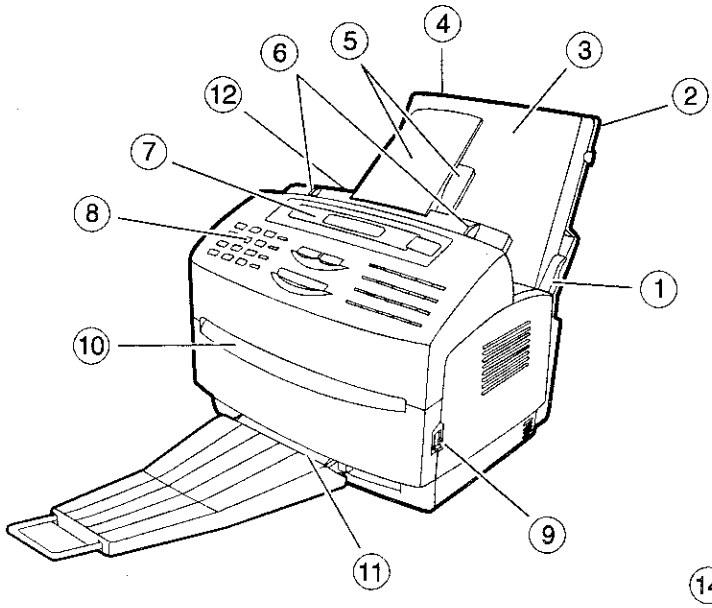
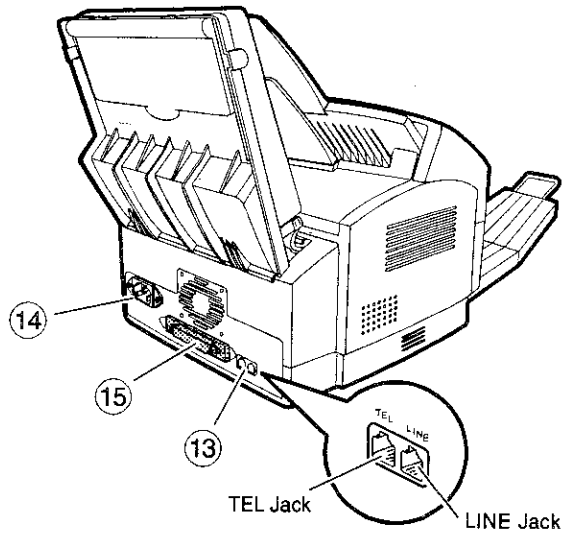
[6] DESCRIPTIONS OF EACH SECTION

1. Out look



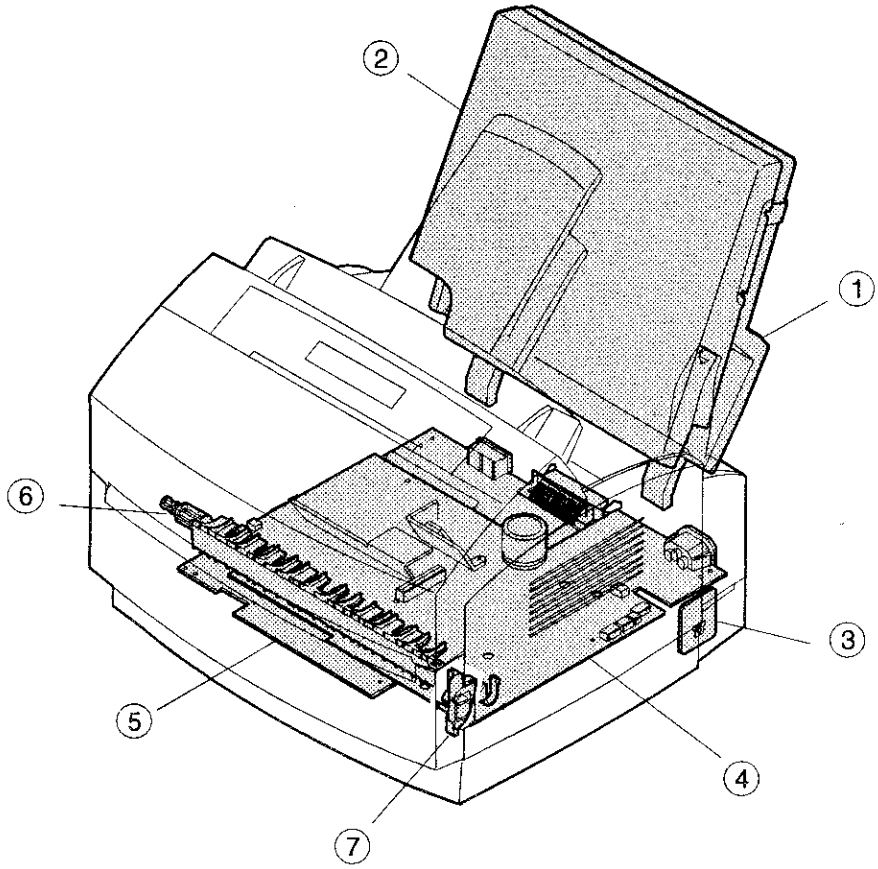
Front



Back

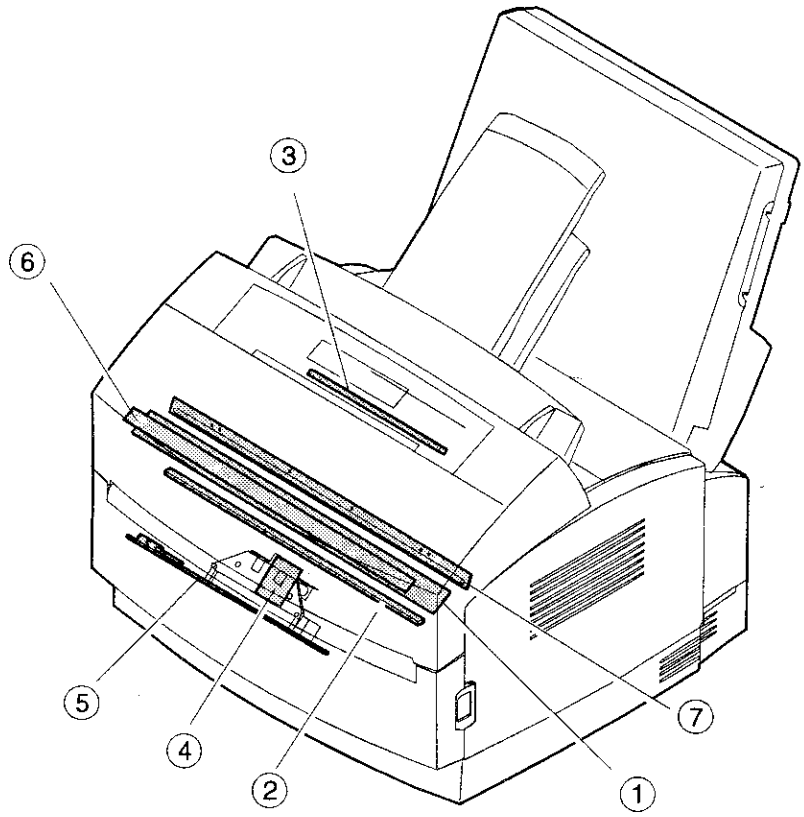
No.	Name	Function
①	Paper release lever	When this lever is pulled toward you, the paper is released to be free. When setting the paper, pull this lever toward you, set the paper, then release the lever.
②	Paper tray	Set the paper on this paper tray. 100 sheets of standard paper can be set. When setting legal size paper, rotate the paper extension tray to extend the tray upward.
③	Extension tray	The extension tray is attached to the tip of the paper tray, and is rotated to be extended for use. It is used when long size paper such as legal size paper is used.
④	Paper tray cover	Used to cover the set paper.
⑤	Original tray	One which is attached to the scanner paper feed port (the upper side in the figure) receives scanner originals. The other which is attached to the printer paper face down port (the lower side in the figure) receives print-out paper.
⑥	Original guide	Indicates the left and right set positions of the scanner original and guides it to be fed in parallel.
⑦	Panel display section	Displays the standby and operation states. The LED lamps indicates toner and paper empty, FAX auto/manual, answering machine connection and setting, and connection with a personal computer or the telephone line.
⑧	Key operation panel	The 10-key pad, the copy key, the stop key, the start key, the one-touch key, and the function key are arranged on this panel. **10-key pad:** Used to enter telephone numbers and numeric figures. **Copy key:** Used for copying. **Stop key:** Used to stop an operation. **Start key:** Used to start an operation. **One-touch key:** Used to memory FAX numbers to send immediately. **Function key:** Used to operate various functions.
⑨	Print-out direction select lever	This lever selects face-up and face-down print-out. For face down, set it up. For face up, set it down.
⑩	Scanner original exit port	Exit port of scanned original.
⑪	Face-up port	Print-out port in face up.
⑫	Paper size sensor	This sensor detects the paper size whether the paper set in the paper tray is of A4 or letter size or the smaller. When A4 or letter size paper is set, copying and FAX reception can be performed. If smaller size paper is set, copying cannot be performed and only memory reception of FAX can be performed. The memory reception data can be outputted only when A4 or letter size paper is set.
⑬	TEL/LINE	Connection port with the telephone set and the telephone line.
⑭	AC inlet	Connection port with the AC cord.
⑮	Centro interface	Interface port with a personal computer. (Interface cable cap)

2. Printer section



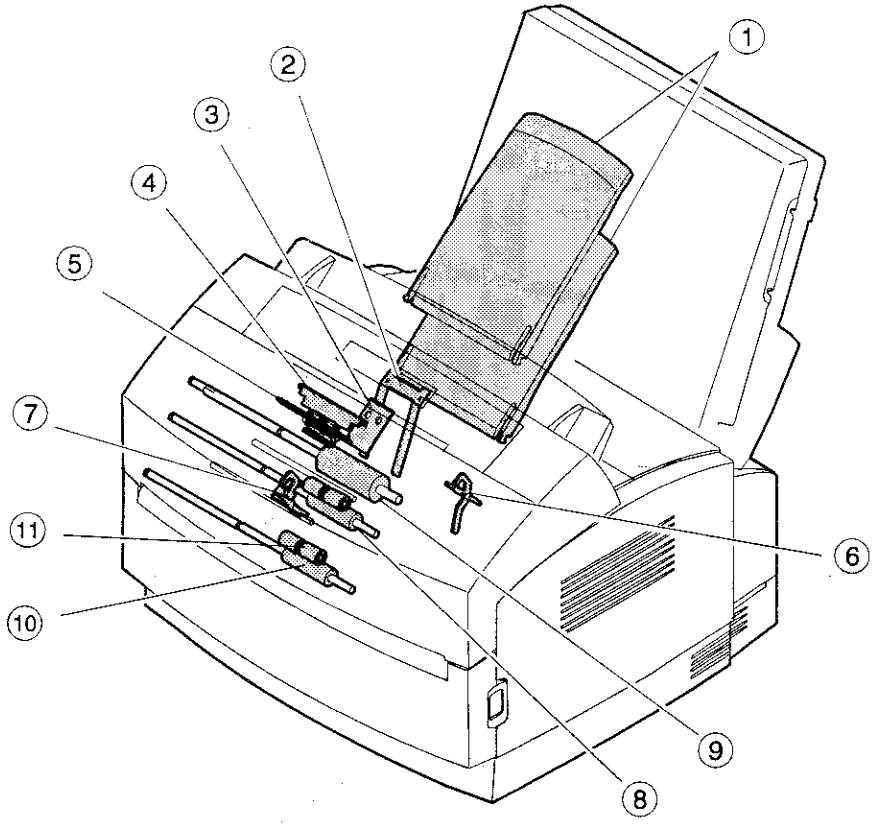
No.	Name	Function
①	Paper tray	The print paper set section of the printer. Paper of max, 216mm width can be set. When setting Letter or Legal size paper, the extension tray is used. When using the machine as a FAX machine, paper of letter size or A4 size must be set.
②	Paper cover	The cover of set paper. This is set in the upper side when Legal size paper is used.
③	External temperature sensor	Detects external temperature when controlling the printer fusing temperature.
④	PC-PS PWB	Printer control and power PWB.
⑤	Main-cont. PWB	Controls the scanner section, FAX section, and PC interface, etc.
⑥	Paper exit flap	Used to select the paper discharge direction of print out paper.
⑦	Paper exit select lever	Used to select the paper exit flap direction to select the print out paper direction. When this is set to UP position, the paper is discharged in face down. When set to DOWN position, face up.

3. Scanner optical system



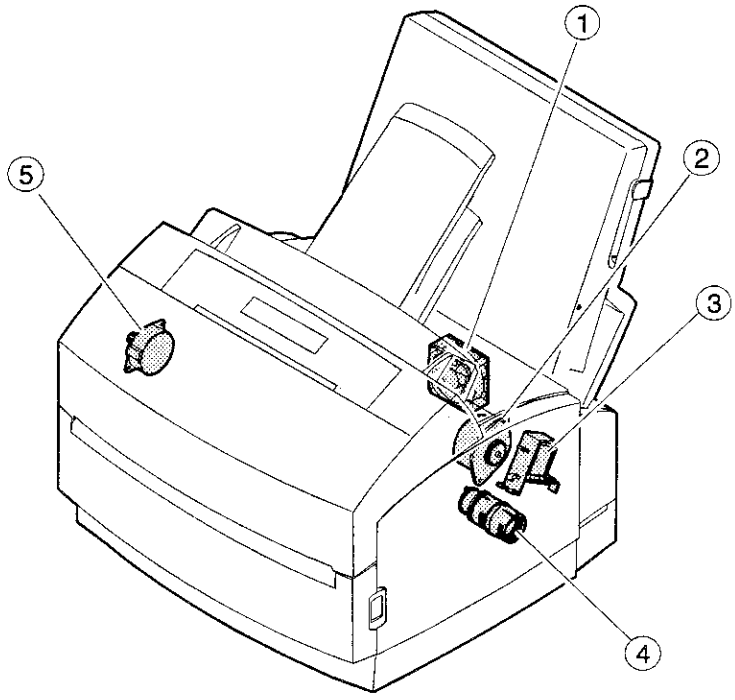
No.	Name	Function
①	Cover glass	The cover of the document scanner section.
②	Mirror (1)	No. 1 mirror used to change the optical path for document scanning,
③	Mirror (2)	No. 2 mirror used to change the optical path for document scanning,
④	Lens	Used to form images of the document on the light reception element,
⑤	CCD PWB	Used to drive the light reception element.
⑥	White balance sheet	Used as the reference white when scanning the document.
⑦	Light source	Supplies light to scan the document. An LED light source is used for A4 machines (scanning width of 210mm).

4. Scanner section drive system



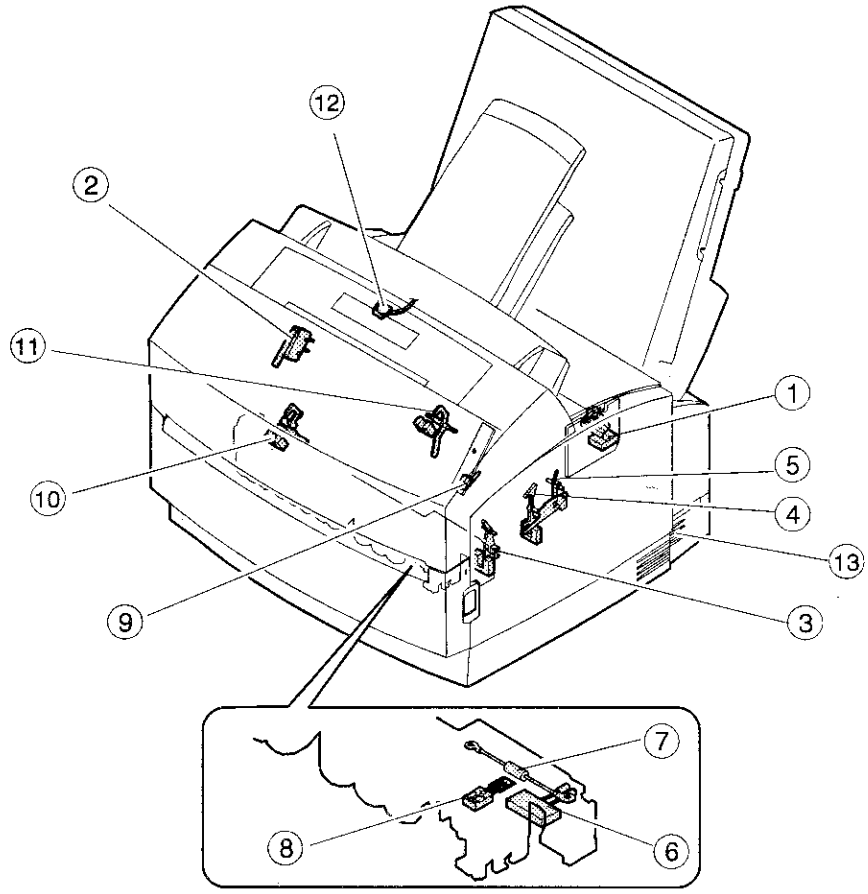
No.	Name	Function
①	Document tray	Used to set document on it. The same one is used in the print out side to received printed paper.
②	Document holding plate spring	Used to press the document onto the separation roller to transmit the drive power of the separation roller to the document when feeding document.
③	Separation sheet	When two or more documents are set on the document tray, this sheet stops the top document to feed the first (bottom) document then feed the next in sequence.
④	Separation sheet holder	Used to hold the separation sheet to make the separation sheet display the specified separation power.
⑤	Separation sheet holding spring	Used to give a proper pressure to the separation sheet holder.
⑥	P sensor	Used to detect the presence of document on the document tray.
⑦	PI sensor	Used to detect the lead edge and the rear edge of the document fed by the separation roller.
⑧	Paper feed roller	Used to feed documents in the proper pitch.
⑨	Paper feed pinch roller	Used to give a pinch pressure to the paper feed roller.
⑩	Paper exit roller	Used to discharge the scanned document.
⑪	Paper exit pinch roller	Used to give a pinch pressure to the paper exit roller.

5. Clutches, motors, solenoids



No.	Name	Function
①	Cooling fan motor	The internal cooling fan of suction type. Controlled to operate only when printing.
②	Main motor	Used to transport paper, drive the drum rotation and drive the printer.
③	Paper feed soelnoid	Used to turn on/off paper feed operation. When the solenoid is ON, paper feed is performed.
④	Paper feed clutch	The Paper feed clutch uses a spring clutch so that rotation of the paper feed roller is transmitted to the paper feed roller.
⑤	Scanner motor	Used to drive the scanner section to perform original transport, etc.

6. Switches and sensors



No.	Parts Name	Type	Description
①	PE sensor (Paper Empty sensor)	Photo transistor (Transmission type)	Detects presence of paper on the multi-purpose paper tray.
②	Front cover open detector	Microswitch	12V line safety switch. When the front cover is opened, this switch is turned off to cut the 12V line except for "ERROR" and "ON LINE" LED. By this, the main motor, the heater lamp, and the high voltage power source is turned off.
③	POUT sensor (Paper OUT sensor)	Photo transistor (Transmission type)	Detects paper out, and paper jams.
④	1st PIN (Paper In) sensor	Photo transistor (Transmission type) (Common with the 2nd PIN sensor)	When this switch is turned on, paper transport and image transfer from the drum are started. This is also used for detection of paper jam.
⑤	2nd PIN (Paper In) sensor	Photo transistor (Transmission type) (Common with the 1st PIN sensor)	This sensor used to detect the rear edge of paper at a position nearer to the paper feed side for feeding the next paper in a short interval. Erroneous feeding together with the previous paper is also detected. Used for the prefeed function.
⑥	Temperature fuse 187°C	Thermal fuse	When the heat roller temperature rises abnormally, this fuse cuts off the power relay power line (12V line).
⑦	Temperature fuse 132°C	Thermal fuse	When the heat roller temperature rises abnormally, this fuse cuts off the heater lamp power line.
⑧	Thermistor	Thermistor	This thermistor detects the temperature on the heat roller.
⑨	Scanner open switch	Microswitch	Checks the scanner original path system open.
⑩	PI sensor	Photo transistor (Transmission type)	Detecs the lead edge of the scanner original.
⑪	P sensor	Photo transistor (Transmission type)	Detects presence of scanner original.
⑫	A4 sensor	Leaf switch	Detects that the printer paper width is greater than A4 width or not.
⑬	Thermistor (PWB)	Thermistor	Detect the ambient temperature.

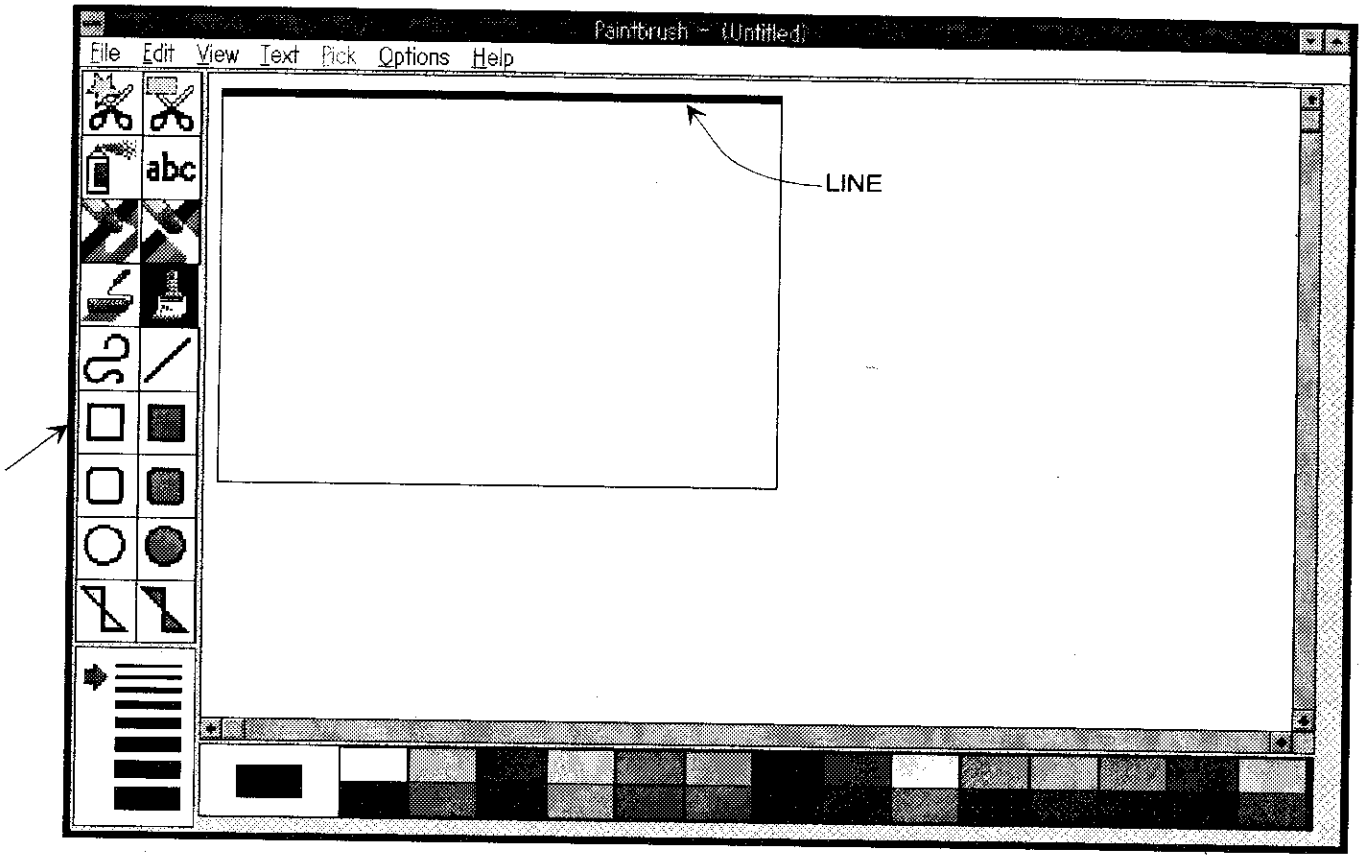
[7] ADJUSTMENT

1. Top margin adjustment

The top margin adjustment cannot be made with the printer only. Printing must be made by PaintBrush on Microsoft Windows.

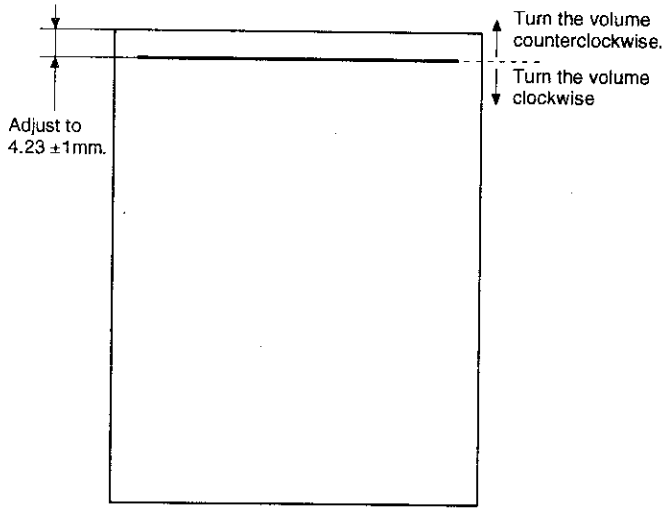
(1) Run Windows, and run PaintBrush.

(2) Draw a line at the top of the draw area of PaintBrush. (Check in the enlarged mode that the top dot is correctly painted.)

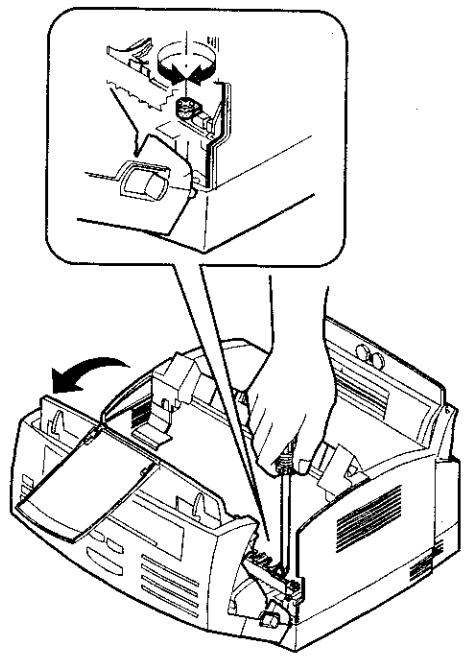


(3) In the margin setting of page layout of PaintBrush, set the top margin to minimum size.

(4) Print from PaintBrush.



(5) Turn the top margin adjustment control VR301 on the MAIN PWB to adjust the top margin to 4.23 ±1mm.



VR301 is located next to CN202. When the cover is opened, it can be seen under the fusing section.

2. Power voltage adjustment

① Similarly to the diag operation, remove the control PWB from the machine.

② Install a resistor of 130 Ω (5 W) between the 13 V output and GND. (Refer to point A in Fig. 1 below figure.)

③ Turn on the power.

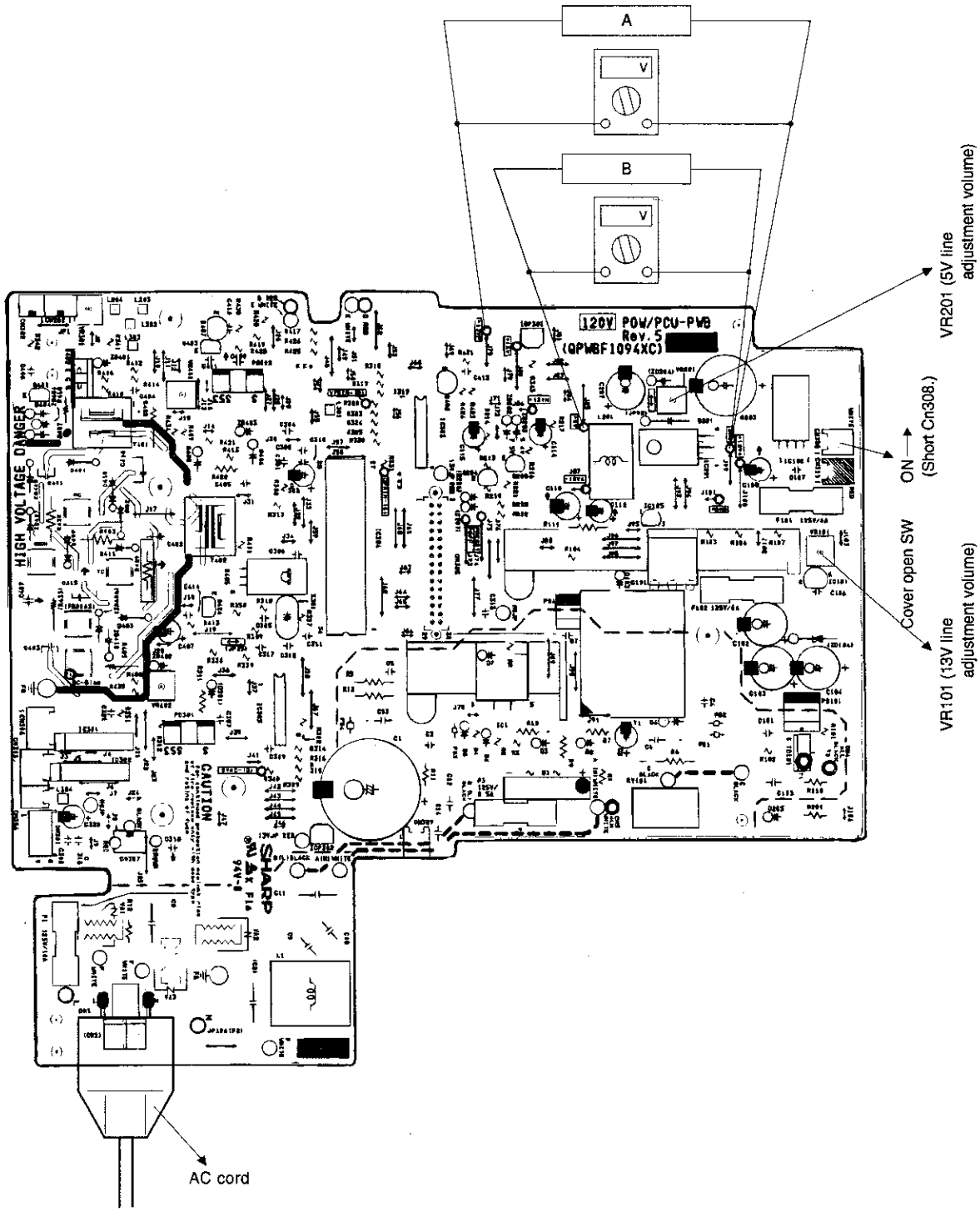
④ Put the voltmeter between the check point of 13 VP on the control PWB and GND, and turn VR101 to set to 13.0 ± 0.05V.

⑤ Turn off the power, remove the resistor of 130 Ω (5 W), and install a resistor of 4 Ω (50 W) in the same manner as ② and put the voltmeter in the same manner as to check that the voltage is 12.5 V or above.

⑥ Turn off the power and install a resistor of 5 Ω (10 W) between the 5 V output and GND. (Refer to Point B in Fig. 1 on below figure.)

⑦ Turn on the power.

⑧ Put the voltmeter between the check point of +5 V on the control PWB and GND, and turn VR201 to set to 5.0 ± 0.05 V.

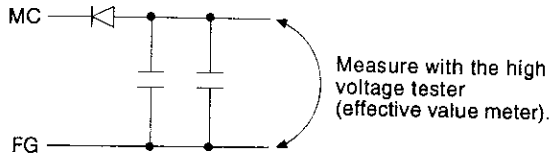


3. High voltage power adjustments

The high voltage power adjustments are composed of the MC output voltage adjustment and the DC bias output voltage adjustment. Either adjustment is performed with the diag function.

① MC output voltage adjustment

In the measurement circuit shown below, adjust VR401 to be −1340 V ± 15 V. For measurement, use a high voltage tester (effective value meter).

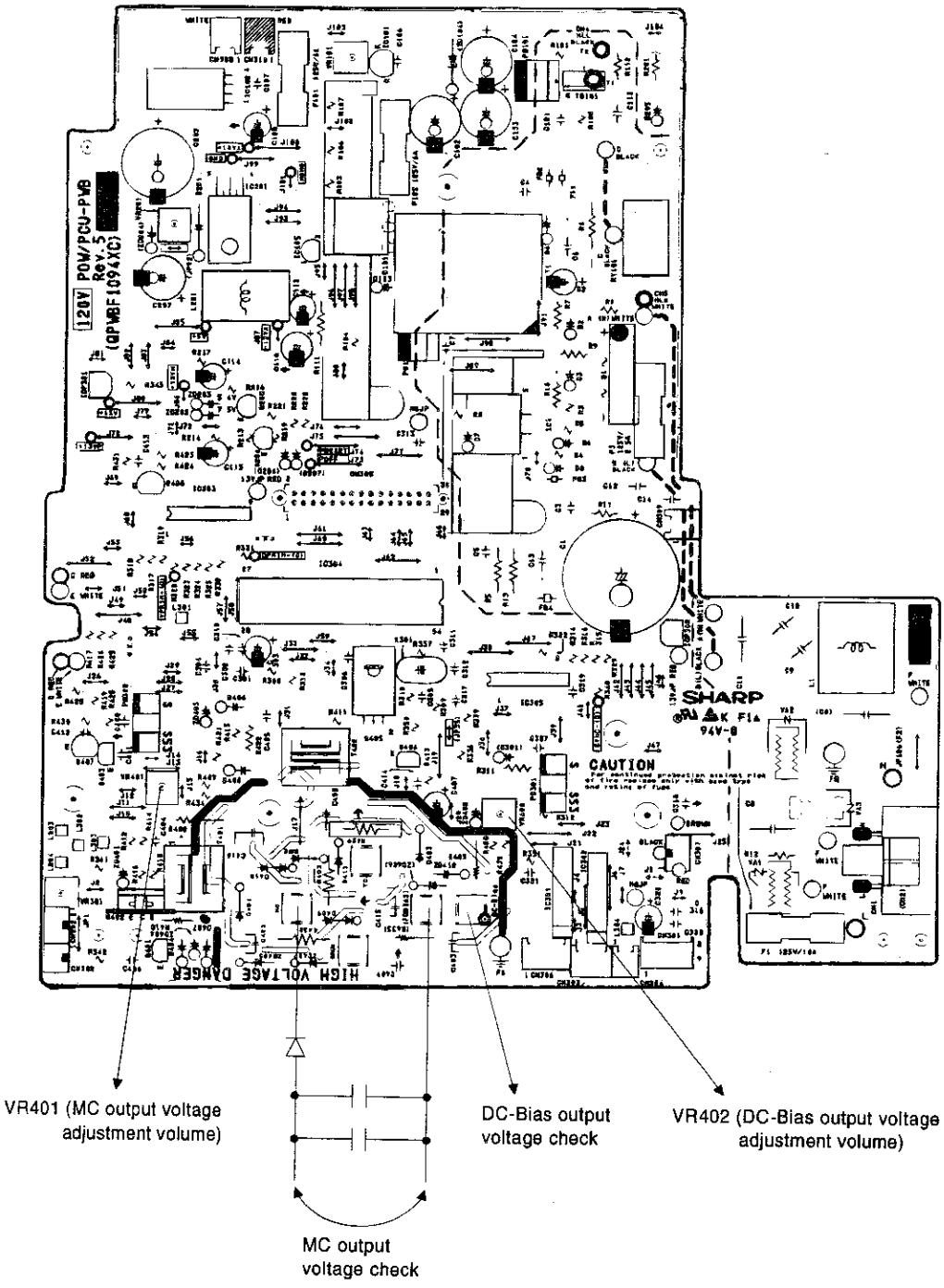


- Capacitor: 1000pF/3kV (VCKYQY3FB102K)
- Diode: SHV-03 (VHDSHV03///-1)

② DC bias output voltage adjustment

Adjust VR402 so that the output voltage is −390 V ± 5 V.

For measurement, use the high voltage tester (effective value meter).



4. Optical adjustment procedures

① Move the CCD PWB so that it can be adjusted.

Open the scanner unit section. Remove two screws which are fixing the panel cabinet lower, and remove the panel cabinet lower. Then the PWB can be seen, and the take-out position of the signal can be seen by an oscilloscope.

② Adjust so that the optical adjustment pattern can be set.

Disengage the lock pawl of the lamp cover on the right of the set, and remove the lamp cover. Remove the two fixing screws and remove the gear plate on the left side of the set. Remove the fixing screw of the FCC cable holder (metal plate), and remove the holder.

③ Optical adjustment pattern set

Open the scanner unit panel section, open the lever on the left and right lock sections, and remove the lock lever from the lower guide boss. Open the panel section, insert the adjustment pattern boss into the lower guide hole and set the optical adjustment pattern in the reading window. After setting the pattern, put the left and right sections of the panel section to the lower guide boss. Attach the gear plate.

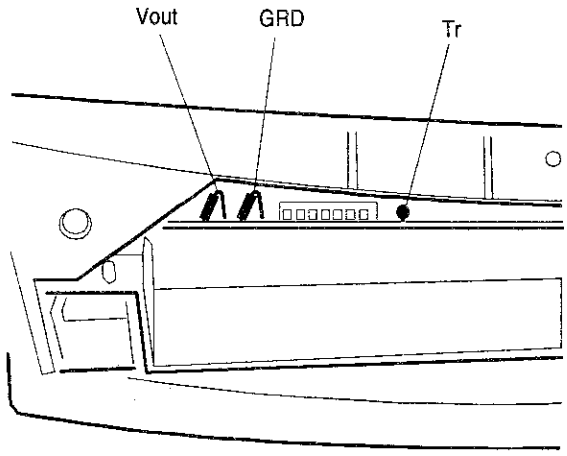
④ Oscilloscope connection

Temporarily fix the gear plate to the scanner unit, and close the scanner unit. At that time, do not close the panel section. (If closed, the optical adjustment pattern is pinched.)
Check pins are arranged in the following sequence from the CCD PWB connector side (the left side of the set).

Vout: Output signal

GRD: Ground

Tr: Trigger



⑤ Output signal check

Turn on the power of the set. Set the white balance in the diag mode by operating the panel key as follows. (Though the panel open display is made, ignore it.)

FUNCTION 9 * 8 # 7

By this operation, the set enters the diag mode.

The LCD display shows:

DIAGNOSTIC MODE (Upper) ROM VERSION=065 (Lower)

Then press the ENTER key.

The LCD display shows:

DIAGNOSTIC MODE (Upper) SELECT MENU (← →) (Lower)

Press ← key to select No. 18 White balance mode.

The LCD display shows:

18: WHITE BALANCE (Upper) PRESS ENTER KEY (lower)

Press the ENTER key, and the lamp is lighted and the CCD output is supplied.

The LCD display shows:

18: WHITE BALANCE (Upper) No display in the lower side

⑥ Line alignment: Align the scanning line so that scanning is made in the right angles to the original feed direction. Adjustment is made under the condition that the lens focus is adjusted. Adjust the PWB position so that the CCD output is as shown in Fig. 1.

0.1V,02ms
(Oscilloscope range setting)

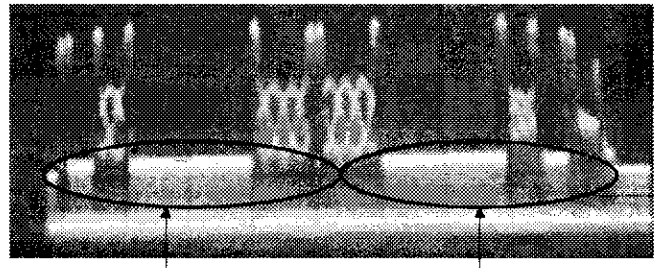


Fig. 1

The CCD output are generally as follows.

Fig. 2

Move the PWB position up and down so that the round mark section in Fig. 2 becomes as shown in Fig. 1.

⑦ Adjust the scanning width and original scanning range.

Enlarge the left edge section of the oscilloscope screen shown in Fig. 1.

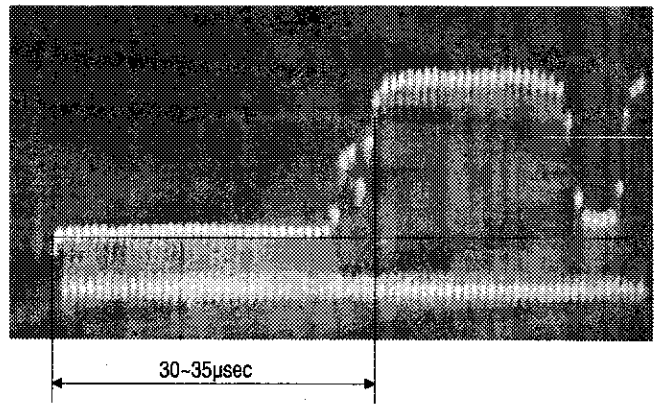


Fig. 3

Move and adjust the PWB position left and left so that the waveform rising position of the right edge waveform of the oscilloscope screen is 30 ~ 35μsec as shown in Fig. 3.

⑧ Gain adjustment

Adjust the CCD PWB volume so that the difference between black and white is 2.5V ± 0.2V.

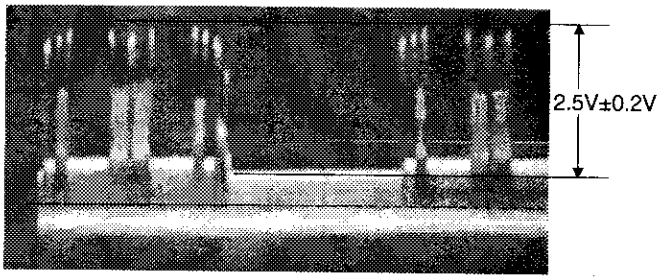


Fig. 4

Align the line again, check the scanning width, and fix the CCD PWB. Be careful to eliminate shift in position of the PWB when fixing with the screw. After fixing with the screw, check the line alignment.

(OPTICAL ADJUSTMENT PATTERN)

PARTS CODE	PRICE RANK
CKOG-7038XC01	BY

[8] DIAGNOSTICS AND SERVICE SOFT SWITCHES

1. How to switch into the Diagnostic mode

	Operation	Corresponding Action
1	Press FUNCTION, 9, *, 8, # then 7	LCD will display the ROM version.
2	Press ENTER	The machine will go into the Diagnostic mode.
3	Press ← or → until the target mode is displayed	Displays the name of each mode one at a time.
4	Press ENTER	Selects the mode currently displayed on the LCD.
5	Operate as instructed in the description of each mode.	The machine will act as described.

You can bypass the above steps 3 and 4 and go into the desired mode directly by entering the two-digit mode number of the specific mode.

2. Function of the Diagnostic mode

FO-2850 has the following functions for diagnostic tests.

TABLE-1: List of diagnostic mode

MODE #	MODE	LCD DISPLAY
01	Soft switch mode	01:SOFT SWITCH
02	ROM & RAM check mode	02:ROM/RAM CHECK
03	Check pattern mode	03:CHECK PATTERN
04	Aging mode 1	04:AGING MODE 1
05	Aging mode 2	05:AGING MODE 2
06	Aging mode 3	06:AGING MODE 3
07	Panel check/Dial test mode	07:PANEL TEST
08	Signal send mode	08:SIGNAL SEND
09	Memory clear mode	09:MEMORY CLEAR
10	Signal detect mode	10:SIG. DETECT
11	Printer aging mode 1 (with paper)	11:PRINTER AGING 1
12	Printer aging mode 2 (without paper)	12:PRINTER AGING 2
13	Printer aging mode 3 (without control of heater and optical system/without paper)	13:PRINTER AGING 3
14	Printer switch check mode	14:PRINTER SW CHECK
15	Printer ROM version check mode	15:PRINTER ROM VER.
16	Scanner aging mode 1 (with document)	16:SCANNER AGING 1
17	Scanner aging mode 2 (without document)	17:SCANNER AGING 2
18	Scanner white balance test mode	18:WHITE BALANCE

01: Soft switch setting mode

This mode is used to change the soft switch settings. The soft switch is stored internally and set by using the keys. The available soft switches are SW1 to SW11. The description of soft switch is shown in TABLE 2. The contents of the soft switch will be backed up.

02: ROM & RAM check mode

In this mode, ROM executes the sum check, and RAM executes the matching test. The result will be notified with the number of short sounds of the buzzer as well as by displaying the result.

Number of short sounds of buzzer 0: No error, 1: ROM error, 2: RAM error

03: Check pattern mode

In this mode, 200 sheets of check pattern are printed.

04: Aging mode 1

If any document is first present, copying will be executed sheet by sheet. If no document is present, the check pattern will be printed sheet by sheet. This operation will be executed at a rate of 8 sheets per hour, and will be ended at a total of 200 sheets.

05: Aging mode 2

In this mode, the following operations are executed at the same time.

1. 11: Printer aging mode (with paper)
2. 16: Scanner aging mode (with document)

06: Aging mode 3

In this mode, the following operations are executed at the same time.

1. 12: Printer aging mode (without paper)
2. 17: Scanner aging mode (without document)

07: Panel check/Dial test mode

In this mode, whether each key operates properly or not is checked. Press a key on the operation panel, and the corresponding key will be displayed.

When the NUM key is pressed during panel test, dialing is performed through DTMF.

08: Signal send mode

This mode is used to send various signals to the line. FAX signals are sent in the level set by the soft switch.

The signals to be sent is as follows.

1. No signal (CML signal turned on)
2. DTMF
3. 14400 bps (V.33)
4. 12000 bps (V.33)
5. 14400 bps (V.17)
6. 12000 bps (V.17)
7. 9600 bps (V.17)
8. 7200 bps (V.17)
9. 9600 bps (V.29)
10. 7200 bps (V.29)
11. 4800 bps (V27ter)
12. 2400 bps (V27ter)
13. 300 bps (FLAG)
14. 2100 Hz (CED)
15. 1100 Hz (CNG)

The signal can be checked by plugging the hand set into the TEL line connector.

09: Memory clear mode

This mode is used to clear the backup memory and reset to the default settings. (Various registrations are cleared.)

10: Signal detect mode

This mode is used to detect signals on the EXT. TEL line (CNG, QUIET, DTMF).

11: Printer aging mode 1

In this mode, the same procedure as that used in the normal printing process will be performed and repeated as long as there is a paper in the tray. If there is no paper in the tray, the printing process will stop temporarily.

12: Printer aging mode 2

In this mode, the same procedure as that used in the normal printing process will be performed and repeated endlessly **with no paper** in the tray.

13: Printer aging mode 3

In this mode, the same procedure as that used in the normal printing process will be performed and repeated endlessly **with no paper** in the tray. But in this mode, the printer engine doesn't control heater and optical system.

14: Printer switch check mode

In this mode, whether each switch in the printer engine operates properly or not is checked.

15: Printer ROM version check mode

In this mode, Printer ROM version will be displayed.

16: Scanner aging mode 1

In this mode, the same procedure as that used in the normal scanning process will be performed and repeated as long as there is a document in the tray. If there is no document in the tray, the scanning process will stop temporarily.

17: Scanner aging mode 2

In this mode, the same procedure as that used in the normal scanning process will be performed and repeated endlessly **with no document** in the tray.

18: Scanner white balance test mode

In this mode, scanner white balance test will be performed.

3. Soft switch settings

List of soft switch

SW No.	Bit No.	ITEM	Soft SW setting and function							INITIAL SETTING	REMARKS
			1			0					
1	1	Reserved								0	
	2	Forced 4800 BPS reception	YES			NO				0	
	3	Reserved								0	
	4	Reserved								0	
	5	Reserved								0	
		Modem speed	Bit No.	14400 BPS	12000 BPS	9600 BPS	7200 BPS	4800 BPS	2400 BPS		
	6		6	1	1	0	0	0	0	1	
	7		7	1	0	1	1	0	0	0	
	8		8	*	*	1	0	1	0	0	
2	1	Maximum copy, transmit, receive page length	No limit			Copy/Send: 1 m Reception: 1.5 m				0	
	2	Reserved								0	
	3	Reserved								0	
	4	Reserved								0	
	5	Quiet detect start time	TIME = 8xBit5 + 4xBit6 + 2xBit7 + 1xBit8 sec Factory setting = 8x0 + 4x1 + 2x0 + 1x1 = 5 sec							0	
	6									1	
	7									0	
	8									1	
3	1	Reserved								0	
	2	Reserved								0	
	3	Reserved								0	
	4	Reserved								0	
	5	Reserved								0	
	6	Reserved								0	
		Protocol monitor		Always ON		Error Only		OFF			
	7		7	1		0		0		0	
	8		8	*		1		0		0	

SW No.	Bit No.	ITEM	Soft SW setting and function		INITIAL SETTING	REMARKS
			1	0		
4	1	Signal transmission level	LEVEL = –8xBit1 – 4xBit2 – 2xBit3 – 1xBit4 – 1 dBm Factory setting = –8x1 – 4x0 – 2x0 – 1x1 – 1 = –10 dBm (When modem speed ≥ 7200 bps: If setting is –1 or –2 dBm, the level is forced to –3 dBm.)		1	
	2				0	
	3				0	
	4				1	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
5	1	Receive sensitivity	Sensitivity offset = 8xBit1 + 4xBit2 + 2xBit3 + Bit4 – 8 dBm		1	
	2				0	
	3				0	
	4				0	
	5	Non-modulation carrier in V.29 transmit mode	ON	OFF	0	
	6	Line Equalizer	6: 0	7: 0	0	
	7				1	
	8	Wait for dial tone when sending	YES	NO	1	
6	1	Modem AGC	Disable	Enable	0	
	2	CED tone signal interval	500 msec	75 msec	0	
	3	Communication error treatment in RTN sending	Not transmission error	Transmission error	0	
	4	NSF receive acknowledge in G3 transmit mode	Twice	Once for NSF reception, Twice for DIS reception	0	
	5	EOL detect timer	25 sec	5 sec	0	
	6	Reserved			0	
	7	Line monitor	7: 1	7: 0	0	
	8		8: *	8: 1	0	
7	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
8	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	

Line Equalizer	None	Equalizer 1	Equalizer 2	Equalizer 3
6	0	0	1	1
7	0	1	0	1

Line monitor	Always ON	Until Answer	OFF
7	1	0	0
8	*	1	0

SW No.	Bit No.	ITEM	Soft SW setting and function		INITIAL SETTING	REMARKS
			1	0		
9	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
10	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
11	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	

3.1. Description of Switches

SW 1 No. 2 Forced 4800 BPS reception

Limits the maximum speed of facsimile reception to 4800 bps.

0: No
1: Yes

SW 1 No. 6-8 Modem speed

Limits the maximum speed of facsimile transmission and reception to 14400bps, 12000bps, 9600bps, 7200bps, 4800bps or 2400bps.

11*: 14400bps
10*: 12000bps
011: 9600bps
010: 7200bps
001: 4800bps
000: 2400bps

SW 2 No. 1 Maximum copy/transmit/receive page length

Specifies whether or not to set the maximum page length of originals copied or sent or received by facsimile.

When this function is enabled, the machine detects pages to be copied or sent by fax, which are longer than 1m and reports them as Document Jam.

Received pages longer than 1.5m will be handled as communications error.

0: Copy/Send – 1m, Reception – 1.5m
1: No limit

SW 2 No. 5-8 Quiet detect start time

This switch is used to specify the time between establishing connection and starting quiet detection when the Reception mode is set to the Answering machine mode.

0000: 0 sec
↓
1111: 15 sec

SW 3 No. 7 Protocol monitor

You can obtain a detailed communications report after a facsimile transmission or reception is completed.

Use this switch to enable or disable this function.

1*: Always ON
01: Error only
00: OFF

SW 4 No. 1-4 Signal transmission level

Sets the signal transmission level of the facsimile.

Valid range of the setting is from –1dBm to –16dBm.

0000: –1 dBm (If modem speed is faster than 4800 bps, the level is forced to –3 dBm)
0001: –2 dBm (If modem speed is faster than 4800 bps, the level is forced to –3 dBm)
0010: –3 dBm
↓
1111: –16 dBm

SW 5 No. 1-4 Receive sensitivity

Sets the offset of signal receive level.

Valid range of the setting is from –8dBm to +7dBm.

This is approximate since it is influenced by the DAA.

1000: –8dBm
1001: –7dBm
1010: –6dBm
1011: –5dBm
1100: –4dBm
1101: –3dBm
1110: –2dBm
1111: –1dBm
0000: 0dBm
0001: 1dBm
0010: 2dBm
0011: 3dBm
0100: 4dBm
:
0111: 7dBm

SW 5 No. 6-7 Line Equalizer

It is set according to the characteristics of the circuit.

Use another equalizer if any communication trouble frequently occurs.

Gain Relative to 2000Hz (dB)

Frequency	None	Equalizer 1	Equalizer 2	Equalizer 3
500	0	+1.2	−1.0	−1.5
1000	0	−0.4	−1.1	−4.1
1500	0	−0.4	−0.6	−3.6
2500	0	+0.7	+0.9	+2.4
3000	0	+2.5	+2.5	+4.9

SW 5 No. 8 Wait for dial tone when sending

By default, looks for dial tone before dialing for facsimile transmission.

If for some reason dial tone can not be detected, setting the bit to 0 will cause to skip dial tone detection and go to dialing state.

0: No detection
1: Wait for dial tone

SW6 No. 1 Modem AGC

When this mode is enabled, if the reception signal level is under −31 dBm. The modem is self controls the signal gain automatically.

0: Enable
1: Disable

SW6 No. 2 CED tone-signal interval

The pause time between CED signal and NSF signal is set. It is effective against the communication trouble which results from echo during oversea communication.

0: 75 ms
1: 500 ms

SW6 No. 3 Communication error treatment (reception) in RTN sending

This switch is provided to determine the communication error treatment if RTN is sent due to an error in the received image during G3 receiving. It will not be regarded as a communication error if it is set at "1".

0: Communication error.
1: Normal end.

SW6 No. 4 NSF receive acknowledge in G3 transmit mode

During G3 sending, DIS receiving is confirmed when DIS is detected two times or when NSF is received one time and DIS is received two times. Either is selected. If it is on, it is effective against a communication trouble due to echo during oversea communication.

0: One time for NSF and two times for DIS.
1: Two times.

SW5 No. 5 Non-modulation carrier in V29 transmission mode

Though any non-modulation carrier is unnecessary in the ITU-TS (CCITT) standard during sending with V29 modem, a non-modulation carrier can be sent prior to the image signal. If it is set at 1, it is effective against a communication trouble due to echo during oversea communication.

0: Not applied.
1: Applied.

SW6 No. 6 EOL detect timer

25 seconds or 13 seconds are selected for the detection timer of EOL (end of line). This is effective against communication trouble on a specific type of long EOL.

0: 13 seconds
1: 25 seconds

SW 6 No. 7-8 Line monitor

During facsimile session, sounds on the line can be heard by setting this switch.

1✱: Always ON
01: Until answer
00: OFF

When using the protocol monitor, be sure to set printer paper.
If not, the content of the protocol monitor may be broken.

3.2. How to change Soft SW settings

Example of LCD messages

SW1=00000110

1. Press FUNCTION, 9, ✱, 8, #, 7, ENTER, 0 then 1 to go into the Soft switch setting mode.
2. Press ← or → to move the cursor to the target bit.
3. Press FUNCTION to reverse the selected bit on which the cursor is located.
4. If you want to change another switch, press ENTER and move to the next switch. (Repeat 2-4 above)
   If not, press STOP and exit from this mode.

4. General diagnostic mode

Even though an error (paper jam, paper empty, toner empty, etc.)
occurs in the diagnostic mode, the error display is not made unless the mode is changed to another mode.

4.1. ROM & RAM check mode

	Operation	LCD	Corresponding Action
1	Press FUNCTION, 9, ✱, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
2	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
3	Press 0, then 2	02:ROM/RAM CHECK	
	(If ROM and RAM are in Normal condition)	ROM/RAM OK	
	(If RAM error is detected)	RAM ERROR	Two short beeps will be played.
	(If ROM error is detected)	ROM ERROR	One short beep will be played.

4.2. Check Pattern mode

	Operation	LCD	Corresponding Action
1	Press FUNCTION, 9, ✱, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
2	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
3	Press 0, then 3	03:CHECK PATTERN PRINTING	Starts test pattern printing.
4	Load papers in the tray if the machine runs out of paper.	03:CHECK PATTERN PRINTING	Printing will be resumed.
5		03:CHECK PATTERN COMPLETE	Goes into WAIT condition after printing 1 sheets of test patterns.
6	(If continue printing) Press ENTER	03:CHECK PATTERN PRINTING	Starts test pattern printing again.

Note: • When a paper jam occurs, recover from it as in the normal operation. Printing will be resumed when the jammed paper has been removed from the machine.

• You can cancel printing and exit from this mode at any time by pressing STOP.

4.3. Aging mode 1

	Operation	LCD	Corresponding Action
1	Press FUNCTION, 9, ✱, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
2	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
3	Press 0, then 4	04:AGING MODE 1	If a document is placed in the tray, copies the document. If not, prints the test pattern.
4	Load papers in the tray if the machine runs out of paper.	04:AGING MODE 1	Printing will be resumed.
5			Exits from this mode after printing 200 sheets.

Note: • When a paper jam occurs, recover from it as in the normal operation. Printing will be resumed when the jammed paper has been removed from the machine.

• You can cancel printing and exit from this mode at any time by pressing STOP.

• Printing or copying will be executed at a rate of 8 sheets per hour.

4.4. Aging mode 2

	Operation	LCD	Corresponding Action
1	Press FUNCTION, 9, ✱, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
2	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
3	Press 0, then 5	05:AGING MODE 2	Printer will print all white data. Scanner will scan the original document.
	(If the machine runs out of paper) Load papers in the tray.	05:AGING MODE 2	Printing will be resumed.
	(If no original is placed in the tray) Load the original in the tray.	05:AGING MODE 2	Scanning will be resumed.

Note: • When a printer paper jam occurs, recover from it as in the normal operation. Printing will be resumed when the jammed paper has been removed from the machine.

• When a scanner paper jam occurs, recover from it as in the normal operation. Scanning will be resumed after the jammed original has been removed from the machine.

• This mode will not be exited from unless you press STOP.

4.5. Aging mode 3

	Operation	LCD	Corresponding Action
1	Remove printer papers and scanning originals.,		
2	Press FUNCTION, 9, ✱, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
3	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
4	Press 0, then 6	06:AGING MODE 2	Performs printing and scanning, both with no paper or original.

Note: • This mode will not be exited from unless you press STOP.

4.6. Panel check/Dial test mode

	Operation	LCD	Corresponding Action
1	Press FUNCTION, 9, ✱, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
2	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
3	Press 0, then 7	07:PANEL TEST	
4	Press any key you want to check	07:PANEL TEST <key name>	Name of the key will be displayed in the lower half of the LCD.
5	Press STOP		Exits from this mode

Note: • Pressing a NUM key (0 – 9) will output the corresponding signal according to the dial mode in optional setting.

4.7. Memory clear mode

	Operation	LCD	Corresponding Action
1	Press FUNCTION, 9, ✱, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
2	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
3	Press 0, then 9	09:MEMORY CLEAR	Clears all the settings
4		09:MEMORY CLEAR MEMORY CLEARED	Memory clear is completed.

5. Facsimile diagnostic mode

5.1. Signal send mode

	Operation	LCD	Corresponding Action
1	Press FUNCTION, 9, ✱, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
2	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
3	Press 0, then 8	08:SIGNAL SEND SELECT SIGNAL	
4	Press ← or → until the target signal type is displayed.	<signal type> PRESS ENTER KEY	Refer to TABLE-3 for a <signal type> list.
5	Press ENTER while the desired signal is displayed.		mode # = 1 → 10 mode # = 2 → 20 mode # = 3 – 7 → 30 mode # = 8 → 40
10		1:NO SIGNAL	The relay has been turned on..
11	Press STOP	08:SIGNAL SEND SELECT SIGNAL	Turns off the relay and exits from the "NO SIGNAL" mode
	(To exit from this mode) Press STOP		Exits from this mode
20		2:DTMF DTMF #=	
21	Press a NUM key(0 – 9), * or #	2:DTMF DTMF #=<pressed key>	Outputs the corresponding DTMF signal.

	Operation	LCD	Corresponding Action
22	Press STOP	2:DTMF DTMF #=	Stops signal output.
	(To continue) Go to 21		
	(To select another signal) Press STOP	08:SIGNAL SEND SELECT SIGNAL	
	(To exit from this mode) Press STOP twice		Exits from this mode.
30		<signal type> SELECT SPEED	
31	Press ← or → until the target speed is displayed.	<signal speed> PRESS ENTER KEY	Refer to TABLE-4 for a <signal speed> list.
32	Press ENTER while the desired speed is displayed.	<signal speed> SELECT DATA	
33	Press ← or → until the target output data is displayed.	<data> PRESS ENTER KEY	Refer to Table-5 for a <data> list.
34	Press ENTER while the desired data is displayed.	<signal speed> <data>	Outputs the selected signal.
35	Press STOP	<signal speed> SELECT DATA	Stops signal output
	(To change the data only) Go to 33		
	(To change the speed only) Press STOP	<signal type> SELECT SPEED	
	(To change the signal type) Press STOP twice	08:SIGNAL SEND SELECT SIGNAL	
	(To exit from this mode) Press STOP three times		Exits from this mode
40		8:TONE SELECT FREQUENCY	
41	Press ← or → until the target frequency is displayed.	<signal freq.> PRESS ENTER KEY	Refer to TABLE-4 for a <signal freq.> list.
42	Press ENTER while the desired frequency is displayed.	<signal freq.>	Outputs the selected signal.
43	Press STOP.	8:TONE SELECT FREQUENCY	Stops signal output
	(To change the frequency only) Go to 41		
	(To change the signal type) Press STOP	08:SIGNAL SEND SELECT SIGNAL	
	(To exit from this mode) Press STOP twice		Exits from this mode.

TABLE-3: Signals in the Signal send mode

MODE #	MENU	DISPLAY
1	No signal	1:NO SIGNAL
2	DTMF	2:DTMF
3	V.33	3:V.33
4	V.17	4:V.17
5	V.29	5:V.29
6	V27ter	6:V27ter
7	FLAG	7:FLAG
8	Tone (CED/CNG)	8:TONE

TABLE-4: Speed/Frequency in the Signal send mode

MODE #	MENU ITEM 1	MENU ITEM 2	MENU ITEM 3	MENU ITEM 4
3	1:V.33 14400BPS	2:V.33 12000BPS		
4	1:V.17 14400BPS	2:V.17 12000BPS	3:V.17 9600BPS	4:V.17 7200BPS
5	1:V.29 9600BPS	2:V.29 9600BPS		
6	1:V27ter 4800BPS	2:V27ter 2400BPS		
7	1:FLAG 300BPS			
8	1:TONE 2100Hz	2:TONE 1100Hz		

TABLE-5: Data which is sent in the Signal send mode

MODE #	MENU (DATA)	DISPLAY
1	00000000b	1:00000000b
2	11111111b	2:11111111b
3	01010101b	3:01010101b

5.2. Signal detect mode

	Operation	LCD	Corresponding Action
1	Press FUNCTION, 9, *, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
2	Press ENTER	DIAGNOSTIC MODE	
		SELECT MENU	
3	Press 1, then 0	10:SIG. DETECT	
	(If DTMF signal is detected)	10:SIG. DETECT DTMF:<number>	
	(If CNG signal is detected)	10:SIG. DETECT CNG	
	(If QUIET is detected)	10:SIG. DETECT QUIET	

Note: • This mode will not be exited from unless you press STOP.

6. Printer diagnostic mode

6.1. Printer aging mode 1

	Operation	LCD	Corresponding Action
1	Load papers in the tray.		
2	Press FUNCTION, 9, *, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
3	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
4	Press 1, then 1 again.	11:PRN. AGING 1	Printer will start printing all white data.
	(If no paper in the tray) Load papers in the tray.	11:PRN. AGING 1	Printing will be resumed.

Note: • When a printer jam occurs, recover from it as in the normal operation. Printing will be resumed after the jammed paper has been removed from the machine.

• This mode will not be exited from unless you press STOP.

6.2. Printer aging mode 2

	Operation	LCD	Corresponding Action
1	Remove papers from the tray.		
2	Press FUNCTION, 9, *, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
3	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
4	Press 1, then 2	12:PRN. AGING 2	Printer will start printing.

Note: • This mode will not be exited from unless you press STOP.

6.3. Printer aging mode 3

	Operation	LCD	Corresponding Action
1	Remove papers from the tray.		
2	Press FUNCTION, 9, ✱, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
3	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
4	Press 1, then 3	13:PRN. AGING 3	Printer will start printing.

Note: • This mode will not be exited from unless you press STOP.

• In this mode, the printer engine does not control the heater and optical unit.

6.4. Printer switch check mode

	Operation	LCD	Corresponding Action
1	Press FUNCTION, 9, ✱, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
2	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
3	Press 1, then 4	14:PRN. SWITCH CHECK	
4	Change the status of a switch or sensor.	14:PRN. SWITCH CHECK <switch status>	Displays the name and new status of the switch or sensor.

Note: • This mode will not be exited from unless you press STOP.

• Switches and sensors that can be detected in this mode are COVER, PIN, POUT, PE, TONER and SMALL PAPER.

6.5. Printer ROM version check mode

	Operation	LCD	Corresponding Action
1	Press FUNCTION, 9, ✱, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
2	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
3	Press 1, then 5	15:PRINTER ROM VER. VERSION=<version>	Displays PCU ROM version.
4	Press STOP		Exits from this mode.

7. Scanner diagnostic mode

7.1. Scanner aging mode 1

	Operation	LCD	Corresponding Action
1	Load the original in the ADF		
2	Press FUNCTION, 9, ✱, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
3	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
4	Press 1, then 6	16:SCN. AGING 1	Scanner will start scanning.
	(If no original in the ADF) Load the original to the ADF.	16:SCN. AGING 1	Scanning will be resumed resumed.

Note: • When a scanner jam occurs, recover from it as in the normal scanning operation. Scanning will be resumed after the jammed original has been removed from the machine.

• This mode will not be exited from unless you press STOP.

7.2. Scanner aging mode 2

	Operation	LCD	Corresponding Action
1	Remove the original from the ADF		
2	Press FUNCTION, 9, *, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
3	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
4	Press 1, then 7	17:SCN. AGING 1	Scanner will start scanning.

Note: • This mode will not be exited from unless you press STOP.

7.3. Scanner white balance test mode

	Operation	LCD	Corresponding Action
1	Press FUNCTION, 9, *, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
2	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
3	Press 1, then 8	18:WHITE BALANCE	The machine will start controlling the CCD and LED.

Note: • This mode will not be exited from unless you press STOP.

7.4. Print soft switch mode

	Operation	LCD	Corresponding Action
1	Press FUNCTION, 9, *, 8, #, then 7	DIAGNOSTIC MODE ROM VERSION=<version>	
2	Press ENTER	DIAGNOSTIC MODE SELECT MENU	
3	Press 1, then 9	19: PRINT SOFT SWITCH	Starts SOFT SWITCH printing.

Note: • This mode will not be exited from unless you press STOP.

(PRINT SAMPLE)

Sep-27-97 Sat 10:32 AM

SW #	NO.12345678	HEX
01	00000110	06
02	00000101	05
03	00000010	02
04	10010000 *	90
05	00000011	03
06	00100000	20
07	00000000	00
08	00000000	00
09	00000000	00
10	00000000	00
11	00000000	00

An asterisk, *, appears under data that have not been specified at the default setting.

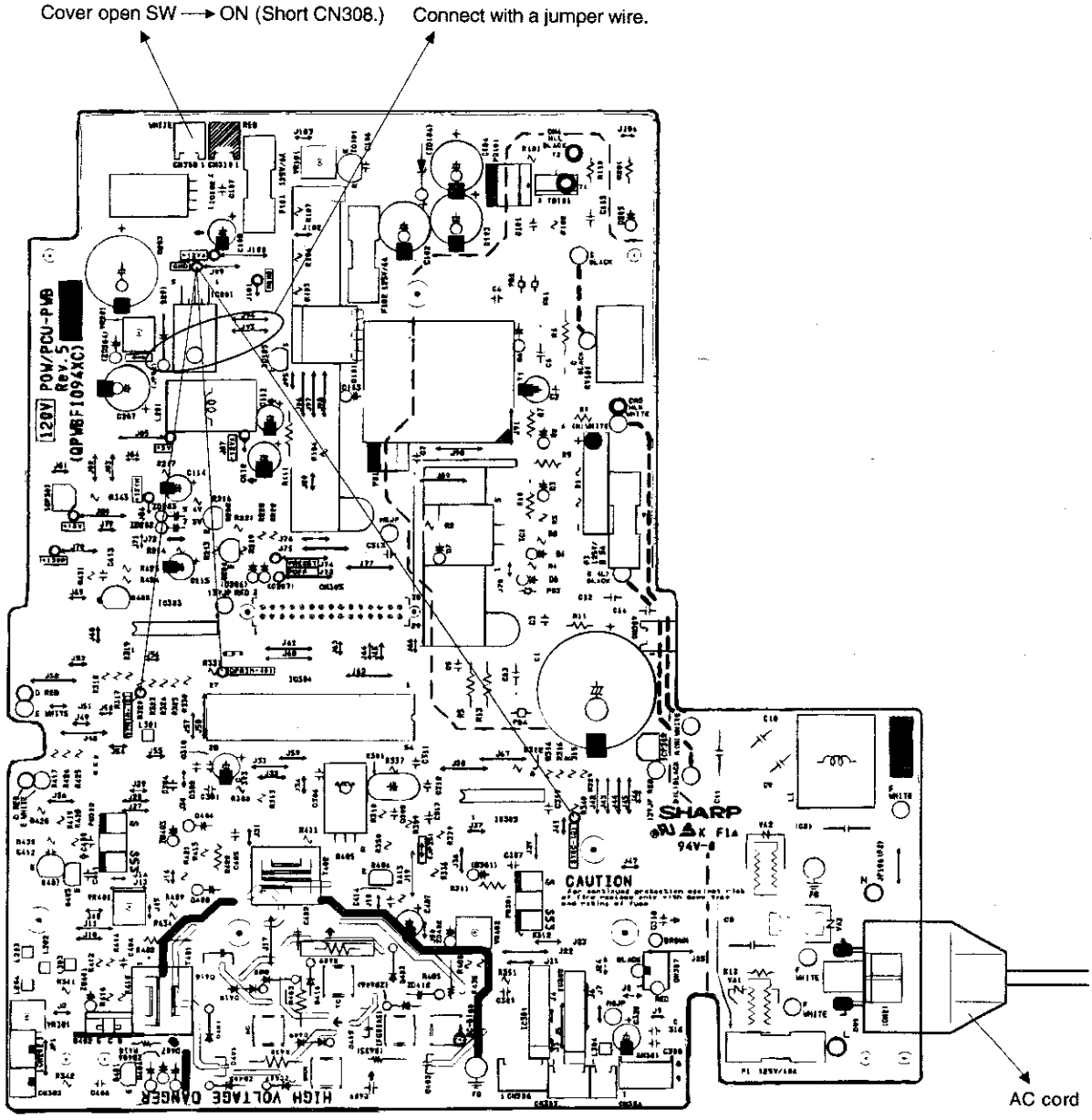
8. Diagnostics (Function test for control board)

In the case of diagnostics of the engine only, there is no need to connect with the host computer for control. By performing simulation with the PWB, the operation of each load circuit can be checked.

8.1. Entering the diagnostics

① Remove the control PWB unit from the printer.

② Insulate the two terminals of the harness connected to the fusing lamp with insulating tape.

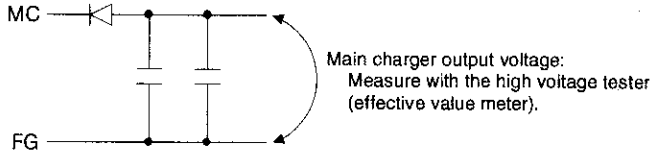


(The parts layout is an example of the 120V system.)

Be careful of the high voltage terminal to which a high voltage is applied.

There is no need to remove the PWB from the metal base.

* For measurement of the main charger output voltage, be sure to use the measurement circuit shown below.



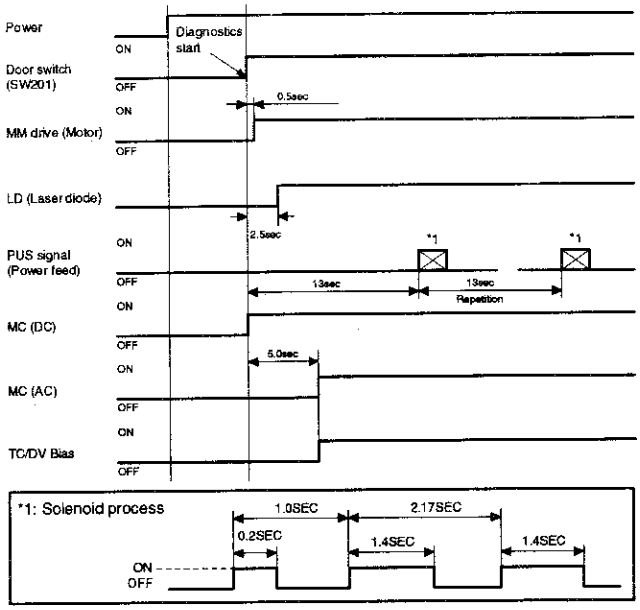
- Capacitor: 1000pF/3kV (VCKYQY3FB102K)
- Diode: SHV-03 (VHDSHV03///-1)

④ Connect the three check points (SYNC, VPRIM, DPRIM) on the PWB to GND with the jumper wire.

⑤ Connect the AC cord.

⑥ Turn on the power.

⑦ Turn on the cover open switch (CN308) or short CN308, and the control signal will be outputted.



8.2. Terminating the diagnostics

① After completion of the test, turn off the power by disconnecting the jumper wire for diagnostics.

② Disconnect the AC cable.

Note: If the transformer is removed with the AC cable connected, the input capacitor is not discharged. The capacitor may be shorted during work which could cause sparks and, in the worst case, damage parts.

The diagnostics can be performed with the actual load connected. However, the control PWB can be checked with an oscilloscope and a voltmeter by checking the output of each control signal.

CHECK LIST FOR CONTROL PWB OPERATION BY DIAGNOSTIC

SECTION	ITEM	SIGNAL NAME	DESCRIPTION	NOTE
DRIVE	MAIN MOTOR	MA/MA_/MB/MB_	Main motor drive signal	ON (Pulse)
PAPER FEED	PAPER FEED CLUTCH	PUS	Paper feed clutch control signal	ON–OFF
HIGH VOLTAGE UNIT	MAIN CHARGER	MC ON	Main charger DC control signal	*–1340 V ± 15 V (without temperature correction)
	Drum earth	MC ON	Main charger DC control signal	–200 V ± 12 V
	TRANSFER CHARGER	TC/BIAS ON	Transfer charger DC/DV bias control signal	+2100 V ± 7% (without temperature correction)
	DV BIAS	TC/BIAS ON	Transfer charger DC/DV bias control signal	–390 V ± 5 V (without temperature correction)
	MAIN/TRANSFER CHARGER	PWMSIN	Main charger/Transfer charger AC control signal	Pulse
SENSOR	PAPER EMPTY DETECTOR	PE	Paper empty detector signal	No connection
	PAPER ENTRY DETECTOR	PIN	Paper entry detector signal	
	PAPER EXIT DETECTOR	POUT	Paper exit detector signal	
POWER	POWER RELAY	PR	Power relay	ON
	WPS ASIC			No operation
	PCU-WPS ASIC I/F			No operation