

**MITSUBISHI GRAPHIC ARTS SYSTEM**

**CP-500S**

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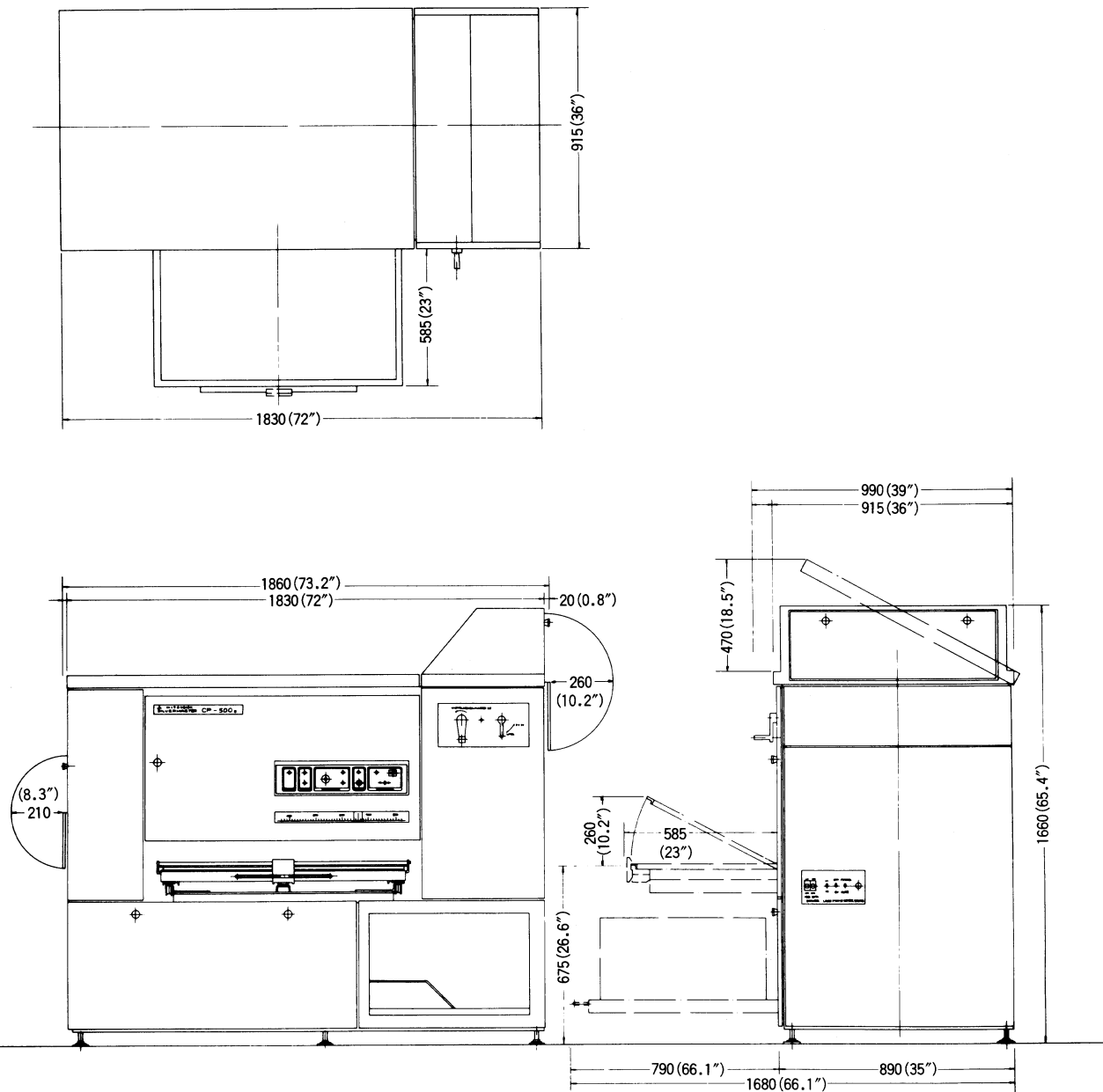
# CHAPTER 1. OUTLINE

## 1. Introduction

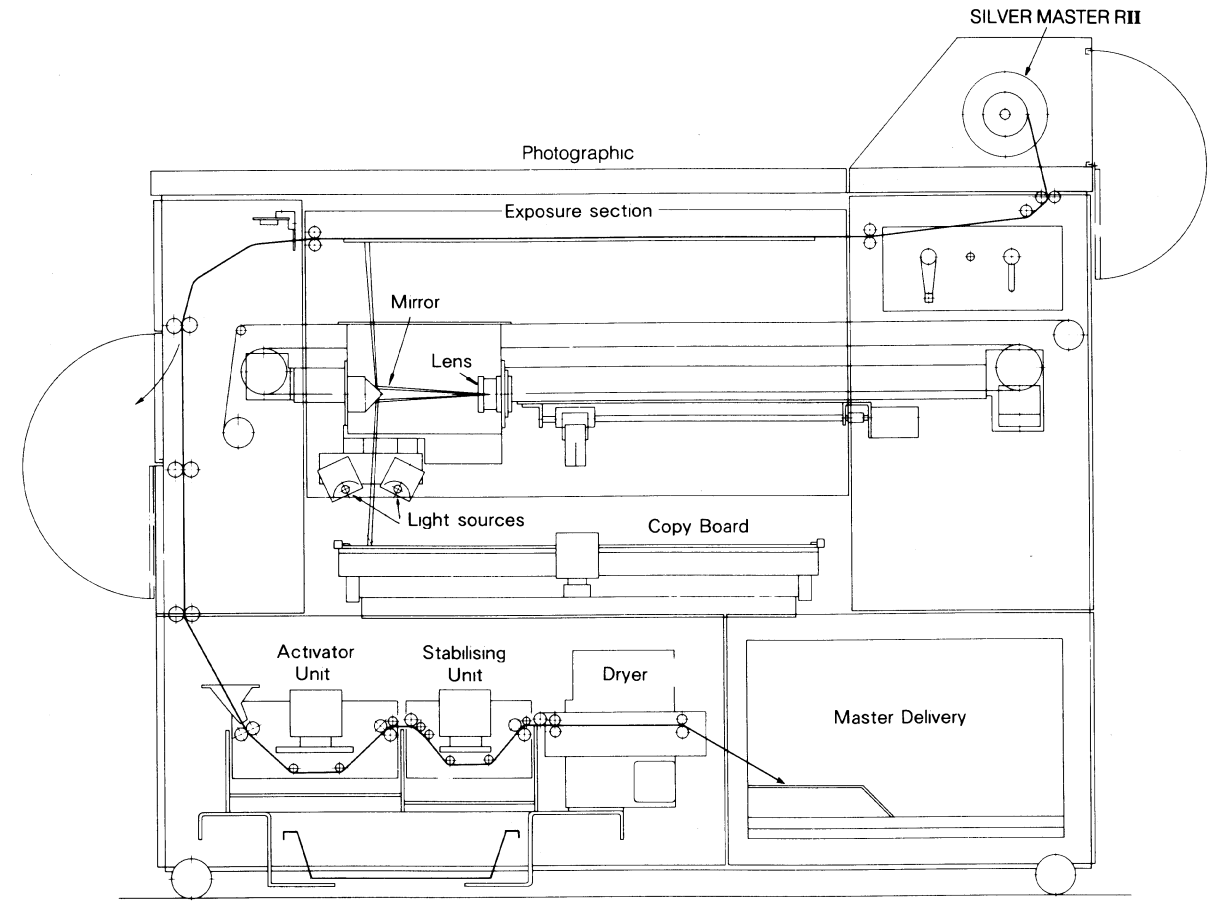
Thank you for choosing the SILVER MASTER PLATEMAKER CP-500S. The SILVER MASTER PLATEMAKER CP-500S is a completely new multi-functional system of platemaking. This machine, in combination with Silver Master RII, produces an offset master plate directly from the copy in a one-touch operation, eliminating the film process. The Silver Master CP-500S has a wide latitude, from B4 to A2. This operation manual has been produced to enable you to enjoy the system's superior qualities.

For information on printing methods, please refer to our separate booklet "SILVER MASTER TECHNICAL GUIDE".

### GENERAL DRAWINGS



### SYSTEM PROCESS

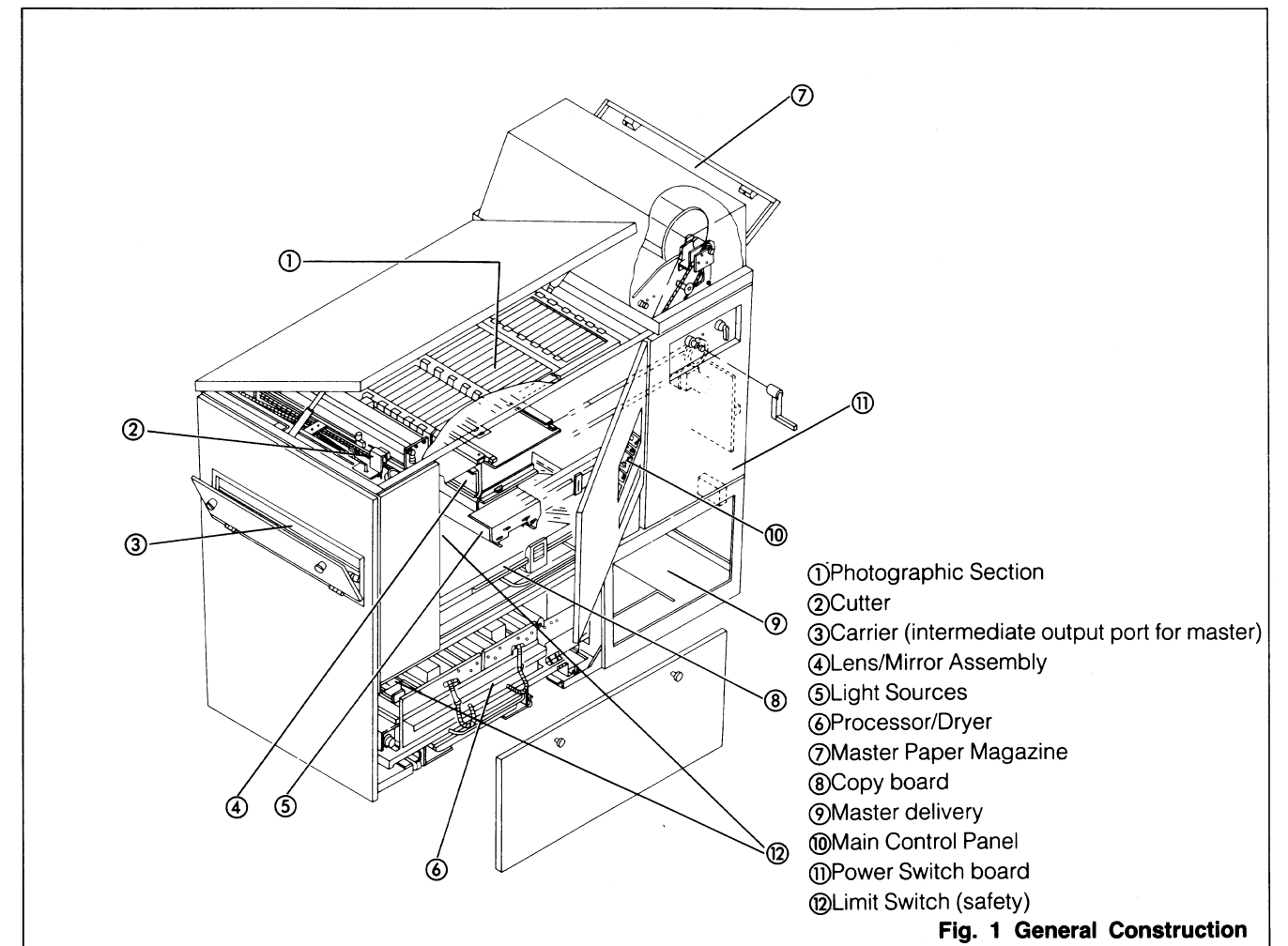


## 2. Specifications

Item	Specifications
Master Plate Width	10"(254mm), 11"(279mm), 12"(305mm), 15 <sup>7</sup> / <sub>8</sub> "(404mm), 20"(508mm), 21.7"(550mm) Continuous alteration possible
Master feed length	14.6"(370mm) ~ 32.3"(820mm)
Effective photographic dimensions	21.7"(550mm) × 31.1"(790mm) blank exposure: 21.7"(550mm) × 32.3"(820mm)
Effective original dimensions	21.7"(550mm) × 31.1"(790mm)
Original loading method	Drawing out original frame and loading an original with its face up Base sheet available for positioning.
Processor capacity	Activator container 4.8 Gallons(18 liters) Stabilizer container 4.2 Gallons(16 liters)
Replenishing bottles	Activator, stabilizer: both 2.1 Quarts (2 liters) each
Temperature control	530 W panel heater (thermodial control type) for the activator tank
Dryer	1.4 kW heater (thermodial control type)
Lens	f: 260mm, in-mirror type
Magnification	100% (same-size output)
Exposure method	Slit type (scanning by lens & light source.)
Exposure adjustment	Power thyristor type (with a light-level adjust dial)
Light source	Two halogen lamps, 130 V, 1.5 kW
Independent switches	MASTER SET switch DRYER switch Master output feed switch Master cut switch
Master rewind apparatus	Rewind by hand
Master splice detection apparatus	Warning buzzer, automatic over-cut
Platemaking speed	With 26.0"(660mm)/feed 120 sec (60 Hz) or 140 sec (50 Hz) for the first plate 58 sec (60Hz) or 68 sec (50Hz) per plate there after
Machine dimensions	73.2" (W) × 39" (D) × 65.4" (H) (1860 × 990 × 1660mm)
Weight	1,430 lb(650kg) [Main unit 1,210 lb(550kg); Processor 221 lb(100kg)]
Electricity	1 ø, 100 V, 1.0 kW, 50/60 Hz
Power source	1 ø, 200 V, 6.4 kW

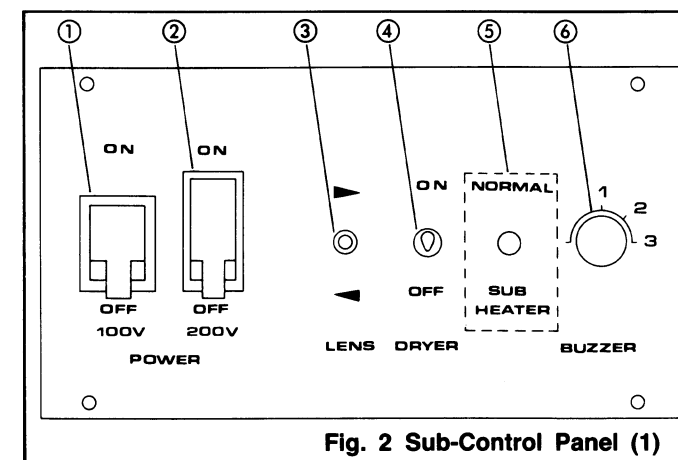
## CHAPTER 2. OPERATION

### 1. General Construction



### 2. Sub-Control Panel (1)

The sub-control panel (1) is on the switchboard provided inside the right side cover.



**①POWER (1 ø, 100 V power switch):**

Contains a 15 A circuit (no fuse) breaker

When the switch is turned on, the operation circuit, processor motor and activator heater are energized and ready for operation.

**②POWER (1 ø, 200 V power switch):**

Contains a 50 A circuit breaker.

When the switch is turned on, the light source and dryer are energized and ready for operation.

**③LENS (Independent lens shift lever):**

While this lever is held up or down, the lens moves in the specified direction. When held up, the lens moves in the direction opposite to the origin. When held down, the lens moves toward the origin. It is used when the lens must be shifted to the center for adjustment or inspection. In this case, the lamp does not light.

**④DRYER (Dryer switch):**

When the DRYER switch is turned on with the 200 V POWER switch ON, the dryer is energized and the heater actuated until hot blast temperature reaches approx. 122°F (50°C). The thermo-switch works to maintain the hot blast at about 122°F (50°C).

(The dryer fan is energized by turning on the 100 V POWER switch.)

Turn on this switch a few minutes before starting operation.

\* If the START button is depressed immediately after the DRYER switch is turned from OFF to ON, the master will pass through the dryer which is not ready to blow air hot enough to dry it yet.

**⑤SUB-HEATER (option):**

This switch is an option specially designed to prevent stabilizer fluid from being frozen at night in cold weather. The switch is

used with a panel heater for stabilizer fluid and a two-way plug socket.

**⑥BUZZER:**  
The buzzer sounds when master paper is exhausted or when

master paper splice has passed. The lamp goes out and the buzzer sounds also when some trouble has occurred and the lens assembly has stopped moving during exposure. The sound level of the buzzer can be controlled by turning the control knob.

### 3. Sub-Control Panel (2)

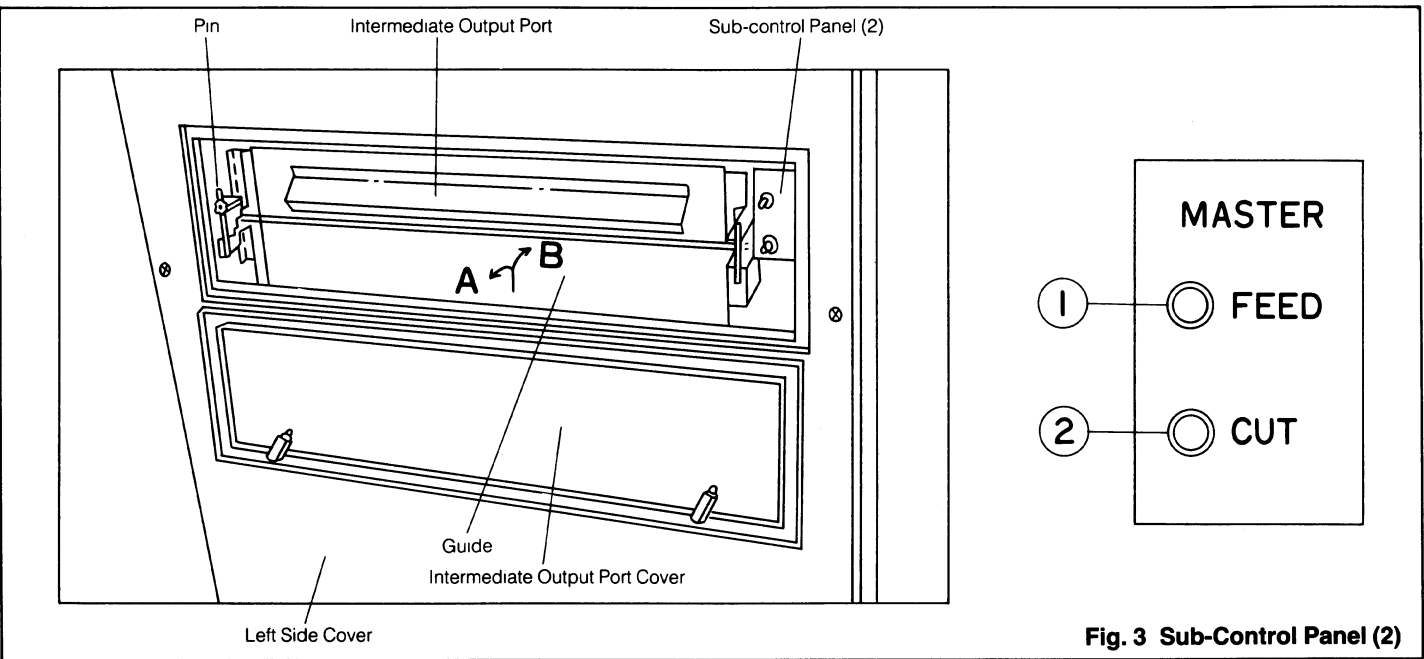


Fig. 3 Sub-Control Panel (2)

The sub-control panel (2) appears when the intermediate output cover on the left side is opened. This panel is used when it is necessary to remove a exposed area of the master paper after loading. Usually, keep the cover closed.

this port. Be sure to depress and hold the switch until the master paper top comes in sight (about 13.8" (35 cm) long). Then depress the CUT switch and pull out the cut-out master paper by hand.

**①FEED (Independent master feed switch):**  
While this switch is held depressed, master paper is fed out. The switch is used to remove the exposed area of master paper after the master paper is loaded.  
Raise the guide a bit to set it in position B and the master paper will not enter the processor but come out of the machine through

With the guide in position B, the START lamp will not be lit and operation can not be started. Usually, keep the guide in position A.

**②CUT (Independent cut switch):**  
When this switch is depressed, the cutter operates. The switch is used to check the cutting quality of a new cutter blade just installed or the result of exposure or after feeding paper with the FEED switch.

Since the thermostat works to maintain the activator within a specified range of temperature, you can keep on plate-making continuously even when the lamp goes on and off alternately provided that the activator temperature has once reached the specified level.

**④EXPOSURE DIAL:**  
Exposure is controlled according to the density and type of an original by using this dial. For line drawings with low densities, decrease the dial setting. For originals with letters or high background densities, increase the dial setting.

**⑤ZERO-EXPOSURE (Exposure changeover switch):**  
With this switch at NORMAL, the light source turns on to perform exposure of a level set on the exposure dial by depressing the START button. Hold the switch at its NORMAL position during operation. If the START button is depressed, with the switch at ZERO, the light source will not turn on and the shutter will not open while the lens assembly will move and master paper will be fed out without being exposed.

The switch is used when the MULTI-EXPOSURE switch is used wrongly.

**⑥MULTI-EXPOSURE (Multi-exposure changeover switch):**  
With this switch at NORMAL, a series of operations (start — exposure — paper feed — cut) automatically proceed  
With this switch at MULTI, the paper just exposed is not fed but ready to be subjected to further exposures. This position is used for special multi-exposure purpose.

In multi-exposure operation, never forget to turn the switch to NORMAL prior to depressing the START button for the last exposure. If you forget it, turn the switch to NORMAL and the ZERO-EXPOSURE switch to ZERO and depress the START button.

**⑦START (Start lamp, green):**  
This pilot lamp goes on when the machine is ready for operation. As soon as the machine is started, it goes out. While it stays off,

the START button is ineffective.  
This pilot lamp does not turn on and the machine can not be started when the MASTER END (master paper end lamp, red) is on and the buzzer is sounding, when the lens assembly is not at its origin, when the master paper output guide plate is not in its appropriate position, or when the master paper is not fed far enough to be cut.

**⑧START (Start pushbutton switch):**  
When this switch is depressed, the following operations proceed sequentially: paper feed back, exposure, paper feed, cutting, transfer, developing, stabilizing, drying and master output. When the START pilot lamp is off, the machine can not be started even by depressing the switch.

**⑨END (Master paper end pilot lamp, red):**  
When the master paper is exhausted or used up, this pilot lamp lights and the buzzer sounds. It also lights and the buzzer goes when master paper is not loaded properly. In such cases, reset the master paper properly.

When it is on and the buzzer is sounding, the machine can't be started with the START switch.

**⑩MASTER LENGTH (Master paper feed length set lever):**  
The cursor on the master paper feed length set scale is set to a desired position of the scale by operating this lever. This will move the lens assembly and the light source by the length set on the scale for making an exposure in master paper. On completion of the exposure, the paper is automatically fed out and cut. A feed length ranging from 14.6" (370mm) to 32.3" (820mm) can be set freely.

**⑪COUNTER:**  
This counter indicates the number of processed master plates. After loading a new master roll or renewing processing solution, depress the reset button to reset the counter to "0".

### 4. Main Control Panel

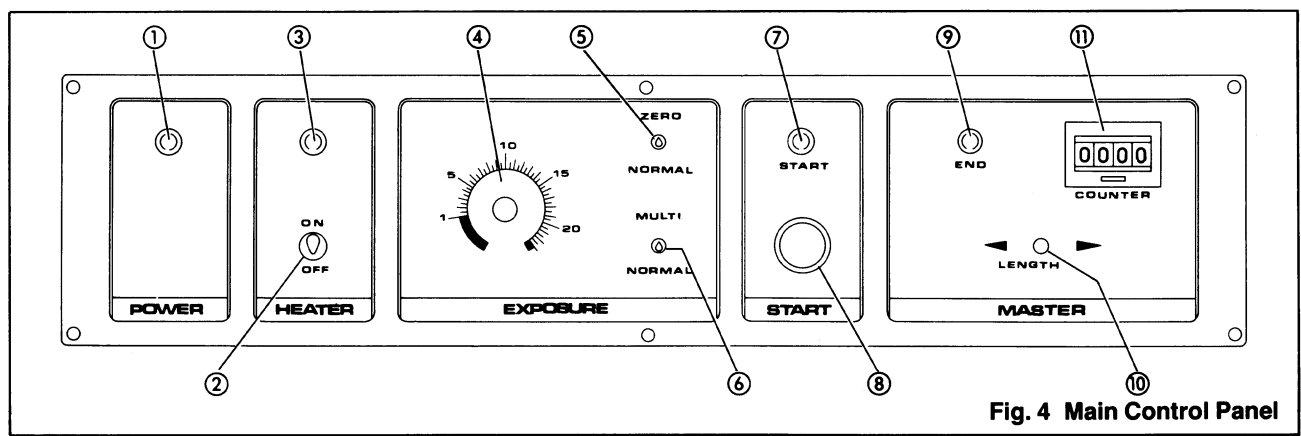


Fig. 4 Main Control Panel

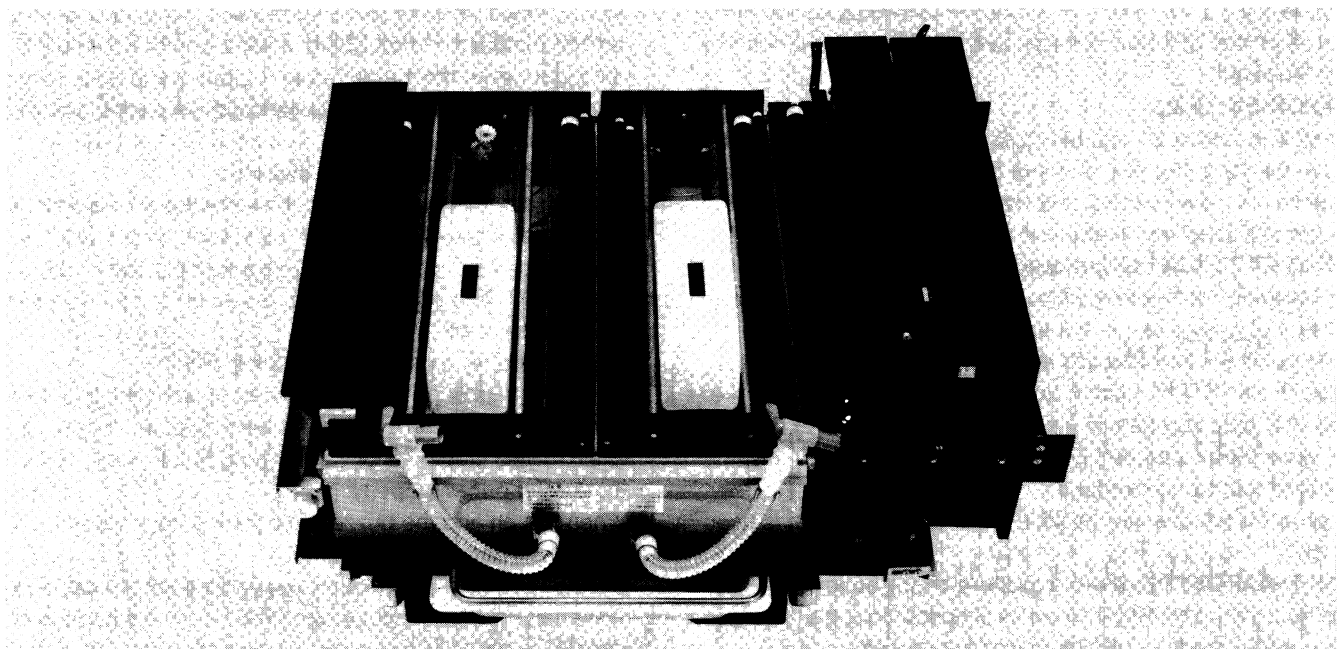
**①POWER (Power lamp, orange):**  
When the POWER switch on the sub-control panel (1) is turned on, this lamp is lit to indicate that the machine is ready for operation.

erature (approx 86°F (30°C)). Keep the switch on while the activator is in use. Be sure to turn it off before draining the activator.

**②HEATER (Heater switch):**  
When this switch is turned on, the panel heater (530 W) built in the activator tank operates to maintain activator fluid at proper temp-

**③HEATER PILOT LAMP (Yellow):**  
This lamp goes out when the activator temperature rises to a specified level 82.4 ~ 87.8°F (28 ~ 31°C). This means that the machine is ready for operation. The lamp goes on when the activator temperature lowers, and off when the temperature rises.

## 5. Processor and Dryer



### A. Preparation of Processing Solutions

- Remove the processor cover and unhook the processor. This will enable the processor to be drawn out of the machine main body.
- The processor consists of a activator tank and a stabilizing tank, each incorporating a conveying unit. After the machine has not been in use for a long time period, the rollers of the conveying unit may not turn smoothly. In such case, turn the rollers by hand before starting the machine.
- For preparing processing fluids, use an exclusive measuring cup.
- When water temperature is low in winter, use hot water of 86 ~ 95°F (30 ~ 35°C).
- In loading or unloading the processor, handle it carefully.

### Activator tank (capacity: 4.8 Gallons (18 ℓ))

- Compounding SLM-AC and water at the one-to-one ratio.
- ① Add 2.4 Gallons (9 ℓ) of water to 2.4 Gallons (9 ℓ) of SLM-AC (undiluted), the exclusive activator solution for SILVER MASTER. After stirring thoroughly, pour the mixture into the activator tank.
  - ② Pour activator solution (one-to-one mixture of SLM-AC and water) into the activator replenisher bottle 0.5 Gallons (2 ℓ). Load the bottle on the unit with its cap down properly.
  - ③ For maintaining the activator solution around 86°F (30°C), the 530 W panel heater thermostat is provided on the activator tank.
  - ④ A thermostat dial is on the left side of the processor. Set the dial to 30. The divisions of the dial represent the temperatures to be set. Checking whether the activator temperature raised corresponds to the setting, adjust the temperature with the dial if necessary. (When the HEATER pilot lamp has just gone out, the activator solution should be at 82.4 ~ 87.8°F (28 ~ 31°C). It takes about twenty minutes to increase activator temperature by 50°F (10°C).

### Stabilizer tank (capacity: 4.2 Gallons (16 ℓ))

- Compounding SLM-ST and water at the one-to-three ratio.
- ① Add 3.2 Gallons (12 ℓ) of water to 1.1 Gallons (4 ℓ) of SLM-ST (undiluted), the exclusive stabilizer for SILVER MASTER. After stirring thoroughly, pour the mixture into the stabilizing tank.
  - ② Pour stabilizer (one-to-three mixture of SLM-ST and water) into the stabilizer replenisher bottle 0.5 Gallons (2 ℓ). Load the bottle on the unit with its cap down properly.

### Replenishment

The amount of solution in each replenisher bottle must be above a certain level. As the solution in the bottle is used up, the liquid level in the processing tank lowers, accelerating exhaustion or fatigue of the solution, which may cause a decline in quality of masters produced.

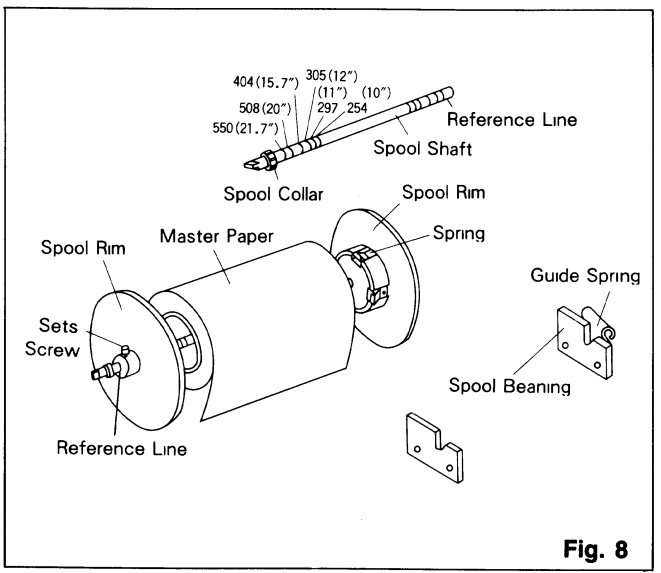
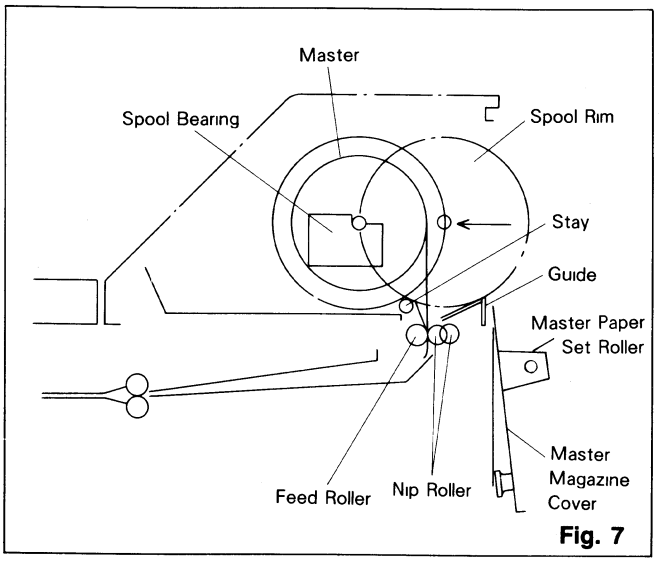
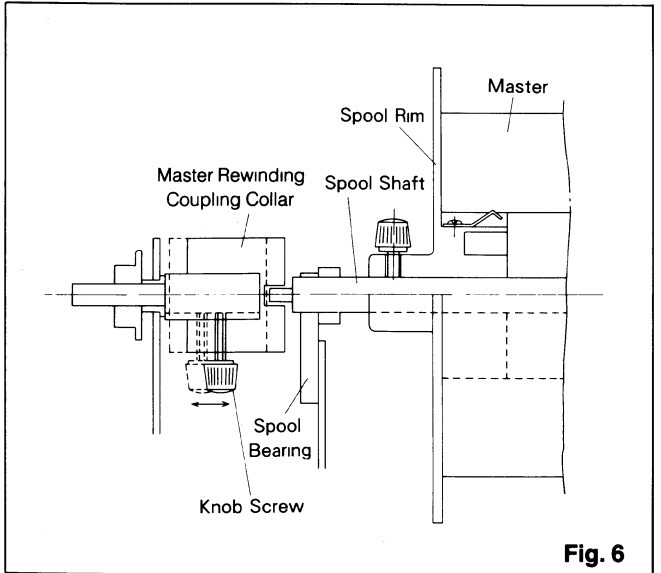
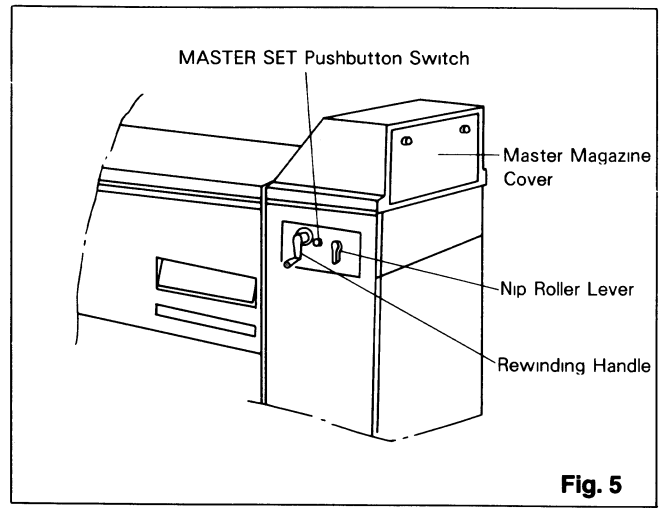
### B. Dryer

- Turn on the 100 V and 200 V POWER switches and then the DRYER switch on the sub-control panel (1). This will energize the dryer and operate the upper heater (800 W), the lower heater (600 W) and the heater fans. The thermostat maintains hot air around 122°F (50°) for drying masters.
- \* In case that the machine is not in use for a long time period with the 100 V and 200 V POWER switches ON, you may turn the DRYER switch from ON to OFF for power saving purpose. Prior to depressing the START button, be sure to return the switch from OFF to ON and allow a few minutes for warming-up of the dryer.
  - \* If the dryer should cause masters to be stained, refer to Section IV-3 ROUTINE MAINTENANCE.

## 6. Magazine and Exposure Section

### A. Loading Master Paper

- ① Open the master paper magazine cover.
- ② Attach the reference spool rim to the spool shaft on the coupling collar side according to the width of the master paper in use and fix it with set-screw.
- ③ Pass the spool shaft through the master paper core hole to set the master paper to the reference spool rim. (The winding direction of master paper should be clockwise facing the reference spool rim side).
- ④ Attach the other spool rim to the end of the master paper core securely and fix it with screw.
- ⑤ Master paper rewinding coupling collar is fixed at the left-hand side in the master paper magazine with a knob screw. Loosen the screw and shift the coupling collar to the left.
- ⑥ Hold the spool with master paper with the emulsion side down and put it on the guide and the stay at the inlet of the master paper magazine lightly.
- ⑦ Then push the spool rims by hand to set the spool shaft on the spool bearings.
- ⑧ Shift the master paper rewinding coupling collar to the right and secure it with the knob screw. (Be sure to tighten the knob screw securely because defective coupling results in incomplete rewinding of master paper.)
- ⑨ The top of master paper is taped with adhesive tape to prevent it from loosening. Remove the adhesive tape and adhesive entirely or the tape or remaining adhesive may cause scratches on the surface of the roller or the exposure section.
- ⑩ Turn the nip roller lever to FREE.
- ⑪ Pull out the master paper approx. 7.9" (200 mm) long and insert it between the feed roller and the nip roller according to the master paper width.
- ⑫ Then turn the nip roller lever to LOCK.
- ⑬ Close the master paper magazine cover.
- ⑭ Depress the MASTER SET push-button switch, and master paper will be fed into the exposure section and set there automatically, the START lamp (green) on the main control panel will light and the machine will become ready for platemaking.



## B. Master Splice Auto-Overcut

Some master paper has a splice in the middle. When the splice passes through the exposure section, the buzzer sounds twice intermittently.

In case that the splice is involved in the set feed length, the master is cut in the normal size. In case that the seam be laid across the normal cut line, the master is cut in such an extended size that the two splice holes are involved in it. This function is provided for preventing the splice from appearing on two plates. Therefore, defect or splice is limited to only one plate and successive plate will be normal.

## C. Rewinding Master Paper

The following procedure should be used when the machine is shut down for a long time period or when the master paper is changed.

- ① Set the nip roller lever to FREE.
  - ② Turn the MASTER REWIND handle in the arrow direction (counterclockwise) slowly to rewind the master paper.
  - ③ The buzzer sounds when the top of the master paper is re-wound to the inlet of the exposure section. At this time, stop the rewinding operation.
- \* In case of replacement of master paper, turn the handle twice after the buzzer sounds. Then, open the master paper magazine cover and change the master paper for a new one.

## D. Resetting Master Paper

To reset master paper after rewinding, set the nip roller lever to LOCK and depress the MASTER SET pushbutton switch. The master paper will be automatically set in the exposure surface and the machine will become ready for start. This concludes the resetting of master paper.

- Standard line "0" in the copy positioning sheet corresponds to the top of master paper.
- In the vertical axis, the scales at 0.2" (5 mm) intervals and master paper width indications are provided for effective exposure ranges.
- In the horizontal axis, the scales at 0.2" (5 mm) intervals are provided for indicating the master paper feed length. Since the double-exposed part due to the slit exposure method appears at the top of the master, the effective exposure range is not from the standard line "0". (The scales of the base sheet can be used for centering the original.)

## C. Use of Copy Illuminating Fluorescent Lamp

In some sites, the copyboard may be hard to look at in loading copy. So the machine is equipped with the copy illuminating fluorescent lamp as an accessory. Open the operator-side front cover and the plug socket will appear behind it. Attach the plug from the fluorescent lamp to the socket and pass the wire behind the cover. Hang the fluorescent lamp at the top of the front cover to use it. It is energized by turning on the 100 V POWER switch. It can also be turned on and off with the pull switch at the fluorescent lamp.

## 7. Copyboard

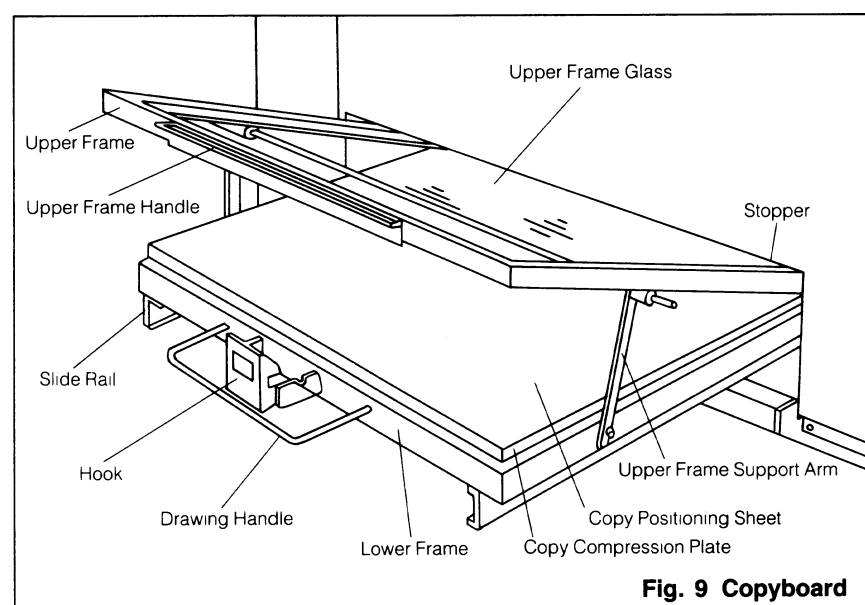


Fig. 9 Copyboard

## A. Loading Original

- ① Holding the drawing handle, pull out the copyboard slowly. The holder drawn along the slide rails will be stopped in the specified position by the magnetic effect. (When drawing the copyboard, it does not slide so smoothly because of magnetic effect.)
  - ② After unlocking the hook, hold the upper frame handle and lift the upper frame gently. The upper frame will be stopped in the specified position automatically due to the upper frame support arm linked with the upper and lower frames. Take care not to handle the holder abruptly because it stands still due to the magnetic effect.
  - ③ Place an original on the copy positioning Sheet with its face up. (Refer to the following section "B. Positioning Copy".)
  - ④ Holding the upper frame handle, push the upper frame support arm a bit forward and close the upper frame.
  - ⑤ After locking the hook securely, push the copyboard back in its place slowly. (The copyboard will be stopped due to the magnetic effect.)
- \* Be sure to draw out the copyboard completely, or the light source assembly may be damaged by opening the upper frame.

## B. Positioning Copy

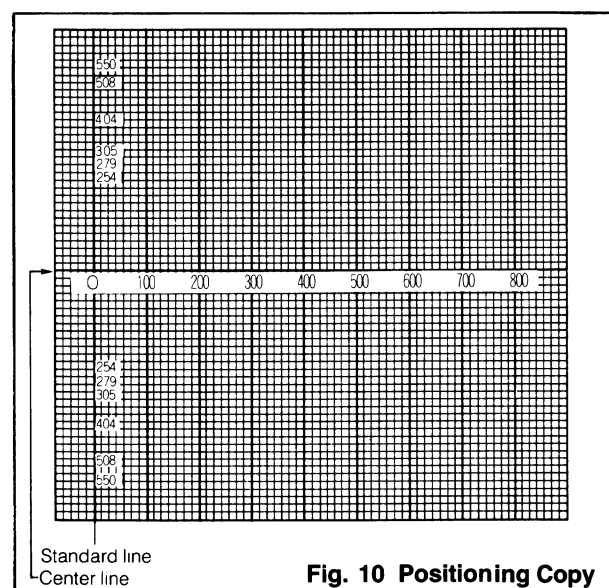


Fig. 10 Positioning Copy

## 8. Lens Assembly

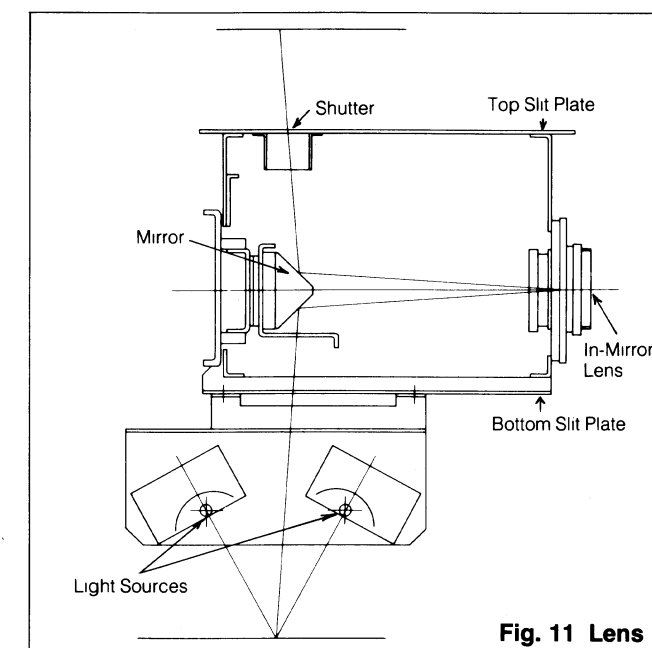
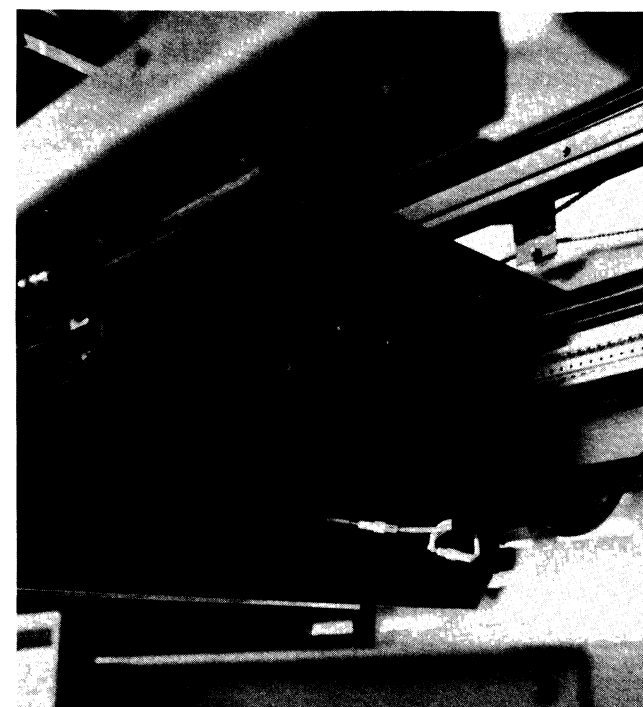


Fig. 11 Lens

The lens assembly employs an in-mirror type lens with a focal length of 260 mm and a fixed diaphragm. The lens and the reflection mirror appear when the bottom slit plate of the lens assembly is pulled out. Never touch them even when cleaning the machine.

## 1. Procedure of Photography

The following items and requirements must be satisfied to perform proper exposure. Check the following items and requirements prior to the exposure operation.

### A. Preparations or Checks before Exposure

- ① Mixing and pouring processing solutions
- ② Loading master paper
- ③ 100 V (1  $\phi$ ) POWER switch: ON
- ④ 100 V (1  $\phi$ ) POWER switch ON
- ⑤ DRYER switch: ON
- ⑥ HEATER switch ON  
HEATER pilot lamp goes off
- ⑦ Nip roller lever: LOCK
- ⑧ ZERO exposure selection switch: NORMAL
- ⑨ MULTI exposure selection switch: NORMAL
- ⑩ START lamp (green): lit

### Requirements

- 1) The MASTER END pilot lamp must not be lit or the master buzzer must not be sounding.
- 2) The zero-point limit switch for the lens assembly must be ON.
- 3) The position of the guide at the master intermediate output port must be correct.
- 4) Master paper must be fed to the cutting plane.
- 5) The cutter must be in the zero position.

## 2. Multiple Exposure

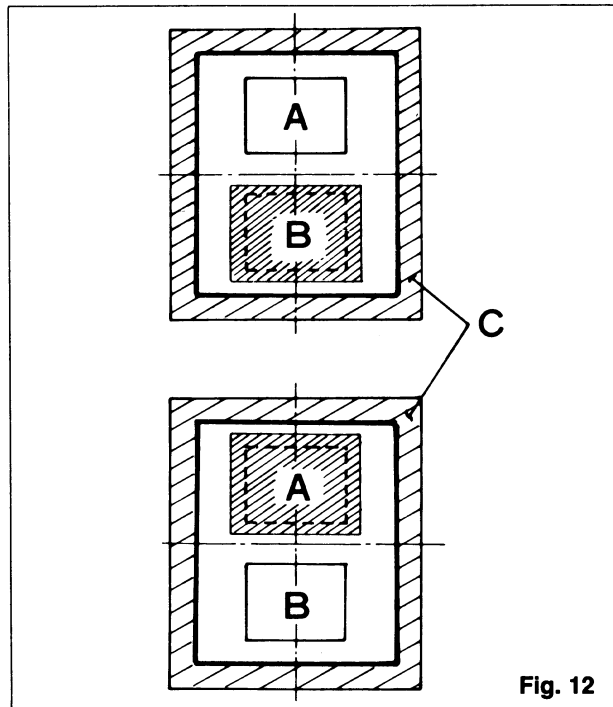


Fig. 12

The multiple exposure method is used when it is necessary to make multiple exposure on a single plate from one original or when the density of one part of original differs from that of the other part.

### B. Normal Exposure Procedure

- ① Loading copy  
Using the standard line and scales of the copy positioning sheet, load an copy in the desired position with its face up.
- ② Setting master length  
According to the plate sizes suitable for User's printing machine, set the master paper feed length setting lever to a desired length. The length ranges from 14.6" (370 mm) to 32.3" (820 mm).
- ③ Setting EXPOSURE dial  
Set the EXPOSURE dial on the main control panel to an optimum exposure amount according to the original loaded.
- ④ Depress the START pushbutton switch, and a series of exposure operations will proceed automatically and a plate will be produced.  
As soon as the lens assembly (light source) starts returning after completion of exposure, the copyboard can be drawn in order to replace the copy.

### [Example]

In case of double exposure

- ① Decide the exposure positions (A and B) and load an original in the position corresponding to the first exposure position (A).
- ② Then, place a mask (black paper with a reflection density of above 2.0) in the position corresponding to the second exposure position (B).

The mask must be a little larger than the original size

- ③ Set the EXPOSURE selection switch to MULTI.
- ④ Set the EXPOSURE dial to an optimum value.
- ⑤ Depress the START switch to perform the first exposure.
- ⑥ Move the original from A to B, and the mask from B to A so that the mask may not overlap the previously masked area.  
Silver will be educed on the overlapped (unexposed) area, so that special care should be taken.

- ⑦ [The second (last) exposure]  
With the EXPOSURE selection switch at NORMAL, depress the START switch to perform the second (last) exposure.

\* The similar procedure to the above is used in case of triple, or more times exposure.

Pay attention to the optimum exposure amount which depends on the reflection density of the mask.

\* For effective multiple photography, it is recommended to cover to (c) part, outside of the master size.

## 3. How to Determine Standard Exposure

Because Silver master has a coating of silver salt emulsion there will be cases where the sensitivity will vary slightly between production lots. The lot number is indicated on the pack. When using masters with different lot numbers, check the sensitivity before making exposures.

An exposure will cause the image to be wide and the surface smeared while an over-exposure will result in a narrow image and loss of image.

It is important to carry an exposure accurately in order to give full play to the high quality capacity of Silver master.

### A. Determining standard Exposure

- ① CP-500S contains a test chart and a standard exposure sample. Make exposure of the test chart and compare its result with the standard exposure sample to determine the standard exposure amount.
- ② Adjust the EXPOSURE dial so that the first step of silver education comes in the position of circled number (12) over the wedges in the test chart. (See the figure below.)
- ③ If the exposed result agrees with the standard exposure sample, the setting is the standard exposure for the test chart.
- ④ Using the standard exposure setting as a reference, determine the optimum exposure setting for each original.

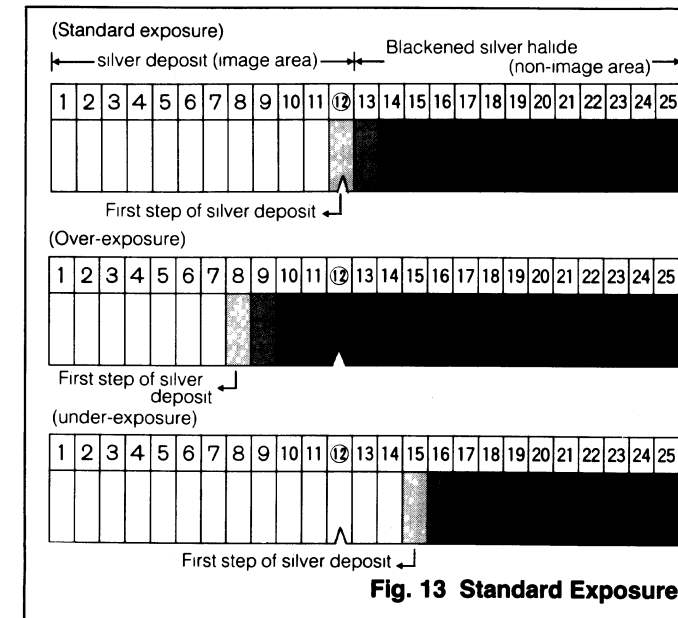


Fig. 13 Standard Exposure

### B. Compensation for Defects of Originals

Original	Adjustment
Letters or lines are thin or blurred.	Decrease the dial setting from the standard setting to the extent that non-image area is not fogged.
Letters are thick and battering Darkbackground	Increase the dial setting from the standard setting

### C. Focusing

The focus of the machine has been adjusted thoroughly at factory.

If necessary, the following procedure is used for checking.

- ① Make exposure of the resolution chart in the test chart and compare the result with the standard resolution sample.
- ② Make exposure with the EXPOSURE dial at higher settings than the standard exposure setting.
- ③ Compare the exposed result with the standard resolution sample. If the result has the sharpness equal to or higher than the sample, the machine is in focus.
- ④ The resolution of the machine is approximately 8 lines/mm when it is in focus.  
(Since the resolution chart is a reproduction, this resolution may not show absolute value.)

[Note]

The color of standard exposure sample may fade if it is stored for a long time period. Store it in a dark place such as desk drawers.



# CHAPTER 4. MAINTENANCE

The following instruction provides necessary information for maintaining continued satisfactory operation of SILVER MASTER PLATEMAKER CP-500S.

## 1. Pre-Operation Inspection

- ① Turn on the 100 V and 200 V power switches
- ② Turn on the HEATER switch and make sure that the HEATER pilot lamp is lit
- ③ Make sure that the processing solutions in the processor and the solutions in the replenisher bottles are full enough.
- ④ Check the copyboard glass for scratches or dirt
- ⑤ Make sure that the start lamp on the main control panel is lit.
- ⑥ Make sure that the DRYER switch is on.
- ⑦ After pouring fresh processing solutions or renewing the master paper make exposures of the test chart for checking the results of exposure

## 2. Post-Operation Inspection

- ① Turn the nip roller lever to FREE.
- ② Rewind the master paper with the master paper rewinding handle until the MASTER BUZZER sounds.
- ③ Turn off the 100 V and 200 V POWER switches
- ④ When the machine is not in use for a long time, be sure to cover it with a vinyl sheet in order to keep out dust.

## 3. General Care

### A. Processor

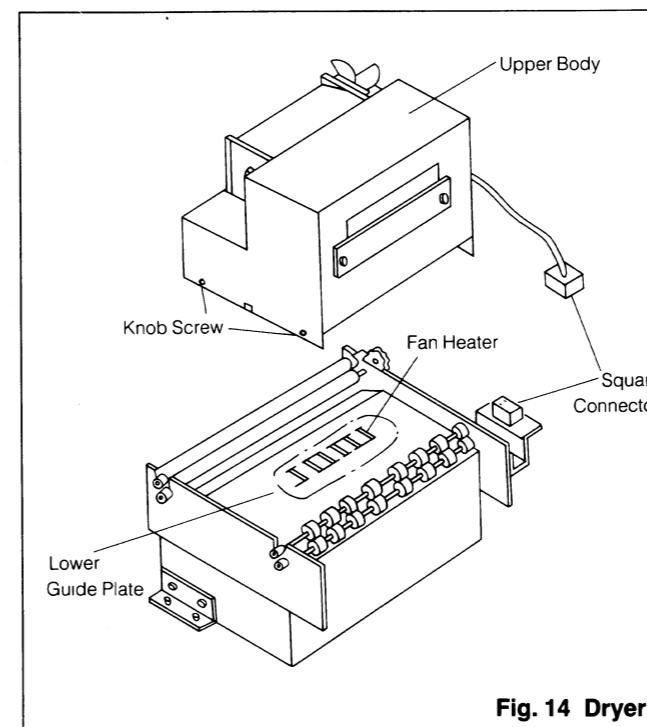
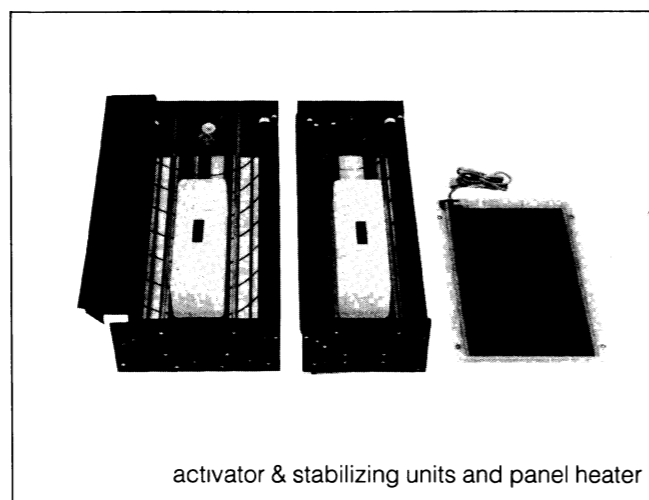
- ① Frequency of processing solution change  
Processing capacity of activator and stabilizer is 1400 plates for size B4, 800 plates for size A3 or 400 plates for size A2. Even when the number of processed plates is within the prescribed number, renew the processing solution 4 weeks after mixing.
- ② Cleaning the processing tanks.  
During platemaking, chemicals deposit, silver, or paper powder from the master paper stick to the tanks. The following procedure is used for changing the processing solutions or cleaning tanks.
  - ① Turn off the 100 V and 200 V POWER switches. If they are ON, the tank will be heated dry, which may cause the heater and processing tanks to be damaged.
  - ② Remove the processor cover and pull out the processor
  - ③ Remove the respective replenisher bottles from the activator and stabilizing tanks.
  - ④ Take out the drain vat and throw down the drain hose. Then open the drain cock.
  - ⑤ After the processing tanks are drained completely, shut the cock and then put the drain hose back to the clamp.
  - ⑥ Remove the heater, activator and stabilizing units from the processing tanks and wash them with water. Wipe away drainings left on each part with a wet cloth or a sponge thoroughly.
  - ⑦ Synthetic rubber used in the rollers of the activator and stabilizing units is easily affected by heat. Use hot water of below 104°F (40°C) for washing. In addition, never use cleaner or polishing powder.

- ⑧ Wash the inside of the activator and stabilizing tanks with water
- ⑨ In case the paper path under the activator and stabilizing units is soiled exceedingly, it may cause master paper to be scratched. So, wash it clean with water and wipe away the moisture thoroughly. Then polish it with a soft cloth moistened with metal cleaner sufficiently until the dirt on the surface comes off completely and the beautiful glossy surface appears.
  - \* Execute the above-mentioned maintenance carefully to keep the preserved master quality.
- ⑩ After draining the tanks completely, turn the drain valve to close and pour the fresh processing solutions into the respective tanks (See P.8 for preparation of the processing solutions.)
  - \* Don't mix the developer with the stabilizer since they have opposite functions.

### B. Dryer

The following procedure is used for cleaning the dirty dryer which caused the master paper to be spoiled.

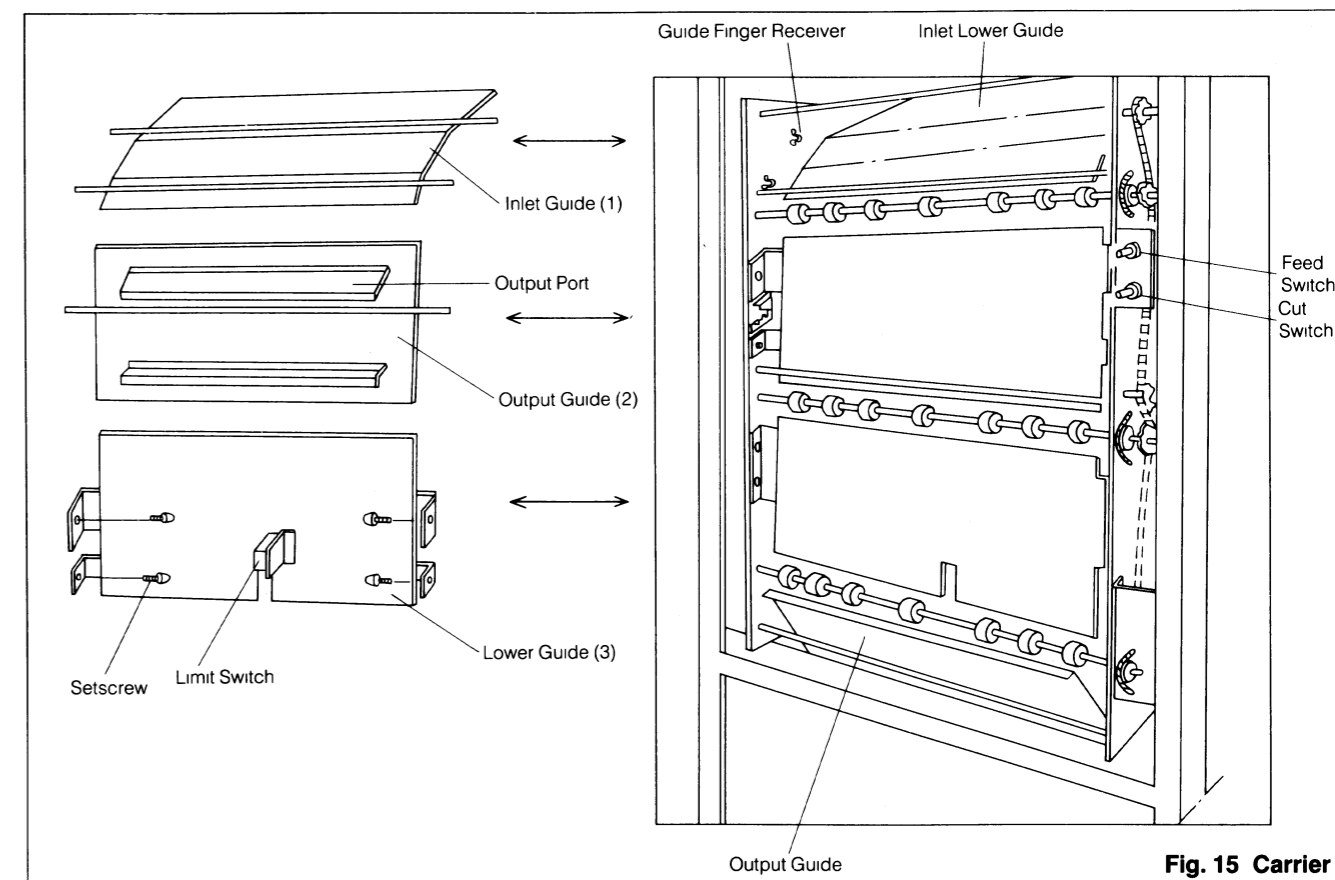
- ① Turn off the POWER switches on the sub-control panel (1).
- ② Pull out the processor dryer, and disconnect the square connector of the dryer from the connector socket
- ③ After loosening the four knob screws, lift and remove the dryer upper body
- ④ Wipe out the dirt on the lower part of the guide plate and the rollers, etc. with tightly squeezed wet rags (Never wipe the rollers while the rollers are working with the POWER switch ON. It is extremely hazardous. Be sure to turn off the POWER switch before cleaning.)
- ⑤ Replace the upper body and reconnect the square connector, and then set the body with knob screws.



### C. Carrier

Remove the left side cover, and the carrier will appear as in the following figures. In case of master paper jamming or cleaning the guide plates, the following procedure is used.

- ① In case of master paper jamming due to defective feeding, open not the left side cover but the intermediate output port cover, and remove the output guide (2) by pulling out the pins. Then, take out the jammed paper.
- ② In case shorter master has been cut out wrongly, remove the left side cover and the inlet cover (1) to remove it.
- ③ In case the dirty carriers cause master paper to be scratched, remove the guide plates to clean them.



#### D. Replacement of Cutter Blade

The cutting capacity of the cutter blade is approx. 220 masters (two 246 ft (75 m) rolls) per blade. Replace the blade every 30 days even if the number of cuttings does not reach the capacity. The following procedure is used for replacing the cutter blade.

- ① Turn off the 100 V POWER switch on the sub-control panel (1).
  - ② Open the top cover of the exposure section.
- \* If master paper is fed to the exposure section, rewind the paper and open the top cover.
- ③ After loosening the cutter knob counterclockwise, lift up the bracket.
  - ④ As a cutter blade, use cutter blade available in the market. Take care not to set the blade in the wrong direction.
  - ⑤ Tighten the setscrew with a coin or the like
  - ⑥ Tighten the knob on the bracket.
  - ⑦ Shift the blade about 4" (10 cm) long by hand to check whether it smoothly moves along the guide, and return it.
  - ⑧ Turn on the POWER switch.
  - ⑨ Turn on the independent cut switch to check the cutter operation.
  - ⑩ Close the top cover on the exposure section.

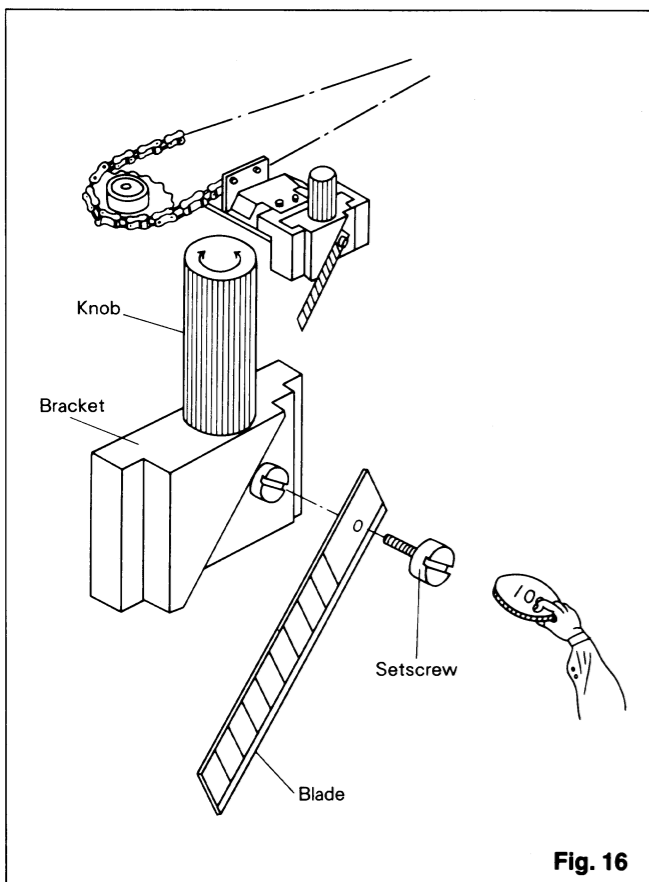


Fig. 16

#### E. Care of Copyboard Upper Frame Glass

Dust or finger-prints on the upper frame glass may affect the master quality. Check the glass everyday. If it is dirty, clean it with a soft cloth and glass cleaner (available the market). Take care to wipe away the cleaner thoroughly.

#### F. Care of Lens and Mirror

Lens and mirror contained in the lens/mirror assembly do not become dirty so easily. With time, however, their optical performances will be deteriorated due to the dust, etc. in the room. Therefore, carefully clean them as follows.

- \* After loosening the two setscrews on the bottom slit plate, pull out the slit plate, and the lens and reflection mirror will appear.
- \* By using the air brush attached as a standard accessory, gently dust off the lens and mirror every month.
- \* In case they are extremely dirty, lightly wipe the lens and mirror with lens paper (available at camera shops) and ethyl alcohol for industrial use (available in the market).
- \* Since the surfaces of the lens and mirror are very soft, special care must be taken not to hit them with the air-brush or wipe their surfaces strongly.
- \* When pulling out the bottom slit plate, take care not to drop it.
- \* Don't touch the slit width adjust screw in the lens assembly.

#### G. Care of Exposure Surface Glass

The exposure surface glass inside the top cover does not become dirty so easily. However, dust or adhesive tape left on the glass surface may cause passing trouble or affect the master quality. Check the glass at replacement of master paper. If it is dirty, clean with a soft cloth and glass cleaner (available in the market). Take care not to leave the cleaner chemicals.

- Open the top cover, and it will stop in the specified position due to the effect of gas springs.
- Hold the compression board handle and lift the board to attach it to the hook on the top cover.
- After checking or cleaning the exposure surface glass, gently put down the compression board and then close the top cover.

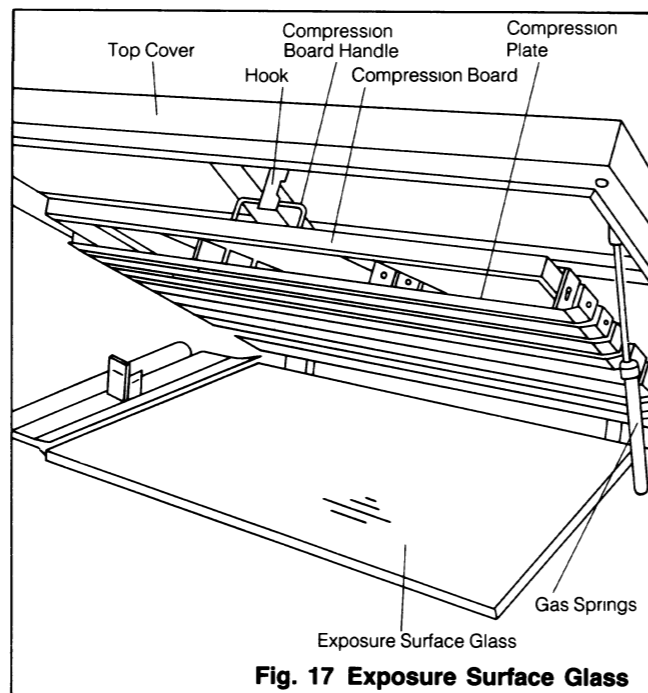


Fig. 17 Exposure Surface Glass

#### H. Replacement of Light Source (halogen lamp)

The machine uses two 130 V, 1.5 kW halogen lamps as a light source. Prior to replacing the lamp with a new one, never fail to make sure that the lamp and the reflection board have cooled down. A careless touch on them will burn yourself.

- ① Turn off the 100 V and 200 V POWER switches
- ② Open the main control panel cover.
- ③ Remove the light shading plate by loosening the left knob screw and shifting horizontally.
- ④ Hold the lamp with a clean dry cloth or gloves on. Never hold it with bare hands. Take enough care not to leave any oily stains or fingerprints on the lamp surface, or that will cause not only an uneven illumination but also a damage to the stained or finger-marked part of concern. If the lamp should be finger-marked or stained, apply a very small amount of ethyl (available in the market) alcohol to lens paper (available at common camera shops) and lightly wipe with the lens paper.
- ⑤ Install the lamp in such a way that its portion bearing an indication of ratings (130 V, 1500 W) is closer to the operator side.

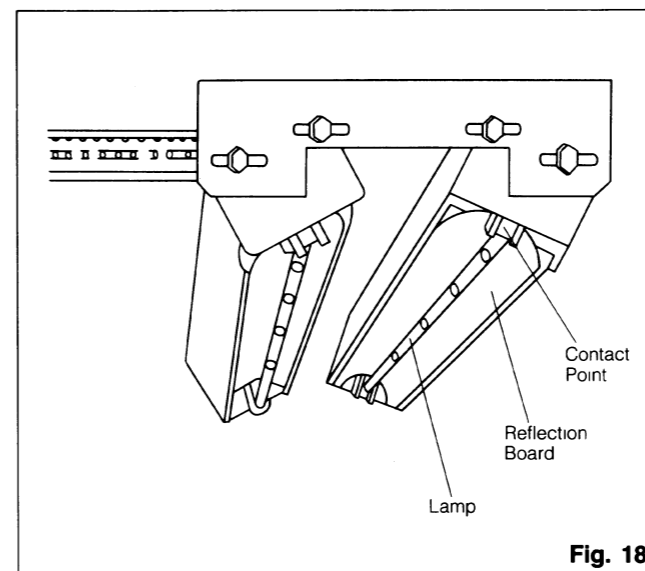


Fig. 18

- ⑥ Push the lamp contact point in the direction of arrow (1) and push the nearer contact point outward with a screw-driver or a similar tool. Push the lamp upward as shown in Fig. 19-(3) and fit the lamp into the pin contact point.

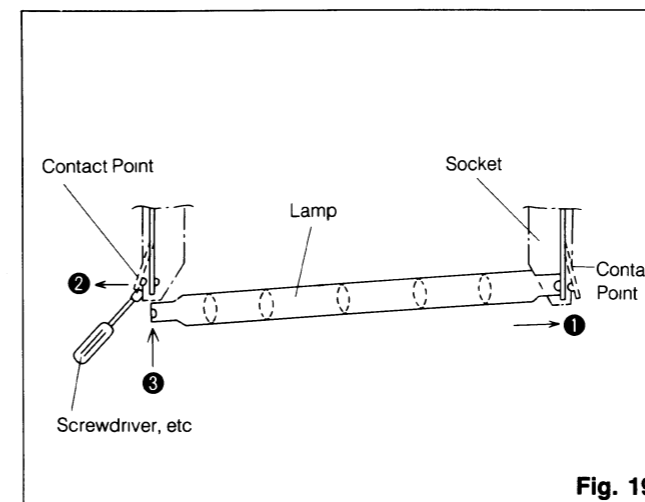


Fig. 19

- ⑦ After installation of the lamp, turn the lamp a bit to check if it is secured in place

\* In case that replacement is to be carried out by one person, the person must take care not to damage the lamp and do the job while spreading the contact point springs. In case that two persons take care of the job, removal of the rear (middle) cover is suggested for easy handling.

\* A crack in the lamp may cause the lamp to be broken during exposure (when the lamp is on and the lens assembly is moving). Therefore, never look into the machine during operation.

#### I. Switchboard

The switchboard appears when the right side cover is removed. It includes various electric parts and devices.

When checking the electric circuit (including replacement of fuse), turn off the 100 V and 200 V POWER switches on the sub-control panel (1).

Don't use any fuses with a capacity other than a specified one

- ① CONTROL CIRCUIT fuses (F<sub>1</sub>, F<sub>2</sub>)  
Two glass tube fuses (5 A) are built in to protect the control circuit.
- ② PROCESSOR MOTOR fuses (F<sub>3</sub>, F<sub>4</sub>)  
Two glass tube fuses (3 A) are built in to protect the processor drive motor circuit.
- ③ HEATER fuses (F<sub>5</sub>, F<sub>6</sub>)  
Two glass tube fuses (10 A) are built in to protect the heater circuit.
- ④ DRYER HEATER fuses (F<sub>7</sub>, F<sub>8</sub>)  
The glass tube fuses (10 A) are built in to protect the dryer heater circuit
- ⑤ LIGHT source fuses (F<sub>9</sub>, F<sub>10</sub>)  
Two enclosed fuses (30 A) are built in to protect the light source circuit.
- ⑥ T<sub>1</sub> [Master paper set timer]  
When the MASTER SET switch is depressed, the master paper loaded is fed and the top of the paper reaches the cutter front limit switch, which actuates the timer so as to stop the paper just in the cutting position. The timer has been adjusted at factory.

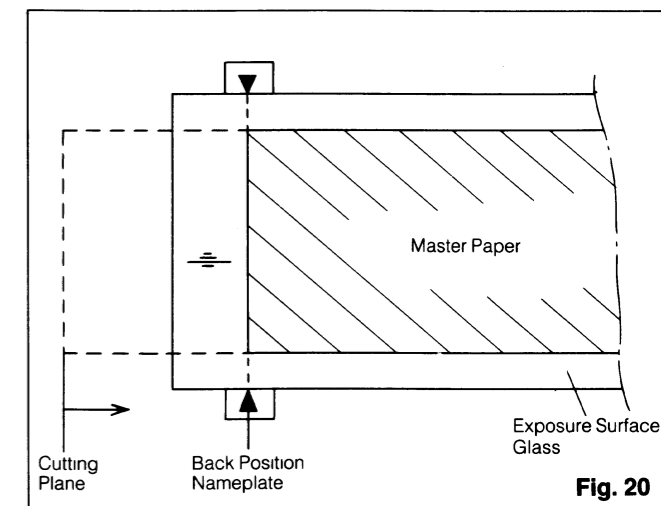
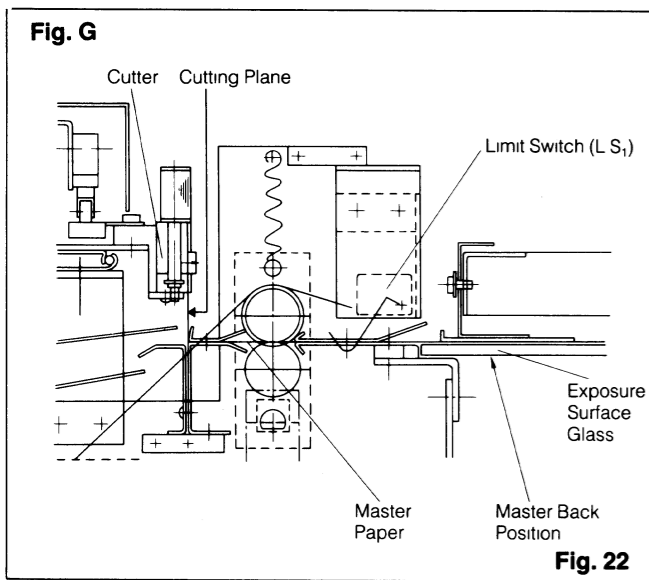
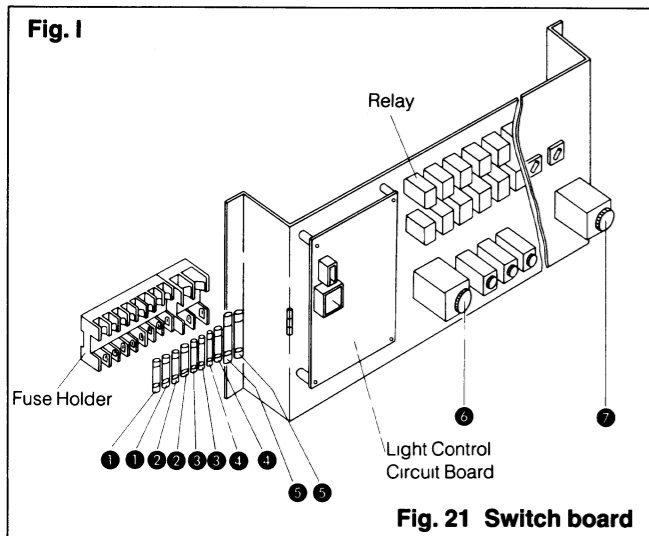


Fig. 20



- ⑤ Master paper feed chains once a month  
(Open the master paper magazine cover.)
- \* For lubricating oil, use SHELLTHERUS #27 or equivalent.

## 5. Ordering and Replacement of Parts

The machine incorporates various kinds of parts. Some of them can be installed only by service personnel.

- ① Whether parts only are needed or both parts and installation (replacement) service are needed.
- ② The items given on the nameplate of your machine:
  - (a) MODEL (CP-500S)
  - (b) MFG NO.
- ③ Descriptions of parts and quantities required, date of delivery required, etc.

[Notes]

1. The detail specifications may be subject to change without notice.
2. The manufacturer assumes no responsibility for trouble caused by the modifications made by users or by the use of another maker's equipment or parts with the machine without our approval.

## 6. Troubles and Remedies

Be familiar with the normal running conditions of the machine and try to find the exact cause of trouble. Typical trouble and remedies are shown below.

Check the corresponding parts according to the list. If the machine is not corrected, contact our distributor

[N.B.]

In case of replacement of the fuses or check of the electric circuits, be sure to turn off the 100 V/200 V POWER switches on the sub-control panel (1).

	Trouble	Cause	Remedy
1.	Processor will not run	<ol style="list-style-type: none"> <li>1. Failure of fuse</li> <li>2. Disconnection of processor connector</li> <li>3. Power switch for camera set to OFF</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the fuse. [Processor motor fuses F<sub>3</sub> / F<sub>4</sub>. 3A].</li> <li>2. Connect it [CN 12].</li> <li>3. Turn the power on [100 V].</li> </ol>
2.	Processor solution temperature will not rise.	<ol style="list-style-type: none"> <li>1. HEATER switch set to OFF.</li> <li>2. Disconnection of heater plug</li> <li>3. Missetting of thermostat</li> <li>4. Failure of fuse</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn it on</li> <li>2. Connect it.</li> <li>3. Set the thermostat to 86°F (30 °C)</li> <li>4. Replace the fuse [Heater fuse F<sub>3</sub> / F<sub>6</sub> 10 A]</li> </ol>
3.	Machine will not start. (Start indication will not be displayed )	<ol style="list-style-type: none"> <li>1. Incorrectly set master paper (Master paper not at the cutting plane)</li> <li>2. Lens assembly not at zero point</li> <li>3. Defective cutter position</li> <li>4. Defective position of guide at the intermediate output port</li> <li>5. Continuous rotation of carrier rollers</li> </ol>	<ol style="list-style-type: none"> <li>1. Set the nip roller lever to LOCK and depress the MASTER SET switch.</li> <li>2. Zero point return of lens assembly (Turn on the limit switch.)</li> <li>3. Zero point return of cutter</li> <li>4. Move the guide forward. (Turn off the limit switch.)</li> <li>5. Turn off the POWER switch and then turn it on again. Check whether the nip roller lever is set to FREE.</li> </ol>
4.	Light source will not light.	<ol style="list-style-type: none"> <li>1. Power switch for camera set to OFF</li> <li>2. Light source selection switch set to ZERO</li> <li>3. Burnout of lamp</li> <li>4. Defective position of guide at the intermediate output port</li> <li>5. Failure of fuse</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn on the 200 V power switch</li> <li>2. Set the light source selection switch to NORMAL.</li> <li>3. Replace the lamp</li> <li>4. Reset the lamp.</li> <li>5. Replace the light source fuses F<sub>9</sub> / F<sub>10</sub> [20 A]</li> </ol>
5.	Exposure amount will not vary.	<ol style="list-style-type: none"> <li>1. Faulty light control PCB</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the light control PCB</li> </ol>
6.	Master paper will not be fed	<ol style="list-style-type: none"> <li>1. Nip roller lever set to FREE</li> <li>2. EXPOSURE selection switch set to MULTI</li> </ol>	<ol style="list-style-type: none"> <li>1. Set the lever to LOCK</li> <li>2. Set the EXPOSURE selection switch to NORMAL.</li> </ol>

### ⑦ T<sub>2</sub> [Master paper back timer]

Before starting, the top of master paper is in the cutting position where light can not be cast even by giving an exposure. Therefore, this timer is used so that the top of the paper goes back to the back position indicated on the nameplate, simultaneously with the press of the START switch.

The timer has been factory-adjusted so that the top of master paper is aligned with the standard line of the copy positioning sheet. If not so, make a necessary adjustment. see Fig. 20.

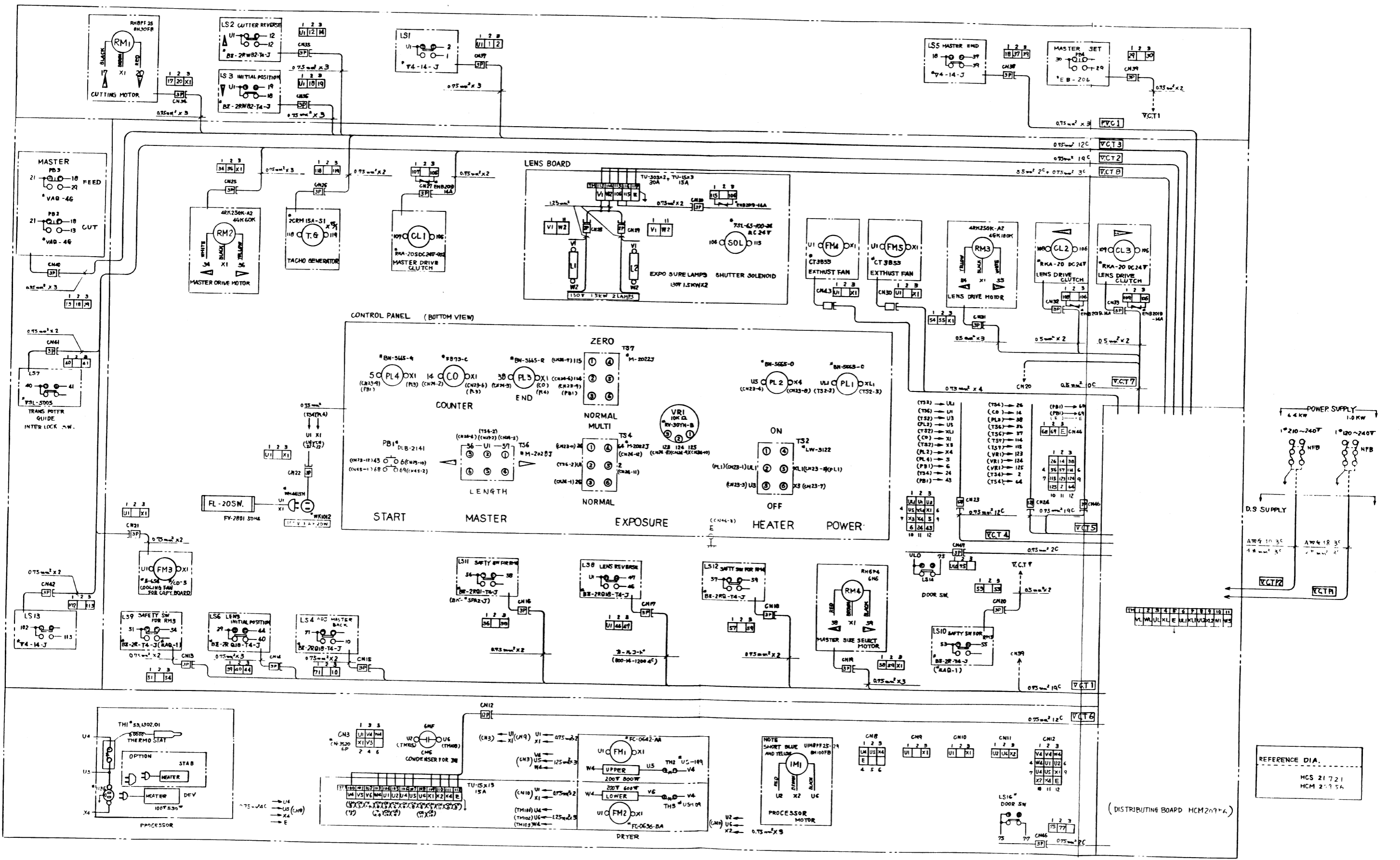
## 4. Lubrication

The frequency of periodic lubrication depends on the number of operations. The following frequencies are recommended for maintaining satisfactory operation.

- ① Processor drive chains once a week  
(Draw out the processor and the dryer.)
- ② Conveying chains once a month  
(Open the intermediate output port cover.)
- ③ Cutter chains once a month  
(Open the top cover of the exposure section.)
- ④ Exposure section drive chains once a month  
(Remove the upper rear cover.)

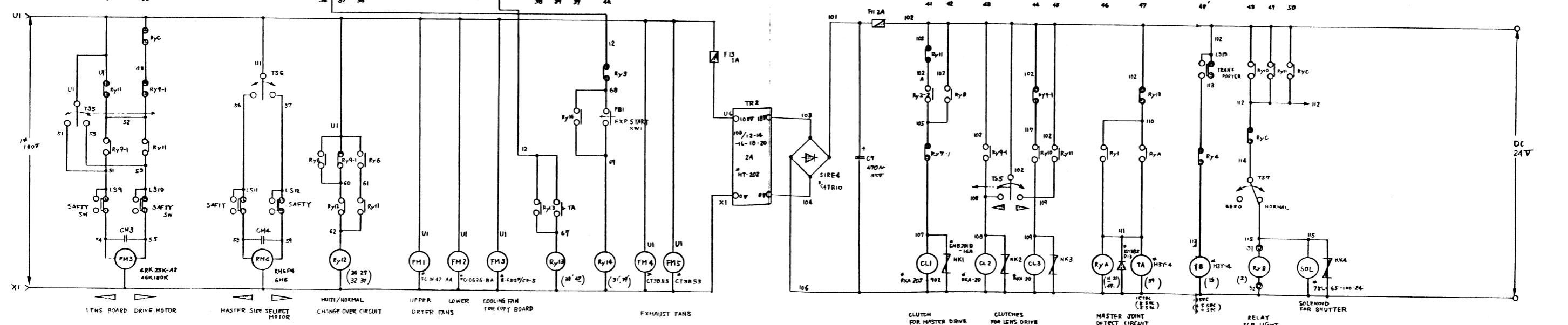
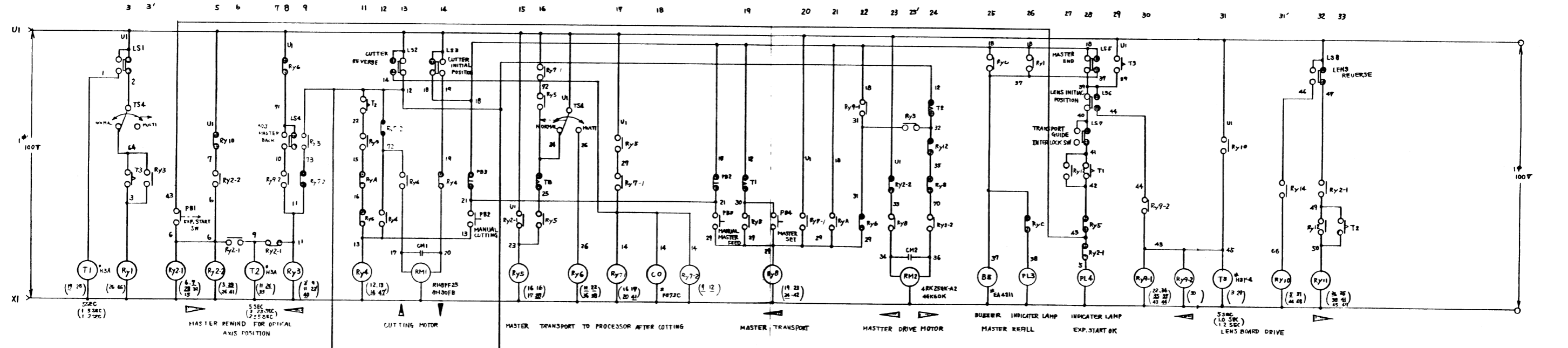
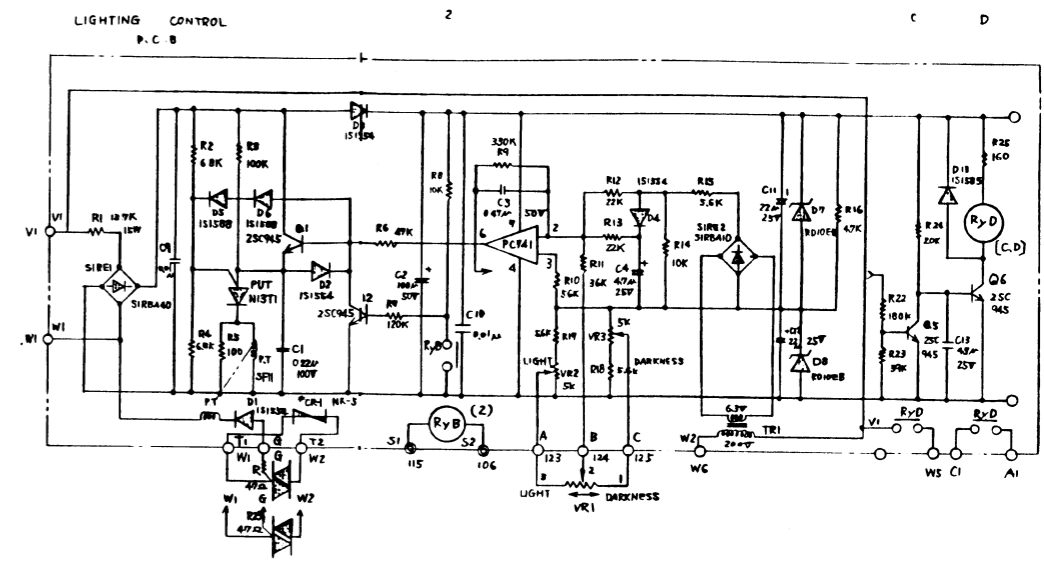
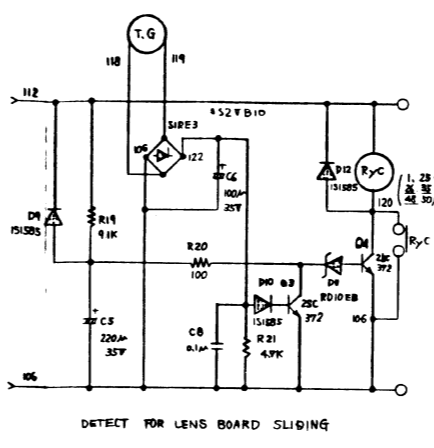
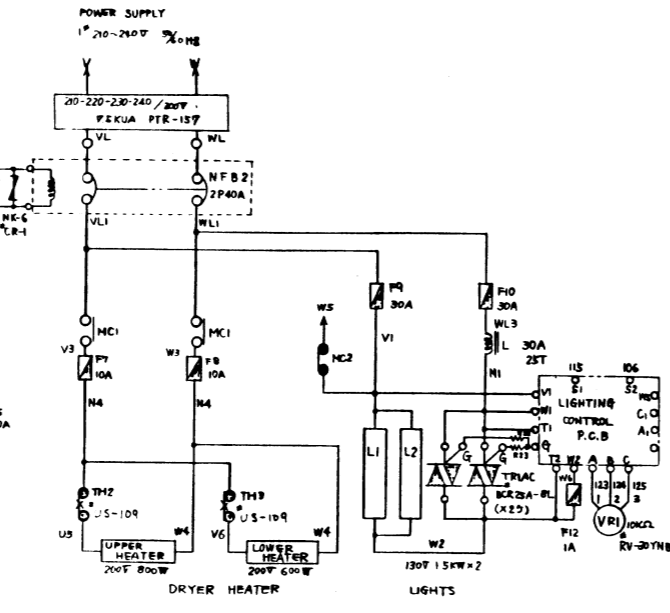
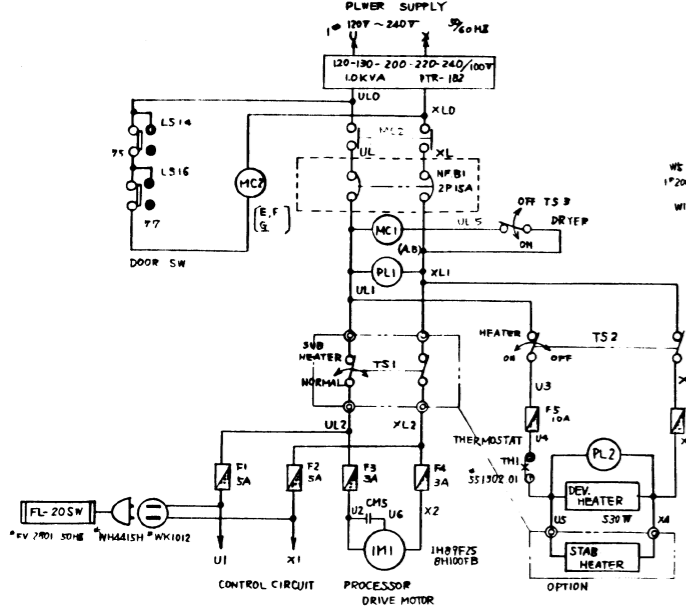
	Trouble	Cause	Remedy
7.	Defective cutting (Faulty cutter operation).	<ol style="list-style-type: none"> <li>1. Dull cutter blade</li> <li>2. Defective contact of cutter end limiter</li> <li>3. Misoperation in case of MULTI exposure</li> <li>4. Defective contact of relay RY<sub>4</sub></li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the cutter blade.</li> <li>2. After turning off the power, check the limiter operation by operating the cutter end limiter (backward) manually.</li> <li>4. Repair (push in thoroughly) or replace it.</li> </ol>
8.	Insufficient drying of master paper.	<ol style="list-style-type: none"> <li>1. Power for camera off</li> <li>2 DRYER switch off</li> <li>3. Disconnection of square plug of the dryer</li> <li>4. Failure of fuse</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn on the 200 V power.</li> <li>2. Set the DRYER switch to ON.</li> <li>3. Insert the plug into the socket thoroughly</li> <li>4. Replace the dryer fuses F<sub>7</sub> / F<sub>8</sub> [10 A].</li> </ol>
9.	Fogging appears in the plate.	<ol style="list-style-type: none"> <li>1. Insufficient density of the corresponding part of the original</li> <li>2. Dirty upper frame glass of original holder</li> <li>3. Unclean mirror</li> <li>4 Dirty exposure section glass</li> </ol>	<ol style="list-style-type: none"> <li>1. Retouch the original.</li> <li>2. Clean the upper frame glass.</li> <li>3. Clean the mirror.</li> <li>4. Clean the exposure surface glass.</li> </ol>
10.	Silver appears on the plate.	<ol style="list-style-type: none"> <li>1. Stain on activator roller in processor</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean the rollers.</li> </ol>
11.	Scratching in the plate.	<ol style="list-style-type: none"> <li>1. Stain or foreign matter on the rollers (along the master paper path) in processor unit</li> <li>2. Stain or foreign matter on the exposure surface glass</li> <li>3. Stain or foreign matter on the carrier guides</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean the master paper path under activator stabilizing units.</li> <li>2. Clean the exposure surface glass.</li> <li>3 Clean the guides.</li> </ol>

# 7. Power Supply Diagram

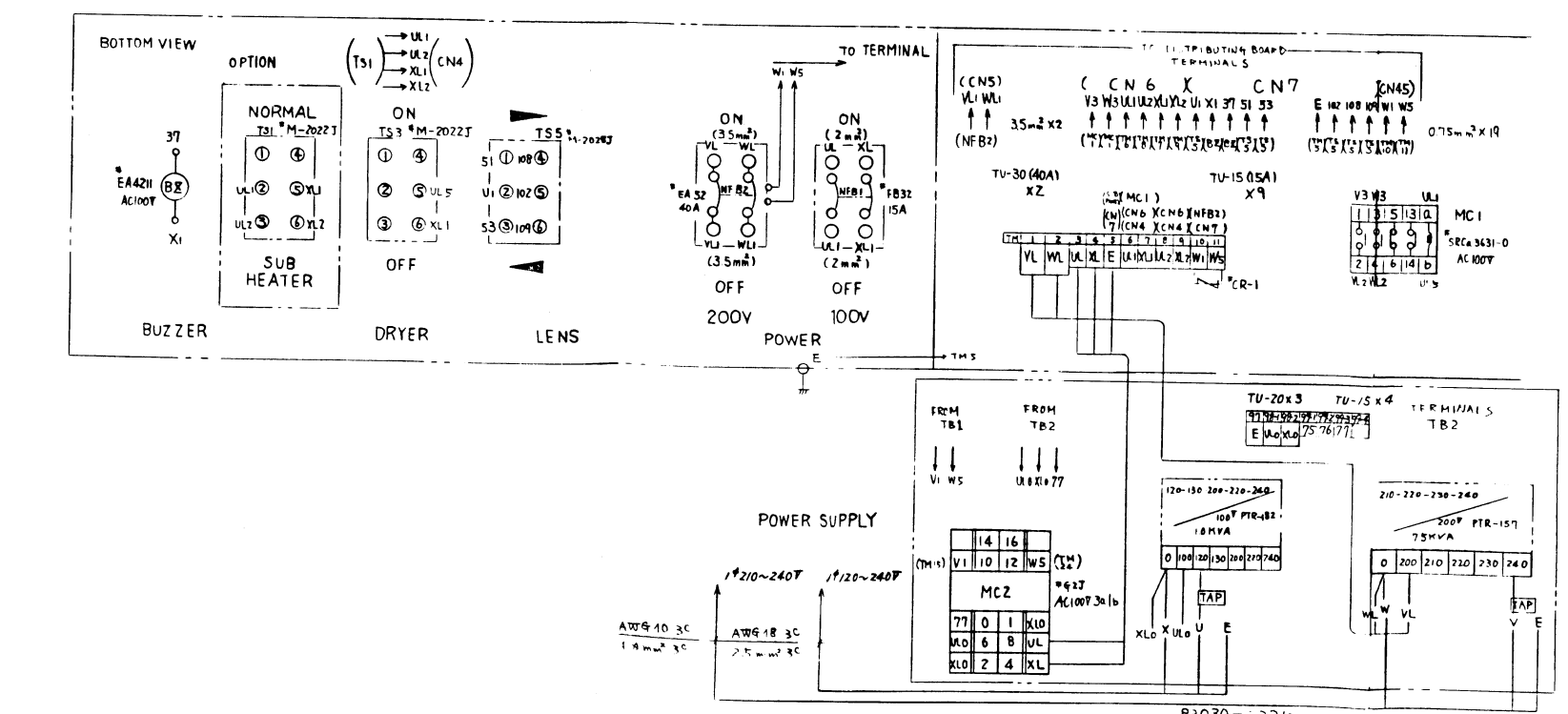
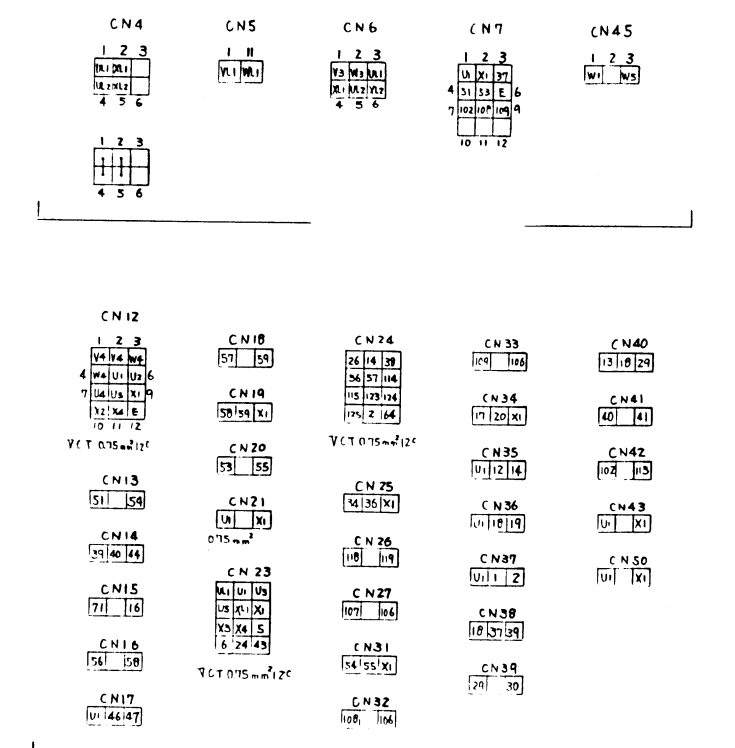
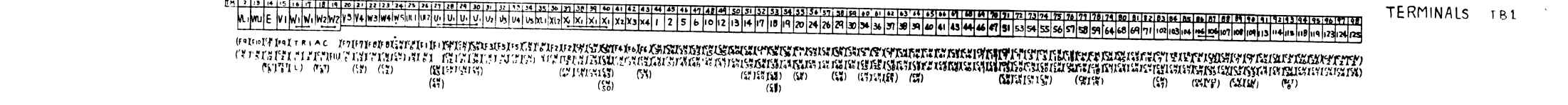
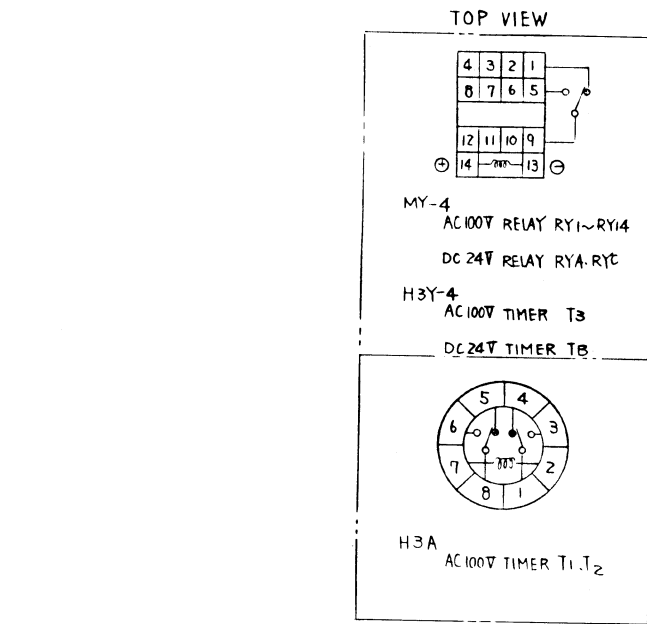
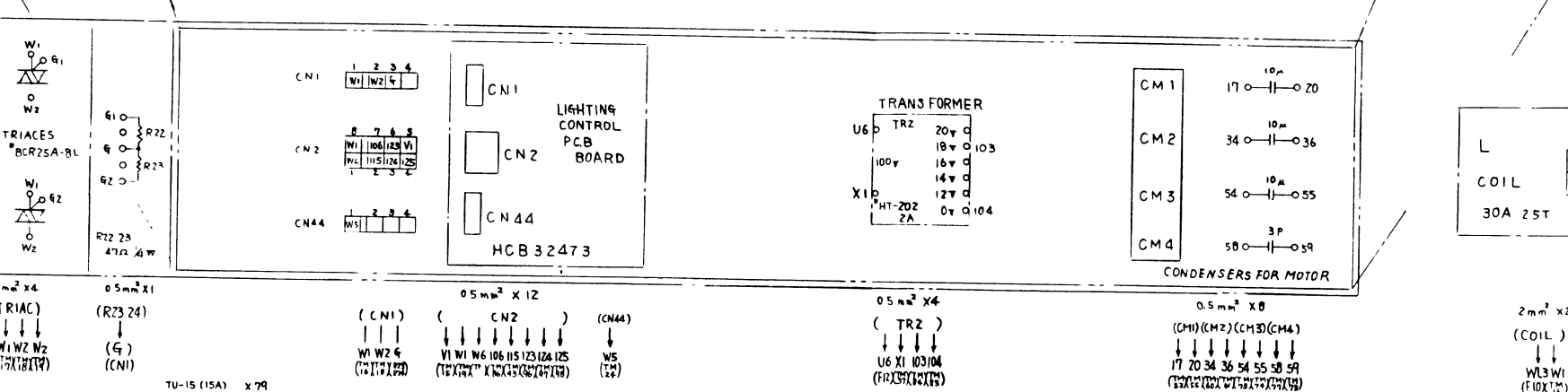
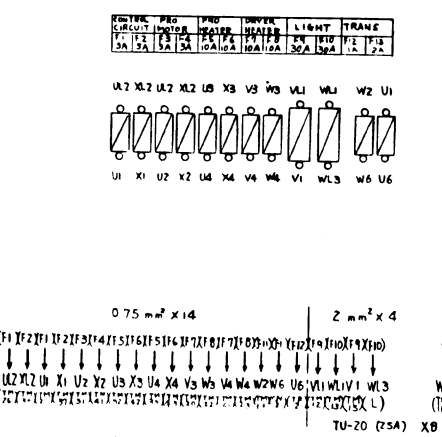
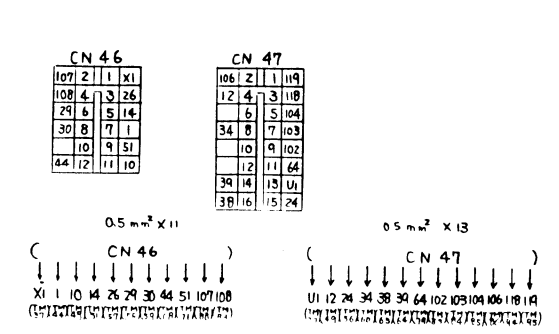
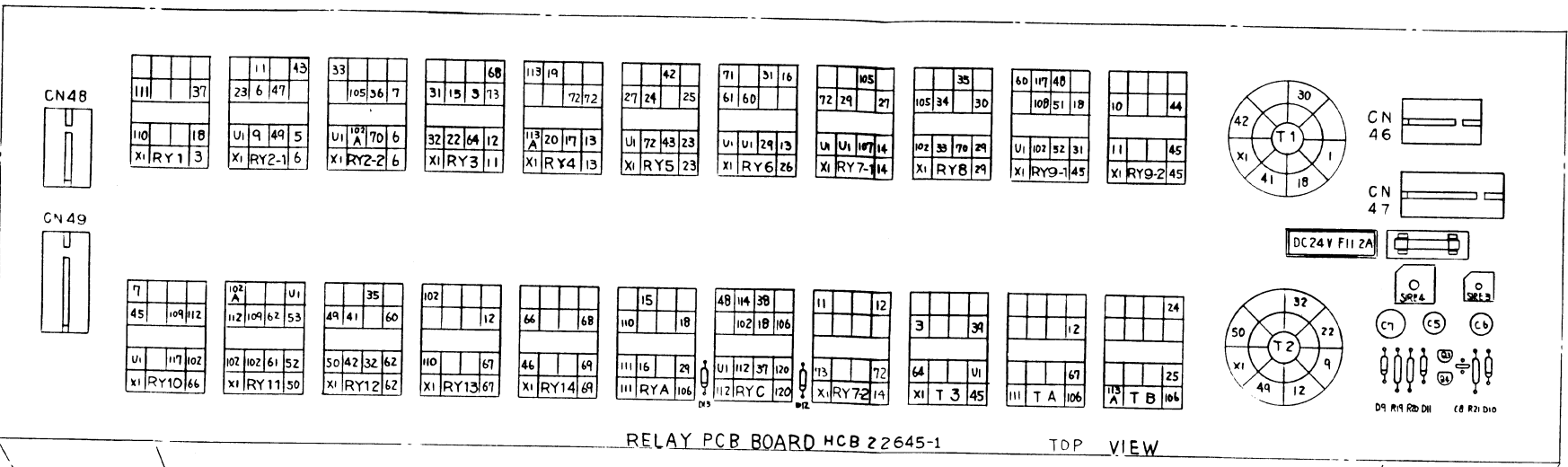
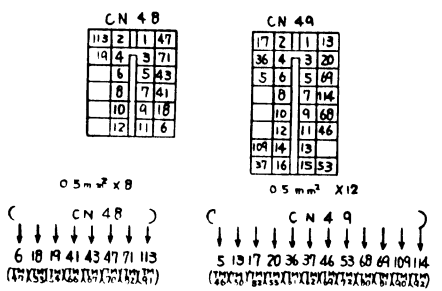


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