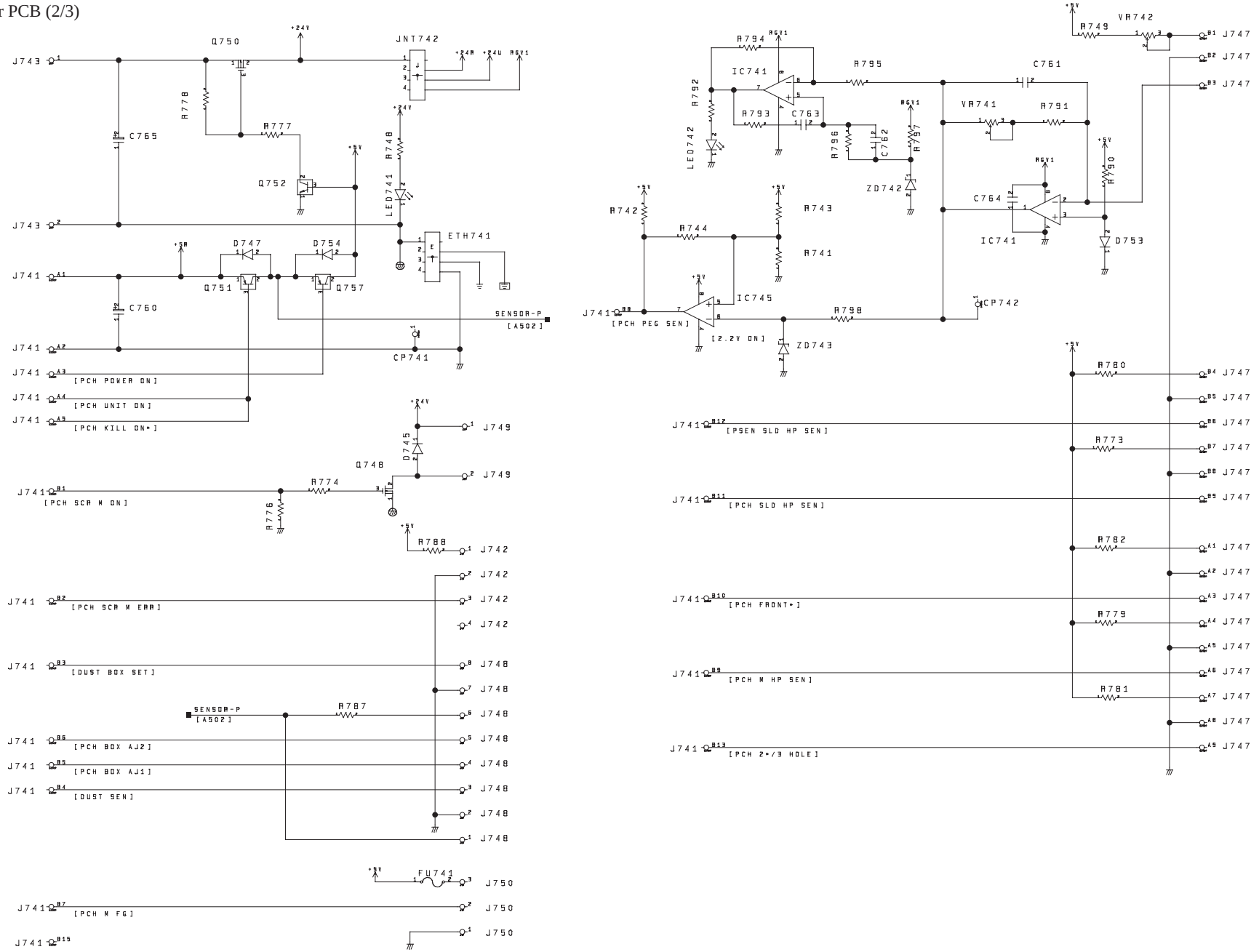


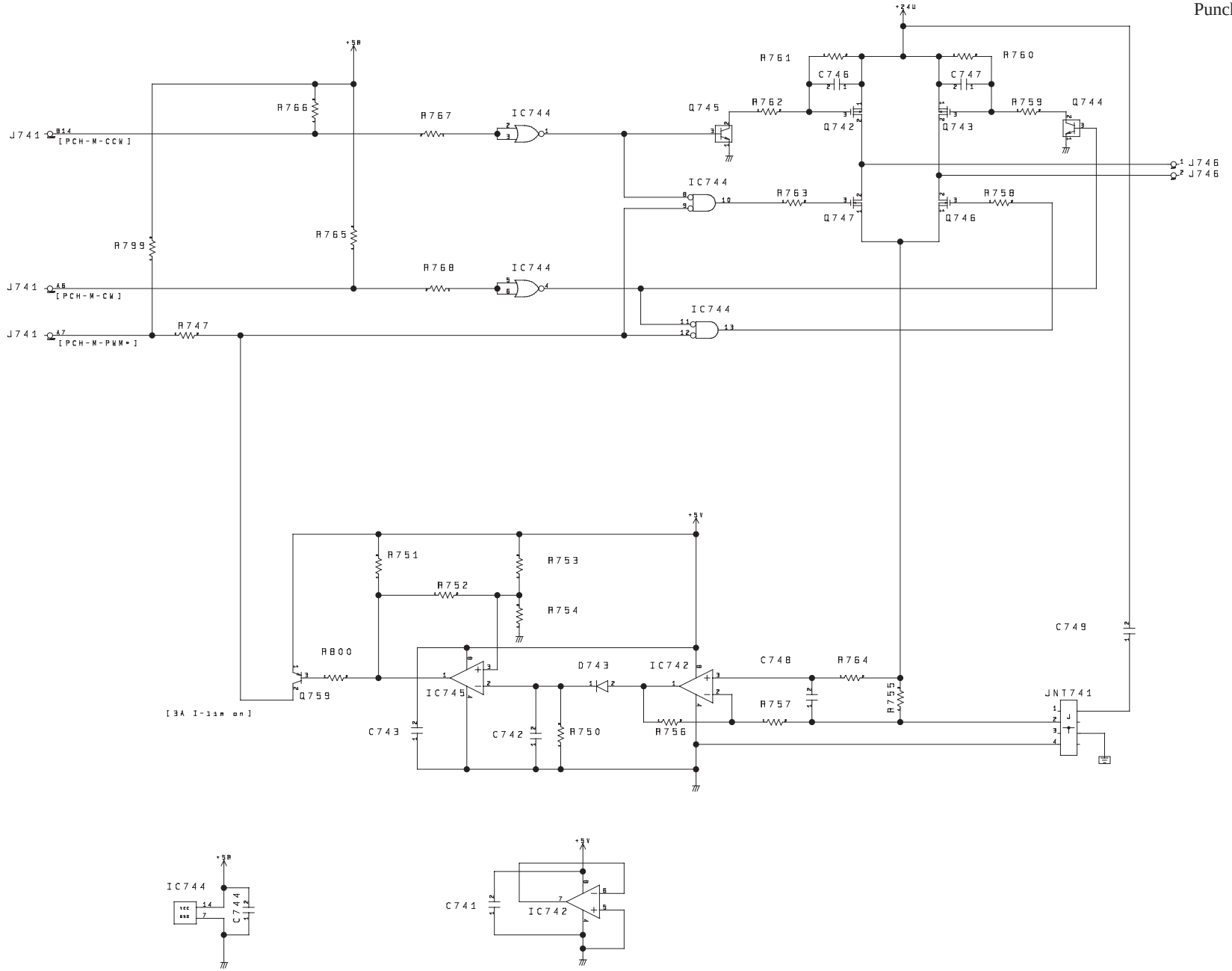


Punch Driver PCB (1/3)

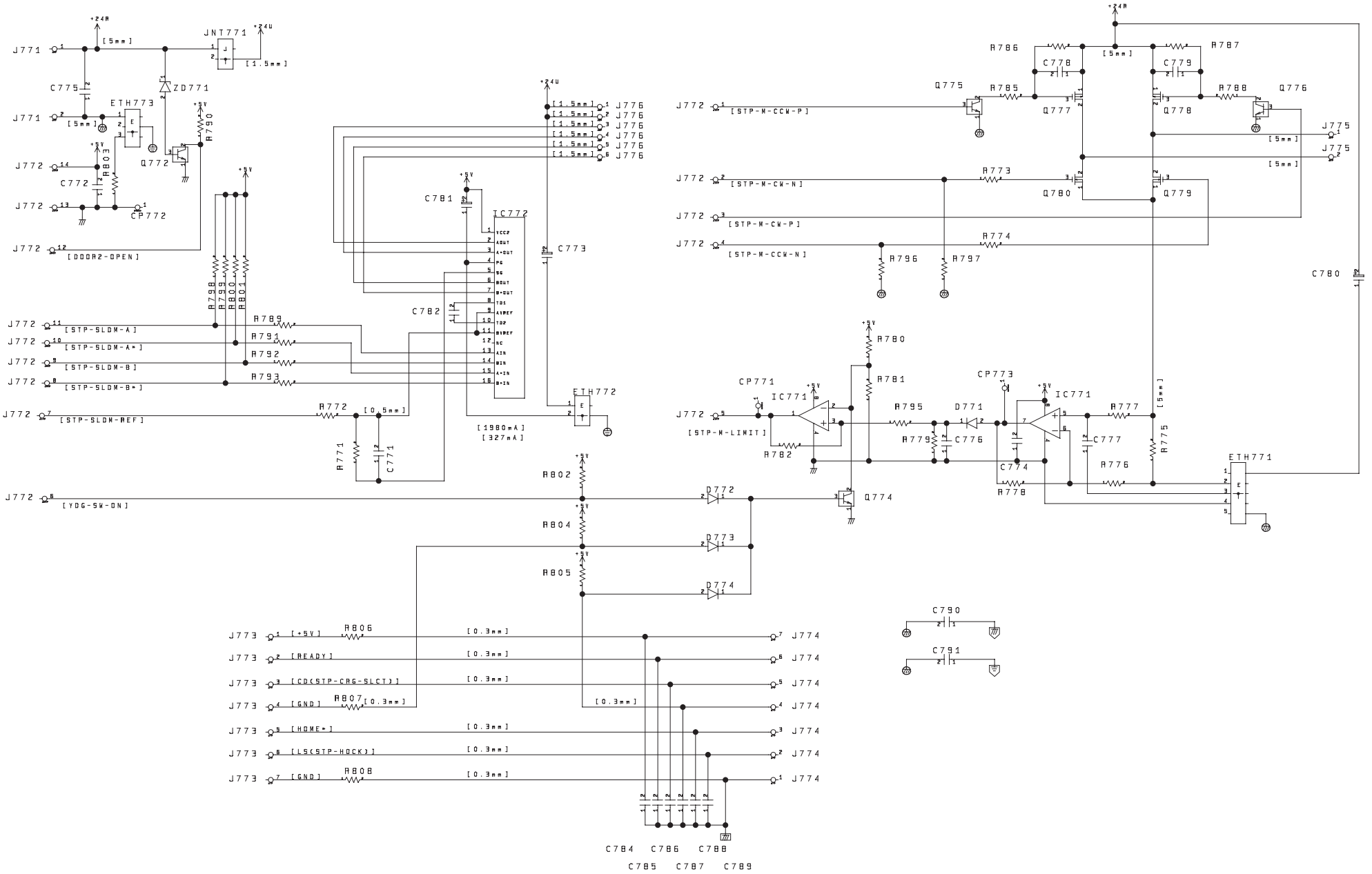


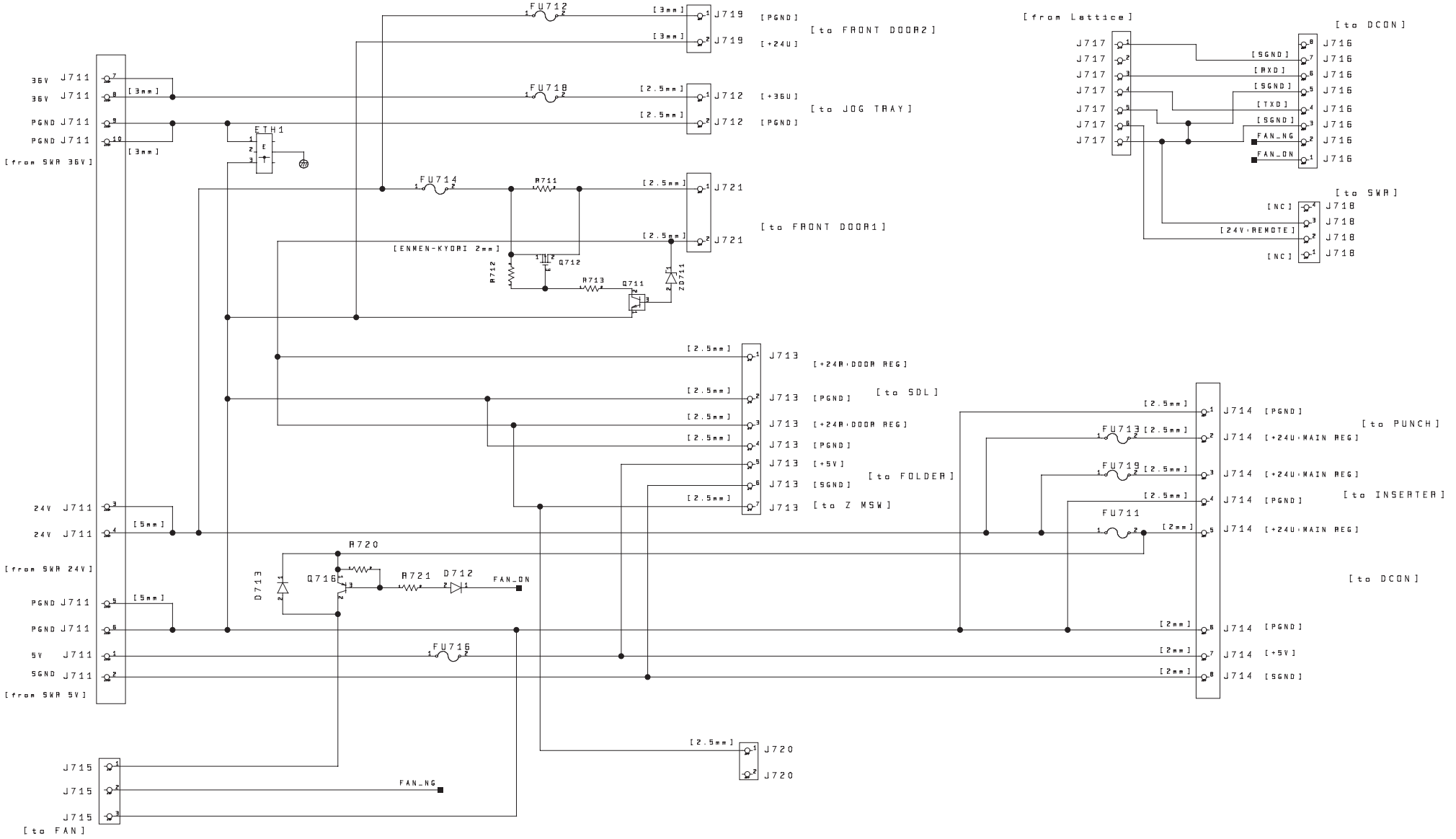
Punch Driver PCB (2/3)

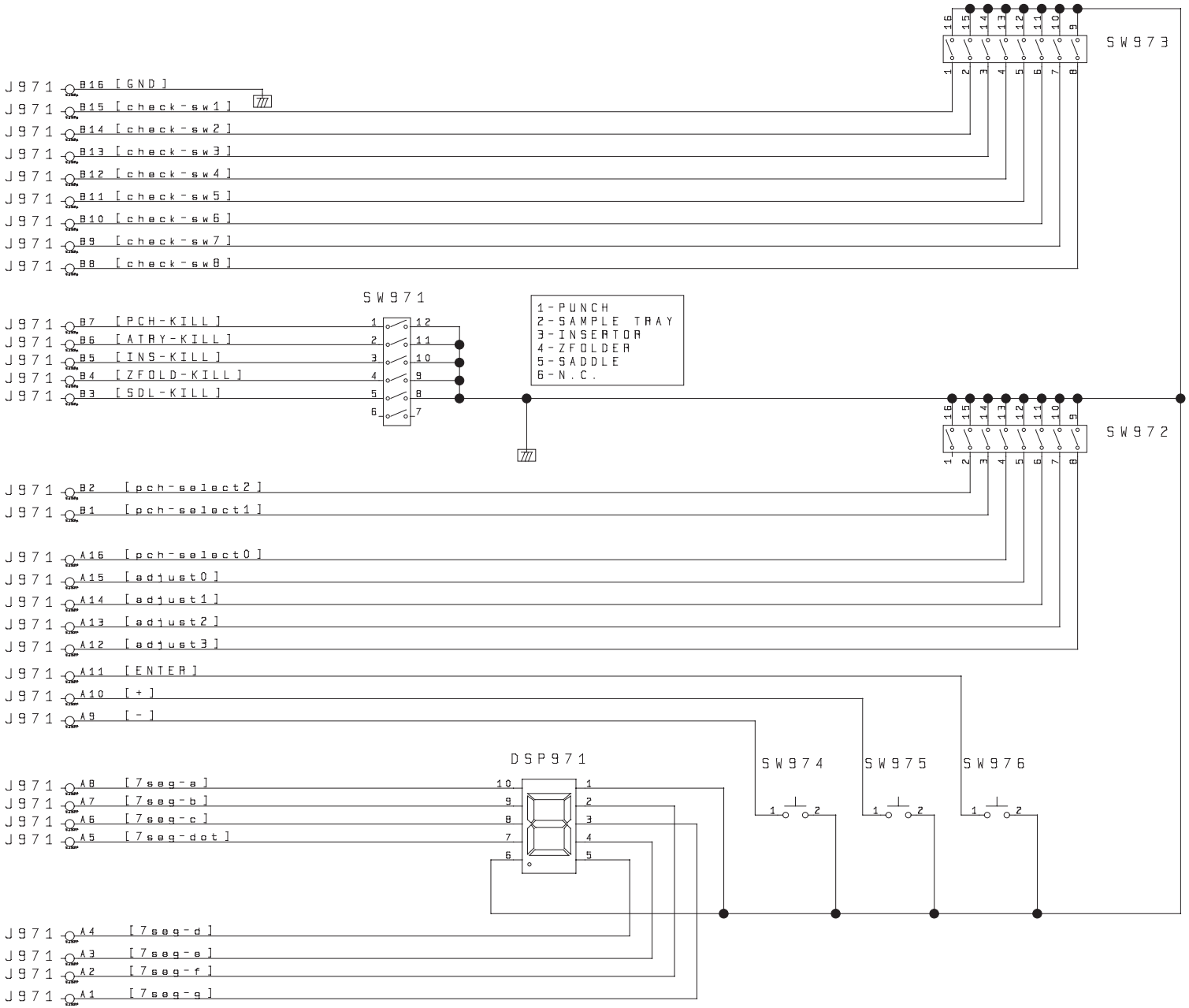



J741
[PCH-M-CCW]
[PCH-M-CW]
[PCH-M-PWM]
R766
R767
R765
R799
R768
R747
IC744
Q745
Q742
Q743
Q744
Q747
Q746
R761
R760
R762
R759
R763
R758
C746
C747
J746
R751
R753
R752
R754
R800
Q759
IC745
D743
IC742
C748
R764
R755
R757
R756
C749
JNT741
C743
C742
R750
C744
C741

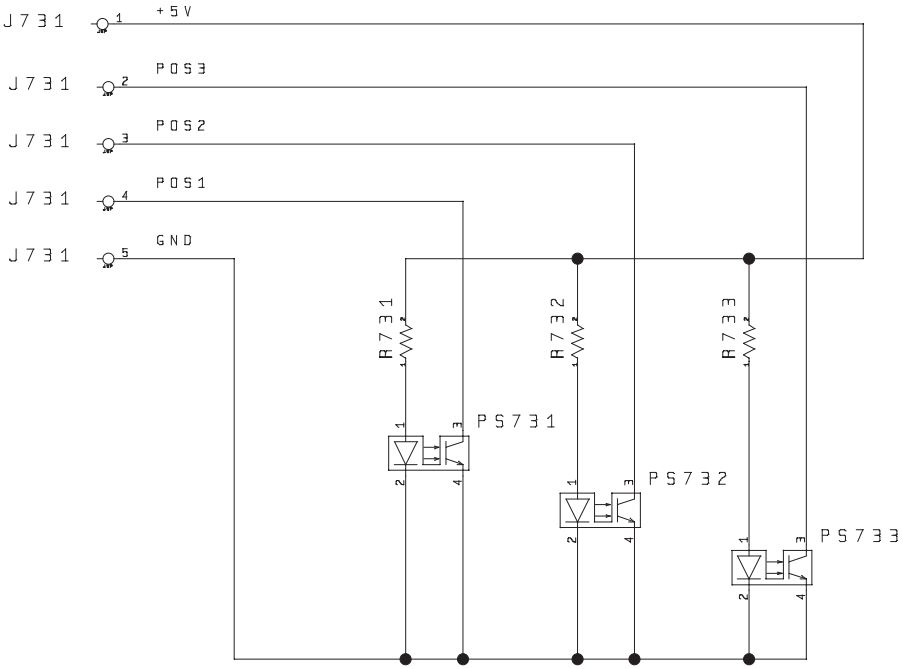
6 STAPLER DRIVER PCB




[from Lattice]
[to DCON]
[to SWR]
[to FRONT DOOR2]
[to JOG TRAY]
[to FRONT DOOR1]
[to SDL]
[to FOLDER]
[to Z MSW]
[to PUNCH]
[to INSERTER]
[to DCON]
[to FAN]
[from SWR 36V]
[from SWR 24V]
[from SWR 5V]
[ENMEN-KYORI 2mm]
FU712
FU718
FU714
FU713
FU719
FU711
FU716
ETH1
R711
R712
R713
R720
R721
Q712
Q711
Q716
D712
D713
ZD711
FAN_NG
FAN_ON
[PGND]
[+24U]
[+36U]
[+24R·DOOR REG]
[+5V]
[SGND]
[NC]
[24V·REMOTE]
[RXD]
[TXD]
[+24U·MAIN REG]
[2mm]
[2.5mm]
[3mm]
[5mm]



9 AREA SENSOR PCB

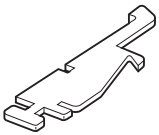
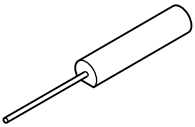
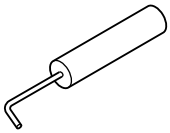


10 SOLVENTS AND OILS LIST

No.	Name	Uses	Composition	Remarks
1	Alcohol	Cleaning; e.g., glass, plastic, rubber (external covers).	Fluorine-family hydrogen carbon, alcohol, surface activating agent	• Do not bring near fire. • Procure locally. • IPA (isopropyl alcohol)
2	Lubricant	Driving parts, friction parts	Silicone oil	• CK-0551 (20g)

11 SPECIAL TOOLS

You will need the following special tools when servicing the machine in addition to the standard tools set.

No.	Tool name	Tool No.	View	Rank	Remarks
1	Door Swich Actuator	TKN-0093		A	
2	Tester Extension pin	FY9-3038-000		A	For making electrical checks; i.e., serving as an attachment to a meter.
3	Tester Extention pin (L-shaped tip)	FY9-3039-000		A	For making electrical checks; i.e., serving as an attachment to a meter.

Rank:
A: Each service person is expected to carry one.
B: Each group of or so sevice persons is expected to carry one.
C: Each workshop is expected to keep one.

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