NP1550

SERVICE MANUAL

Canon
FY8-13BN-010

PRINTED IN JAPAN

I. FEATURES

1. Copies as large as A3 in size (DIRECT) may be made, and the copyboard is of a fixed type.
   - Although compact in design the copier enables making copies as large as A3 in size in the DIRECT mode.
   - The copyboard is of a fixed type so that pages of a book may be copied with much ease.

2. Zooming between 50% and 200%.
   - Copies may be made in reproduction rations of between 50% and 200%, selectable in 1% increments.

3. Front loading for faster supply of paper.
   - Paper is loaded from the front of the copier so that the cassette may be replenished with paper without wasting time. The design also saves space.

4. Single component fine particle toner for high resolution.
   - Copies are developed using the single component toner projection method. Further, the copier uses toner of extremely fine particles for enhanced image quality.

5. Multifeeder (stack bypass) pick-up.
   - As many as 50 copies (80 g/m^2) may be made continuously using the multifeeding mechanism.

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II. SPECIFICATIONS

A. Type

Body	Desktop
Copyboard	Fixed
Light sourse	Halogen lamp (300W)
Lens	Zoom lens
Photosensitive medium	OPC

B. System

Reproduction		Indirect electrostatic method
Charging		Corona
Exposure		Slit (moving light source)
Copy density adjustment		Auto or Manual
Development		Dry
Pick-up	Automatic	Exclusive cassette
	Manual	Multifeed
Transfer		Corona
Separation		Curvature and Static eliminator
Drum cleaning		Blade
Fixing		Heat roller (900W)

C. Performance

Type of document		Sheet,Book,3-D object(2 kg)
Document size		A3 max.
Wait time		75 sec (approx.;at 20°C)
First copy		9.4 sec (A4, AE ON/OFF, 1:1)
Continuous copying		99 copies
Copy size		A3(max.),A6(min,;148x105 mm)
Type of copy paper	Cassette	Plain paper(64 to 80 g/m^2),Tracing paper, Colored paper
	Multifeed tray	Plain paper(64 to 128 g/m^2),Tracing paper*, Colored paper, OHP film*, Postcard, Label sheet

*Use of tracing paper may cause double feeding. If thin paper or OHP film, feed one sheet at a time.

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Two-sided copying	Multifeed tray	Plain paper(64 to 128 g/m^2), Colored paper, Postcard
Overlay copying	Multifeed tray	Plain paper(64 to 128 g/m^2), Colored paper, Postcard
Cassette	Claw	Provided.
	Standard	27 mm deep(about 250 sheets of 80 g/m^2 paper)
	Universal	None.
Copy tray		100 sheets(approx.; A4, 80 g/m^2)
Non-image width (1st side)	Leading edge	2.0 ±1.5 mm or less
	Left/Right	2.5 ±1.5 mm or less
Auto clear		Provided. (2 min, standard)
Auto shutoff		None.
Option		ADF-A1, CT unit, MS-A1, Stapler Sorter-B1, CC-V

D. Others

Power supply		Serial Numbers	
	220V 50Hz	UBN XXXXX	
	240V 50Hz	QBN XXXXX	
Power consumption	Maximum	1.5kW or less	
	Standby	0.148 kWh (Reference value)	
	Continuous copying	0.64 kWh (Reference value)	
Noise	Copying	55dB or less	(sound power level as prescribed by ISO)
	Standby	40dB or less	
Ozone		0.05ppm or less (UL standards.)	
Dimensions	Width	697mm	
	Depth	617mm	
	Height	391mm	
Weight		50.6kg	
Operating environment	Temperature	15.0°C to 30.0°C	
	Humidity	5% to 80%	
	Atmospheric pressure	0.6 to 1	
Others		Keep copy paper wrapped to protect against moisture.	

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Reproduction mode		Paper size	Cassette	Copies/min
DIRECT		A3 (297x420mm)	A3	9
		A4 (210x297mm)	A4	15
		B4 (257x365mm)	B4	10
		B5 (182x257mm)	B5	17
		A5R (210x149mm)	A5R	16
REDUCE	I	50%		
	II	A3 → A4	A4R	10
ENLARGE	I	A4 → A3	A3	9
	II	200%		

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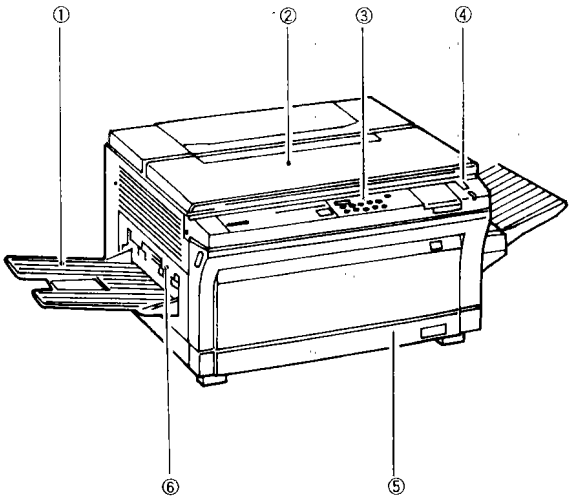
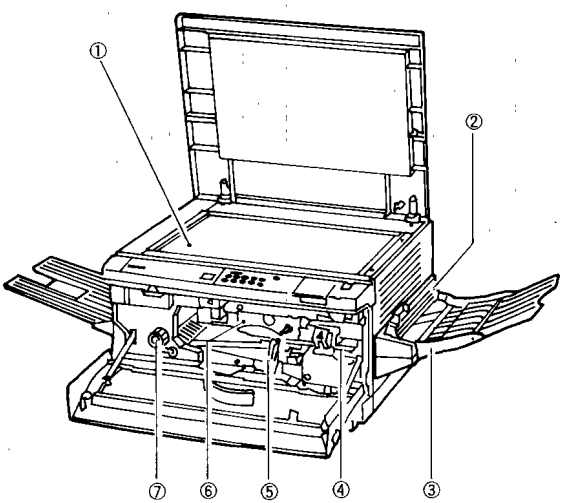
III. NAMES OF PARTS

A. External View



① Copy tray
② Copyboard cover
③ Control panel
④ Power switch
⑤ Cassette
⑥ Delivery cover

Figure 1-1



① Copyboard glass
② Multifeeder cover
③ Multifeeder tray
④ Developing assembly release lever
⑤ Feeder assembly release lever
⑥ Drum unit
⑦ Fixing assembly knob

Figure 1-2

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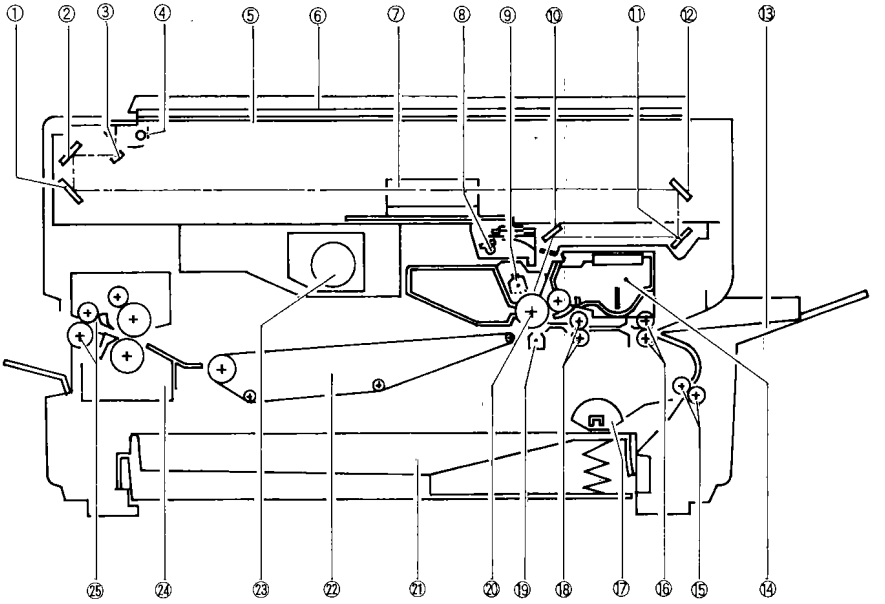
B. Cross Section



① No. 3 mirror
② No. 2 mirror
③ No. 1 mirror
④ Scanning lamp
⑤ Copyboard glass
⑥ Copyboard cover
⑦ Lens
⑧ Pre-exposure lamp
⑨ Primary corona assembly
⑩ No. 6 mirror
⑪ No. 5 mirror
⑫ No. 4 mirror
⑬ Multifeeder tray
⑭ Developing assembly
⑮ Feeder roller 1
⑯ Registration roller
⑰ Pick-up roller
⑱ Feeder roller 2
⑲ Transfer corona assembly
⑳ Photosensitive drum
㉑ Cassette
㉒ Feeder assembly
㉓ Exhaust fan
㉔ Fixing assembly
㉕ Delivery roller

Figure 1-3

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IV. OPERATION

A. Control Panel

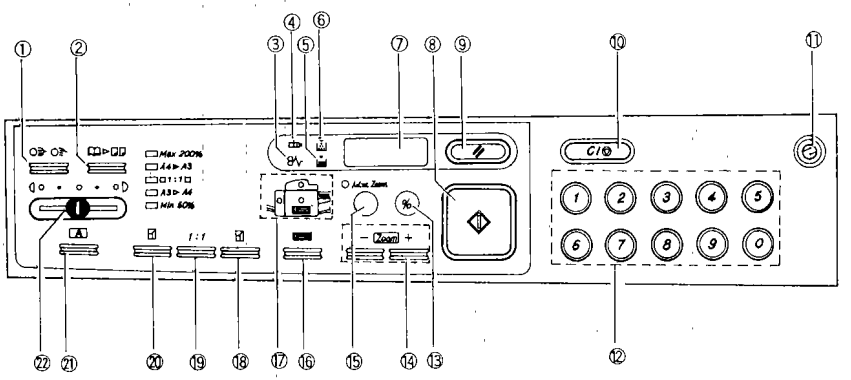

Figure 1-4

① SORT/GROUP key
Press it to select the sort, group, or non-sort mode. The indicator remains unit when the non-sort mode is selected.
⇶ sorting
⇶ grouping

② PAGE SEPARATION key
Press it to select the page separation mode.

③ JAM indicator

④ CONTROL CARD indicator

⑤ ADD PAPER indicator

⑥ ADD TONER indicator

⑦ COPY COUNT/RATIO indicator
It indicates the reproduction ratio when the % key is pressed.

⑧ COPY START key
- glows orange when the copier is not ready for copying.
- glows green when the copier is ready for copying.

⑨ RESET key
Press it to reset the copier to its default settings.
Default Settings
- copy count 1
- DIRECT
- AE (may be turned OFF using 'C15' of service mode)
- non-sort

⑩ CLEAR/STOP key

⑪ STANDBY key

⑫ NUMERIC keypad

⑬ % key
Press it to check the reproduction ratio using the copy count indicator.
The display changes to the copy count 2 sec after the key is released.

⑭ ZOOM key
Press it to select desired reproduction ratios between 50% and 200% in 1% increments.

⑮ AUTO RATIO key
Press it to select or deselect the auto reproduction ratio mode.
The key is effective when the ADF is attached.

⑯ PAPER SELECT key
Press it to select the cassette or multifeeder as the source of paper.

⑰ PAPER SELECT/JAM indicator
A LED goes ON to indicate the location of the paper or flashes to indicate the location of the jam, if any.

⑱ ENLARGE key

⑲ DIRECT key

⑳ REDUCE key

㉑ AE (automatic exposure (density) adjustment) key

㉒ COPY DENSITY lever

B. Basic Copying Operation

1) Set the power switch to ON (I).
   a) If the temperature of the fixing roller is too low for copying, the indicator of the COPY START key will blink green.
   b) When the temperature of the fixing roller becomes high enough for copying, the indicator will glow green.
   c) The normal waiting time at room temperature (20°C) is about 75 seconds.
2) Raise the copyboard cover, place an original on the copyboard with the side to be copied facing downward, and align it with the size indication.
3) To adjust the copy density manually, the AE key indicator should be OFF; press the key once if it is ON. Set the COPY DENSITY lever to suit the original.
4) Check the size of paper in the cassette.
   a) If the cassette does not have the desired size of paper, remove it and install a cassette with the desired size.
5) Set the required number of copies (1 to 99) using the NUMERIC keypad and confirm that the correct number appears on the COPY COUNT/RATIO indicator.
   a) If an error was made in inputting the number of copies, press the CLEAR/STOP key and reset the number of copies.
6) Press the COPY START key
   a) To stop a continuous copying operation, press the CLEAR/STOP key or RESET key. The copier will complete the copy in progress, then stop.
      The COPY COUNT/RATIO indicator will display the initially set copy quantity.
   b) It is possible to switch from automatic exposure control to manual density adjustment at any time from the start of copying to the completion of the final copy. However, it is not possible to switch from manual density adjustment to automatic.

Example:
If the copy is too dark or too faint using AE, cancel AE and vary the copy density with the COPY DENSITY lever.

   c) If the ADD PAPER indicator goes ON during copying, the copier will stop. Refill the cassette and press the COPY START key. The remaining number of copies will be made automatically.
   d) If the copier has a ADF, place a document (original) on the document tray. The document will be fed automatically and copying will start.
   e) If no other operation is performed, the copier will return to the STANDARD mode approximately 2 minutes after it completes a copy or after the last key operation.

C. Pick-Up from Multifeeder

1) Set documents on the copyboard.
2) Press the PAPER SELECT key to select the multifeeder.
3) Open the multifeeder tray.
4) Open the multifeeder cover.
5) Set the slide guide to the size of the copy paper.
6) Set copy paper.
   • As may as 50 sheets (80 g/m²) may be set.
7) Close the multifeeder cover.
8) Set the desired reproduction ratio using the DIRECT, REDUCE, ENLARGE, or ZOOM key.
9) Cancel the AE mode, and set the COPY DENSITY lever if manual adjustment of the density is desired.
10) Enter the number of copies using the NUMERIC keypad.
11) Press the COPY START key.

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D. Two-Sided Copying

Copy one side of a 2-sided original. Invert the original so that the same edge faces the front. Invert the copy in the same way (front edge facing the front) and feed it into the copier.

a) Use dry, uncurled paper.
b) Use paper in the weight range 60 to 128 g/ m²
c) When making two-sided copies, only one image can be made on each side of the copy paper.
d) Both overlay and two-sided copies cannot be made on the same sheet of copy paper.

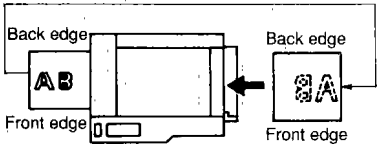

Figure 1-5

E. Overlay Copy Operation

By changing the developing assembly, a 2-color copy can be made on the same side of the copy paper.

a) Use paper in the range of 60 to 128 g/m²
b) When making an overlay copy a maximum of two images can be made on one side of the copy paper.
c) Overlay and two-sided copies cannot be made on the same sheet of copy paper.

F. Auto Start

The auto start mechanism may be made use of while the copier is in the wait mode (COPY START key blinking green); i.e., after it is switched ON or after the standby mode is cancelled.

Set a document while the copier is in the wait mode, and select the copy mode; then, press the COPY START key.

The COPY START key changes from blinking green to orange to indicate that the auto start mechanism has been activated.

The copier starts making copies as soon as it enters the standby mode using the selected copy modes.

The auto start mechanism may be cancelled by pressing the CLEAR/STOP or RESET key.

G. Replacing the CT Unit

1) Open the front door.
2) Swing the developing assembly release lever counterclockwise.
3) Pull the developing assembly forward.
4) Grasp the handle of the developing assembly, and gently raise it.

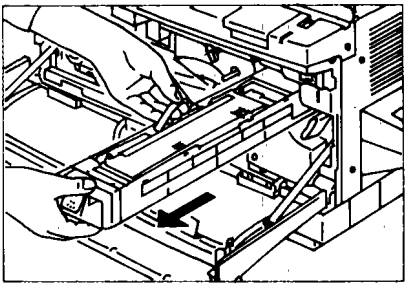

Figure 1-6

5) Place the CT unit gently on the developing assembly guide rails and push it in the copier.
6) Shift the developing assembly release lever clockwise until it is horizontal.
7) Close the front door.

Note:
i. Do not tilt or handle the developing assembly or the CT unit roughly.
ii. Do not place the developing assembly or the CT unit on the floor. Be sure to place them in their storage box or in the pedestal of the copier.

V. WARNING INDICATOR AND REQUIRED ACTION

A. JAM Indicator

If an area of this indicator flashes while copying is taking place, it is likely that the paper has jammed at the position represented by the part that is flashing. Check and take action as follows.

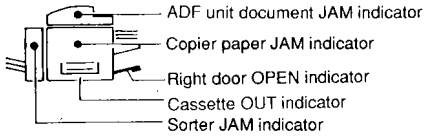

Figure 1-7

When clearing a paper jam which has occurred in an option unit (sorter or ADF), refer to the Service Manual for the option unit.

- ADF unit document JAM indicator
- Copier paper JAM indicator
- Right door OPEN indicator
- Cassette OUT indicator
- Sorter JAM indicator

If paper jams inside the copier, check the paper pick-up area, separation feeder area, fixing/copy delivery area, and cartridge area; and remove all jammed paper.

1) Open the front door.
2) Remove the copies from the copy tray.
3) Operate the release and open the copy delivery assembly.
4) Check if there is copy paper jammed in the fixing assembly. If there is paper jam in it, turn the knob of the fixing rollers clockwise to remove the jammed paper.

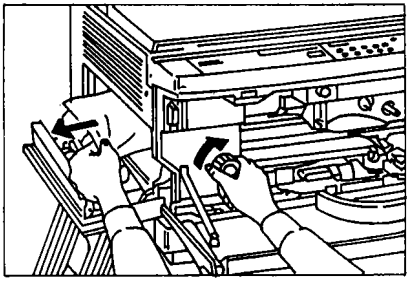

Figure 1-8

5) Close the copy delivery assembly.
6) Check if there is paper jammed in the separation/feeder area. If there is, swing the feeder release lever counterclockwise to open the feeder, then remove the jammed paper. Be careful not to tear it.

Note:
When removing jammed paper from the separation area be very careful not to touch the photosensitive drum.

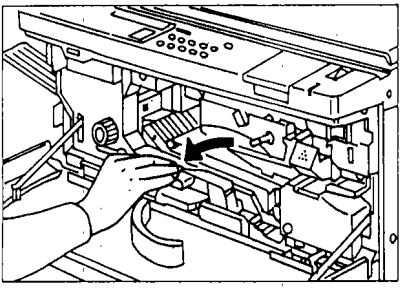

Figure 1-9

7) Open the multifeeder cover, and remove the paper from the multifeeder tray.
8) Hold the grip found at the bottom of the multifeeder cover, and open the right door; then, remove the jam.

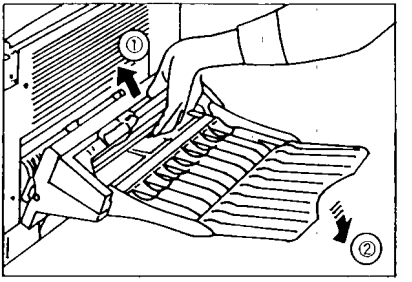

Figure 1-10

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9) Close the right door.

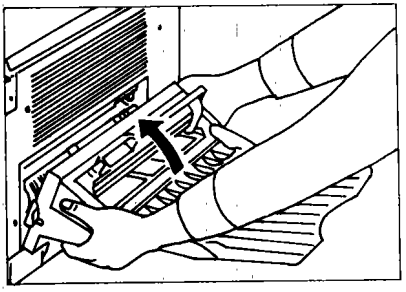

Figure 1-11

10) Close the front door.

B. ADD PAPER Indicator

1. Cassette

The indicator goes ON when no cassette is found in the cassette or no paper is found inside the cassette.

1) Push the center of the cassette.
   • The cassette springs out automatically.

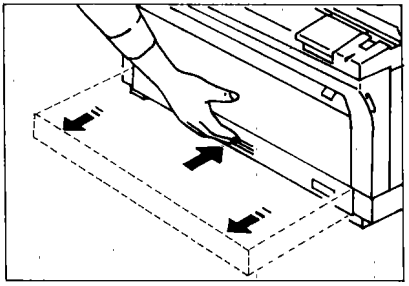

Figure 1-12

2) Set copy paper inside the cassette.
   • As many as 250 sheets of copy paper (80 g/m²) may be set.

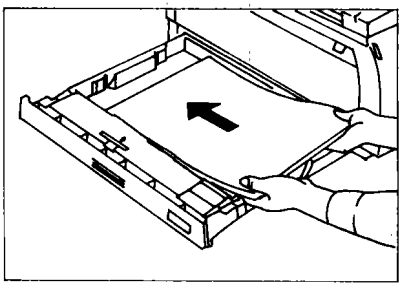

Figure 1-13

3) Hold the center of the cassette, and slide it into the cassette holder until it stops.

2. Multifeeder

The indicator goes ON when the paper on the multifeeder tray is not positioned correctly or the multifeeder cover is left open.

- As many as 50 sheets of copy paper (80 g/m²) may be set on the multifeeder tray.

C. ADD TONER Indicator

This indicator flashes when the amount of toner in the black developing assembly has become low.

1. Black developing assembly

1) Open the front door.
2) Turn the developing assembly release lever counterclockwise.
3) Pull the developing assembly forward as far as possible.
4) Open the top cover of the developing assembly.
5) Shake the toner cartridge back and forth about 10 times.
6) Place the toner cartridge on the developing assembly.
7) While holding the toner cartridge in place, remove the seal slowly to allow the toner to flow out.

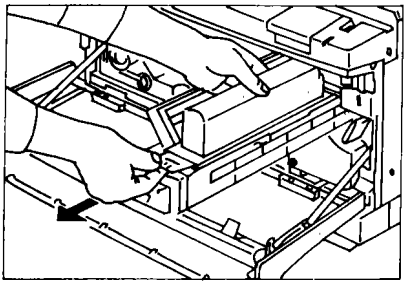

Figure 1-14

8) Tap the top of the toner cartridge to remove any toner remaining in the cartridge.
9) Carefully remove the toner cartridge.
10) Close the top cover of the developing assembly.
11) Put the developing assembly back into the copier.
12) Swing the developing assembly release lever clockwise.
13) Close the front door.

2. CT Unit (color developing unit)

If copy images become faint, the color toner has probably run out. In this case, replace the CT unit. The copy image can sometimes be temporarily restored by placing the CT unit in its storage box and agitating it.

Note:
The CT unit is a discardable type. When the color toner has been used up, toner is not added to the CT unit; rather, the entire unit is replaced.

D. CONTROL CARD Indicator

The control card indicator operates on a copier with a control card unit. It flashes in the following cases.

a) When there is no control card in the control card unit.
b) When there is a control card in the control card unit but the indication on the control card unit is "P" or "EE".

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VI. DAILY INSPECTION TO BE PERFORMED BY THE CUSTOMER

Carefully instruct the customer to be sure to clean the following parts of the copier once a week.

1. **Primary corona assembly**
   Slide in and out the wire cleaner to clean the corona wires.
2. **Copyboard glass**
   Clean the copyboard glass with a damp cloth, then wipe it dry.
3. **Copyboard cover**
   Clean the copyboard cover with a mild detergent solution, then wipe it dry.
4. **Transfer corona assembly**
   Remove the transfer corona assembly from the copier, then slide the knob (wire cleaner) at the bottom of the transfer corona assembly back and forth to clean the corona wires.
   Further, clean the static eliminator using the cleaning brush (accessory).

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I. IMAGE FORMATION PROCESS

A. Outline

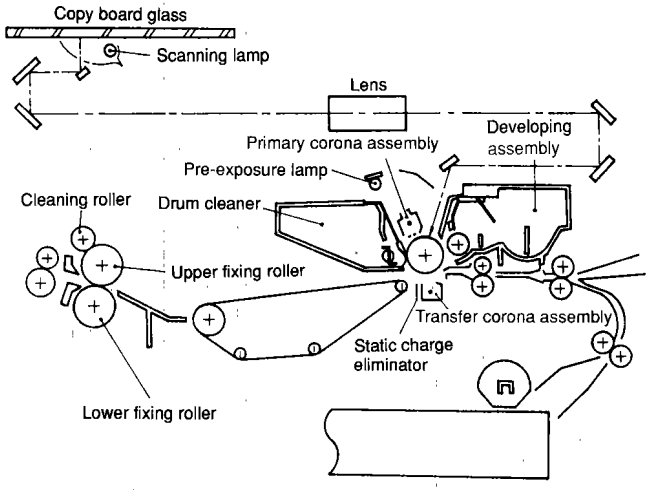

Figure 2-1

This copier consists of the units shown in Figure 2-1.

The image forming process is divided into the eight steps shown below.

Step 1: Pre-exposure
Step 2: Primary corona (negative DC)
Step 3: Image exposure
Step 4: Developing (positive plus AC)
Step 5: Transfer (negative DC)
Step 6: Separation
Step 7: Fixing
Step 8: Drum cleaning

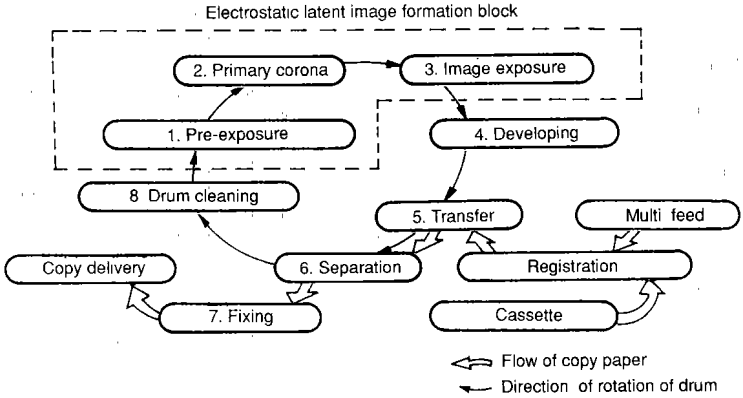

Figure 2-2

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The outer surface of the photosensitive drum is a layer of organic photoconductor (OPC).The base is an aluminum (conductive) cylinder.

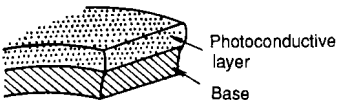

Figure 2-3

B. Electrostatic Latent Image Formation Block

This stage consists of three steps. At the end of the stage, the drum has a pattern of negative electrical charges on its surface corresponding to the dark parts of the document image. The light areas of the document image are represented on the drum by an absence of charges.

The pattern of negative charges cannot be seen by the eye, hence it is called an electrostatic latent image.

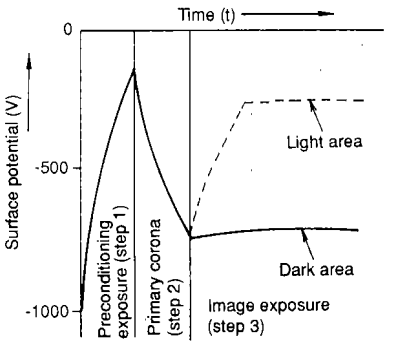

Figure 2-4

C. Step 1 Pre-Exposure

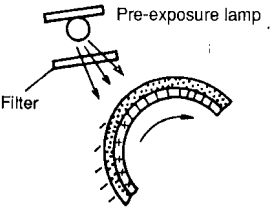

Figure 2-5

Before the primary corona step, light from the pre-exposure lamps is shone onto the surface of the drum (pre-exposure). This process eliminates residual charges and helps to make the density of the copy even.

D. Step 2 Primary Corona

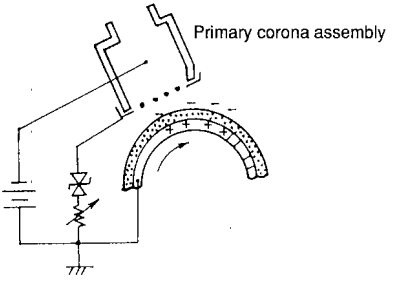

Figure 2-6

The primary corona (negative) applies a uniform layer of negative charges over the drum surface.

The drum surface potential is determined by the grid potential. The grid is connected to ground through a varistor, which holds the drum potential constant at the varistor breakdown voltage.

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E. Step 3 Scanning Exposure

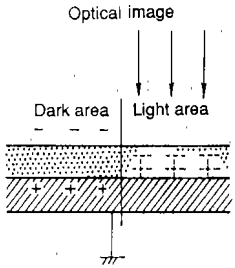

Figure 2-7

Light from the original is projected onto the drum surface. Charges in these light areas on the drum are neutralized by drum photosensitive effects.

F. Step 4 Developing

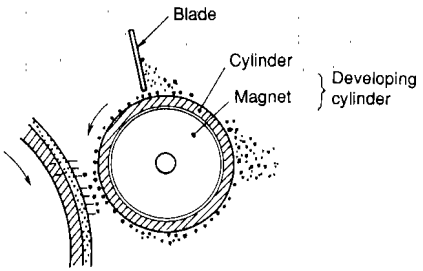

Figure 2-8

As shown in Figure 2-8, the developing assembly consists of a developing cylinder (a stationary magnet surrounded by a rotating sleeve) and a blade made of magnetic material. Black toner is a single component type consisting of a fine powder of mixed magnetite and resin binder. The toner has insulating properties and is charged to a positive potential by friction with the rotating cylinder.

Color developer is a two-component type consisting of iron powder (carrier) and toner mixed together in a fixed ratio. The main component of the toner is resin. The toner is charged to a positive potential and the iron powder to a negative potential by friction with the rotating cylinder.

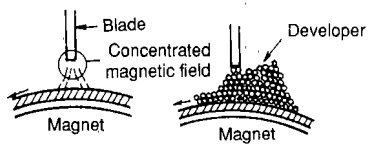

Figure 2-9

A concentrated magnetic field develops between the magnet and the edge of the blade. This field attracts the charged developer.

The developer is held virtually immobile by the magnetic field, forming a curtain along the edge of the blade. As the cylinder rotates, this curtain skims the toner particles on its surface to a thin uniform layer.

An AC bias plus a negative DC bias are applied simultaneously to the developing cylinder so that the waveform of the developing bias has a larger negative excursion than positive.

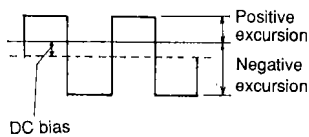

Figure 2-10

During copying toner is attracted to the drum by the charges on the drum surface and by repulsion due to the developing bias (during the positive excursion), transforming the latent electrostatic image into a visible image. Excess toner particles are attracted back to the cylinder from the drum due to the charges on the drum surface and the developing bias (during the negative excursion).

The DC bias affects copy density and fogging: As the DC bias becomes less negative (approaches 0V), the density and degree of fogging both increase.

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G. Step 5 Transfer

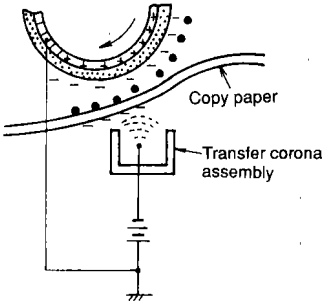

Figure 2-11

In this step, a negative corona is applied to the back of the copy paper, attracting the toner from the surface of the drum to the copy paper.

H. Step 6 Separation

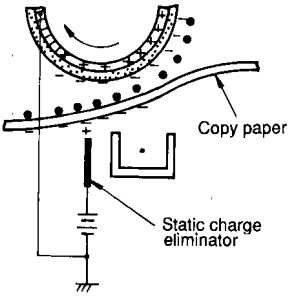

Figure 2-12

The copy paper is separated from the drum by utilizing its stiffness. Thin paper, however, is not stiff, and may wrap around the drum instead of separating from it. To prevent this, a positive voltage is applied to the separation static charge eliminator, weakening the attraction between the drum and the copy paper. This enables the paper to separate easily from the drum.

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I. Step 7 Fixing

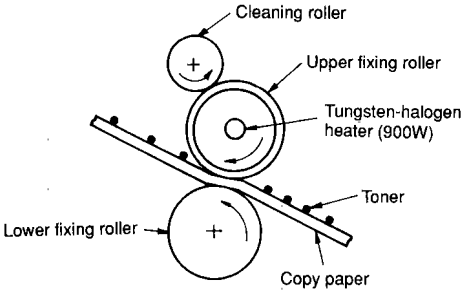

Figure 2-13

In this step, the copy paper is pressed between two heated rollers to make the toner image permanent.

To prevent the copy paper from wrapping around the roller and toner offsetting (adhesion of toner to the roller and transfer of the toner to the next copy), the surface of the upper fixing roller is cleaned with the cleaning roller.

J. Step 8 Drum Cleaning

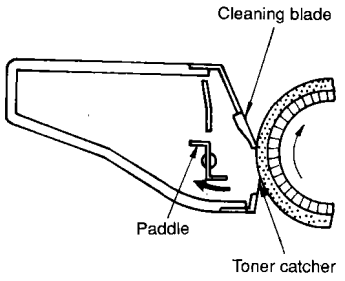

Figure 2-14

This step prepares the drum surface for the next copying operation. Any residual toner scraped off the drum by the cleaning blade and picked up by the toner catcher. It is then pushed to the back by the paddle.

II. AUXILIARY PROCESSES

A. Blank Exposure

Blank exposure is the process of shining light onto is simply the removal of the drum surface potential in the non-image areas resulting from REDUCTION copying and using some cassette sizes (paper sizes). The light for this is produced by the preconditioning lamp and is reflected onto the drum by a reflector.

In the non-image area on the drum between successive sheets of copy paper, the grid bias of the primary corona is reduced to prevent adhesion of toner. For these areas, there is no blank exposure for removal of the surface charges.

B. Ozone Filter

A catalytic ozone filter in the exhaust fan prevents ozone (generated by the coronas) from escaping to the atmosphere by converting the ozone to oxygen.

I. BASIC OPERATION

A. Functions

The copier can be divided into four functional sections: paper pick-up and feed system, exposure system, image formation system, and control system.

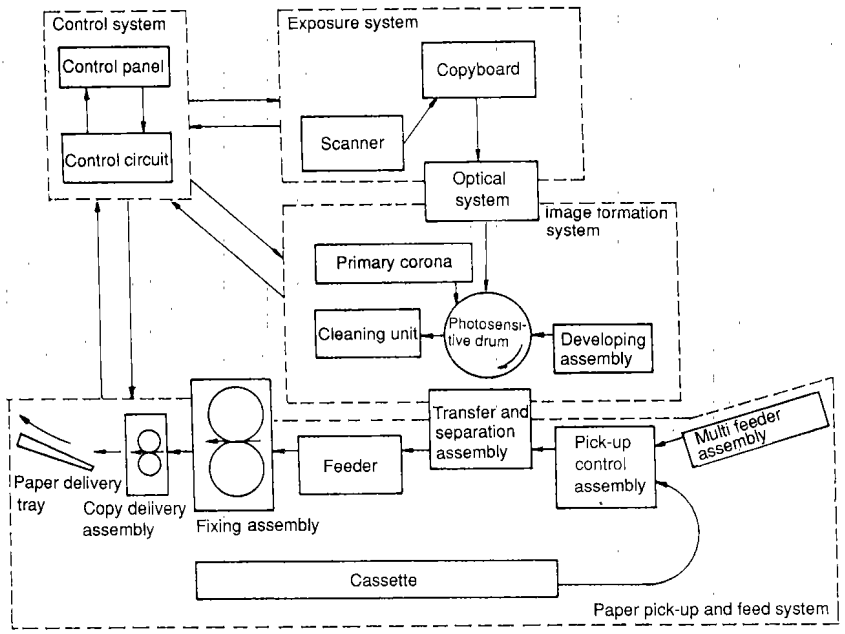

Figure 3-1

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B. Outline of Electric Circuitry

The NP-1550's main mechanisms are controlled by the microprocessor, PROM, and EEPROM on the DC controller PCB.

1. Microprocessor (Q303)
   - controls the copying sequence
   - controls the control panel
   - controls the main motor/scanner motor
   - controls the scanning lamp
   - reads the analog signals
2. PROM (Q318)
   - contains the sequence program
3. EEPROM (Q315)
   stores data that can be modified in the service mode (replaces conventional variable resistors and switches)

Note:

EEPROM is a type of ROM in which data may be erased or stored newly.

For this reason, the NP-1550's RAM and RAM are not backed up by a lithium battery.

Note:

The NP-1550 is equipped with an A/D converter and, therefore, its microprocessor can read analog signals.

Note:

The main motor (M1) is a synchronous motor that uses the frequency of the power supply as the reference of its operation.

The scanner motor (M2) are stepping motor that use the oscillation frequency of the crystal oscillator on the DC controller.

Fluctuations of the frequency in the power supply during copying operation affects only the revolution of the main motor (M1) and result in expansion or contraction of the images.

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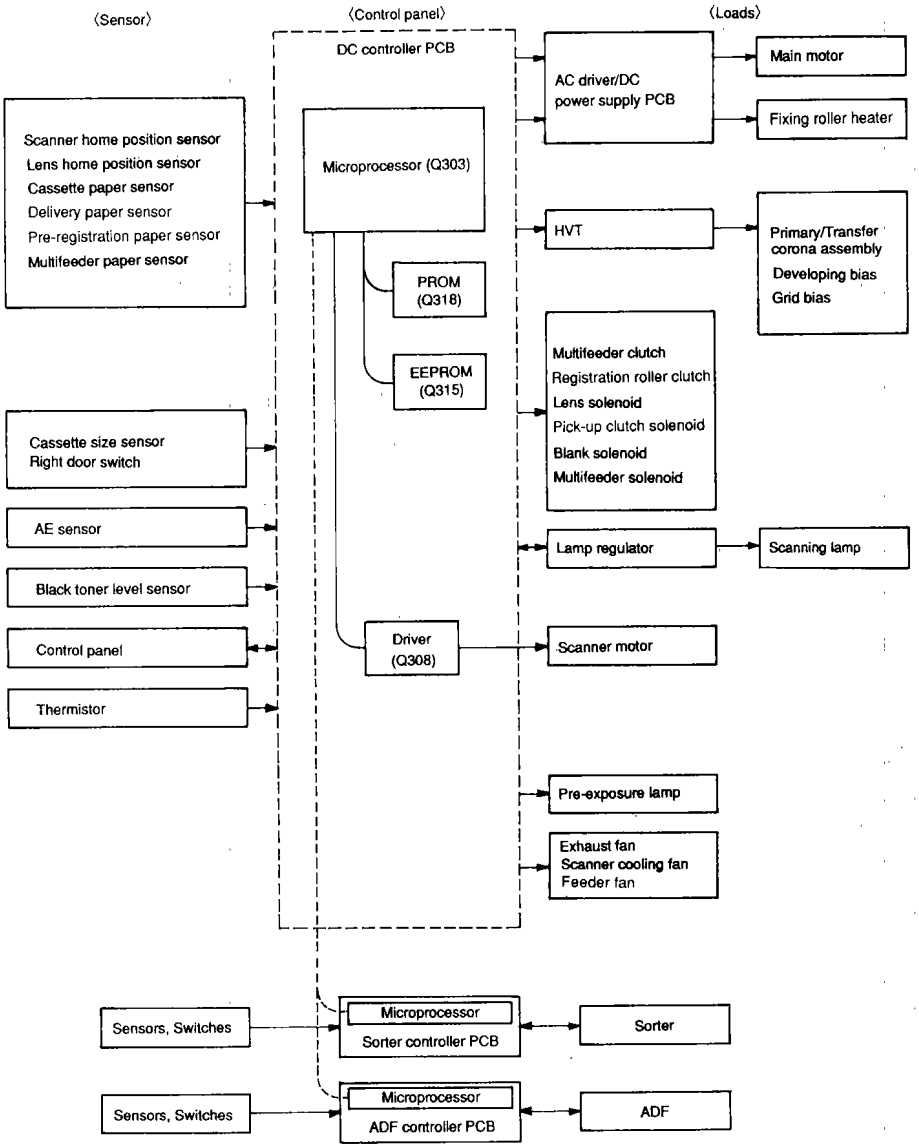

Figure 3-2

CANON NP-1550 REV.0 JAN. 1992 PRINTED IN JAPAN (IMPRIME AU JAPON)

C. Inputs to DC Controller

1. Inputs to DC Controller (1/2)

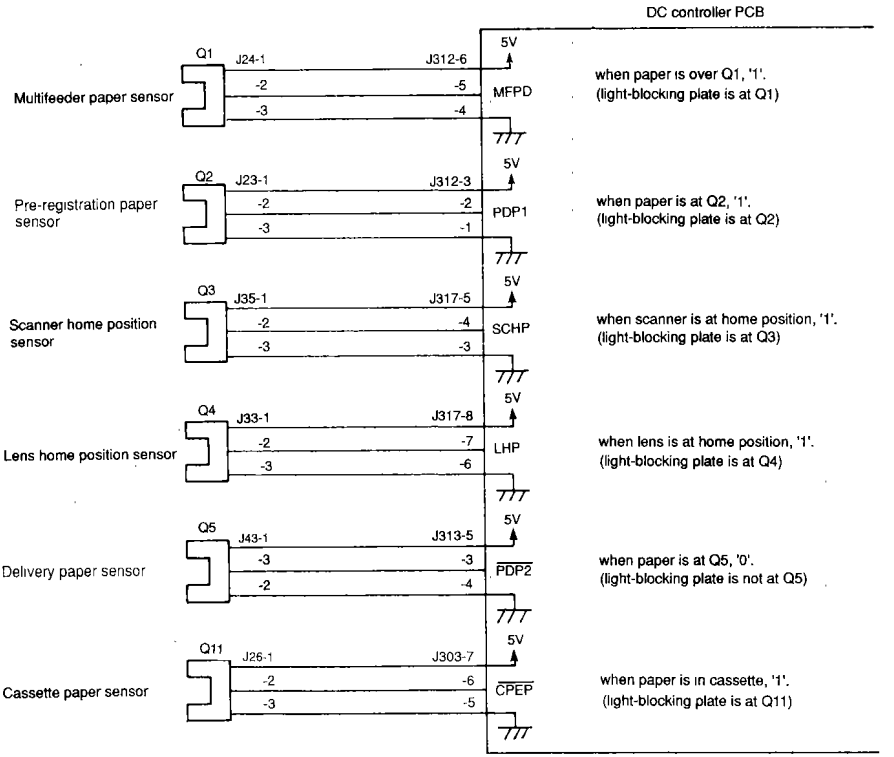

Figure 3-3

CANON NP-1550 REV.0 JAN. 1992 PRINTED IN JAPAN (IMPRIME AU JAPON)

2. Inputs to DC Controller (2/2)

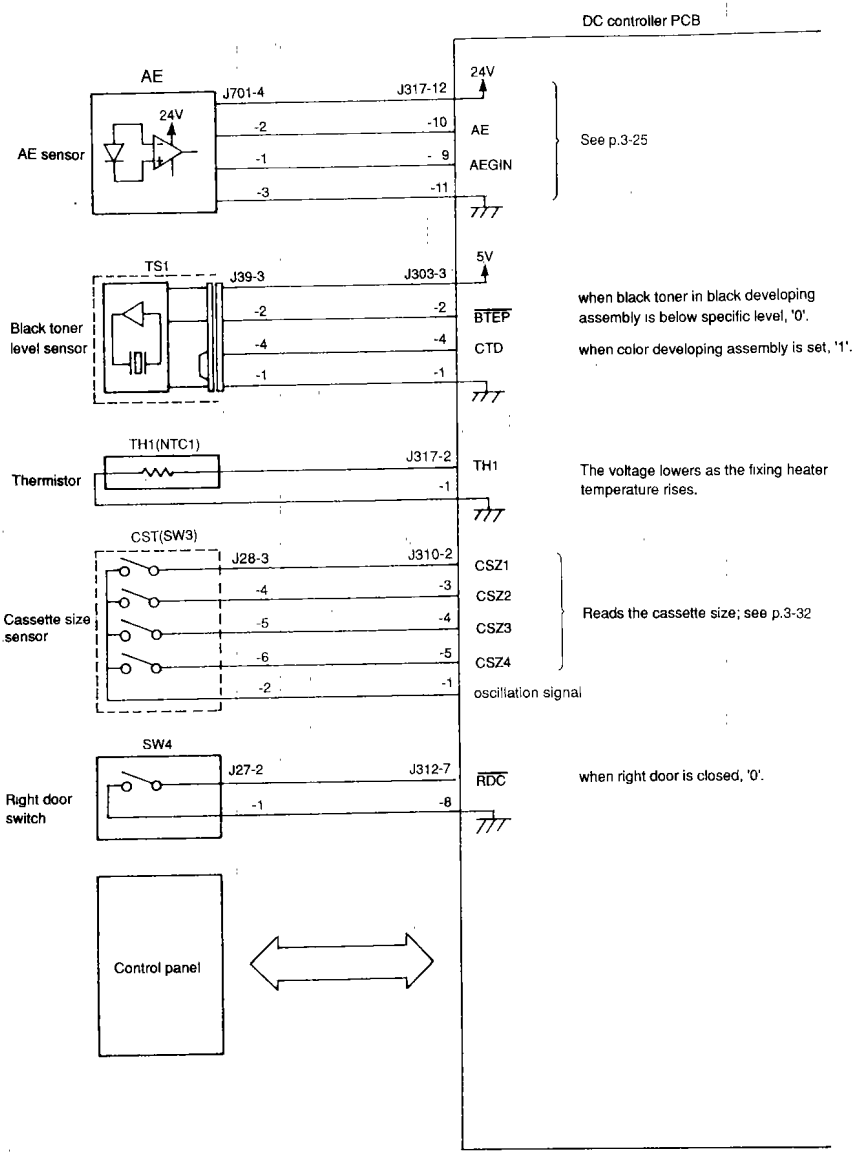

Figure 3-4

CANON NP-1550 REV.1 SEPT. 1992 PRINTED IN JAPAN (IMPRIME AU JAPON)

D. DC Controller Outputs

1. DC Controller Out Puts (1/3)

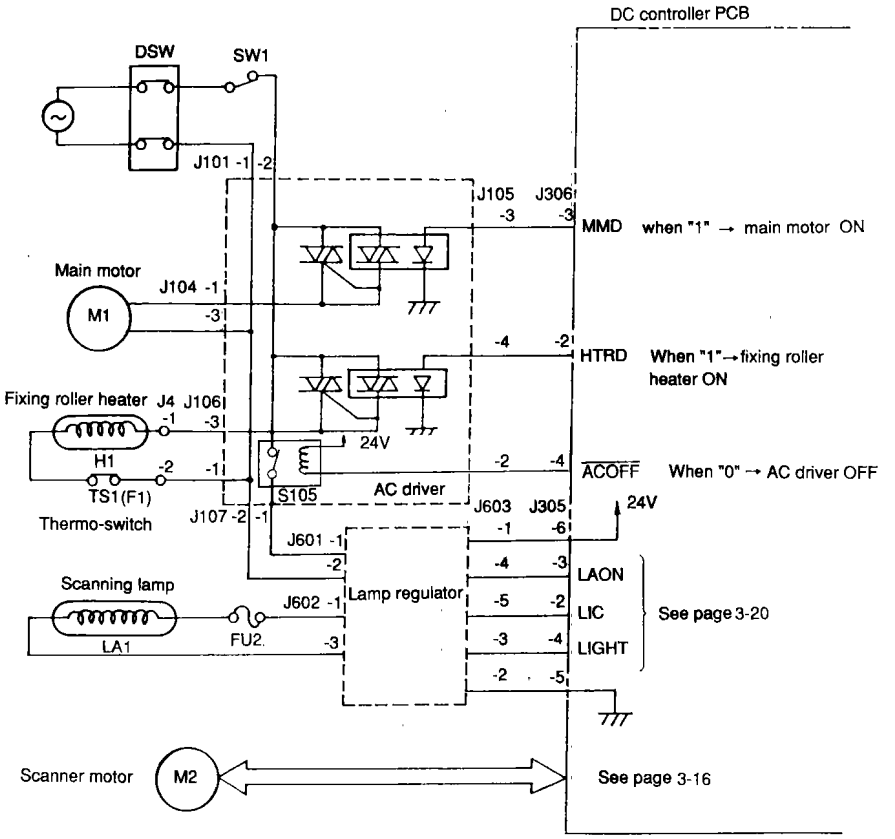

Figure 3-5

CANON NP-1550 REV.1 SEPT. 1992 PRINTED IN JAPAN (IMPRIME AU JAPON)

2. DC Controller Out Puts (2/3)

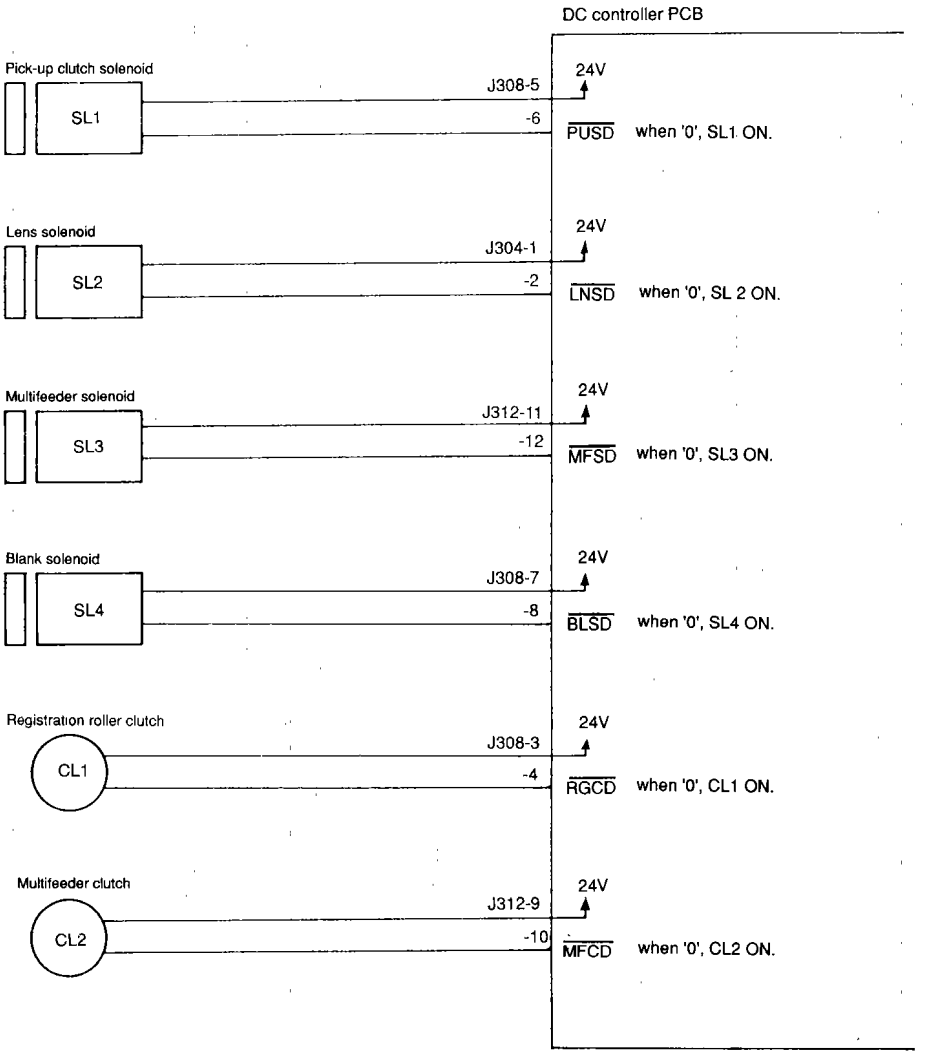

Figure 3-6

CANON NP-1550 REV.1 SEPT. 1992 PRINTED IN JAPAN (IMPRIME AU JAPON)

3. DC Controller Out Puts (3/3)

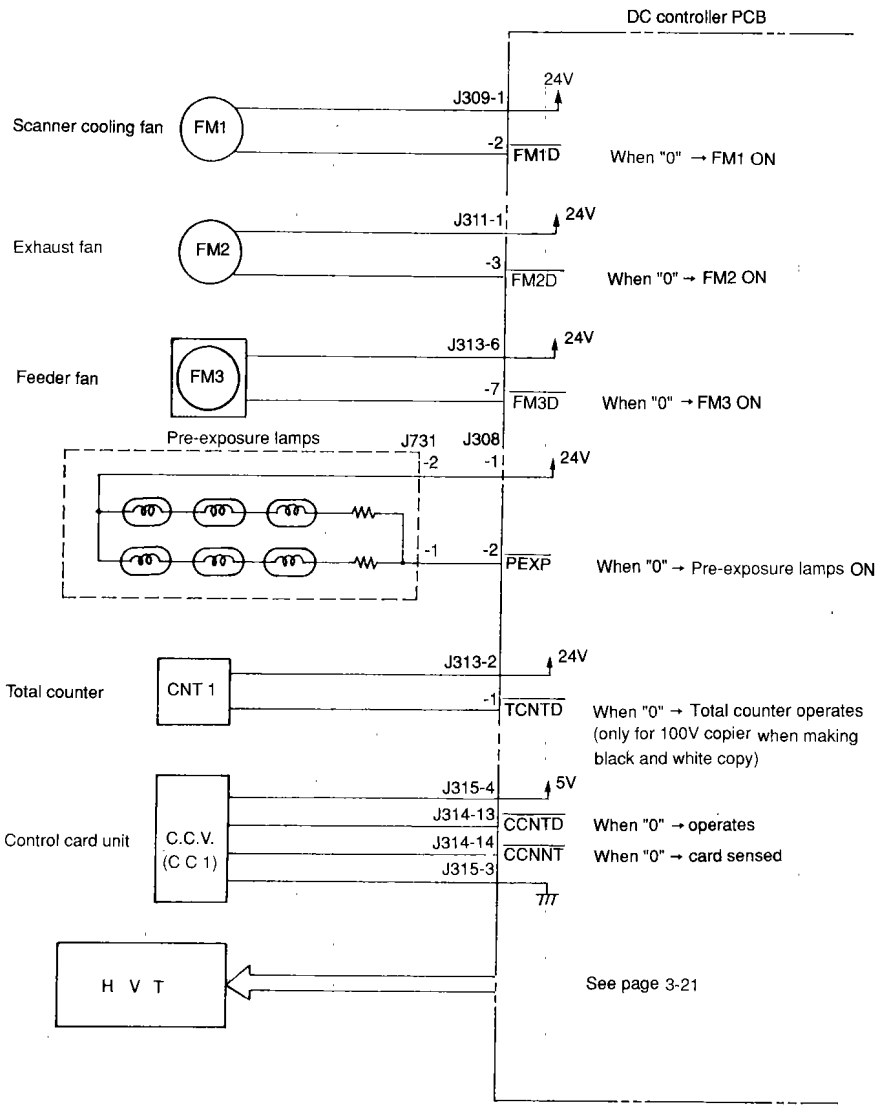

Figure 3-7

CANON NP-1550 REV.1 SEPT. 1992 PRINTED IN JAPAN (IMPRIME AU JAPON)

E. Basic Sequence of Operations (Direct, Continuous Copying (2 sheets))

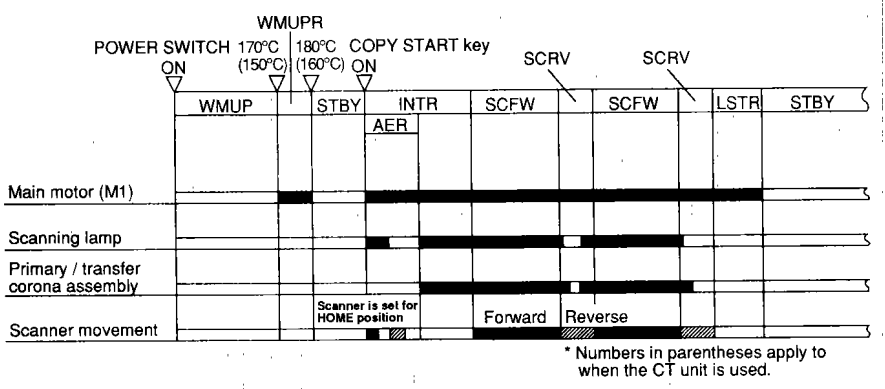

Figure 3-8

Period		Purpose	Remarks
WMUP (Warm-Up)	From switch on until the fixing roller temperature reaches 170°C for the black developer or 150°C for the CT unit. (About 75 seconds at an ambient temperature of 20°C)	Allows time for fixing roller to warm up	Warm-up time varies with fixing roller temperature at power ON. When the COPY START key is lighting green.
WMUPR (Warm-Up rotation)	Until the fixing roller temperature reaches 170° to 180°C for the black developer or 150° to 160°C for the CT unit	Keeps fixing roller temperature uniform	• After the WMUPR period ends, the READY/WAIT indicator changes from orange to green. • Even when the fixing roller has warmed up, it rotates for at least 4.2 seconds.
INTR (INITIAL rotation)	About 2.2seconds after COPY START key is pressed	Stabilizes drum sensitivity to prepare for copying	A PAPER FEED signal is generated to feed first sheet of copy paper. **Note:** AE mode: About 3.2 seconds Non-AE mode: About 2.2 seconds

Table 3-1 (a)

CANON NP-1550 REV.1 SEPT. 1992 PRINTED IN JAPAN (IMPRIME AU JAPON)

Period		Purpose	Remarks
AER (AE rotation)	From when the scanner moves forward about 70 mm from the end of the image until it returns to its home position.	Move the scanner forward about 70 mm from the end of the image and measure the document density.	In the non-AE mode, the scanner does not move forward or in reverse.
SCFW (Scanner Forward)	When the scanner is moving forward • Travel distance changes with copy paper size.	Scanning lamp illuminates original, and reflected optical image is transmitted to photosensitive drum through mirrors and lens array.	• A REGISTRATION signal is generated, and copy paper is fed to transfer area. • A PAPER FEED signal is generated to feed next sheet of copy paper.
SCRV (Scanner reverse)	While the scanner is moving in reverse • The speed of the reverse movement is 2.5 times that of the forward movement.	Scanner is moved back to HOME position to prepare for next copy	
LSTR (LAST rotation)	Untill the main motor stop after SCRV for last copy ends	Ensures full ejection of last copy	
STBY (STANDBY)		Waits until COPY START key is pressed	

Table 3-1 (b)

CANON NP-1550 REV.0 JAN. 1992 PRINTED IN JAPAN (IMPRIME AU JAPON)

II. EXPOSURE SYSTEM

A. Changing the Reproduction Ratio

The reproduction ratio across the drum is varied by changing the position of the lens. It is moved by the lens drive system. The reproduction ratio around the drum is varied by changing the speed of the scanner. Figure 3-9 shows how the position of the lens is varied to change the reproduction ratio across the drum.

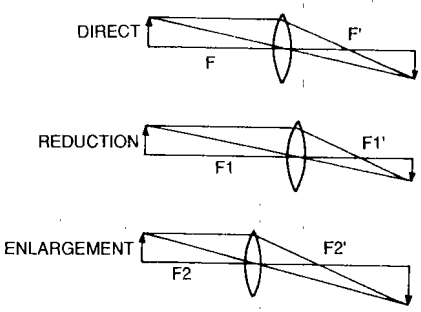

Figure 3-9

The scanner drive system changes the reproduction ratio around the drum by varying the speed at which mirror 1 moves relative to the peripheral speed of the drum. (The scanner is mirror 1 plus the scanning lamp.)

The mirror speed is faster than the drum peripheral speed for REDUCTION and slower for ENLARGEMENT.

Note:

1. The relative position of the mirrors is not changed to vary the reproduction ratio.
2. For DIRECT copying, the speed of the mirror is the same as the peripheral speed of the drum.

B. Lens Drive System

1. Outline

The lens is moved by the scanner motor (M2). Normally, the coupling gear is in its upper position, and connects the scanner motor to the scanner drive capstan. To move the lens, the lens solenoid (SL2) goes ON, causing the coupling gear to disengage from the scanner capstan gear and engage with the lens capstan gear. The lens is a "floating element" type. In operation, the relative position of lens elements (individual lenses) changes, and the focal length changes as a result, but the changes are to optimize lens sharpness for each reproduction ratio, not to make the lens function as a zoom lens. (The lens should not be dismantled.)

When the scanner motor rotates (CW), the lens will be moved to the left (for ENLARGEMENT) by the capstan and cable.

When the cassette size is changed or when the copier is in the REDUCE mode, the blank exposure shutter moves in relation to the distance over which the lens travels, thereby blanking out the width corresponding to the reproduction ratio; see p. 3-28.

The DC controller indicates 'E210' on the control panel in response to an error in the lens drive system.