OKI

OKIPAGE 16n
LED Page Printer

Troubleshooting Manual
with Component Parts List

Approval

All specifications are subject to change without notice.

CONTENTS

1. OUTLINE

This manual has been written to provide guidance for troubleshooting of the OKIPAGE 16n Printer (primarily for its printed circuit boards), on an assumption that the reader is knowledgeable of the printer. Read the maintenance manual for this printer P/N 40029801TH (ODA) and/or P/N 40029803TH (OEL) if necessary.

Notes:

1. The power supply board containing a high voltage power supply is dangerous. From the viewpoint of the safety standards, the local repairing of a defective board is not allowed. Thus, the objects to be locally repaired as a result of troubleshooting are switches and fuses.
2. Replacement of CPU (MHM2029K) is not recommended. If CPU is founded to be defective, board replacement is suggested.

2. TOOLS

For troubleshooting the printer, the tools listed below may be needed in addition to general maintenance tools.

Tool	Remarks
Extension kit	4YA4046-1667G1
Connector extractor tool	4PP4076-5395P1
Oscilloscope	Frequency response 100 MHz or higher
Soldering iron	A slender tip type, 15-20 Watt

3. CIRCUIT DESCRIPTION

3.1 Outline

The control board controls the reception of data transferred through a host I/F and processes command analysis, bit image development, raster buffer read. It also controls the engine and the operator panel. Its block diagram is shown in Fig. 3-1.

(1) Reception control
The OKIPAGE 16n has one centronics parallel I/F port .
When optional PostScript board is installed, the printer is provided with one LocalTalk serial I/F port. One of the two I/F ports which receives data first can be used automatically.
The other I/F port outputs a busy state.
The centronics parallel I/F port can specify the following item when set by the control panel:

PARALLEL SPEED: HIGH/MEDIUM
BI-DIRECTION : ENABLE/DISABLE
I-PRIME : OFF/ON

An interface task stores all data received from the host into a receive buffer first.

(2) Command analysis processing
The OKIPAGE 16n has the following emulation mode.

Laser Jet Series IV : Hewlett Packard
Proprinter III XL : IBM
FX : EPSON
PostScript Level 2 : Adobe (Only when the PostScript board is installed additionally.)

An edit task fetches data from the receive buffer, analizes commands, and reconstructs the data in such a way that print data are aligned from up to down and from right to left; then it writes the resultant data into a page buffer with such control data as print position coordinate, font type, etc. added.

(3) Font Processing
When one page editing is finished, a developing task makes an engine start and fetches data from the page buffer synchronizing with a printing operation; then it developes the fetched data to a bit map as referring to data from a character generator, and writes the resultant data into the raster buffer (of band buffer structure).

(4) Raster buffer read.
As controlling the engine operation, an engine task sends data from the raster buffer to the LED head.

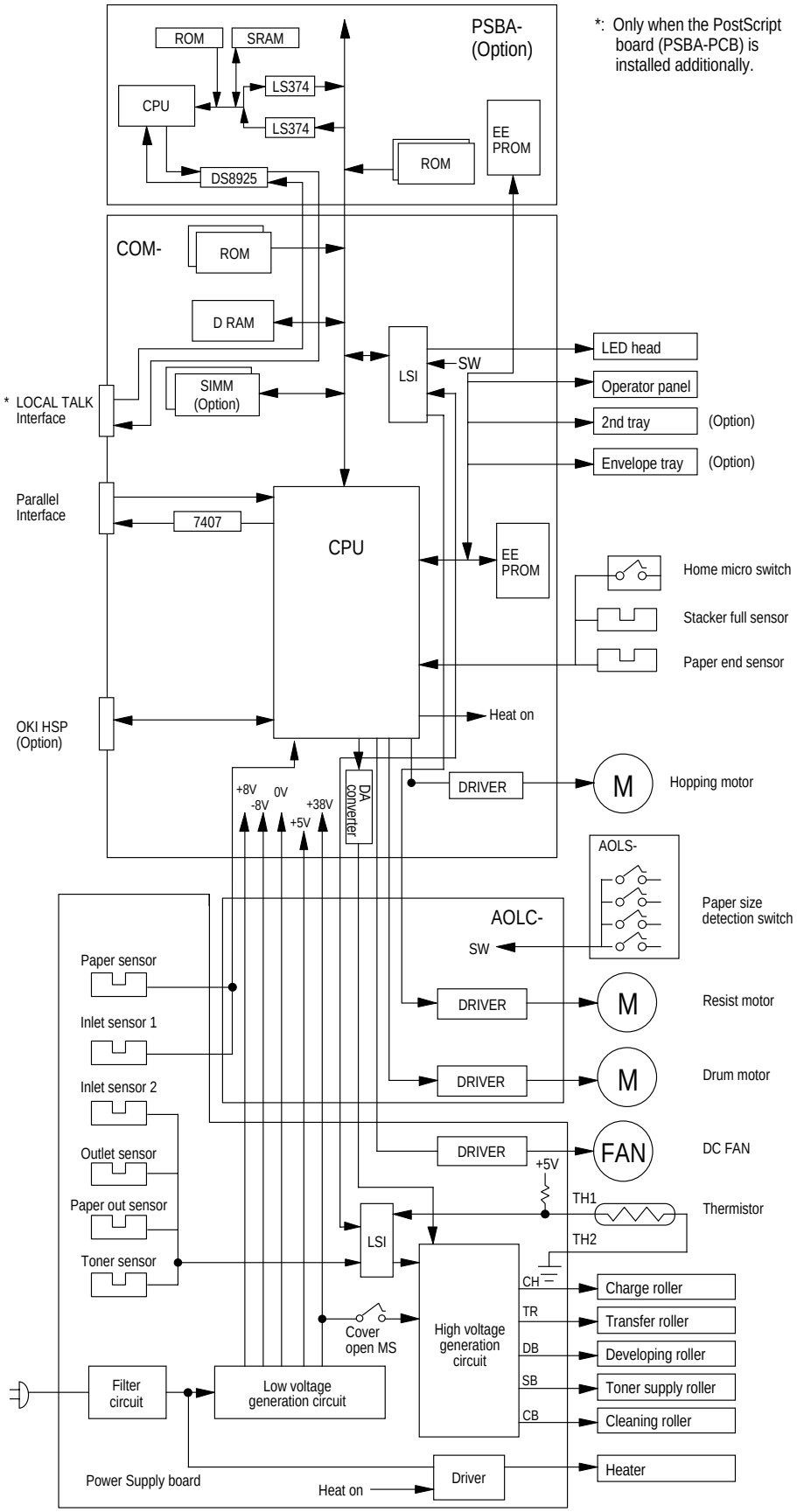


Figure 3-1 Block Diagram

3.2 CPU and Memory

(1) CPU (MHM2029-004K-37)
CPU core : RISC CPU (MIPS R3000 compatible)
CPU clock : 31.9488 MHz
Data bus width : Exterior 32 bits, Interior 32 bits

(2) ROM (HP LaserJet IV emulation)
ROM capacity : 4 Mbytes (16-Mbit mask ROM two pieces)
ROM type : 16 Mbits (1M x 16 bits)
Access time : 100 ns

(3) ROM (Adobe PostScript emulation) (Option)
ROM capacity : 4 Mbytes (16-Mbit mask ROM two pieces)
ROM type : 16 Mbits (1M x 16 bits)
Access time : 100 ns

(4) Resident RAM
RAM capacity : 2 Mbytes (4-Mbit D-RAM four pieces)
RAM type : 4 Mbits (512k x 8 bits)
Access time : 80 ns

(5) SIMM (When the PostScript board is installed, 4 Mbytes SIMM shall be installed at the time of installation.)
RAM capacity : Max. 32 Mbytes (1 Mbyte, 2 Mbytes, 4 Mbytes, 8 Mbytes, 16 Mbytes, 32 Mbytes)
Access time : 60 ns, 70 ns, 80 ns, 100 ns

The block diagram of CPU and memory circuits is shown in Fig. 3-2.

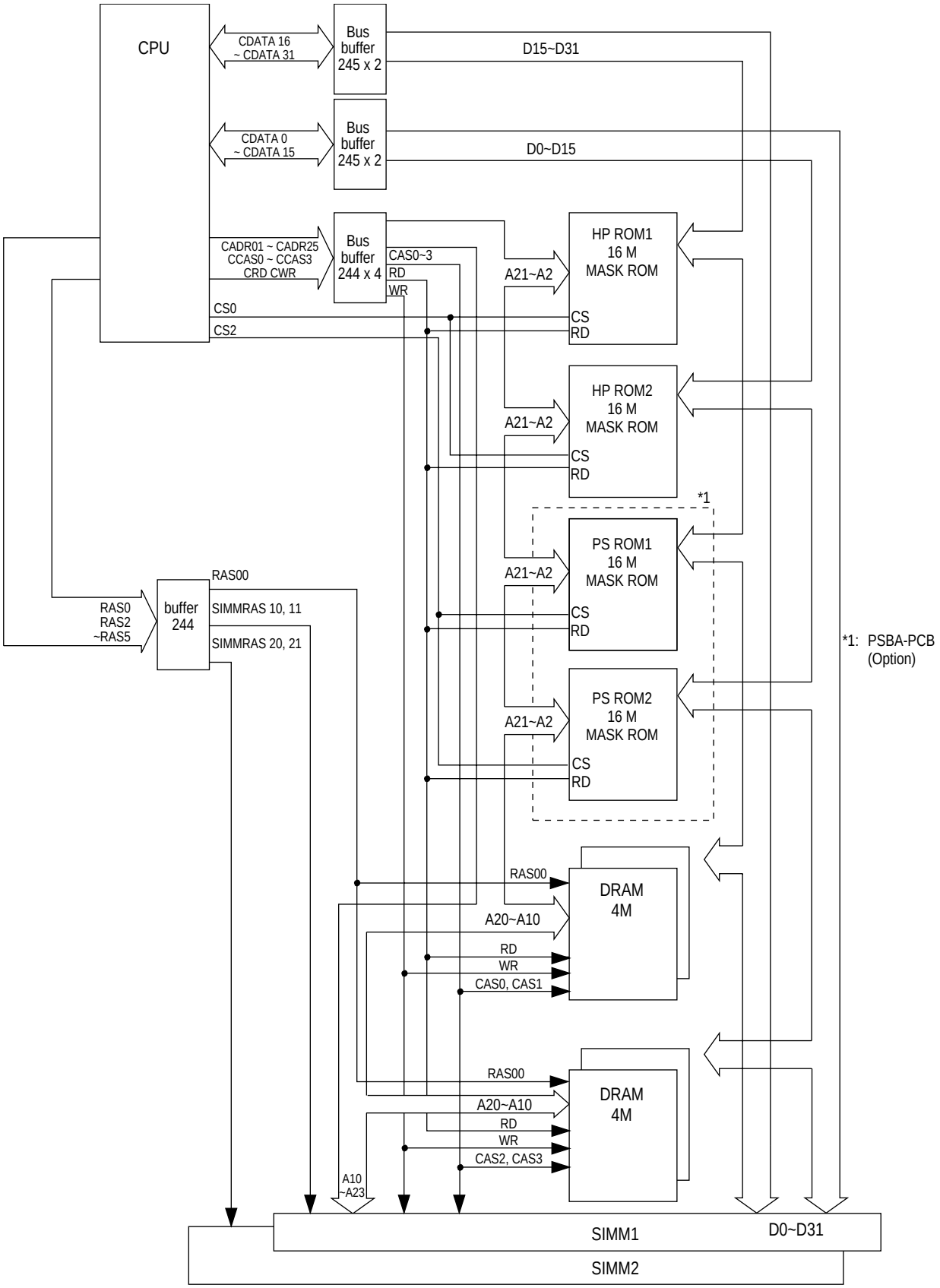
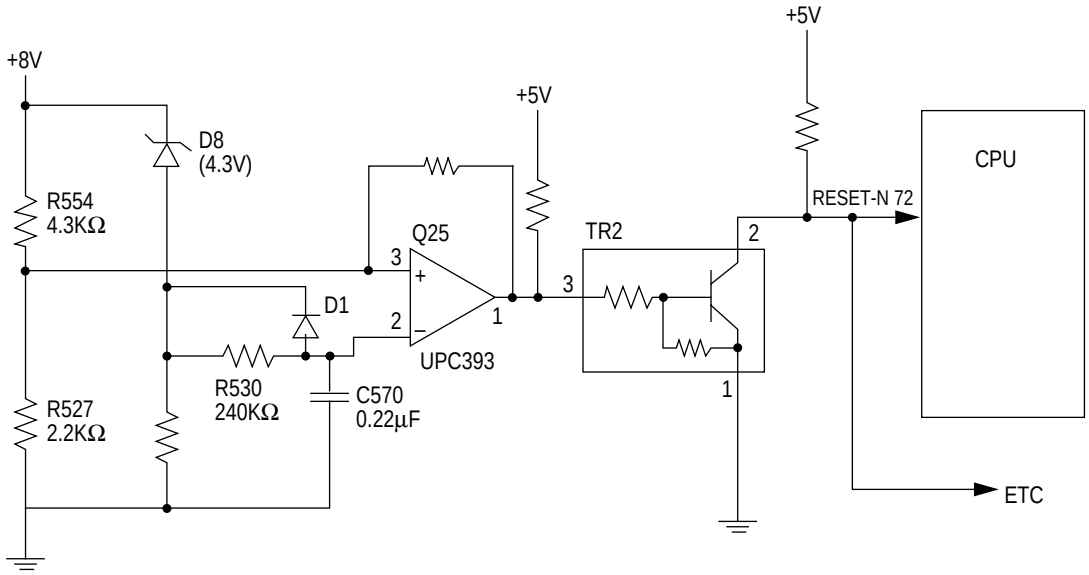
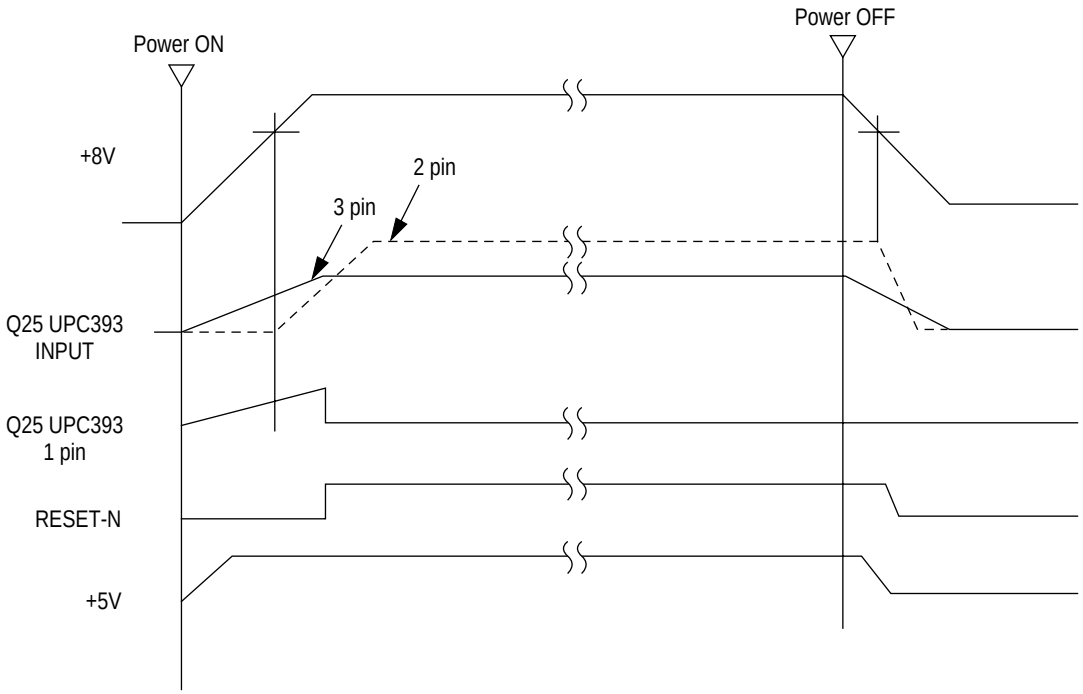


Figure 3-2 Block Diagram of CPU & Memory

3.3 Reset Control

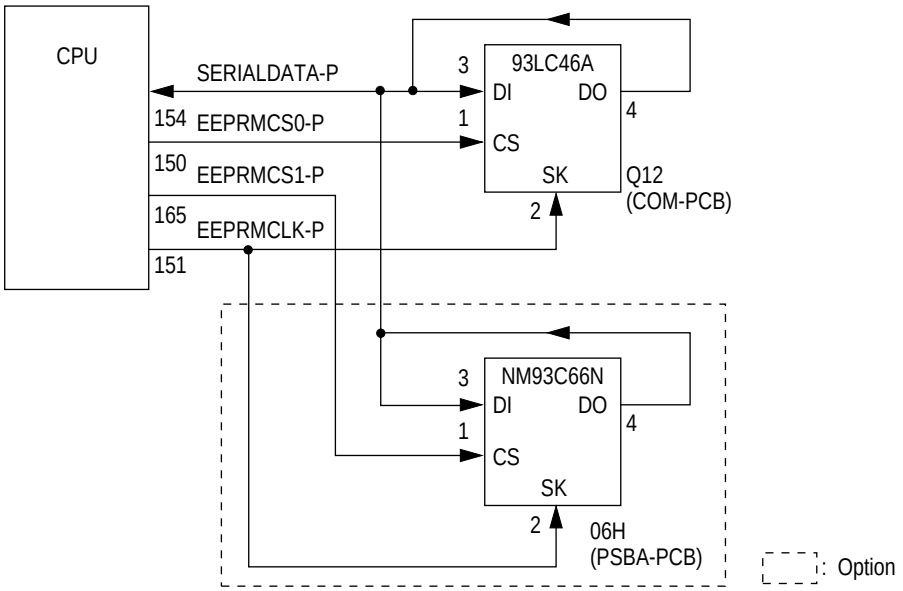
When power is turned on, a RESET-N signal is generated by the rising sequence of +8V power supply.





3.4 EEPROM Control

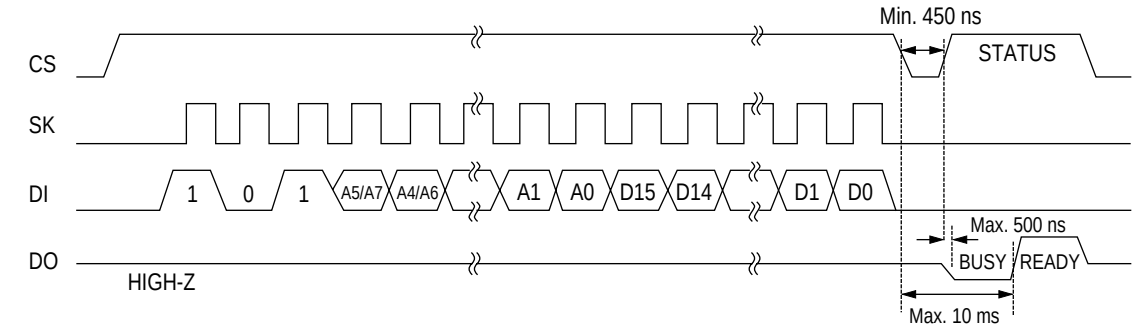
The 93LC46A is an electrical erasable/programmable ROM of 64-bit x 16-bit configuration and the NM93C66N is an electrical erasable/programmable ROM of 256-bit x 16-bit configuration. Data input to and output from the ROM are bidirectionally transferred in units of 16 bits through a serial I/O port (SERIALDATA-P) in serial transmission synchronized with a clock signal from the CPU.



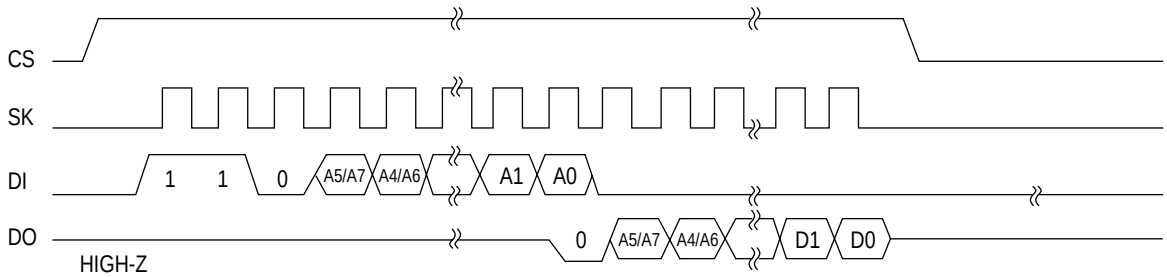
The EEPROM operates in the following instruction modes

Instruction	Start Bit	Operation Code	Address		Data
			93LC46A	NM93C66N	
Read (READ)	1	10	A5 to A0	A7 to A0	
Write Enabled (WEN)	1	00	11XXXX	11XXXXXX	
Write (WRITE)	1	01	A5 to A0	A7 to A0	D15 to D0
Write All Address (WRAL)	1	00	01XXXX	01XXXXXX	D15 to D0
Write Disabled (WDS)	1	00	00XXXX	00XXXXXX	
Erase	1	11	A5 to A0	A7 to A0	
Chip Erasable (ERAL)	1	00	10XXXX	10XXXXXX	

Write cycle timing (WRITE)

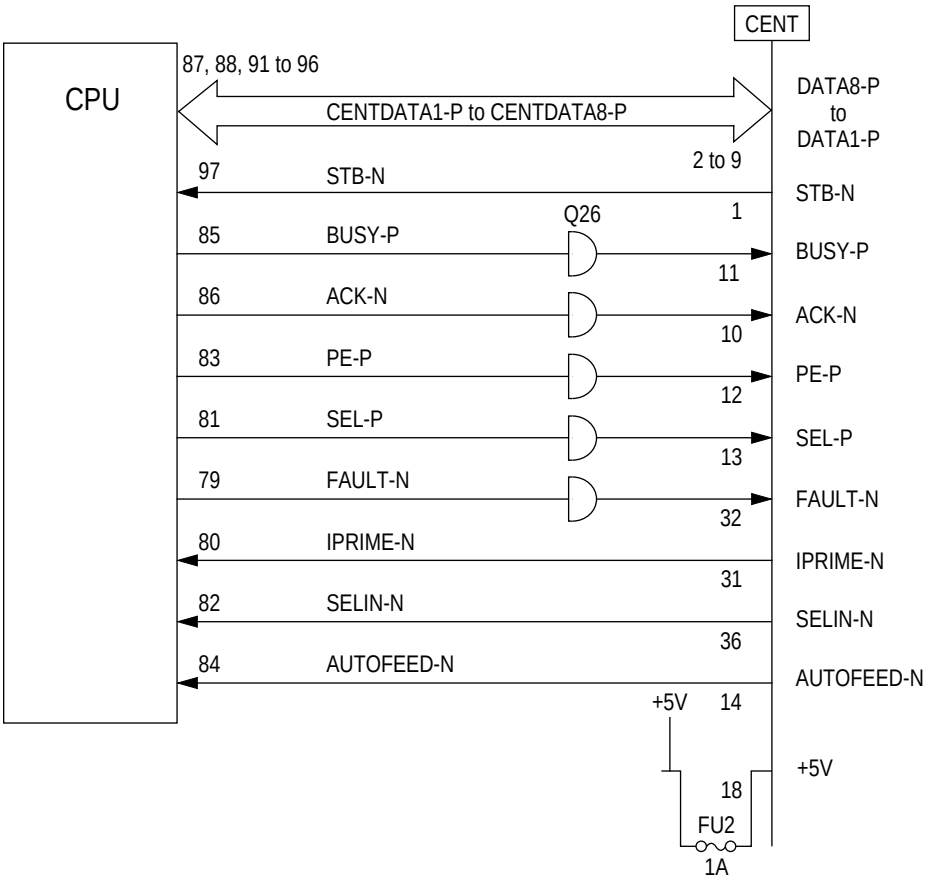


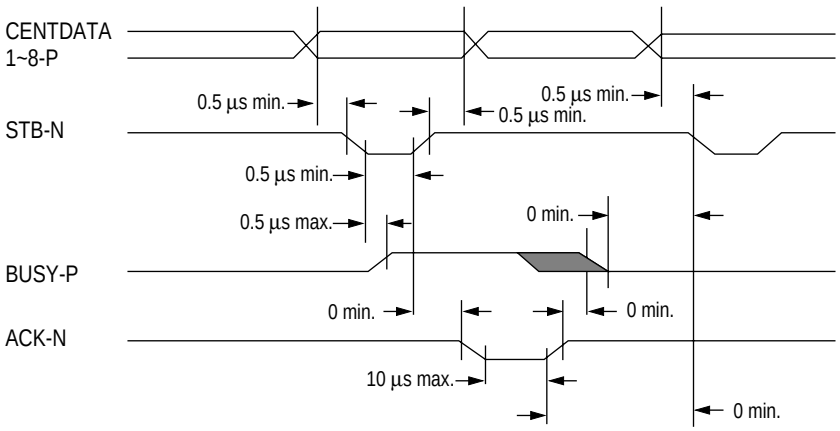
Read cycle timing (READ)



3.5 Centronics Parallel Interface

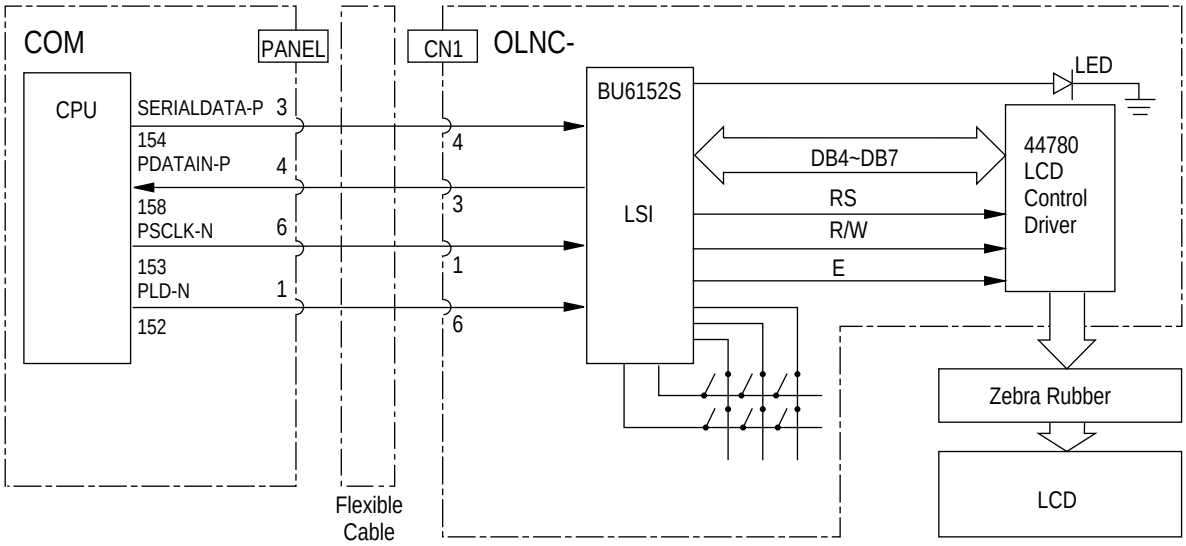
The CPU sets a BUSY-P signal to ON at the same time when it reads the parallel data (CENTDATA1-P to CENTDATA8-P) from the parallel port at the fall of STB-N signal. Furthermore, it makes the store processing of received data into a receive buffer terminate within a certain fixed time and outputs an ACK-N signal, setting the BUSY-P signal to OFF.





3.6 Operator Panel Control

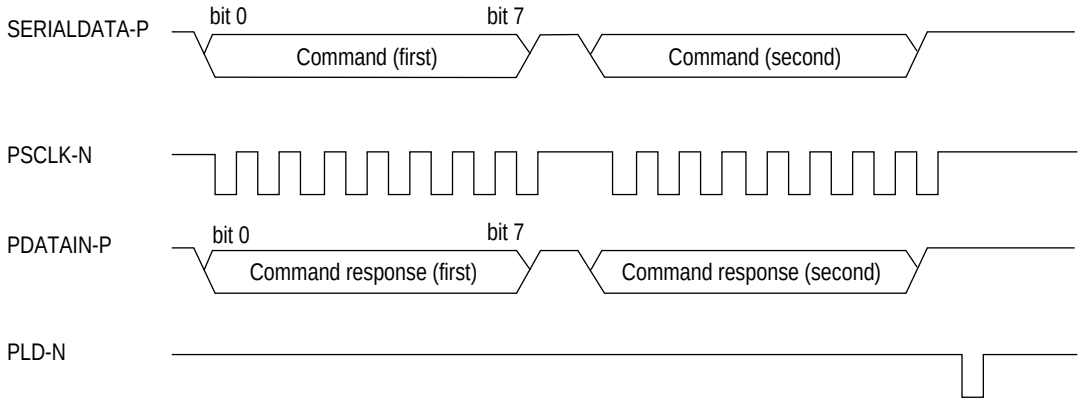
The operator panel consists of the following circuits.



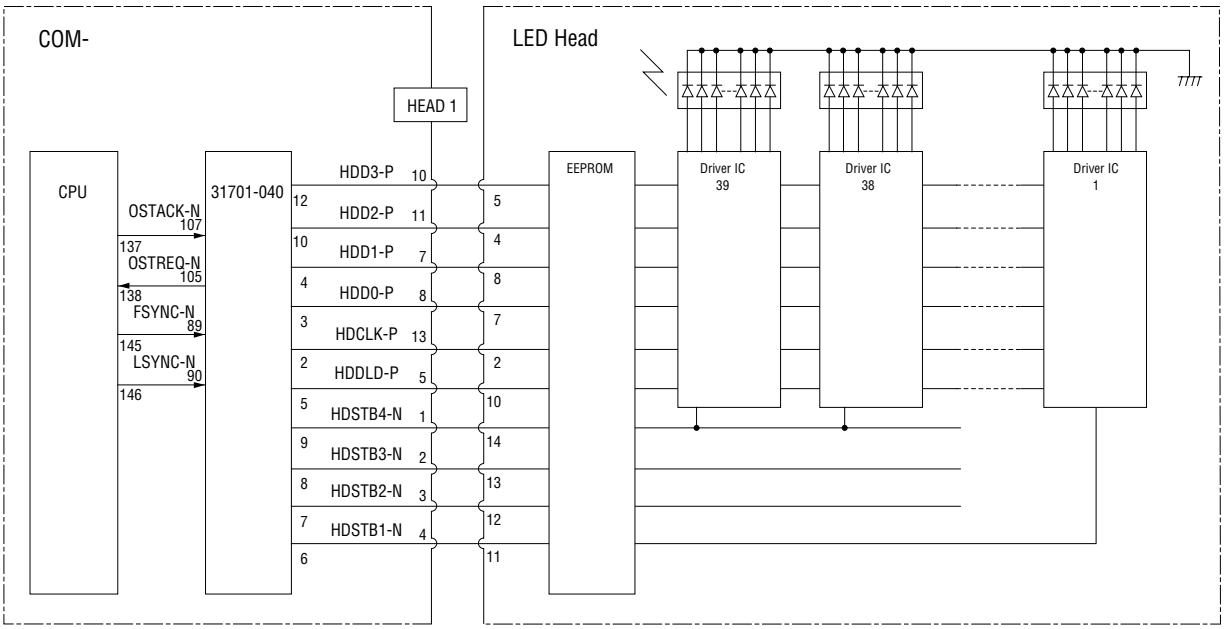
(1) BU6152S (LSI)

This LSI is connected to a clock synchronous serial port of the CPU. It controls switch data input, LED data output and LCD data input/output according to the commands given by the CPU. The CPU sends the 2-byte (16-bit) command (SERIALDATA-P) together with the shift clock signal (PCLK-N) to the LSI and then makes a predetermined input/output control if the command decoded by the LSI is found to be a normal command.

On receiving a command sent from the CPU, the LSI, synchronizing with the serial clock of the command, returns a 2-byte command response to the CPU.



3.7 LED Head Control

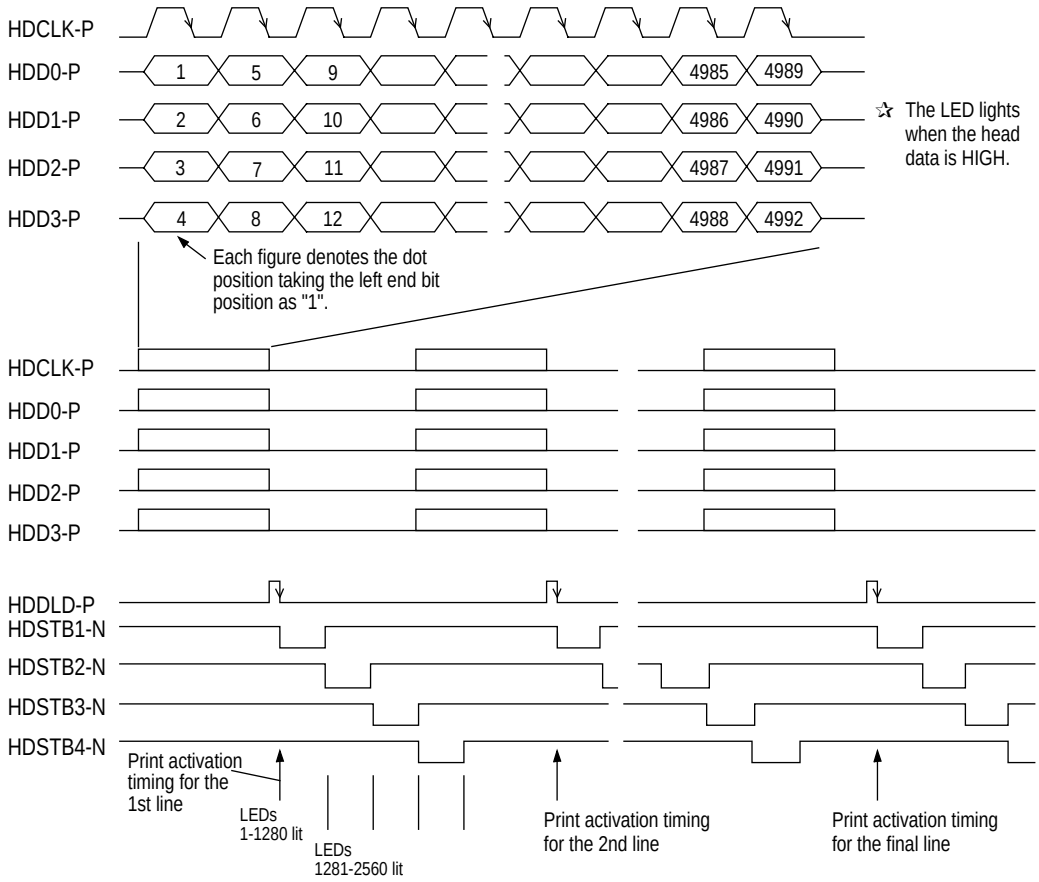


Data is transferred to the head unit starting with the data at the left end of the paper in the synchronous serial transfer mode using the HDCLK-P signal as the sync signal.

The total number of LEDs in the head unit is 4992. The data for the driver latches causes the corresponding LEDs to light only during the time when the HDSTBn-N signal is output. There are four HDSTBn-N signals (HDSTB1-N, HDSTB2-N, HDSTB3-N, and HDSTB4-N), each of which controls the corresponding driver for 1248 LEDs (4992/4).

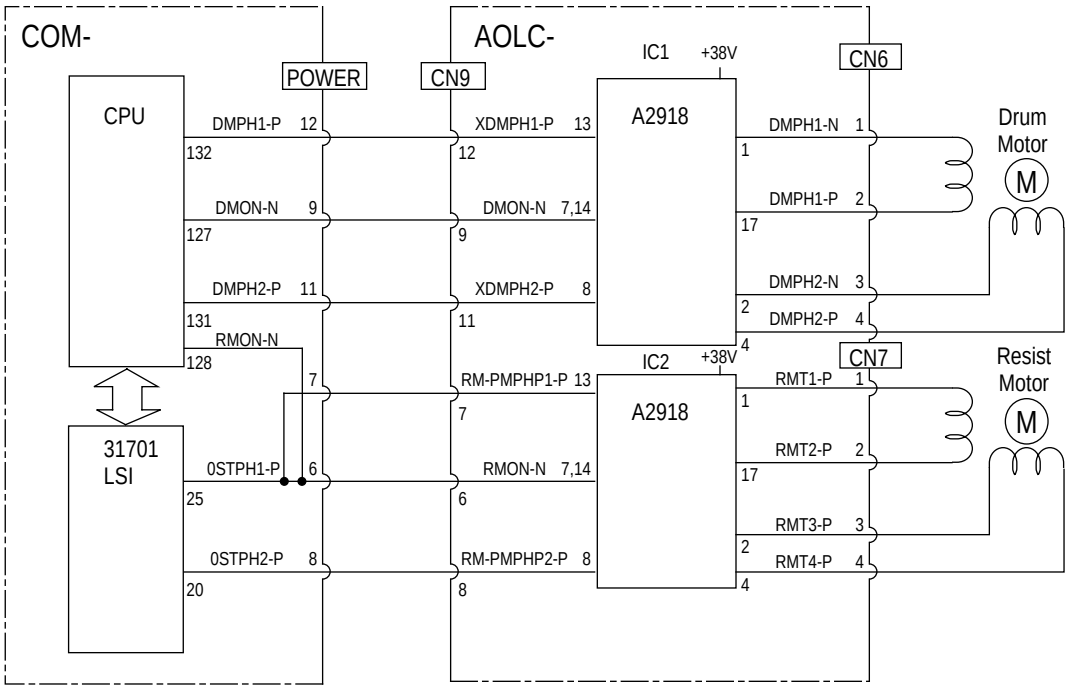
The four HDSTBn-N signals must be output within the time when the LEDs for one line continue to emit light. After the data is moved to the latches by the HDSTBn-N signal, the transfer of the data of the next line can be started.

The timing chart for the outline of this operation is shown below.

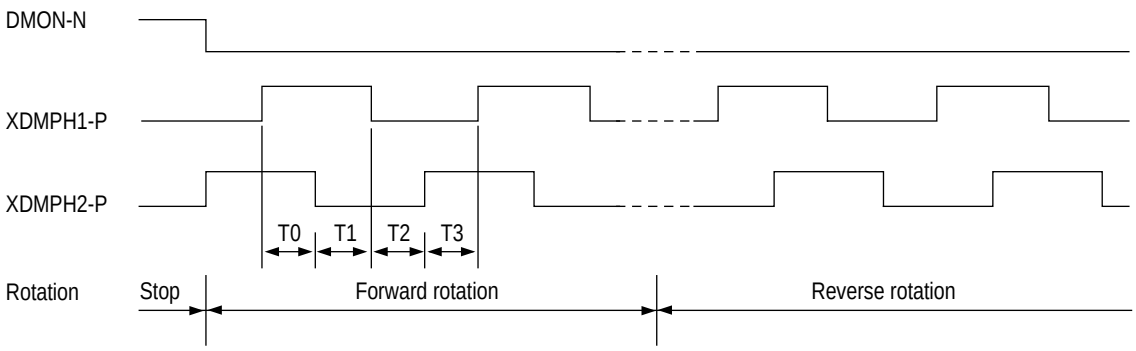


3.8 Motor Control

(1) Resist motor and Drum motor
A resist motor and a drum motor are driven by means of control signals from the CPU or the LSI (31701) and a driver IC.

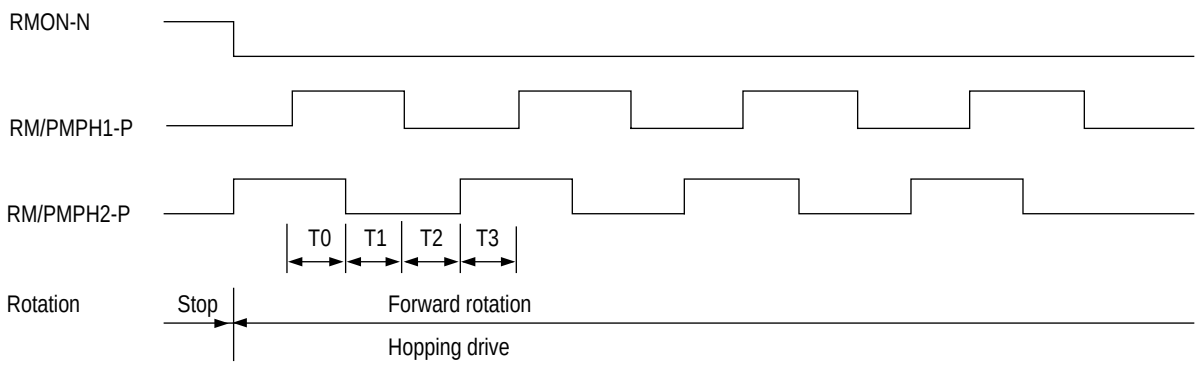


a. Drum motor



Operation at normal speed: T0 to T3 = 918 μs

b. Resist motor

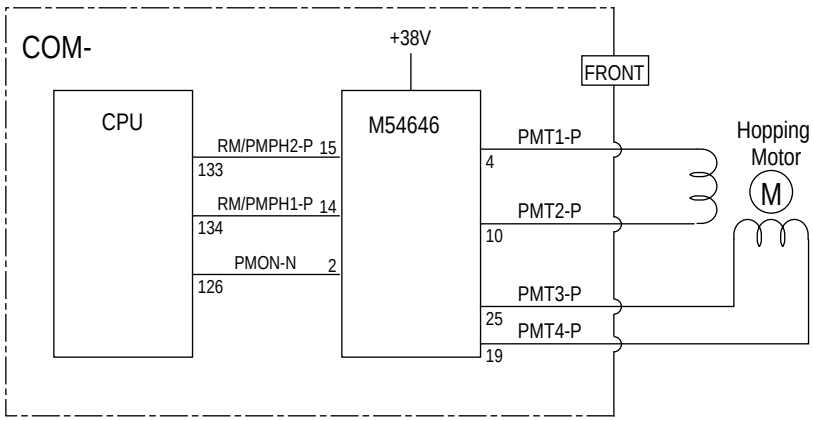


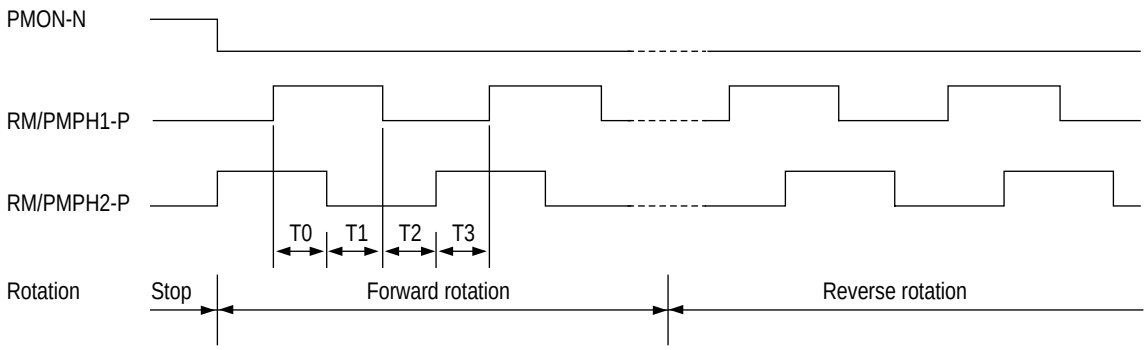
Operation at normal speed: T0 to T3 = 918 µs

c. Drive control
Time T0 to T3 determines the motor speed, while the phase different direction between phase signals XDMPH1-P and XDMPH2-P (0STPH1-P and 0STPH2-P) determines the rotation direction. DMON-N and RMON-N signals control a motor coil current.

(2) Hopping motor

The hopping motor is driven by the driver IC according to the control signal from the CPU. The hopping motor drives either the hopping roller of the 1st tray or the hopping roller of the front feeder depending on its rotation.



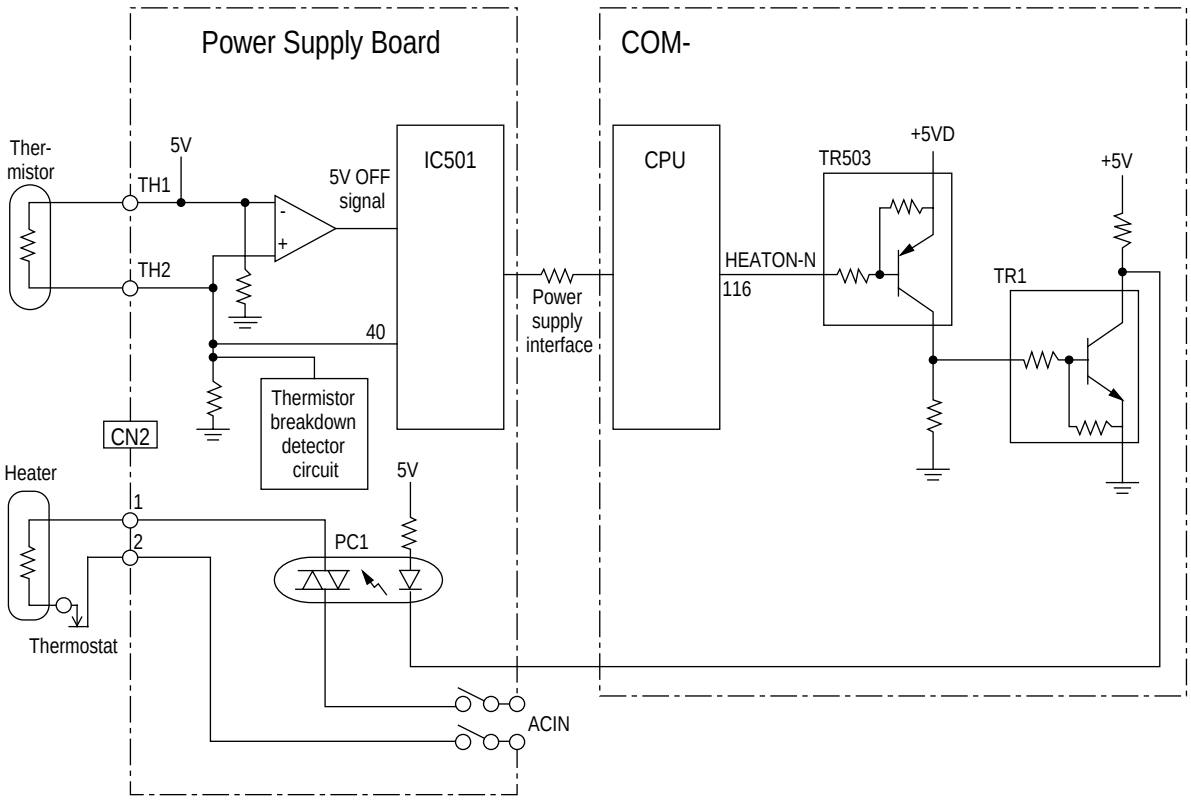


Operation at normal speed: T0 to T3 = 918 µs

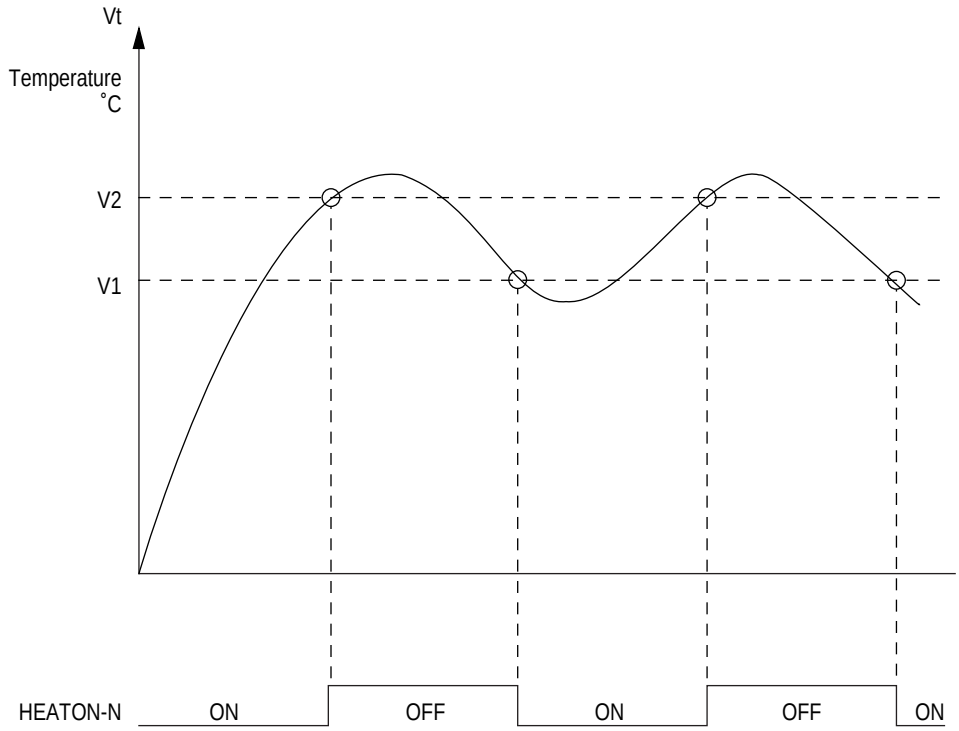
3.9 Fuser Temperature Control

For the temperature control by heater control, the variation in the resistance of the thermistor is A/D converted in IC501 and the resultant digital value is read and transferred to the CPU. The CPU turns on or off the HEATON-N signal according the value of the signal received from IC501 to keep the temperature constant.

Immediately after the power is turned on, the thermistor is checked for shortcircuit and breakdown. If the thermistor is shorted, the A/D converted value shows an extremely high temperature, so that the shortcircuit can be detected. If the breakdown of the thermistor occurs, the A/D converted value shows the normal temperature. In this case, the thermistor breakdown can be detected by the sequence shown at the end of this section. If the heater is overheated, 5V supply is turned off by detecting that the resistance of the thermistor exceeds the predetermined value.



The temperature control is described below.



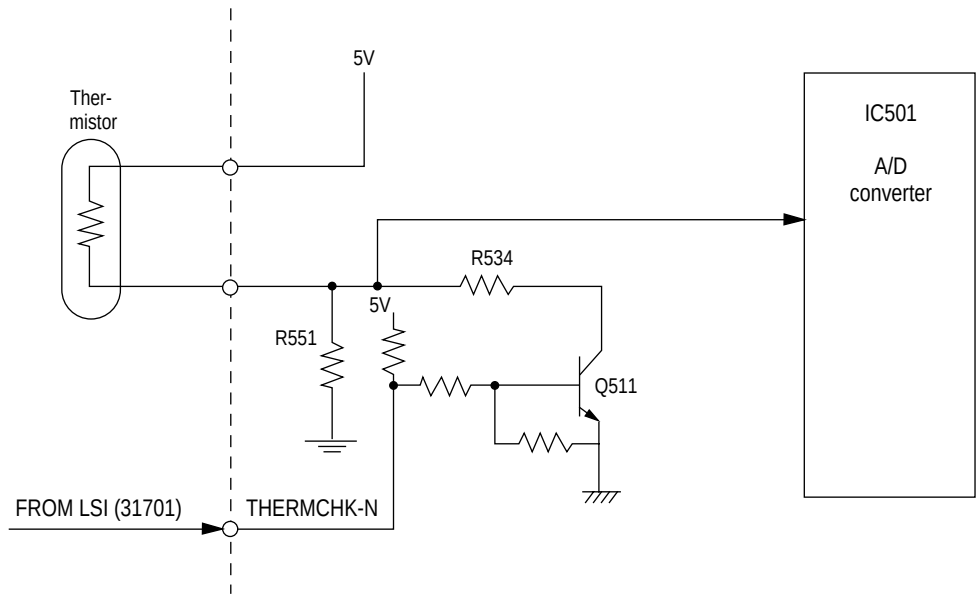
V2	194˚C
V1	190˚C

* The values V1 and V2 vary according to setting mode.

(Standard temperature)

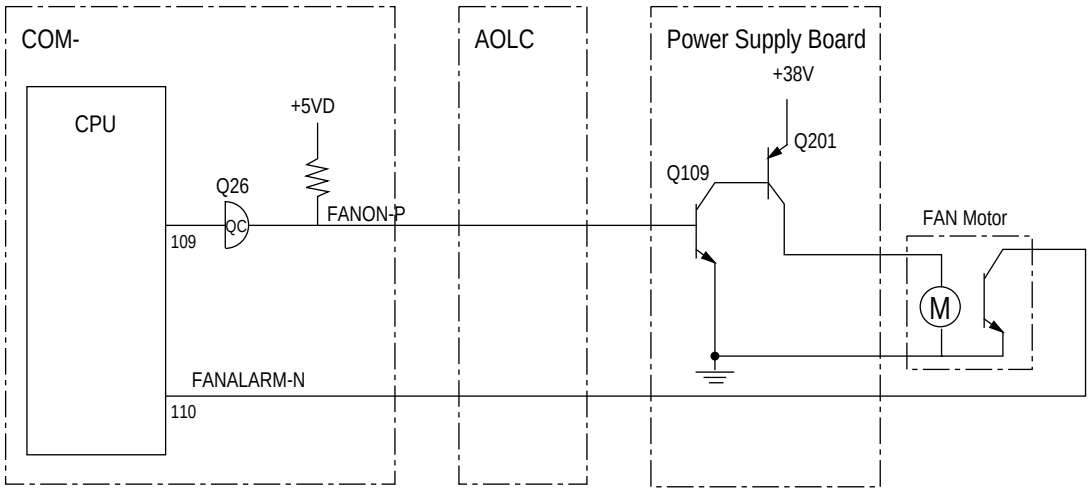
When Vt rises to V2 or more, the heater is turned off (by setting HEATON-N signal to HIGH). When Vt drops to V1 or less, the heater is turned on (by setting HEATON-N signal to LOW). In this way, the temperature can be kept within the predetermined range.

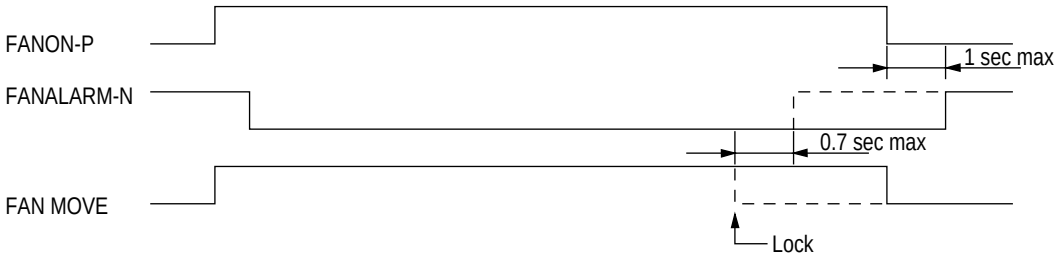
To detect the breakdown of the heater, the heater is turned on. If the corresponding temperature rise is not detected, it is judged that heater breakdown occurs. To shorten the breakdown detecting time, the following circuit is used. When the thermistor is checked for breakdown immediately after the power is turned on, the THERMCHK-N signal is turned on to turn transistor Q511 on. As a result, the thermistor serial resistance is varied to increase the reading resolution.



3.10 Fan Motor Control

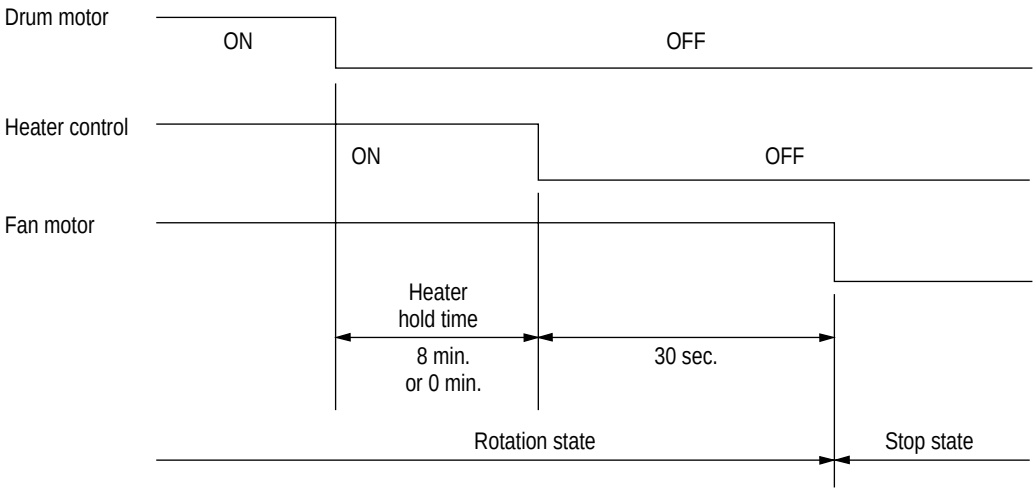
The stop/rotation of the fan motor is controlled by a FANON-P signal. When the fan motor rotates normally, a FANALM-N signal generated in the hole element built in the fan motor is input to the CPU.





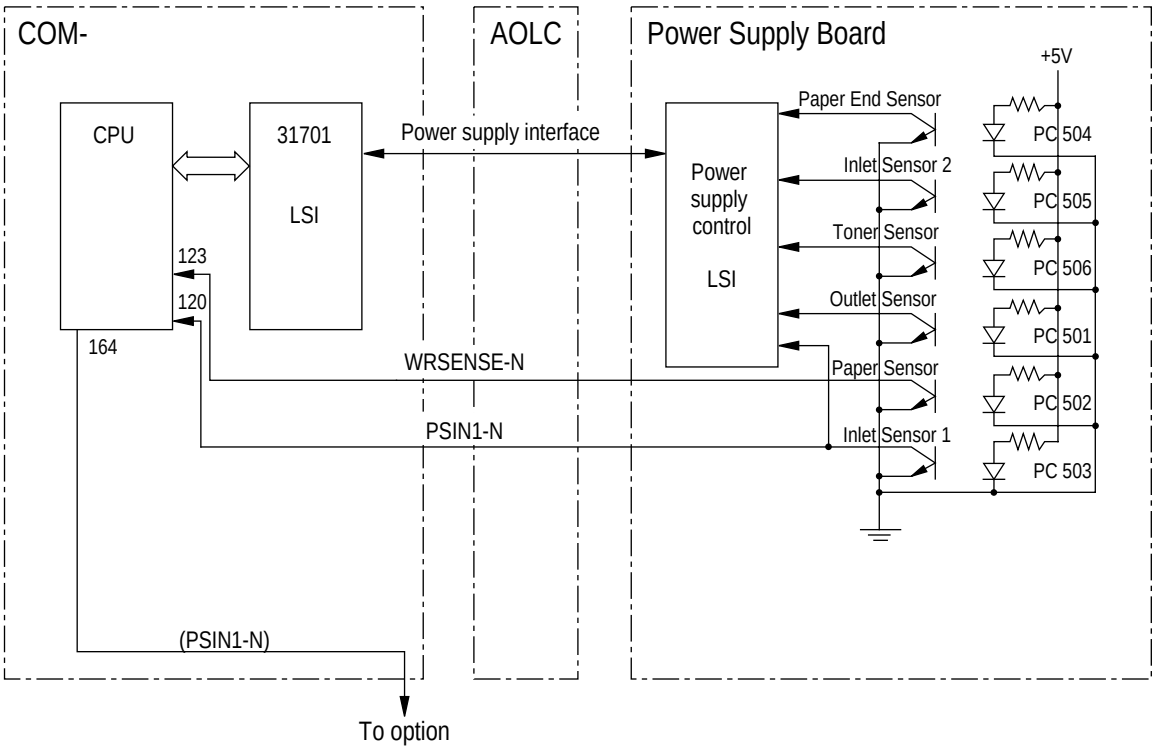
Fan motor start: Initial request, heater on, print start request

Fan motor stop:
- The motor immediately stops when an engine error or a fan error occurs.
- The motor stops 30 seconds after the occurrence of a paper jam, size error, or fuse error.
- The motor stops in the power save mode as below.



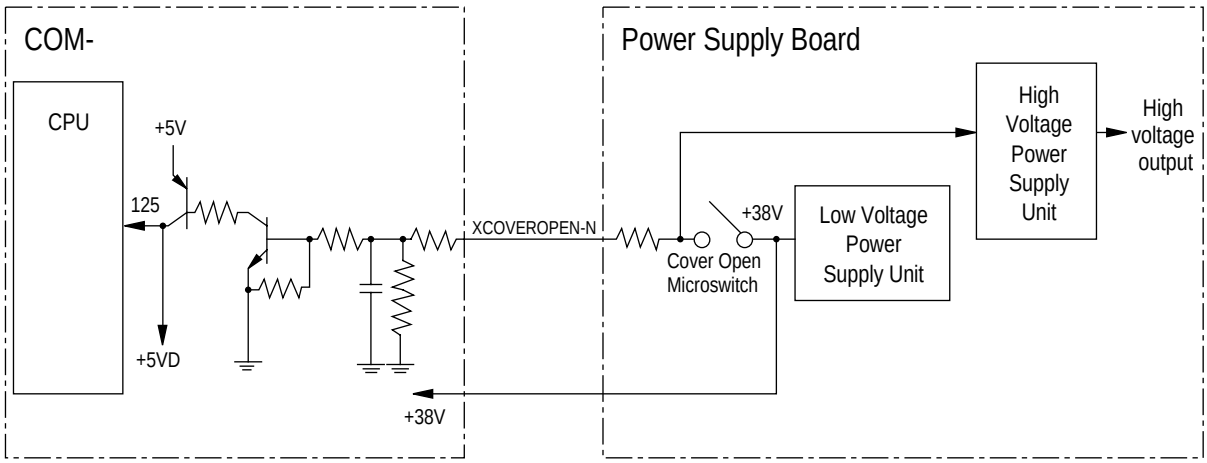
3.11 Sensor Supervision

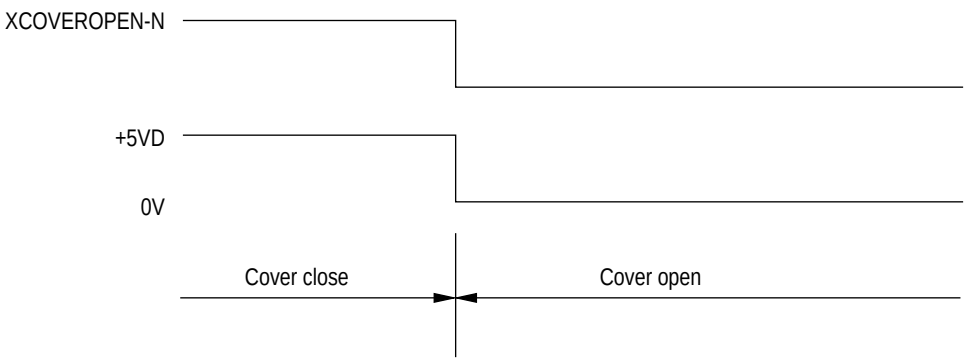
The paper sensor signal (WRSENSE-N) and inlet sensor 1 signal (PSIN1-N) enter the CPU through their dedicated own lines. When the state of the WRSENSE-N signal or PSIN1-N signal is changed, the paper sensor state is read into the CPU at the interrupt timing (INT3). The state of other sensors is read into the CPU through the power supply interface at the CPU sense timing.



3.12 Cover Open

When the cover is opened, a cover open microswitch is opened. This makes a XCOVEROPEN-N signal low, then off the +5VD, thereby the CPU detects the open state. Furthermore, opening the cover stops applying a +38V power to the high voltage power supply unit, resulting in stopping all high voltage outputs.



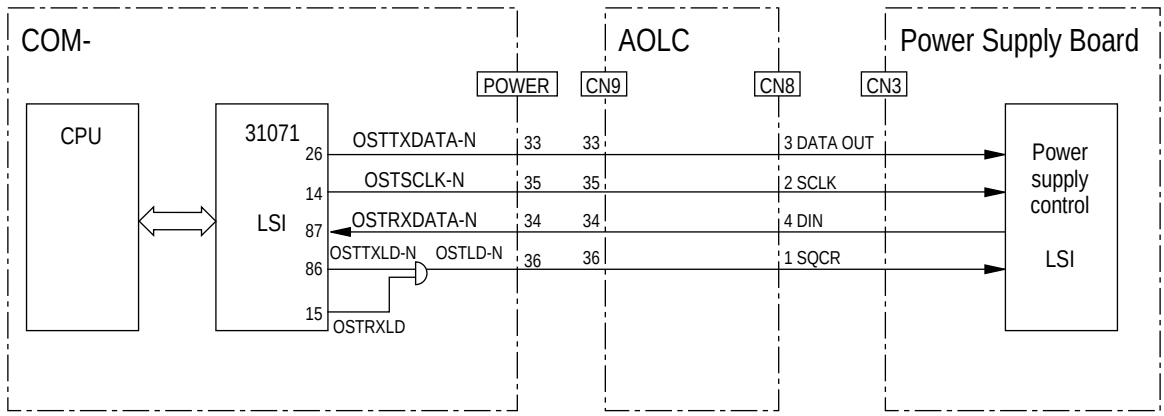


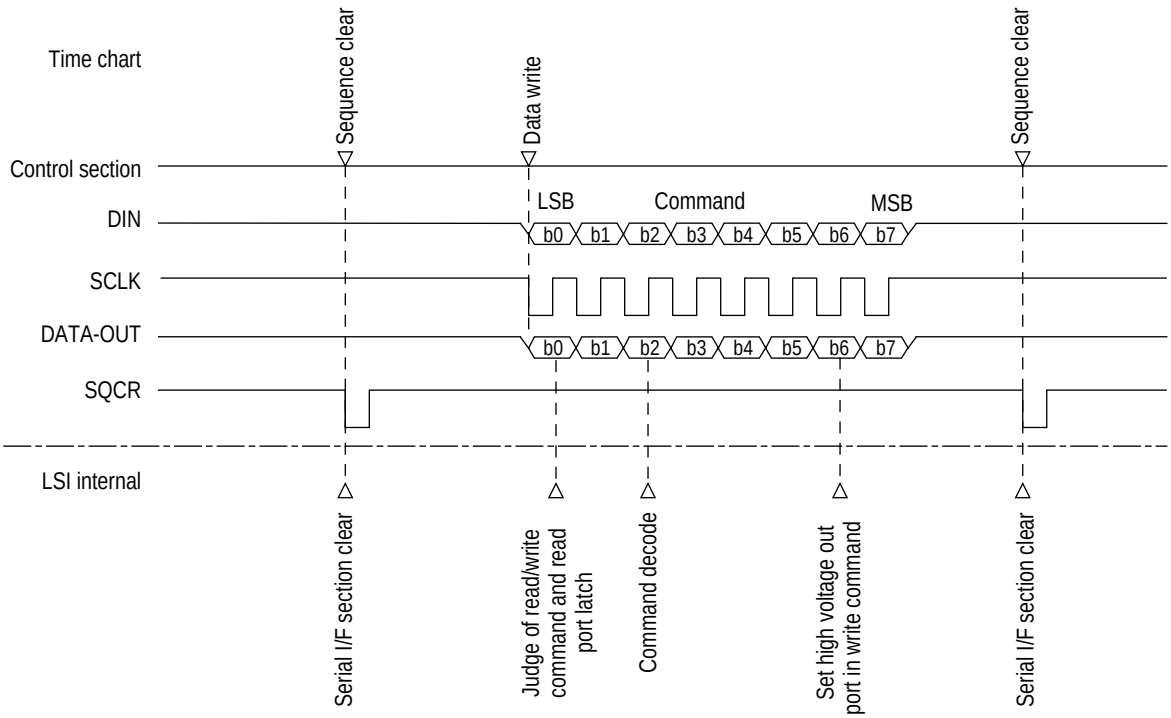
3.13 Power Supply Interface

The power supply interface is an 8-bit clock synchronous serial interface between the synchronous serial I/O ports of LSI (31701) and the power control LSI in the power supply board under the control of the CPU.

When the control section transmits a command on OSTTXDATA-N signal in synchronization with the clock (OSTSCLK-N) to the power supply board, this power supply board transmits a response on OSTRXDATA-N signal in synchronization with the same clock to the control section.

The commands include the control data of the high-voltage power supply, sense command, etc. The responses include sensor information, fuser unit temperature information, etc.

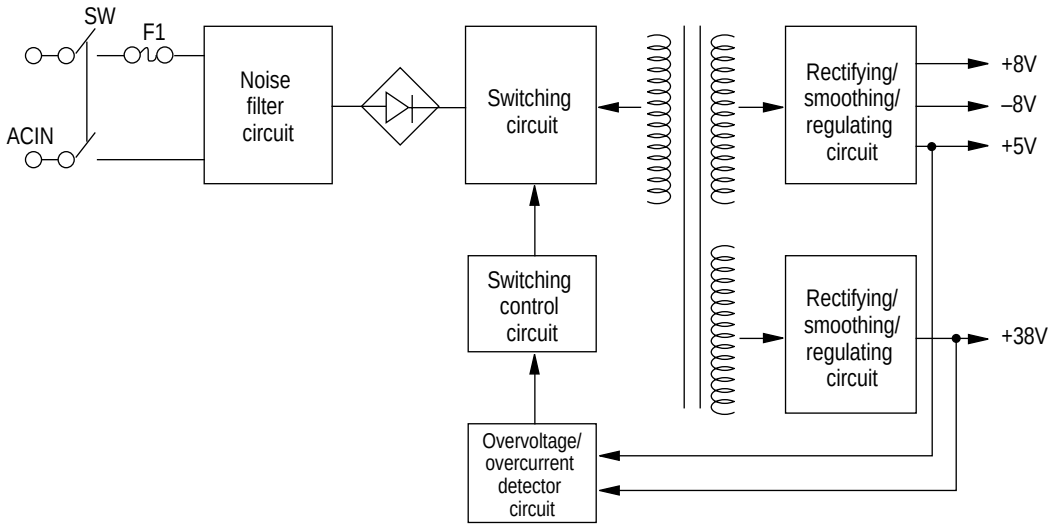


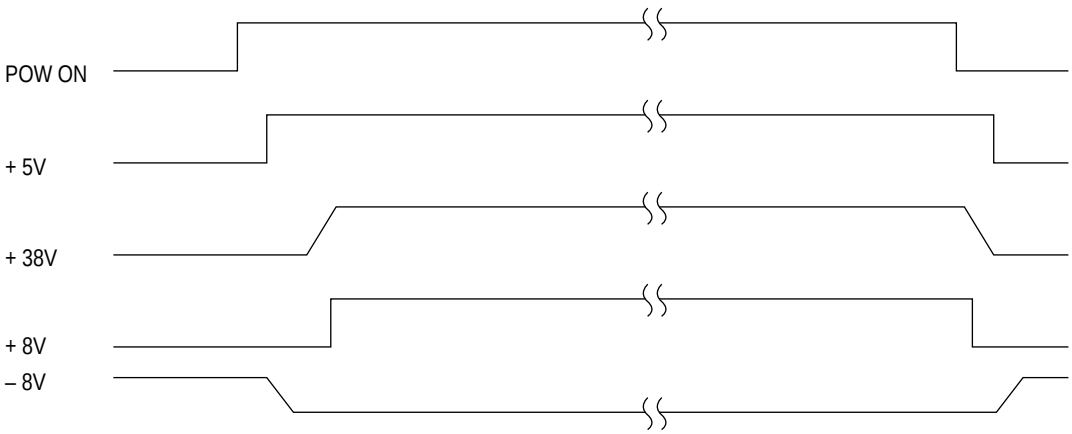


3.14 Power Supply Board

The power supply circuit consists of the low-voltage power supply circuit and the high-voltage power supply circuit. The low-voltage power supply circuit adopts a switching power supply system and provides DC voltages required for the control of the equipment. The high-voltage power supply circuit receives +38V power from the low-voltage power supply circuit and provides various high voltages required for the electrophotographic process according to the control signals from the control section.

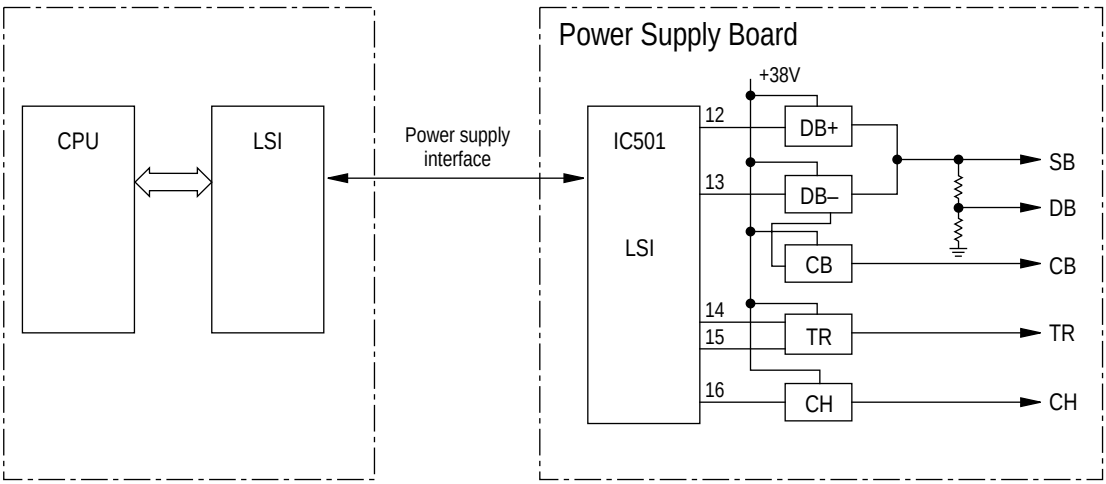
(1) Low-voltage power supply circuit





(2) High-voltage power supply circuit

This high-voltage power supply circuit receives the high-voltage generation timing control command that is transmitted in serial through the power supply interface from the control section. It decodes this command by LSI (IC501) and outputs high-frequency pulses to the corresponding high-voltage generating circuits through pins 12, 13, 14, 15 and 16 of LSI (IC501). It supplies +38V to each high-voltage generating circuit as the source voltage. When the cover is open, the supply of +38V is interrupted to interrupt all the high-voltage outputs. The relationship between the high-frequency pulse output pins and the high-voltage outputs is shown in the following table.



High-voltage outputs / High -frequency pulse output pins	SB	DB	CB	TR	CH
12	+450V	+300V	+220V		
13	–360V	–240V	+400V		
14				+4.415KV	
15				–1.3KV	
16					-1.3KV

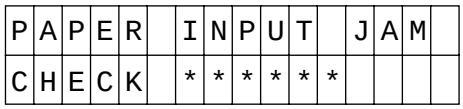
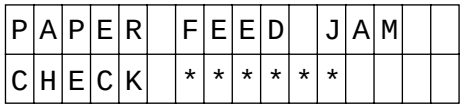
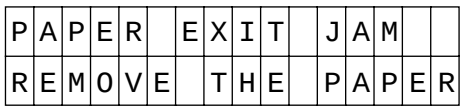
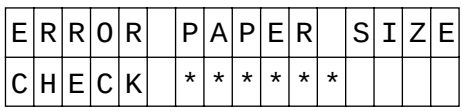
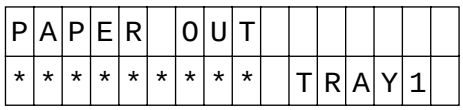
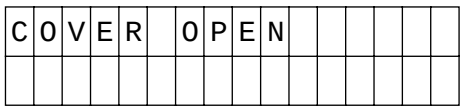
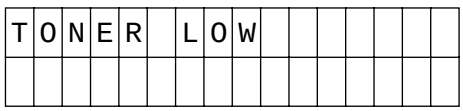
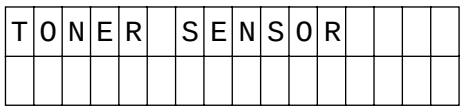
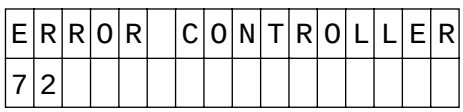
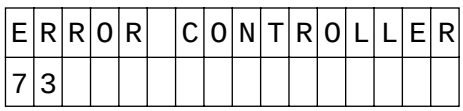
Part with slant line: no output

4. TROUBLESHOOTING

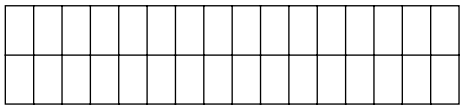
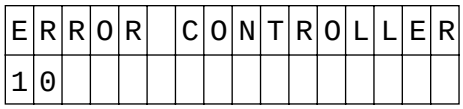
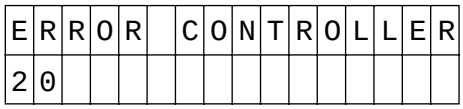
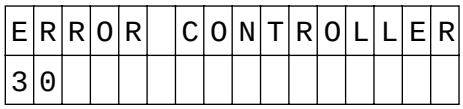
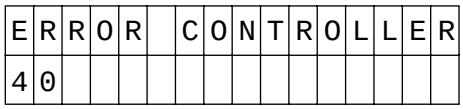
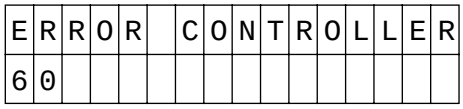
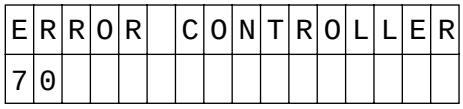
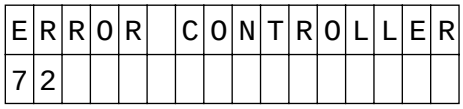
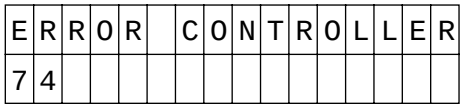
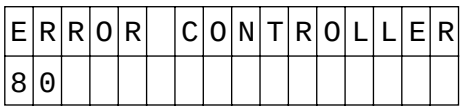
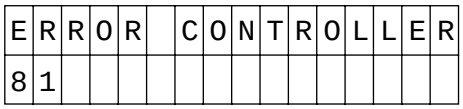
4.1 Troubleshooting Table

(A) Power/sensor board

Note: The malfunction of the power supply is not repaired by an agency. The abnormality to be treated here is taht of sensors only.

Failure	LCD Message	Flowchart No.
A paper input jam occurs frequently.		A - 1
A paper feed jam occurs frequently.		A - 2
A paper-exit jam occurs frequently.		A - 3
A paper size error occurs frequently.		A - 4
The message "PAPER OUT" remains displayed on the LCD.		A - 5
The message "COVER OPEN" remains displayed on the LCD.		A - 6
The message "TONER LOW" remains displayed on the LCD.		A - 7
The message "TONER SENSOR" remains displayed on the LCD.		A - 8
A thermistor open error occurs frequently.		A - 9
A thermistor short error occurs frequently.		A - 10

(B) Main control board (COM-) (1/2)

Failure	LCD Message	Flowchart No.
Abnormal message display on the LCD (no display, unclear display, display with some dot not lit).		B - 1
Program ROM error		B - 2
Font ROM error		B - 3
Resident RAM error		B - 4
EEPROM error		B - 5
Option RAM error		B - 6
Cooling fan error		B - 7
Thermistor open error		B - 8
SSIO error		B - 9
Opepanel I/F time out error		B - 10
Option tray I/F timeout error		B - 11

(B) Main control board (2/2)

Failure	LCD Message	Flowchart No.
Watchdog timer timeout	ERROR CONTROLLER 90	B - 12
Program error	ERROR CONTROLLER F *	B - 13
Processor error	ERROR CONTROLLER 0 *	B - 14
Cover open occurs frequently	COVER OPEN	B - 15
Receive buffer overflow occurs frequently	ERROR RECEIVE BUFFER OVERFLOW	B - 16
Paper input JAM occurs	PAPER INUT JAM CHECK *****	B - 17
Paper size error occurs	ERROR PAPER SIZE CHECK *****	B - 18
The message "STACKER FULL REMOVE THE PAPER" remains displayed on the LCD	STACKER FULL REMOVE THE PAPER	B - 19
Data sent through the centronics I/F cannot be received.		B - 20

(C) Operator panel board (OLNC-)

Failure	LCD Message	Flowchart No.
Abnormal message display on the LCD (no display, display with some dot not lt, etc.)		C - 1
The key switch operation on the operator panel is disabled.		C - 2

(D) Connection/Driver board (AOLC-)

Failure	LCD Message	Flowchart No.
Paper feed JAM occurs	PAPER FEED JAM CHECK *****	D - 1

(E) Cassette switch board (AOLS-)

Failure	LCD Message	Flowchart No.
Paper size error occurs	ERROR PAPER SIZE CHECK TRAY1	E - 1

(F) PostScript board (PSBA-)

Failure	LCD Message	Flowchart No.
Option software ROM error	ERROR CONTROLLER 50	F - 1
Data sent through the LOCALTALK I/F cannot be received.		F - 2

4.2 Troubleshooting Flowchart

A-1 A paper input jam occurs frequently.

- Is PC503 (Inlet Sensor 1) operating normally?
  - No — Replace PC503.
- Yes — Is PC505 (Inlet Sensor 2) operating normally?
  - No — Replace PC505.
- Yes — Replace CN3.

A-2 A paper feed jam occurs frequently.

- Is PC503 (Inlet Sensor 1) operating normally?
  - No — Replace PC503.
- Yes — Is PC505 (Inlet Sensor 2) operating normally?
  - No — Replace PC505.
- Yes — Is PC502 (Paper Sensor) operating normally?
  - No — Replace PC502.
- Yes — Is PC501 (Outlet Sensor) operating normally?
  - No — Replace PC501.
- Yes — Replace CN3.

A-3 A Paper exit jam occurs frequently.

- Is PC501 (Outlet Sensor) operating normally?
  - No — Replace PC501.
- Yes — Replace CN3.

A-4 A paper size error occurs frequently.

- Is PC503 (Inlet Sensor 1) operating normally?
  - No Replace PC503.
- Yes Is PC505 (Inlet Sensor 2) operating normally?
  - No Replace PC505.
- Yes Replace CN3.

A-5 The message "PAPER OUT" remains displayed on the LCD.

- Is PC504 (Paper End Sensor) operating normally?
  - No Replace PC504.
- Yes Replace CN3.

A-6 The message "COVER OPEN" remains displayed on the LCD.

- Is Cover Open Switch operating normally?
  - No Replace Cover Open Switch.
- Yes Replace CN3.

A-7 The message "TONER LOW" remains displayed on the LCD.

- Is PC506 (Toner Sensor) operating normally?
  - No Replace PC506.
- Yes Replace Cn3.

A-8 The message "TONER SENSOR" remains displayed on the LCD.

- Is PC506 (Toner Sensor) operating normally?
  - No Replace PC506.
- Yes Replace CN3.

A-9 A thermistor OPEN error occurs frequently.

- Is the heater lamp lit?
  - No Failure of PC1 (photocoupler)
  - Yes Failure of IC501

A-10 A thermistor short error occurs frequently.

- Failure of IC501

B-1 Abnormal message display on the LCD.

- Replace Q18, Q19
- OK?
- No — Is the 8.000 MHz clock signal being put out to pin 1 of OSC1?
  - • No — Replace OSC1.
- Yes — Is the output at pin 2 (RESET-N) of TR2 (DTC114EK) normal? (Refer to [3.3 Reset Control] page 7.)
  - • No — Replace TR2 (DTC114EK).
  - OK?
  - No — Replace Q25 (UPC393G2)
- Yes — Failure of Q13 (MHM2029K-004K-37)

B-2 Program ROM error (ERROR CONTROLLER 10)

• Replace Q18, Q19

B-3 Font ROM error (ERROR CONTROLLER 20)

• Replace Q18, Q19

B-4 Resident RAM error (ERROR CONTROLLER 30)

- Are negative pulses being put out to Pin 8 (RAS00-N) of Q1, Q2, Q3, Q4?
  - No — Are negative pulses being put out to Pin 2 (RAS0-N) of Q20 (74LS244)?
    - • No — Failure of Q13 (MHM2029K-004K-37)
  - Yes — Failure of Q20 (74ALS244)
- Yes — Are negative pulses being put out to Pins 23 (CAS0-N, CAS2-N, CAS1-N, CAS3-N) of Q1, Q2, Q3, Q4?
  - No — Are negative pulses being put out to Pins 71, 70, 69, 68 (CCAS0-N, CCAS1-N, CCAS2-N, CCAS3-N) of Q13 (MHM2029K-004K-37)?
    - • No — Failure of Q13 (MHM2029K-004K-37)
  - YES — Replace Q15 (74ALS244): When CCAS0-N, CCAS1-N is no good.
    Replace Q11 (74ALS244): When CCAS2-N, CCAS3-N is no good.
- Yes — Replace Q1, Q2, Q3, Q4.

B-5 EEPROM error (ERROR CONTROLLER 40)

- Replace Q12 (93LC46A).
- OK?
- No — Failure of Q13 (MHM2029K-004K-37)

B-6 Option RAM error (ERROR CONTROLLER 60)

- Are negative pulses being pin out to Pins 33, 34, 44, 45 (SIMMRAS10-N, SIMMRAS11-N, SIMMRAS20-N, SIMMRAS21-N) of SIMM1, SIMM2?
  - No — Replace Q20 (74ALS244).
    - OK?
    - No — Failure of Q13 (MHM2029K-004K-37)
  - Yes — Replace SIMM.

B-7 Cooling fan error (ERROR CONTROLLER 70)

- Is the fan rotating?
  - No — Is +38V power being supplied to Pin 1 (FAN POW) of Connector (CN5) in Power/sensor board?
    - No — Is the output at Pin 17 (FANON) of Connector (Power) being at high level?
      - No — Is the output at Pin 109 (FANON-P) of Q13 (MHM2029K-004K-37) being at high level?
        - No — Failure of Q13 (MHM2029K-004K-37)
      - Yes — Replace Q26 (7407).
    - Yes — Replace AOLC board or Power/sensor board.
  - Yes — Replace the fan.
- Yes — Is the output at Pin 18 (FANALARM) of Connector (Power) being at high level?
  - No — Failure of Q13 (MHM2029K-004K-37)
  - Yes — Replace the fan.

B-8 Thermistor OPEN error (ERROR CONTROLLER 72)

- Is the heater lamp lit?
  - No — Is pin 31 of the connector (power) in the OFF state?
    - No — Failure of the heater or the power/sensor board
    - Yes — Is pin 3 of TR1 (transistor) in the OFF state?
      - No — Replace TR1 (transistor).
      - Yes — Is pin 3 of TR503 (transistor) in the OFF state?
        - No — Replace TR503 (transistor).
        - Yes — Failure of Q13 (MHM2029K-004K-37)
  - Yes — Failure of the power/sensor board

B-9 SSIO error (ERROR CONTROLLER 74)

- Is the 32.0000 MHz clock signal being put out to pin 3 of OSC2?
  - No — Replace the OSC2
  - Yes — Are OSTTXDATA-N (Power connector-33), OSTSCLK-N (Power connector-35) and OSTLD-N (Power connector-36) operating normally?
    - No — Replace Q23 (31701-040)
    - Yes — Failure of the power/sensor board.

B-10 Opepanel I/F Timeout error (ERROR CONTROLLER 80)

- Is the connection of connector (PANEL) properly?
  - No — Replace connector (PANEL).
  - Yes — Failure of Q13 (MHM2029K-004K-37)

B-11 Option tray I/F Timeout error (ERROR CONTROLLER 81)

- Is the connection of connector (2nd tray) properly?
  - • No Replace connector (2nd tray).
- Yes Is the connection of connector (envelope) properly?
  - • No Replace connector (envelope).
- Yes Failure of Q13 (MHM2029K-004K-37)

B-12 Watchdog timer timeout (ERROR CONTROLLER 90)

- Replace Q18, Q19.
- OK?
- No Failure of Q13 (MHM2029K-004K-37)

B-13 Program error (ERROR CONTROLLER F*)

- Replace Q18, Q19.
- OK?
- No Failure of Q13 (MHM2029K-004K-37)

B-14 Processor error (ERROR CONTROLLER 0*)

- Replace Q18, Q19.
- OK?
- No Failure of Q13 (MHM2029K-004K-37)

B-15 Cover OPEN occurs frequently.

- Is the signal at Pin 125 (+5VD) of Q13 (MHM2029K-004K-37) being at low level?
  - Yes Is the signal at Pin 3 of TR4 being at high level?
    - • No Replace TR4.
  - Yes Is the signal at Pin 3 of TR501 being at low level?
    - • No Replace TR501.
  - Yes Is the signal at Pin 30 of Connector (Power) being at high level (30V)?
    - • Yes Replace Connector (Power).
  - No Failure of an element other than COM-PCB
- No Failure of Q13 (MHM2029K-004K-37)

B-16 ERROR RECEIVE BUFFER OVERFLOW occurs frequently.

[Centronics I/F]

- Is the BUSY signal being put out to Pin 11 (BUSY-P) of connector (CENT)?
  - No Is the BUSY signal put out to Pin 1 (BUSY-P) of Q26 (7407)?
    - • Yes Replace Q26 (7407).
  - No Failure of Q13 (MHM2029K-004K-37)
- Yes Make sure of setting of a host computer.

B-17 PAPER INPUT JAM occurs.

- Is the hopping motor rotating normally?
  - No — Are the normal waveforms of the RM/PMPH1-P and RM/PMPH2-P signals as shown in section 3.9 (2) output to pins 14 and 15 of Q5 (M54646P) respectively?
    - No — Failure of Q13 (MHM2029K-004K-37)
  - Yes — When the motor is rotating, does the output to pin 2 and 27 of Q5 (M54646P) go HIGH?
    - No — Is the normal waveform of the PMON-N signal as shown in section 3.9.2 output to pin 3 of TR502 (DTA114K)?
      - No — Failure of Q13 (MHM2029K-004K-37)
      - Yes — Replace TR502 (DTA114K).
  - Yes — Is the voltage at pin 3, 11, 18 and 26 of 02D (M54646P) +38V?
    - No — Replace AOLC board or Power/sensor board.
  - Yes — Replace Q5 (M54646P).
- Yes — Replace Q13 (MHM2029K-004K-37).
- OK?
- No — Failure of the power/sensor board.

B-18 PAPER SIZE ERROR occurs.

- Do the output signals (PAPER SIZE 0 to 3 signals) at pins 97, 96, 95, and 94 of Q23 (31701-040) comply with the following table?

Paper size	Pin 97	Pin 96	Pin 95	Pin 94
Letter	L	H	H	H
Executive	L	H	L	H
A4	L	L	H	H
Legal 14	H	H	H	L
Legal 13	H	L	H	H
B5	H	H	L	H
A5	H	H	L	L
A6	H	L	L	H

  - No — Check to see if the paper size SW of the paper tray is set properly.
- Yes — Replace Q23 (31701-040).

B-19 The message "STACKER FULL REMOVE THE PAPER" remains displayed on the LCD.

- Is the output signal (STKFULL-P signal) at pin 119 of Q13 (MHM2029K-004K-37) being at low level?
  - No Check the stacker full sensor.
- Yes Failure of Q13 (MHM2029K-004K-37)

B-20 Data sent through the centronics I/F cannot be received.

- Is the signal at Pin 11 (BUSY-P) of connector (CENT) being at low level?
  - No Is the signal at Pin 1 (BUSY-P) of Q26 (7407) changed as shown below, at data reception?

	ON-LINE	OFF-LINE
BUSY-P	Low	High

    - No Failure of Q13 (MHM2029K-004K-37)
  - Yes Replace Q26 (7407).
- Yes Is the level of the signal at Pin 1 (STB-N) of connector (CENT) changed at data reception?
  - No Make sure of the connection of I/F cable or the operation of the host computer.
- Yes Are the signals at Pin 3 (ACK-N), Pin 11 (FAULT-N) of Q26 (7407) being respectively at low level and high level in on-line mode?
  - Yes Replace Q26 (7407).
  - OK?
  - No
- No Failure of Q13 (MHM2029K-004K-37)

C-1 Abnormal message display on the LCD (no display, display some dot lit, etc.).

- Replace IC2 (HD44780).
- OK?
- No Replace IC3 (5259).
- OK?
- Replace IC1 (BU6152S).

C-2 The key switch operation on the operator panel is disabled.

- Are the level of the signal at Pins, 3, 7, 10, 18, 23, 31 of IC1 (BU6152S) changed from the high level to the low one by the key switch pushing?
  - No Replace SW1 to SW8.
- Yes Is the connection of CN1 correct?
  - No Connect it correctly.
- Yes Replace IC1 (BU6152S).

D-1 PAPER FEED JAM occurs.

- Is the drum motor rotating normally?
  - No — Are the normal waveforms of XDMPM1-P and XDMPM2-P as shown in section 3.9. (1) output to pins 13 and 8 of IC1 (A2918) respectively?
    - No — Failure of Main control board (COM-PCB)
  - Yes — When the drum motor is rotating, is the DMON-N signal at pin 7 of IC1 (A2918) LOW?
    - No — Failure of Main control board (COM-PCB)
  - Yes — Replace IC1 (A2918).
- Yes — Is the resist motor rotating normally?
  - No — Are the normal waveforms of RM/PMPH1-P and RM/PMPH2-P signals as shown in section 3.9. (1) output to pins 13 and 8 of IC2 (A2918) respectively?
    - No — Failure of Main control board (COM-PCB)
  - Yes — When the resist motor is rotating, is the RMON-N signal at pin 7 of IC2 (A2918) LOW?
    - No — Failure of Main control board (COM-PCB)
  - Yes — Replace IC2 (A2918).
- Yes — Failure of an element other than AOLC board

E-1 PAPER SIZE ERROR occurs.

- Does the PAPER SIZE 0 signal at pin 4 of CN11 go LOW when SW1 is depressed and does the same signal go HIGH when SW1 is not depressed?
  - No Replace SW1.
- Yes Does the PAPER SIZE 1 signal at pin 3 of CN11 go LOW when SW2 is depressed and does the same signal go HIGH when SW2 is not depressed?
  - No Replace SW2.
- Yes Does the PAPER SIZE 2 signal at pin 2 of CN11 go LOW when SW3 is depressed and does the same signal go HIGH when SW3 is not depressed?
  - No Replace SW3.
- Yes Does the PAPER SIZE 3 signal at pin 1 of CN11 go LOW when SW4 is depressed and does the same signal go HIGH when SW4 is not depressed?
  - No Replace SW4.
- Yes Failure of an element other than AOLS board

F-1 Option software ROM error (ERROR CONTROLLER 50)

• Replace 02C, 02D.

F-2 Data sent through the LOCALTALK I/F cannot be received.

• Replace 02E.

OK?

No — Is the 14.7456 MHz clock signal being put out to pin 1 of OSC1?
Is the 3.6864 MHz clock signal being put out to pin 2 of OSC1?

• No — Replace OSC1.

Yes — Are negative pulses being put out to pins 22, 24 of 02E and pins 20, 22, 27 of 02G?

• No — Replace 05G.

Yes — Replace 02G.

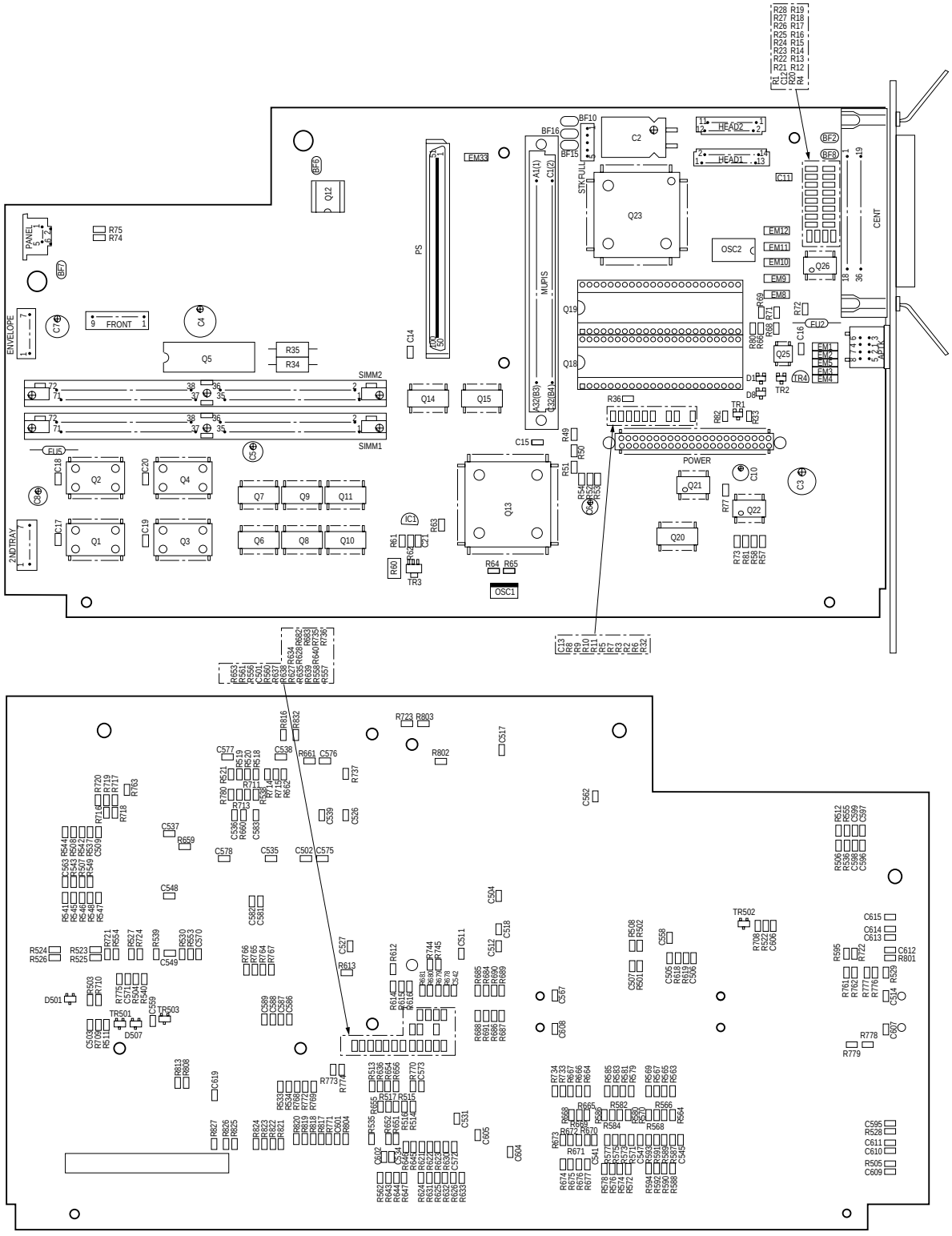
OK?

No — Replace 01B or 01D.

5. CIRCUIT DIAGRAM

6. COMPONENT PARTS LIST

Main Controller PCB (COM-PCB)	(Rev. 4)
Connection/Driver PCB (AOLC-PCB)	(Rev. 6)
Operation Panel PCB (OLNC-PCB)	(Rev. 3)
Cassette Switch PCB (AOLS-PCB)	(Rev. 6)
PostScript PCB (PSBA-PCB)	(Rev. 3)



COM-Printed Circuit Board Rev. 4
(40030302 - 1/2)

COM-Printed Circuit Board Rev. 4
(40030302 - 2/2 - 1/7)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1	D507	SS100MA80VACP Signal DI (CP)	611A0000N0001	1	
2	D1, D501	SS100MA80VKCP Signal DI (CP)	611A0000N0002	2	
3	D8	RD4.3M-B3 Zenor DI (CP)	613A0233M0092C	1	
4	R65	RM73B2A105F RN Resistor (CP)	323A5003F0105	1	
5	R62	RM73B2A181F RN Resistor (CP)	323A5003F0181	1	
6	R61	RM73B2A471F RN Resistor (CP)	323A5003F0471	1	
7	R20	RM73B2A101J RN Resistor (CP)	323A5003J0101	1	
8	R1-R4, R36, R501-R506, R537, R542, R764-R767, R802, R803	RM73B2A102J RN Resistor (CP)	323A5003J0102	19	
9	R5, R8-R11, R80, R507, R508, R724	RM73B2A103J RN Resistor (CP)	323A5003J0103	9	
10	R74, R75	RM73B2A122J RN Resistor (CP)	323A5003J0122	2	
11	R511, R512, R723	RM73B2A153J RN Resistor (CP)	323A5003J0153	3	
12	R709	RM73B2A182J RN Resistor (CP)	323A5003J0182	1	
13	R513	RM73B2A201J RN Resistor (CP)	323A5003J0201	1	
14	R514-R517, R522	RM73B2A202J RN Resistor (CP)	323A5003J0202	5	
15	R12-R19, R523-R526, R664-R674, R676-R691	RM73B2A220J RN Resistor (CP)	323A5003J0220	39	
16	R527	RM73B2A222J RN Resistor (CP)	323A5003J0222	1	

COM-Printed Circuit Board Rev. 4
(40030302 - 2/2 - 2/7)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
17	R528, R529, R801	RM73B2A241J RN Resistor (CP)	323A5003J0241	3	
18	R773, R774	RM73B2A242J RN Resistor (CP)	323A5003J0242	2	
19	R530	RM73B2A244J RN Resistor (CP)	323A5003J0244	1	
20	R63	RM73B2A270J RN Resistor (CP)	323A5003J0272	1	
21	R533-R536, R653	RM73B2A272J RN Resistor (CP)	323A5003J0272	5	
22	R737	RM73B2A331J RN Resistor (CP)	323A5003J0331	1	
23	R21-R28, R64, R539-R541, R543-R549	RM73B2A332J RN Resistor (CP)	323A5003J0332	19	
24	R553, R761, R762	RM73B2A431J RN Resistor (CP)	323A5003J0431	3	
25	R554	RM73B2A432J RN Resistor (CP)	323A5003J0432	1	
26	R72, R555	RM73B2A471J RN Resistor (CP)	323A5003J0471	2	
27	R618, R619	RM73B2A473J RN Resistor (CP)	323A5003J0473	2	
28	R49-R54, R58, R73, R81, R621-R628, R630-R640, R643-R647, R651, R652, R654-R656, R659-R662, R675, R733-R736, R816, R818, R820, R822-R824, R826, R827, R832	RM73B2A510J RN Resistor (CP)	323A5003J0510	56	
29	R708	RM73B2A511J RN Resistor (CP)	323A5003J0511	1	
30	R32, R33, R68, R71, R556-R558, R560-R595, R612-R616, R710, R722, R744,	RM73B2A512J RN Resistor (CP)	323A5003J0512	64	

COM-Printed Circuit Board Rev. 4
(40030302 - 2/2 - 3/7)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
	R745, R768, R770-R772, R775-R779, R817, R819, R821				
31	R538, R711, R713-R720, R763, R780	RM73B2A560J RN Resistor (CP)	323A5003J0560	12	
32	R518-R521, R804	RM73B2A561J RN Resistor (CP)	323A5003J0561	5	
33	R825	RM73B2A680J RN Resistor (CP)	323A5003J0680	1	
34	R721	RM73B2A683J RN Resistor (CP)	323A5003J0683	1	
35	R57	RM73B2A750J RN Resistor (CP)	323A5003J0750	1	
36	R769	RM73B2A821J RN Resistor (CP)	323A5003J0821	1	
37	R66, R69, R77, R82, R808, R813	2125JPW Tip Jumper (CP)	323A5003P0001	6	
38	R60	ERJ-12YJ750 RN Resistor (CP)	323A5019J0750	1	
39	R34, R35	MSF1/2B0.51ΩJ RS Resistor	324A1001J0518	2	
40	C14, C501-C504, C581-C583	CC2012CH1H101J 50V CC Capacitor (CP)	303A3007C0101	8	
41	C599, C609, C611-C613	CC2012CH1H330J 50V CC Capacitor (CP)	303A3007C0330	5	
42	C596-C598, C610, C614	CC2012CH1H680J 50V CC Capacitor (CP)	303A3007C0680	5	
43	C21, C505-C509	CC2012SL1H102J 50V CC Capacitor (CP)	303A3007K0102	6	
44	C12, C586-C589	CC2012SL1H561J 50V CC Capacitor (CP)	303A3007K0561	5	
45	C11	CK92F1E155ZS 25V CK Capacitor 1.5uF	303A4117Z2155	1	

COM-Printed Circuit Board Rev. 4
(40030302 - 2/2 - 4/7)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
46	C531, C534, C573, C601	CK2012B1H102K 50V CK Capacitor (CP)	303A6008K3102	4	
47	C511, C512, C571, C602, C604, C605	CK2012F1C105Z 16V CK Capacitor (CP) 1uF	303A6008Z1105	6	
48	C13, C15-C20, C514, C517, C518, C526, C527, C535-C539, C541, C542, C545, C547-C549, C558, C559, C562-C563, C567, C572, C575-C578, C595, C606-C608, C615, C619	CK2012F1E104Z 25V CK Capacitor (CP)	303A6008Z2104	39	
49	C570	CK2012F1E224Z 25V CK Capacitor (CP)	303A6008Z2224	1	
50	C2	SXE10VB-1800-12.5D CE Capacitor 1800uF	304A1034A1182	1	
51	C3	SXE10VB-470 10V CE Capacitor 470uF	304A1034A1471	1	
52	C4	SXE50VB-100 50V CE Capacitor 100uF	304A1034H1101	1	
53	C7	10MS5-68M 10V CE Capacitor 68uF	304A1046A1680	1	
54	C6, C10	16MS5-10M 16V CE Capacitor 10uF	304A1046C1100	2	
55	C5	SME10VB-100-0A 10V CE Capacitor 100uF	304A1123A1101	1	
56	C8	KMG50VB-10M-FC 50V CE Capacitor 10uF	304A1180H1100	1	
57	Q26	7407FP BIP Digital IC (SO)	700A0003N0007	1	
58	Q10, Q11, Q14, Q15, Q20	74ALS244AFP BIP Digital IC (SO)	700A2503N0244	5	
59	Q6-Q9	74ALS245AFP BIP Digital IC (SO)	700A2503N0245	4	

COM-Printed Circuit Board Rev. 4
(40030302 - 2/2 - 5/7)

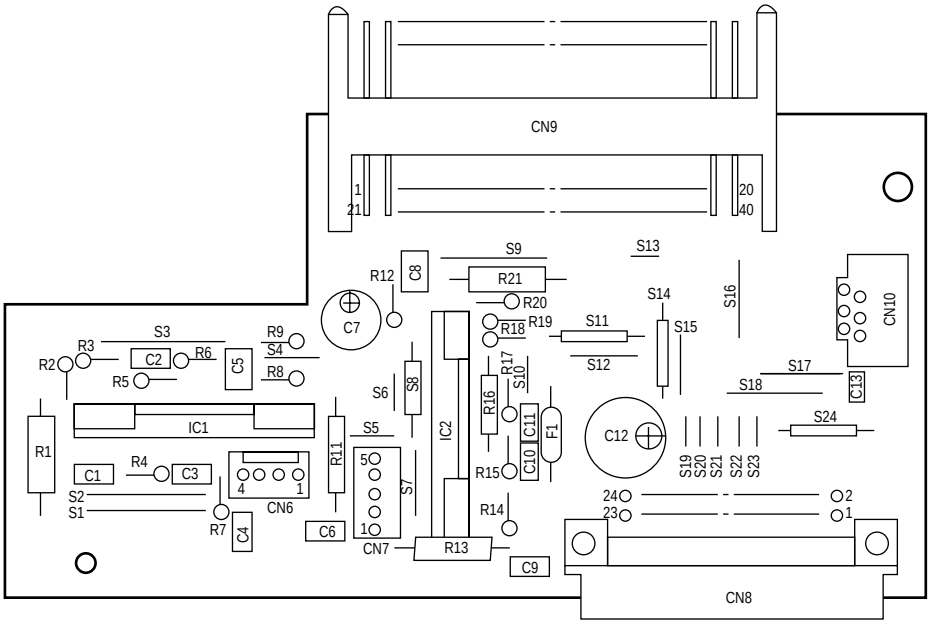
REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
60	Q22	SN74AS08NS BIP Digital IC (SO)	700A3050N0008	1	
61	Q23	MBCE31701-040PF-BND MOS Digital IC (FP)	702A4720N0002	1	
62	Q25	UPC393G2 BIP Linear IC (SO)	720A0523N0011	1	
63	IC1	TL431CLP/NJM431L Analog IC-BIP Linear	7200903M9001	1	
64	Q5	M54646AP BIP Linear IC	720A1822M0002	1	
65	Q21	M62354FP BIP Data IC (SO)	722A0022N3001	1	
66	Q1-Q4	MSM514807A-80JS MOS-D-RAM (SO)	802A0024N2625	4	
67	Q12	93LC46A-NW MOS-EEPROM	816A0303M0000	1	
68	Q13	MHM2029-004K-37 Micro Computer-MOS F	851044N0002	1	
69	EM1-EM5	DST306-55B271M EMI Filter	342A1004P1271	5	
70	EM8-EM12, EM33	ZJSC-R47-181 EMI Filter	342A1012P1181	6	
71	TR502, TR503	A1344/UN2111/DTA114K PNP-HF-TR (CP)	600A1003N0003	2	
72	TR4	2SB740 PNP-LF-TR	601A1121M0004	1	
73	TR1, TR2, TR501	DTC114EKA NPN-HF-TR (CP)	602A1035N0005	3	
74	TR3	2SD1623S NPN-LF-TR (CP)	603A1132N0001S	1	
75	CENT	57RE-40360-830B-D29 Rectangular Connector	2201001P0360	1	
76	APTK	TCS7187-01-201 Round Shaped Connector	221A1780P0080	1	

COM-Printed Circuit Board Rev. 4
(40030302 - 2/2 - 6/7)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
77	PS	DHB-PB100-S131NA PC Connector	224A3219P1000	1	
78	POWER	00-9072-240-901-883 PC Connector	224A3377P0400	1	
79	STKFULL	B5B-PH-K-S-GW PC Connector	224A3538P0050	1	
80	HEAD2	ZC-012 PC Connector	224A3590P0120	1	
81	HEAD1	ZC-014 PC Connector	224A3590P0140	1	
82	PANEL	ZC-106 PC Connector	224A3591P0060	1	
83	MUPIS	00-8345-396-949-014 PC Connector	224A3618P0640	1	
84	2NDTRAY, ENVE-LOPE	175487-7 PC Connector	224A4322P0070	2	
85	FRONT	175487-9 PC Connector	224A4322P0090	1	
86	OSC1	EFO-EC8004A4 Ceramic Oscillator	381A1033B0004	1	
87	OSC2	SG-531PTJ-32MHz Crystal Oscillator	3842143C0001	1	
88	BF2, BF6-BF8, BF10, BF15, BF16	ZBF253D-01 Beads Filter	377A1115P1309	7	
89	FU2, FU5	251-001 Fuse	540A2208S1102	2	
90	2	2-176438-7 IC Socket	245A1372P0720	2	
91	3	DICF-8CS-E IC Socket	245A1221P0080	1	
92	4	DICF-42CS-E IC Socket	245A1221P0420	2	
93	5	Plate Panel	40036401	1	

COM-Printed Circuit Board Rev. 4
(40030302 - 2/2 - 7/7)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
94	6	Earth Plate (A)	PP4128-1131P001	1	
95	7	Screw	P3-6G	2	
96	8	MPS-04-0 Card Spacer	143A1047P0001	2	



AOLC-Printed Circuit Board Rev. 6
(4YA4046-1620G011 - 1/2)

AOLC-Printed Circuit Board Rev. 6
(4YA4046-1620G011 - 2/2 - 1/3)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1					
2					
3	R9, 12	RD1/6-100ΩJ RD Resistor	3213420J0101	2	
4	R2, R8, R14, R20	RD1/6-1KΩJ RD Resistor	3213420J0102	4	
5	R18, R19	RD1/6-1.5KΩJ RD Resistor	3213420J0152	2	
6					
7	R3	RD1/6-2.7KΩJ RD Resistor	3213420J0272	1	
8	R5, R7, R15, R17	RD1/6-33KΩJ RD Resistor	3213420J0333	4	
9	R4	RD1/6-750ΩJ RD Resistor	3213420J0751	1	
10	R6	RD1/6-5.1KΩJ RD Resistor	3213420J0512	1	
11					
12	R1, R11, R13, R21	MSF1/2B0.51ΩJ RS Resistor	324A1001J0518	4	
13					
14	R16	RD1/4Y5.1KΩJ RD Resistor	321A1421J0512	1	
15					
16	C4, C9, C13	CK92F1H104ZY 50V CK Capacitor 0.1UF	303A0420Z3104	3	
17	C7	KMG50VB-47M 50V CE Capacitor 47UF	304A1164H1470	1	

AOLC-Printed Circuit Board Rev. 6
(4YA4046-1620G011 - 2/2 - 2/3)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
18	C1-C3, C5, C6, C8, C10, C11	TCK45B1H102KYA 50V CK Capacitor 1000PF	302A4027K3102	8	
19	C12	SME50VB-220-CC 50V CE Capacitor 220UF	304A1165H1221	1	
20					
21	IC1, IC2	A2918SWV BIP Linear IC	720A1826M0004	2	
22					
23					
24	CN8	00-8272-224-501-112 PC Connector	224A3368P0241	1	
25					
26	CN6	00-8263-0412-00-000 PC Connector	224A3357P0040	1	
27	CN7	00-8263-0512-00-000 PC Connector	224A3357P0050	1	
28					
29	CN10	ZC-106 PC Connector	224A3591P0060	1	
30					
31	CN9	PR40BOMA PC Connector	224A4360P0400	1	
32					
33					
34					

AOLC-Printed Circuit Board Rev. 6
(4YA4046-1620G011 - 2/2 - 3/3)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
35	F1	251-002 Fuse	540A2208S1202	1	
36					
37	S8, S11, S14, S24	JPW02 Jumper Wire	321A1520P0001	4	
38					
39					
40					
41	S5, S6, S10, S13, S19, S20, S21, S22, S23	Short Wire (U-type) 0.65 P = 5.0	5KH-31036-50	9	
42					
43	S4, S15	Short Wire (U-type) 0.65 P = 7.5	5KH-31036-75	2	
44	S7, S12, S16, S17	Short Wire (U-type) 0.65 P = 10	5KH-31036-100	4	
45	S1, S2, S3, S9, S18	Short Wire (U-type) 0.65 P = 15	5KH-31036-150	5	
46					
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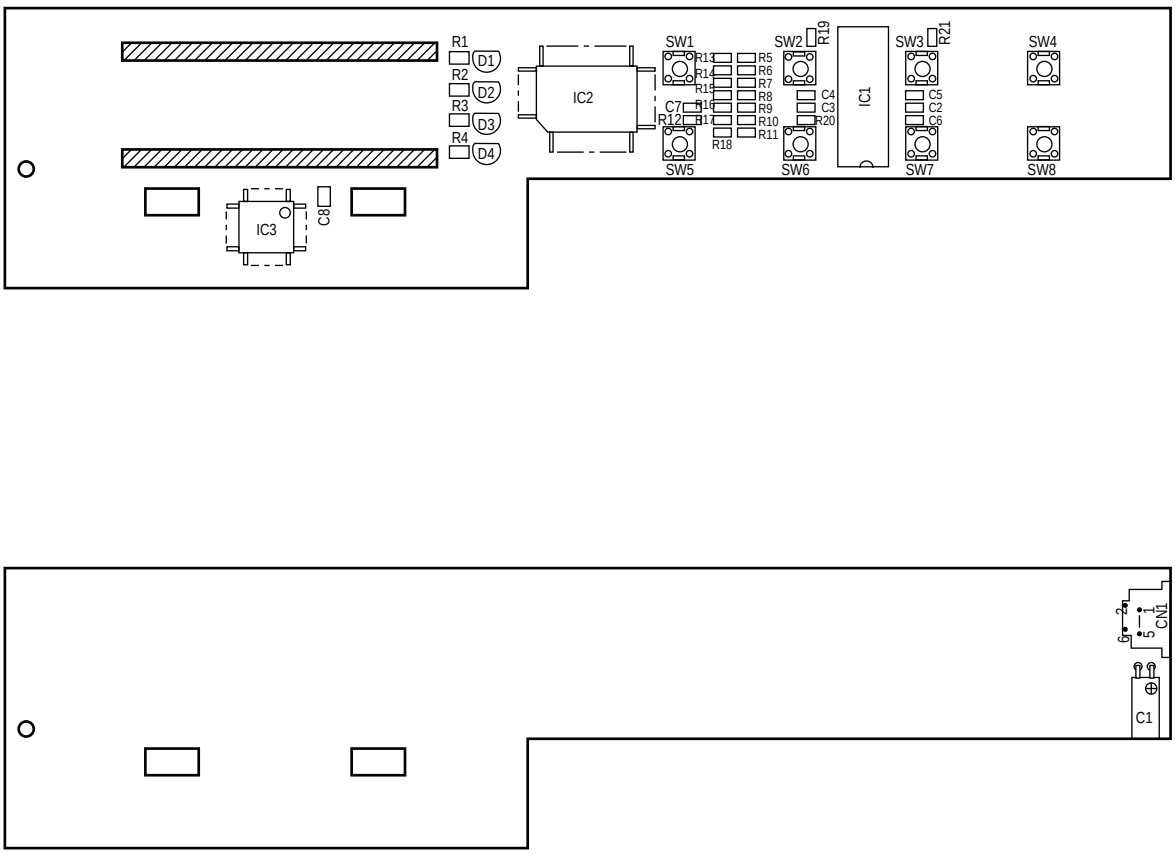

OLNC-Printed Circuit Board Rev. 3
(2YU5005-2235G001 - 1/2)

OLNC-Printed Circuit Board Rev. 3
(2YU5005-2235G001 - 2/2 - 1/2)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1					
2					
3	D1, D4	SEL3910D-YZ LED	650A0229M0018	2	
4	D2, D3	SEL3210R-YZ LED	650A0129M0016	2	
5					
6	R1-R4, R19-R21	RM73B2A201J RN Resistor (CP)	323A5003J0201	7	
7	R5-R11	RM73B2A103J RN Resistor (CP)	323A5003J0103	7	
8	R12	RM73B2A913F RN Resistor (CP)	323A5003F0913	1	
9	R13-R17	RM73B2A752J RN Resistor (CP)	323A5003J0752	5	
10	R18	RM73B2A512J RN Resistor (CP)	323A5003J0512	1	
11					
12	C1	KME10VB-100 10V CE Capacitor 100UF	304A1115A1101	1	
13	C2, C7, C8	CK2012F1E104Z 25V CK Capacitor (CP)	303A6008Z2104	3	
14	C3-C6	CC2012CH1H101J 50V CC Capacitor (CP)	303A3007C0101	4	
15					
16	IC1	BU6152S MOS Digital IC	702A4733M0002	1	
17	IC2	HD44780UB01FS CPU-INF-IC (FP)	855A0421N0002	1	

OLNC-Printed Circuit Board Rev. 3
(2YU5005-2235G001 - 2/2 - 2/2)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
18	IC3	MSM5259GS-VK CPU-INF-IC (FP)	855A0024N0001	1	
19					
20	SW1-SW8	SOR-113HS Push Button Switch	205A1165P1000	8	
21					
22					
23	CN1	ZC-106 PC Connector	224A3591P0060	1	
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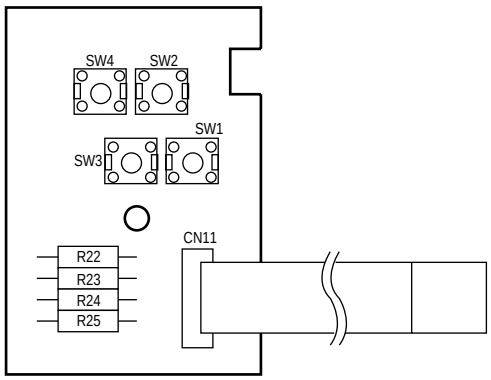
34					



AOLS-Printed Circuit Board Rev. 6
(4YA4046-1621G011 - 1/2)

AOLS-Printed Circuit Board Rev. 6
(4YA4046-1621G011 - 2/2 - 1/1)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1					
2					
3	R22-R25	RD1/4Y10KΩJ RD Resistor	321A1421J0103	4	
4					
5	CN11	00-5062-301-006-000 PC Connector	224A5114P0060	1	
6					
7	SW1-SW4	SOR-113HS Push-button Switch	205A1165P1000	4	
8					
9	2	SUMI Card Assy.	4YX4046-1668G001	1	
10					
11					
12					
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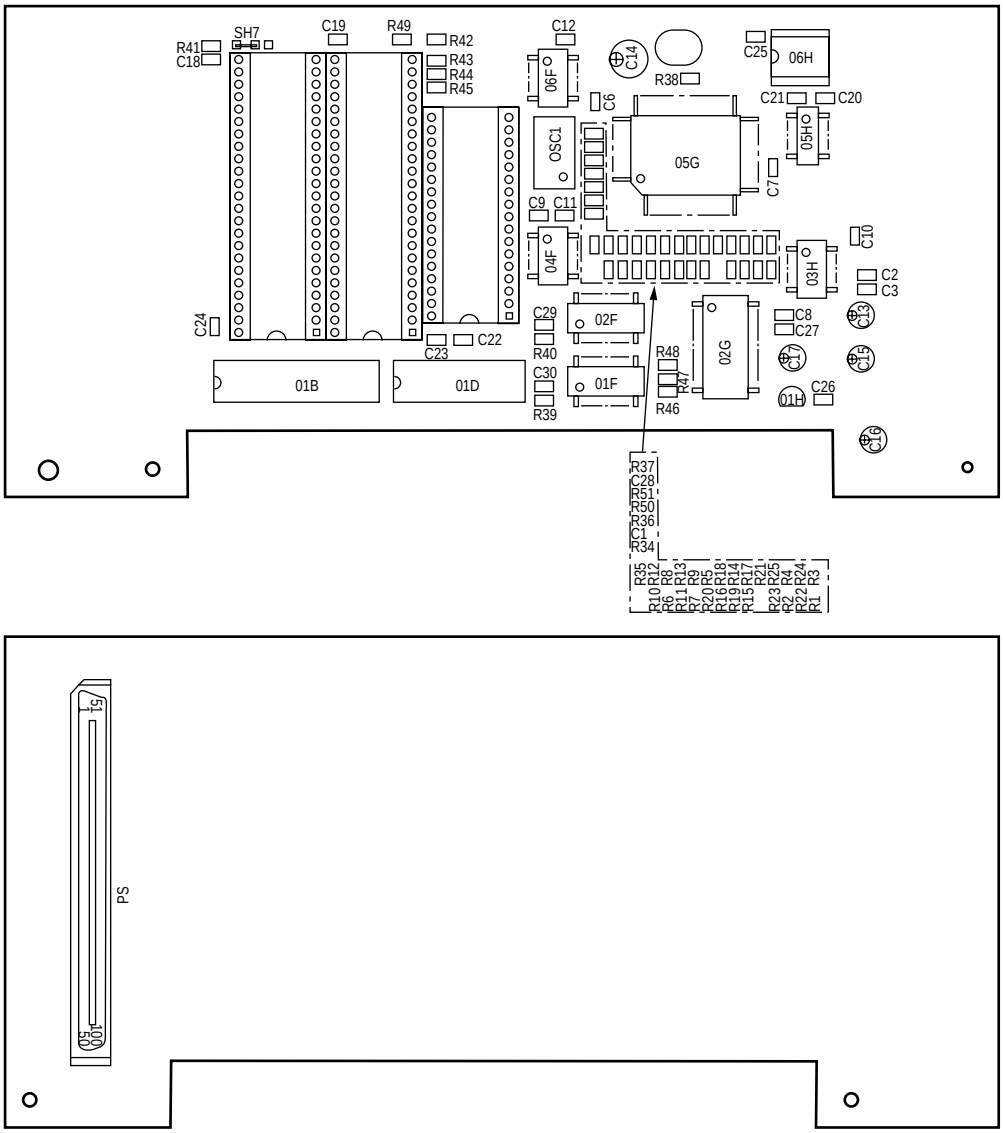
14					
15					
16					
17					



PSBA-Printed Circuit Board Rev. 3
(4YA4046-1632G011 - 1/2)

PSBA-Printed Circuit Board Rev. 3
(4YA4046-1632G011 - 2/2 - 1/3)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1					
2					
3	C1-C3	CC2012CH1H101J 50V CC Capacitor (CP)	303A3007C0101	3	
4	C6, C7	CK2012F1C105Z 16V CK Capacitor (CP) 1UF	303A6008Z1105	2	
5	C8-C12, C18-C30	CK2012F1E104Z 25V CK Capacitor (CP)	303A6008Z2104	18	
6					
7	C13	KME50VB-1R0-OA 50V CE Capacitor 1.0UF	304A1039H1109	1	
8	C14	10MS5-68M 10V CE Capacitor 68UF	304A1046A1680	1	
9	C15	SME10VB-100-OA 10V CE Capacitor 100UF	304A1123A1101	1	
10	C16, C17	SME16VB-47-OA 16V CE Capacitor 47UF	304A1123C1470	2	
11					
12	R1-R25	RM73B2A101J RN Resistor (CP)	323A5003J0101	25	
13	R34-R41	RM73B2A472J RN Resistor (CP)	323A5003J0472	8	
14	R42-R49	RM73B2A512J RN Resistor (CP)	323A5003J0512	8	
15	R50, R51	RM73B2A680J RN Resistor (CP)	323A5003J0680	2	
16					
17	04F	SN74LS74ANS BIP Digital IC (SO)	700A0550N0074A	1	

PSBA-Printed Circuit Board Rev. 3
(4YA4046-1632G011 - 2/2 - 2/3)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
18	06F	SN74LS00NS BIP Digital IC (SO)	700A0550N0000	1	
19	01F, 02F	SN74LS374NS BIP Digital IC (SO)	700A0550N0374	2	
20	03H	74HC14FP MOS Digital IC (SO)	702A1703N0014	1	
21					
22	05G	Z8018110FEC CPU-INF-IC (FP)	855A0462N0001	1	
23	02G	62256LFP-7LL MOS-S-RAM (SO)	804A0003N8302	1	
24	06H	NM93C66N-NW MOS-EEPROM	816A2323M0000	1	
25					
26					
27	01D	TIBPAL16L8-25CN-0242 PLA Memory IC	818A7091M0242	1	
28	01B	PALCE22V10H-15PC0003 PLA Memory IC	818A1239M0003	1	
29					
30	01H	79L05P BIP Linear IC	720A1000M5005	1	
31	05H	DS8925M BIP-INF-IC (SO)	710A2053N0002	1	
32					
33					
34	2	DICF-8CS-E IC Socket	245A1221P0080	1	

PSBA-Printed Circuit Board Rev. 3
(4YA4046-1632G011 - 2/2 - 3/3)

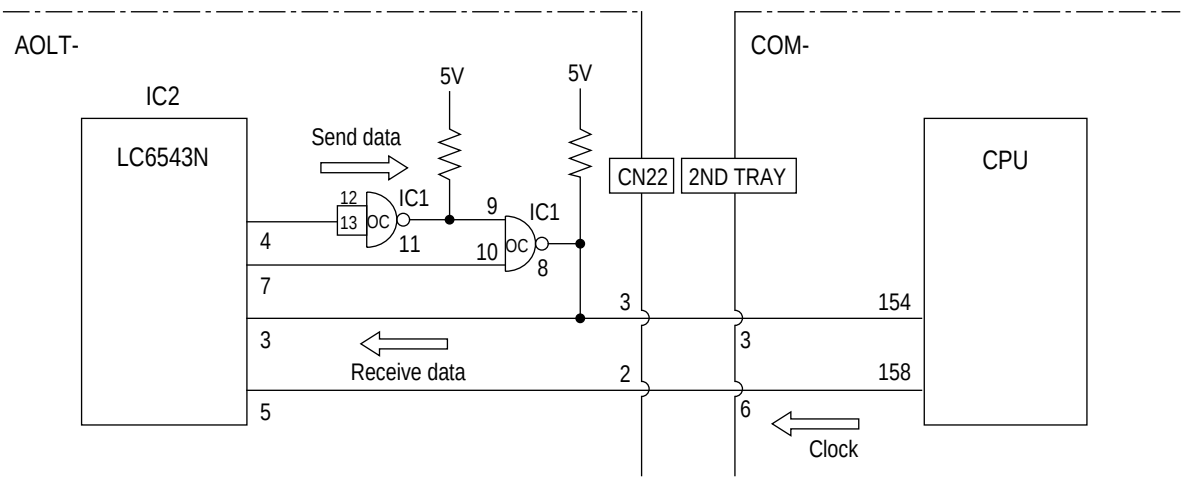
REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
35					
36					
37	5	DICF-32CS-E IC Socket	245A1221P0320	1	
38	6	DICF-42CS-E IC Socket	245A1221P0420	2	
39					
40	PS	DHB-RD100-S131N-4.9 PC Connector	224A3220P1000	1	
41					
42	OSC1	EXO-3-14.7456MHZ Crystal Oscillator	384A2067B0012	1	
43					
44	SH7	Short Wire (U-type) 0.65 P=2.5	5KH-31036-25	1	
45					
46	7	MPS-16-0 Card Spacer	143A1047P0007	1	
47					
48	02C	LH537U03	8174624M0003	1	
49	02D	LH537U04	8174624M0004	1	
50	02E	ROM IC Writing Specification	40203401	1	
51					

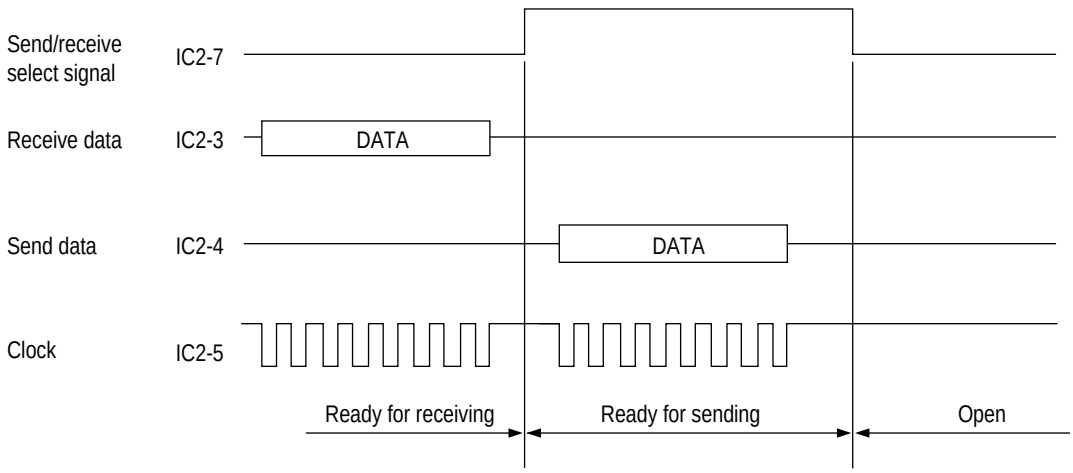
APPENDIX A HIGH CAPACITY SECOND PAPER FEEDER (OPTION)

1. CIRCUIT DESCRIPTION

1.1 Interface

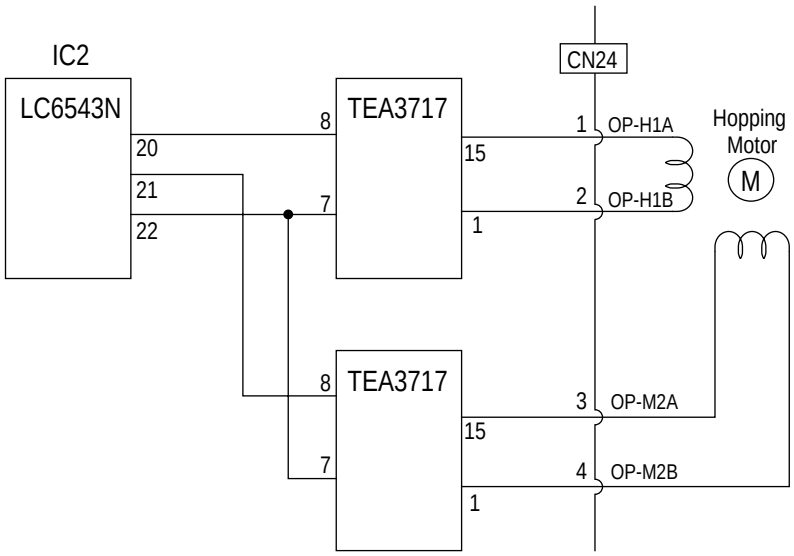
IC2 (LC6543N) uses a single line for transferring data to and from the CPU on the main unit side by performing the switchover between sending and receiving. To receive data from the CPU on the main unit side, IC2 (LC6543N) causes the send/receive select signal at pin 7 of IC2 to be LOW in order to drive the open collector output (pin 8 of IC1) to the high impedance state. As a result, the line in the send direction is open and the receive data ready state is established. To send data to the CPU on the main unit side, IC2 causes the send/receive select signal (pin 7 of IC2) to be HIGH, so that the send data ready state can be established. Under this condition, IC2 can send out data through pin 4. When finishing data transmission, IC2 causes the send/receive select signal (pin 7 of IC2) to be LOW to open the send direction of the line.

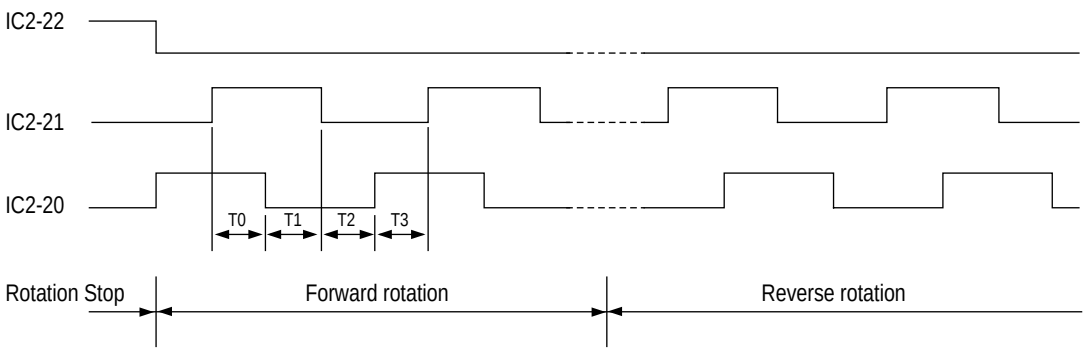




1.2 Motor Control

The hopping motor is driven by the driver IC according to the control signal from IC2 (LC6543N). The hopping motor will drive either the hopping roller or the feed roller depending on the rotation direction of the motor.





2. TROUBLESHOOTING

2.1 Troubleshooting Table

(A) Interface/motor control board (AOLT)

Failure	LCD Message	Flowchart No.
Paper input JAM occurs.	PAPER INPUT JAM CHECK TRAY2	A - 1
Paper size ERROR occurs.	ERROR PAPER SIZE CHECK TRAY2	A - 2
The message "PAPER OUT" remains displayed on the LCD.	PAPER OUT ********* TRAY2	A - 3
• Option Tray I/F timeout error occurs.	ERROR CONTROLLER 81	A - 4

(B) Cassette switch board (AOLD)

Failure	LCD Message	Flowchart No.
Paper size ERROR occurs.	ERROR PAPER SIZE CHECK TRAY2	B - 1

2.2 Troubleshooting Flowchart

A-1 Paper input JAM occurs.

- Is the hopping motor rotating normally?
  - No — Are the normal waveforms as shown in section 1.2 output to pins 20, 21 and 22 of IC2 (LC6543N)?
    - No — Replace IC2 (LC6543N).
  - Yes — Is +38V output to pin 3 of IC3 (TEA3717)?
    - No — Replace F1 (fuse).
  - Yes — Replace IC3 (TEA3717).
  - OK?
  - No — Replace IC4 (TEA3717).
- Yes — Failure of an element other than AOLT board

A-2 Paper size ERROR occurs.

- Do the output signals at pins 11, 12, 13 and 14 of IC2 (LC6543N) comply with the following table?

Paper size	Pin 11	Pin 12	Pin 13	Pin 14
Letter	L	H	H	H
Executive	L	H	L	H
A4	L	L	H	H
Legal 14	H	H	H	L
Legal 13	H	L	H	H
B5	H	H	L	H
A5	H	H	L	L
A6	H	L	L	H

  - No — Check to see if the SW1 to SW4 on AOLD board are set properly?
- Yes — Replace IC2 (LC6543N).

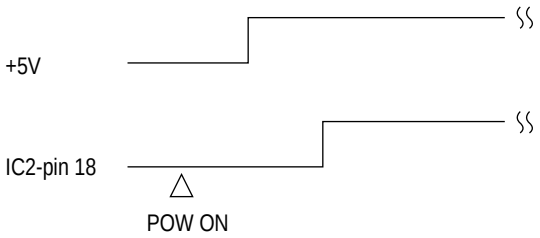
A-3 The message "PAPER OUT" remains displayed on the LCD.

- Is SEN1 (Paper END Sensor) operating normally?
  - No Replace SEN1.
- Yes Replace IC2 (LC6543N).

A-4 Option Tray I/F timeout error.

- Is the normal clock as shown in section 1.1 output to pin 5 of IC2 (LC6543N)?
  - No Failure of COM board on the main unit side.
- Yes Is the normal receive data as shown in section 1.1 output to pin 3 of IC2 (LC6543N)?
  - No Is the level on pin 9 or 10 of IC1 (LS38) HIGH at all time?
    - No Replace IC1 (LS38).
    - OK?
    - No Failure of COM board on the main unit side or envelope feeder AOLE board.
  - Yes Replace IC2 (LC6543N).
- Yes Is the normal send data as shown in section 1.1 output to pin 3 of IC2 (LC6543N)?
  - No Is the normal send data as shown in section 1.1 output to pin 4 of IC2 (LC6543N)?
    - Yes Replace IC1 (LS38).
  - No Is an oscillation waveform output to pin 15 of IC2 (LC6543N)?
    - No Replace OSC1 (oscillator).
    - OK?
    - No Replace IC2 (LC6543N).

Yes Is the following reset waveform output to pin 18 of IC2 (LC6543N)?



No Replace TR1 (DTA114S).

OK?

No Replace D2 (diode).

OK?

No Replace D3 (RD3.9E-B).

Yes Replace IC2 (LC6543N).

Yes Failure of COM board on the main unit side or envelope feeder AOLE board.

B-1 PAPER SIZE ERROR occurs.

- Does the PAPER SIZE 1 signal at pin 1 of CN25 go LOW when SW1 is depressed and does the same signal go HIGH when SW1 is not depressed?
  - No Replace SW1.
- Yes Does the PAPER SIZE 2 signal at pin 2 of CN25 go LOW when SW2 is depressed and does the same signal go HIGH when SW2 is not depressed?
  - No Replace SW2.
- Yes Does the PAPER SIZE 3 signal at pin 3 of CN25 go LOW when SW3 is depressed and does the same signal go HIGH when SW3 is not depressed?
  - No Replace SW3.
- Yes Does not PAPER SIZE 4 signal at pin 4 of CN25 go LOW when SW4 is depressed and does the same signal go HIGH when SW4 is not depressed?
  - No Replace SW4.
- Yes Failure of an element other than AOLD board

3. CIRCUIT DIAGRAM

Figure 3 - 1 AOLT-PCB (AOLT-1/1) (Rev. 4)

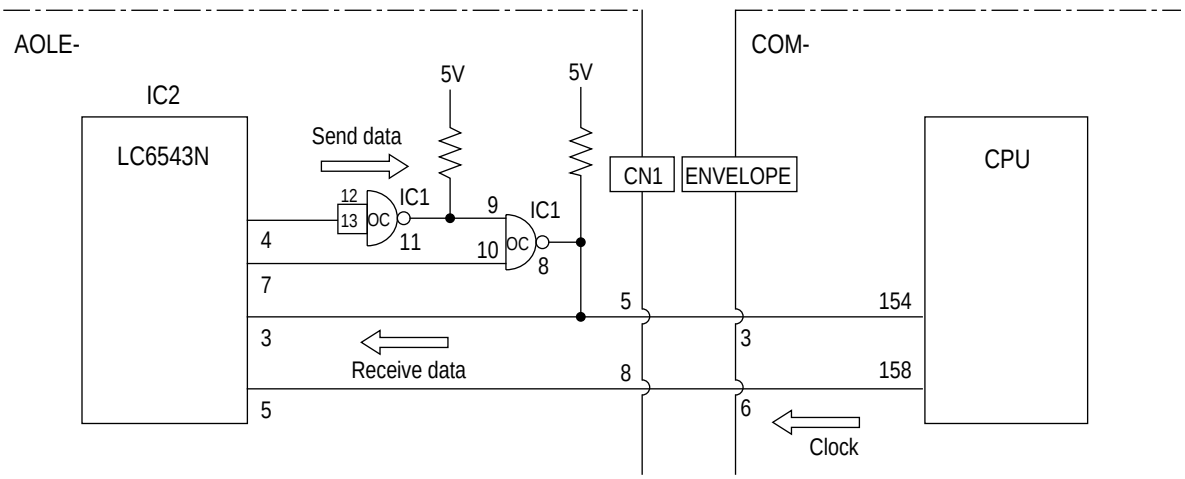
Figure 3 - 2 AOLD-PCB (AOLD-1/1) (Rev. 4)

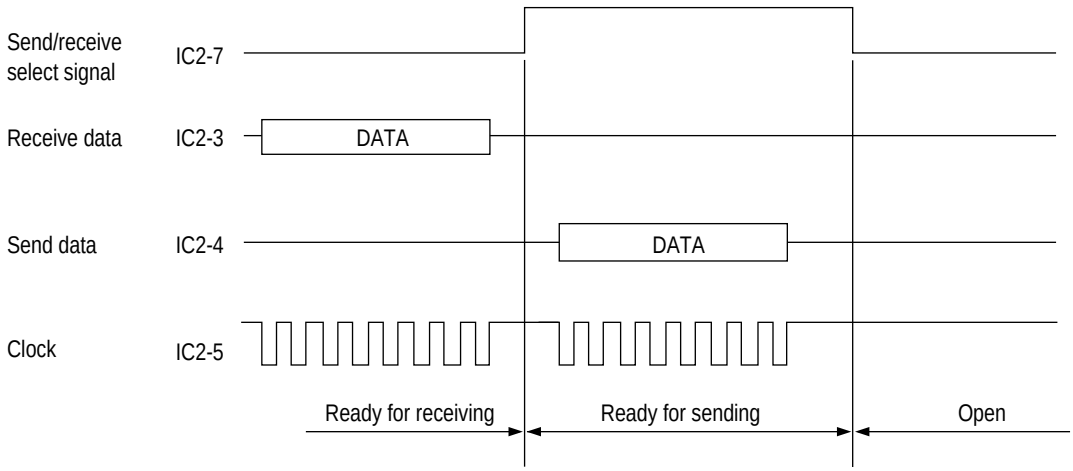
APPENDIX B POWER ENVELOPE FEEDER (OPTION)

1. CIRCUIT DESCRIPTION

1.1 Interface

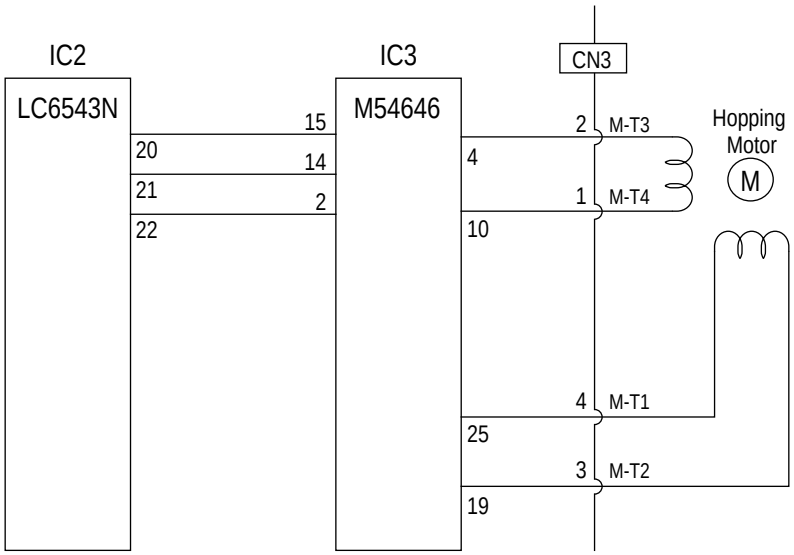
IC2 (LC6543N) uses a single line for transferring data to and from the CPU on the main unit side by performing the switchover between sending and receiving. To receive data from the CPU on the main unit side, IC2 (LC6543N) causes the send/receive select signal at pin 7 of IC2 to be LOW in order to drive the open collector output (pin 8 of IC1) to the high impedance state. As a result, the line in the send direction is open and the receive data ready state is established. To send data to the CPU on the main unit side, IC2 causes the send/receive select signal (pin 7 of IC2) to be HIGH, so that the send data ready state can be established. Under this condition, IC2 can send out data through pin 4. When finishing data transmission, IC2 causes the send/receive select signal (pin 7 of IC2) to be LOW to open the send direction of the line.

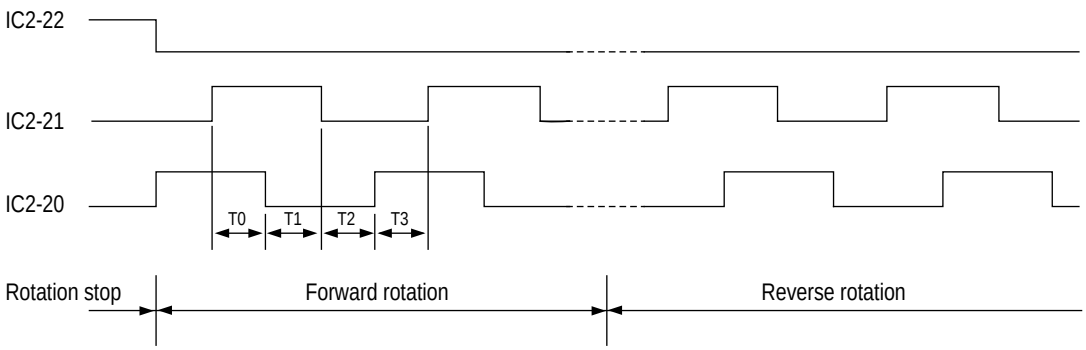




1.2 Motor Control

The hopping motor is driven by the driver IC according to the control signal from IC2 (LC6543N). The hopping motor will drive either the hopping roller or the feed roller depending on the rotation direction of the motor.





2. TROUBLESHOOTING

2.1 Troubleshooting Table

(A) Interface/motor control board (AOLE)

Failure	LCD Message	Flowchart No.
Paper input JAM occurs.	PAPER INPUT JAM CHECK FEEDER	A - 1
The message "PAPER OUT" remains displayed on the LCD.	PAPER OUT ********* FEEDER	A - 2
• Option Tray I/F timeout error occurs.	ERROR CONTROLLER 81	A - 3

2.2 Troubleshooting Flowchart

A-1 Paper input JAM occurs.

- Is the hopping motor rotating normally?
  - No — Are the normal waveforms as shown in section 1.2 output to pins 20 and 21 of IC2 (LC6543N)?
    - No — Replace IC2 (LC6543N).
  - Yes — Does the output at pin 2 of IC3 (M54646) go HIGH when the motor is rotating?
    - No — Is the normal waveform as shown in section 1.1 output to pin 22 of IC2 (LC6543N)?
      - No — Replace IC2 (LC6543N).
    - Yes — Replace TR1 (DTA114).
  - Yes — Is +38V output to pin 3 of IC3 (M54646)?
    - No — Replace F1 (fuse).
    - OK?
    - No — Replace D1 (diode).
    - OK?
    - No — Replace D2 (diode).
  - Yes — Replace IC3 (M54646).

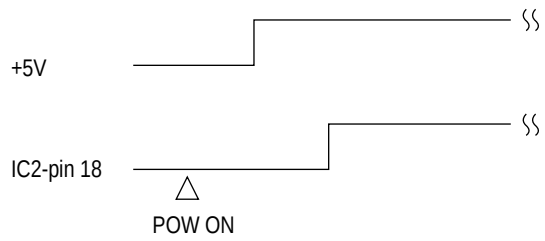
A-2 The message "PAPER OUT" remains displayed on the LCD.

- Is SEN2 (Paper END Sensor) operating normally?
  - No — Replace SEN2.
  - Yes — Replace IC2 (LC6543N).

A-3 Option Tray I/F timeout error.

- Is the normal clock as shown in section 1.1 output to pin 5 of IC2 (LC6543N)?
  - No — Failure of COM board on the main unit side
  - Yes — Is the normal receive data as shown in section 1.1 output to pin 3 of IC2 (LC6543N)?
    - No — Is the level on pin 9 or 10 of IC1 (LS38) HIGH at all time?
      - No — Replace IC1 (LS38).
      - OK?
      - No — Failure of COM board on the main unit side or second TRAY AOLT board
    - Yes — Replace IC2 (LC6543N).
  - Yes — Is the normal send data as shown in section 1.1 output to pin 3 of IC2 (LC6543N)?
    - No — Is the normal send data as shown in section 1.1 output to pin 4 of IC2 (LC6543N)?
      - Yes — Replace IC1 (LS38).
    - No — Is an oscillation waveform output to pin 15 of IC2 (LC6543N)?
      - No — Replace OSC1 (oscillator).
      - OK?
      - No — Replace IC2 (LC6543N).

Yes Is the following reset waveform output at pin 18 of IC2 (LC6543N)?



No Replace TR2 (DTA114K).

OK?

No Replace D3 (diode).

OK?

No Replace D4 (RD3.9E-B).

Yes Replace IC2 (LC6543N)

Yes Failure of COM board on the main unit side or second TRAY AOLT board.

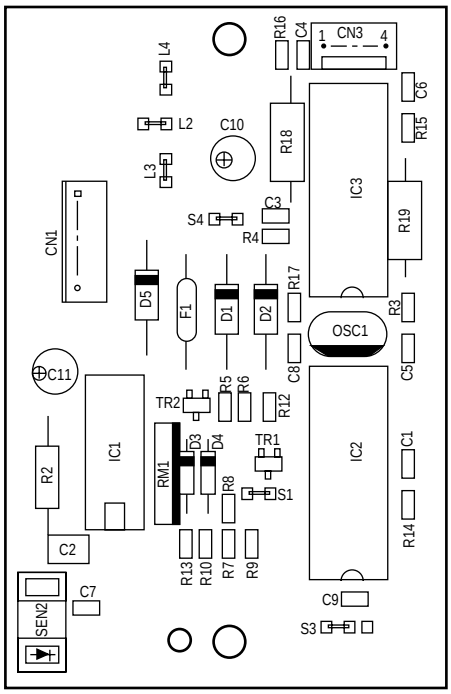
3. CIRCUIT DIAGRAM

Figure 3 - 1 AOLE-PCB (AOLE-1/2) (Rev. 1)

Figure 3 - 2 AOLE-PCB (AOLE-2/2) (Rev. 1)

4. COMPONENT PARTS LIST

AOLE-PCB (Controller)	Rev. 1	4YA4046-1647G1



AOLE-Printed Circuit Board
(4YA4046-1647G001 - 1/2)

AOLE-Printed Circuit Board
(4YA4046-1647G001 - 2/2 - 1/3)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1					
2					
3	D1, D2, D5	EM01Z/SM1XN02/DSM1D2 Rectifier DI	610A0003M0001	3	
4	D4	RD3.9E-B Zenor DI	613A1231L0082	1	
5	D3	1S953/1S2075K/1S2473 Signal DI	611A0003L0001	1	
6					
7	R15, R16	RM73B2A473J RN Resistor (CP)	323A5003J0473	2	
8	R18, R19	MSF1/2B0.51ΩJ RS Resistor	324A1001J0518	2	
9	R3-R6	RM73B2A102J RN Resistor (CP)	323A5003J0102	4	
10	R2	RD1/4Y180ΩJ RD Resistor	321A1421J0181	1	
11	R7-R10, R14	RM73B2A103J RN Resistor (CP)	323A5003J0103	5	
12	R12	RM73B2A363J RN Resistor (CP)	323A5003J0363	1	
13	R17	RM73B2A182J RN Resistor (CP)	323A5003J0182	1	
14	R13	RM73B2A153J RN Resistor (CP)	323A5003J0153	1	
15	RM1	MRM-4-512JA Block Resistor	334A3266J0512	1	
16					
17	C10	KMG50VB-10M 50V CE Capacitor 10UF	304A1164H1100	1	

AOLE-Printed Circuit Board
(4YA4046-1647G001 - 2/2 - 2/3)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
18	C11	10MS5-33M 10V CE Capacitor 33UF	304A1046A1330	1	
19	C2	RPE122-127E334M50 CK Capacitor 0.33UF	303A4116M3334	1	
20	C1	CC2012SL1H471J 50V CC Capacitor (CP)	303A3007K0471	1	
21	C3-C6	CK2012B1H102K 50V CK Capacitor (CP)	303A6008K3102	4	
22	C7-C9	CK2012F1E104Z 25V CK Capacitor (CP)	303A6008Z2104	3	
23					
24	IC3	M54646AP BIP Linear IC	720A1822M0002	1	
25	IC1	74LS38P BIP Digital IC	700A0503M0038	1	
26	IC2	LC6543N-4B52 MOS-CPU (ROM)	853A0036M0002	1	
27					
28	SEN2	SG-205-B Photocoupler	652A0114M0001	1	
29	TR1, TR2	A1344/UN2111/DTA114K PNP-HF-TR (CP)	600A1003N0003	2	
30	OSC1	CST4.000MGW Ceramic Oscillator	381A1025B0002	1	
31					
32	S1, S3, S4, L2-L4	Short Wire (U-type) 0.65 P = 2.5	5KH-31036-26	6	
33	F1	251-001 Fuse	540A2208S1102	1	
34					

AOLE-Printed Circuit Board
(4YA4046-1647G001 - 2/2 - 3/3)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
35	CN3	00-8263-0412-00-000 PC Connector	224A3357P0040	1	
36					
37	CN1	175487-7 PC Connector	224A4322P0070	1	
38					
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