MITSUBISHI GRAPHIC ARTS MATERIAL

SILVER MASTER SYSTEM

SILVER MASTER PLATEMAKER CP-404 II

OPERATION MANUAL

MITSUBISHI PAPER MILLS, LTD.

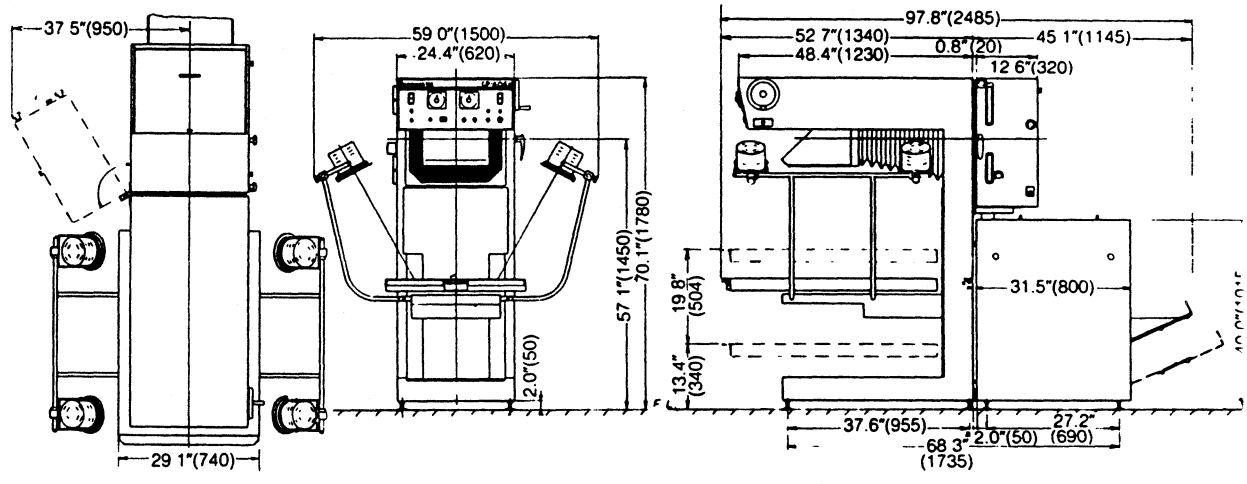
CONTENTS

CHAPTER 1. OUTLINE

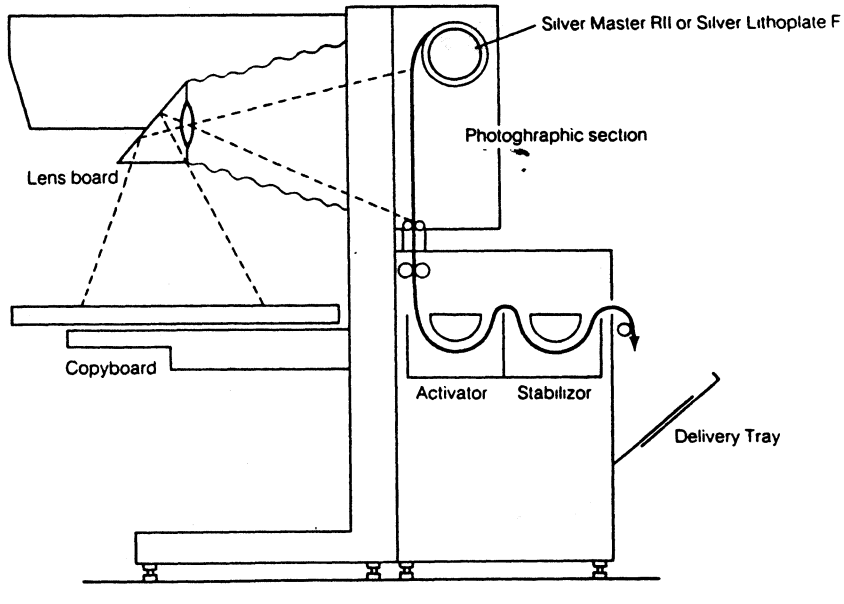
1. Introduction

We at Mitsubishi are very grateful to you for selecting the Silver Master Platemaker CP-404II.
The Silver Master Platemaker CP-404II is a completely new multi-functional system of platemaking. This machine, combination with Silver Master RII or Silver Lithoplate F, produces an offset master plate directly from the copy in one-touch operation, eliminating the film process. The Silver Master CP-404IIhas a wide latitude, from B4 to A3.
This operation manual has been produced to enable you to enjoy the system's superior qualities. For information c printing methods, please refer to our separate booklet "Silver Master Technical Guide".

GENERAL DRAWINGS



SYSTEM PROCESS

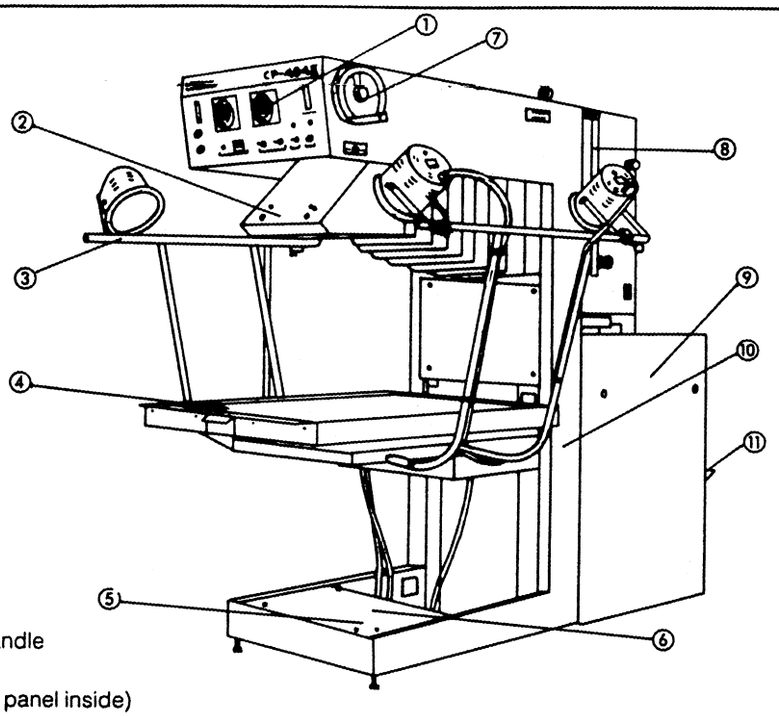


Specifications

	Specifications
Master Plate Width:	10″(254mm), 11″(279mm), 12″(305mm), 15.9″(404mm) Continuos alteration possible
Master Feed Length:	14.6″(370mm) ~ 20.1″(510mm)
Effective Photograph Dimensions	15.9″(404mm) × 17.3″(440mm) (70% ~ 125%) 11.0″(279mm) × 17.3″(440mm) (50% ~ 125%)
Maximum copy size:	25.6″(650mm) × 38.4″(975mm)
Lens:	APO-NIKKOR f= 16.5″(420mm) F:9
Magnification:	50% ~ 125%
Focus:	Auto-focussing by magnification scale
Exposure adjustment:	0 ~ 30 sec. by timer
Light source:	4 × 500 watt halogen lamps
Master rewind apparatus:	Rewind by hand
Master splice detection apparatus:	Warning buzzer, automatic overcut
Separate switches:	Absorption fan, master feed, cut, focus
Processor tank capacity:	Activator tank 4.2 gallons(16 liters) stabilizer tank 3.2 gallons(12 liters)
Refill bottles:	Activator, stabilizer both 2.1 quarts (2 liters) each
Plate making speed:	78 sec.(60Hz) or 92 sec.(50Hz) for the first plate, and 24 sec.(60Hz) or 26 sec. (50Hz) per plate thereafter
Machine demensions:	Width 59.0″(1500mm), Depth 99.8″(2485mm), Height 70.1″(1780mm)
Weight:	992.0 lb(450 kg)
Power source:	1 ø, 100 V, 3.0 KW 50/60Hz

CHAPTER 2. OPERATION

1. General Construction



①Main control panel
②Lens board
③Light source
④Copy board
⑤Power swtich
⑥Power swtich board
⑦Lens board driving handle
⑧Photographic section
(containg Sub-control panel inside)
⑨Processor
⑩Frame
⑪Delivery tray

Fig. 1 General constructi

2. Processor and Preparation of Treating Fluids

1. Processor composition

①Activator conntainer:

The activator container is equipped with 530W panel heaters, thermostat swtich, sensor and conveyor unit.

It can tanke 4.2 Gallons (16 liters) of activator fluid. When in use the temperature of the fluid is maintained at a constant level through the operation of the heaters the thermoswitch.

②Stabilizer container:

The stabilizer container includes a conveyor unit and can take 3.2 Gallons (12 liters) of stabilizer fluid.

③Heater power socket:

For use of heaters in the developer container. When replacing fluid or cleaning, be careful not to spill fluid, water, etc., on the sockets.

④Thermo dial:

For controlling the temperature of the fluid in the developer container. The correct setting for use is 30; rotate the dial until 30 is in line with the red guide line. The dial readings show the set temperature.

If the fluid temperature is low when in use (signified by the extinguishing of the heater pilot lamp) adjust the dial indicator upwards by the amount by which it is too low. Conversely, if it is high, adjust it downwards by that amount.

⑤Fluid drain valve:

A fluid drain valve is located in the lower part of the develope stabilizer containers. The valves are in the OPEN position \ the valve handle and the pipe run parallel to each other, a the CLOSED position when they are at right angles.

If the handle is not firmly closed, fluid leaks may result. There always make sure that the handle is normally horizontall clined.

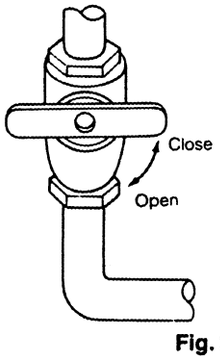


Fig. 2 Fluid drain val

⑥Delivery tray:

The delivery tray can be adjusted to two positions accordi the length of the master.

1. for short masters, use the top setting.

setting.
can also be adjusted in the same way to suit
. For long masters, pull and use it.

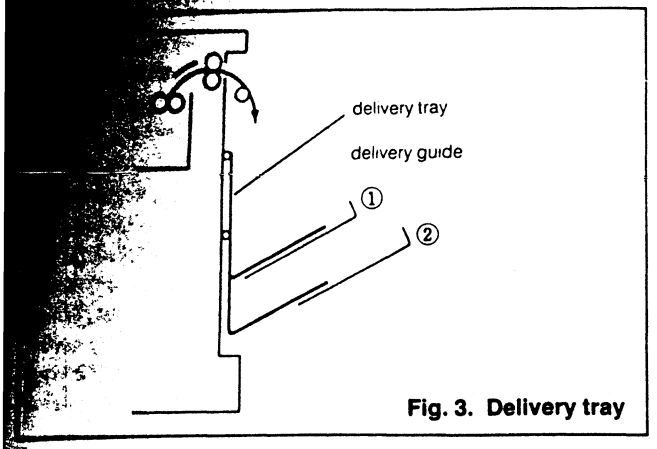


Fig. 3. Delivery tray

⑦Limit switch (for Safety):
When the upper cover of processor is taken off power source is automatically turned down.

2. Preparation of activator (SLM-AC) 1:1 mixture ratio
(Use special measuring cups when mixing the compound)

①Pour 2.1 gallons (8 litres) of Silver Master exclusive activator SLM-AC (undiluted solution) and 2.1 gallons (8 litres) of water in a ratio of 1:1 into a measuring cup, etc. After stirring well pour the dilluted solution into activator container through the activator fluid funnel.

②Pour 2.1 quarts (2 litres) of diluted activator (mixed in a ratio of one part undiluted fluid to one part water) into the activator refill bottle, and fix the bottle correctly in the refill funnel.

- During the winter period when the water temperature is low, always use hot water at 86 ~ 95°F (30 ~ 35°C.)

3. Preparation of stabilizer (SLM-ST) 1:3 mixture ratio

①Pour 0.8 gallons (3 litres) of Silver Master stabilizer SLM-ST (undiluted solution) and 2.4 gallons (9 litres) of water in a ratio of 1:3 into a measuring cup, etc. Stir well and pour the diluted solution into stabilizer container through the stabilizer fluid funnel.

②Pour 2.1 quarts (2 litres) of diluted stabilizer (mixed in a ratio of one part undiluted solution to three parts water) into the stabilizer refill bottle, and fix the bottle correctly in the refill funnel.

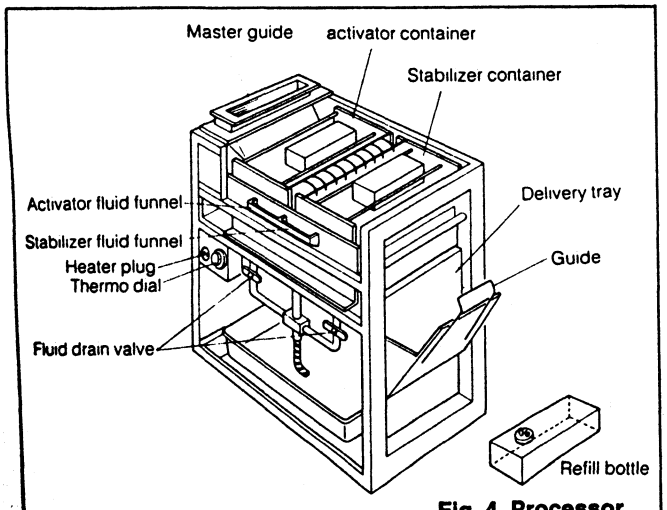


Fig. 4 Processor

4. Replenishment of fluids

①The refill bottles must always contain a certain amount of diluted fluid mixed in the correct proportions Always check to ensure that the refill bottle caps are closed tight and the bottles correctly inserted in the respective funnels

②Insufficient refill volumes or complete using up of refill fluid may lead to a drop in the fluid level inside the container, speeding up of fluid fatigue and a deterioration in quality.

③Replacement of fluids.

See the page on general care (Page 14)

Caution in handling chemicals

①Be careful never to drink or get into eyes processing chemicals. (In case of such accidents check with a doctor)

②When chemicals splash onto skin or cloths immediately wash with running water.

③Use chemicals properly according to instruction.

④Keep chemicals out of reach of children.

3. Power Switchboard

The power switchboard is located in the lower part of the main frame and consists of the following components.

①POWER switch
When the switch is turned on, the system is ready for operation

②OPERATION circuit fuse
Two 3A glass tube fuses to protect the operation circuit Do not use any other capacity fuse.

③PROCESSOR motor fuse
Two 3A glass tube fuses to protect processor motor circuit. d not use any other capacity fuse.

④HEATER fuse
Two 10A fuses to protect the heater circuit. Do not use any othe capacity fuses.

⑤T_2 (Master feed length basic adjustment timer)
Comprises the MASTER LENGTH (master feed length dial) o the main control panel and this T_2.
When the master feed length is at variance with the MASTE LENGTH dial setting, this timer makes the adjustment.

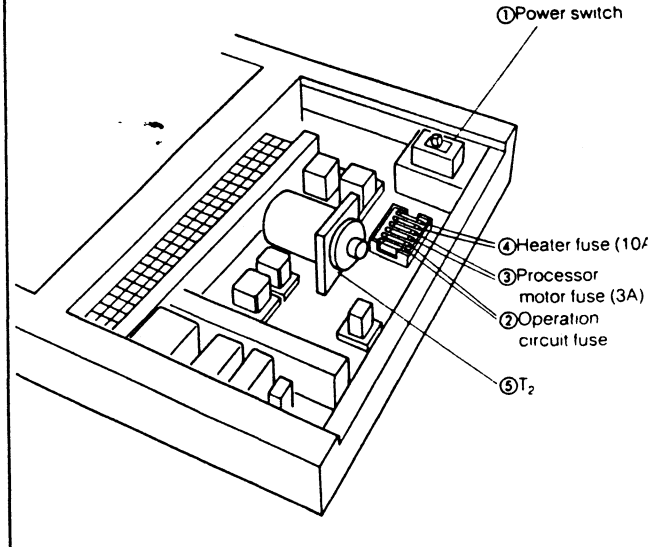


Fig. 5 Power switch board

4. Main control Panel

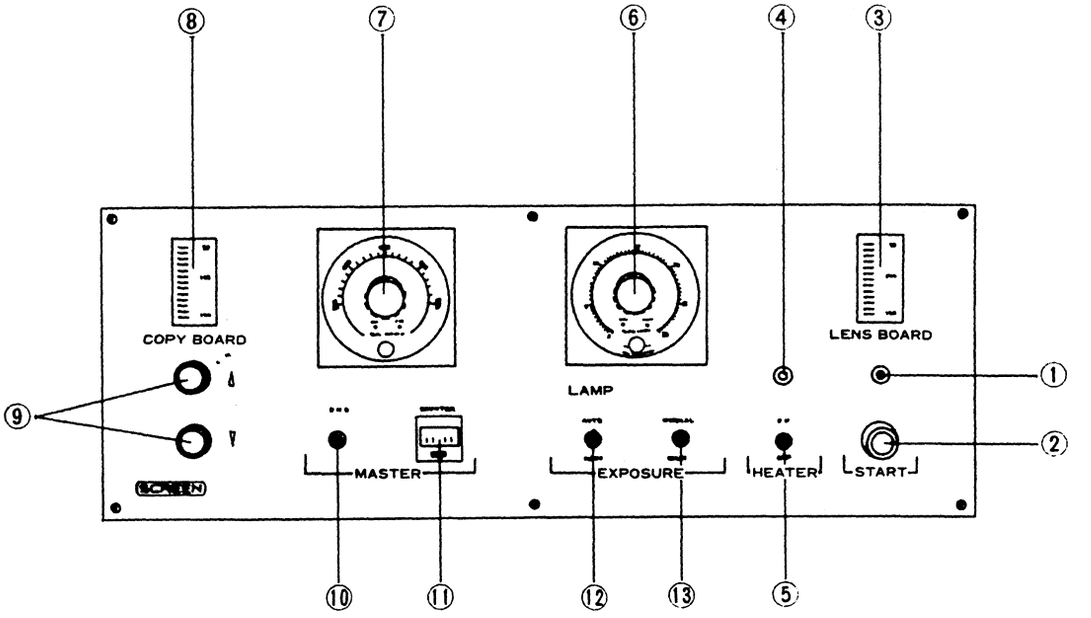


Fig. 6 Main control panel

①START indicator lamp (PL)
When lit up, the lamp indicates the system is ready to operate. As soon as it is started, the lamp will go off.
While the start lamp is off, the system will not function if the start button is pressed.

②START button
When pressed, photographing commences.
However, when the START (PL) indicator lamp is extinguished, the system will not start to operate even if the button is pressed.
The START (PL) indicator lamp will not light up during operation, or when the MASTER END indicator lamp is on, or when the buzzer sounds or when the vacuum fan switch is in the OFF position.

③LENS BOARD (magnification indicator)
The degree of magnification is indicated in percent. To reduce the parallux, take your reading at the point where the two cursor guide lines coincide.
Lens board is operated by using the handle located on right side. If you turn the handle on clockwise, the lens board will move to the side for enlargements while turn on counter-clockwise results in a movement for reductions.

④HEATER (activator temperature indicator lamp)
The pilot lamp goes off when the temperature of the activator fluid reses to the range where the activator may be used 82.4 ~ 87.8°F(28°C ~ 31°C) and platemaking may commence.
The lamp will come on if the temperature subsequently drops, and will go off again when it resis.
Should this happen, it indicates that the thermostat is working perfectly; therefore, once the temperature has risen, platemaking can continue even if the lamp goes on and off.

⑤HEATER switch
When turned to the ON position, the panel heater located inside the activator container is activated, heating the activator fluid to and maintaining it at the correct temperature.
Be sure always to keep the switch in the ON position when the activator fluid is in its usable state, and to turn it to the OFF position when activator fluid is being emptied.

⑥EXPOSURE timer
Sets the exposure time. The lamp will stay on and the shutter open for the duration of this period.
* Selection of cycle
  Set the cycle converter knob in accordance with the cycle used in your area (50Hz, 60Hz).

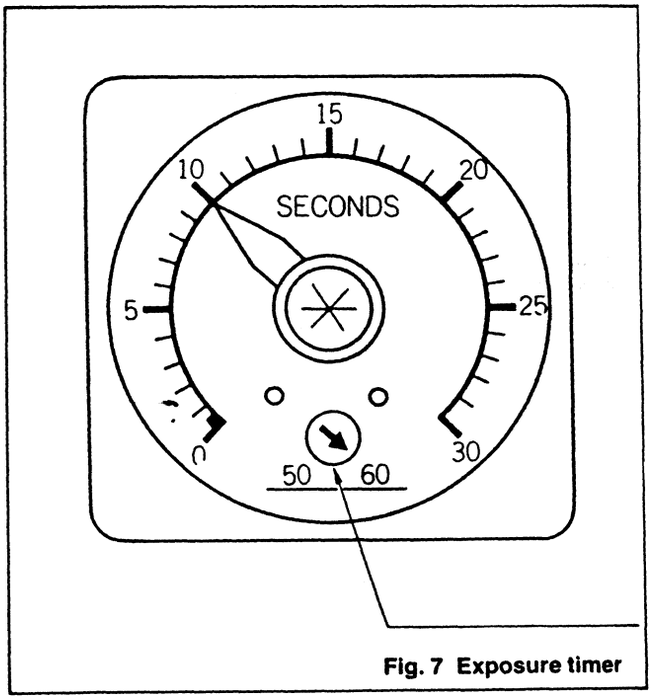


Fig. 7 Exposure timer

⑦MASTER LENGTH dial
Following the completion of the exposure, a master, exactly the length of this dial setting, will be fed through and automatically cut. The feed length may be set at your discretion between 14.6" (370mm) and 20.1" (510mm).

⑧COPY BOARD magnification indicator
The degree of magnification is indicated in terms of percent To reduce the parallux, take your reading at the point where the two cursor guide lines at the front and back coincide.

⑨COPY BOARD operating buttons
If you press the ▲ button, the copy board will move upwards for enlargements while pressing the ▼ button will result in a downwards movement for reductions.

⑩MASTER END indicator lamp
When the master runs out the pilot lamp will come on and a buzzer will sound. If the loading of the master is imperfect, the lamp will again light up and the buzzer sound. If this should happen, reload the master correctly.
As long as the lamp is on and the buzzer sounding, the machine will not operate even if the START button is pushed.

⑪MASTER COUNTER
Indicates the number of master plates produced When changing the treating fluids or replacing the master it is good management to reset the counter at (0) by pushing the return butoon

⑫LAMP (Light source converter switch)
When this switch is on AUTO and the START button is pressed, the light source lights up; when the exposure time is completed, the lamps automatically go off. When photographing takes place, the switch will normally be set in the AUTO position.
When the switch is on MANU, one light only will light up continuously, the shutter is closed and nothing is exposed on the master. One uses the MANU setting to closely examine the copy boasrd, such as for placement of copy or cleaning of the glass

⑬EXPOSURE converter switch
When this switch is set in the NORMAL position, a sequence of events proceeds automatically — start — exposure — master feed — cut
When the switch is flicked to the MULTI position, the master is not fed on after completion of the exposure and multiple exposures may be made on the same master. One uses this for double or triple photography. For the final exposure, one must switch back to NORMAL

5. Sub Control Panel

1. The sub control panel is located within the photography section and consists of the following components:

①FEED (master feed switch)
One can feed the master on by the length desired by turning the switch to ON. It is used when setting the master to remove any foggy sections, etc

②CUT switch
When the vacuum fan switch is in the ON position, one can make the cutter operate by itself by use of this switch. When the switch is in the ON position, the cutter will operate continuously.
(Keep it in the OFF position normally).

> CAUTION:
> Be careful to remember that when the vacuum fan switch is in the OFF position, this cut switch will not operate

③FOCUS (Shutter/light source switch)
If this switch is moved to ON the light source will turn on regardless of the exposure timer and the shutter will open. Turned to OFF the light source will be extinguished and the shutter will close. This switch is used to make adjustments and so is normally kept in the OFF position

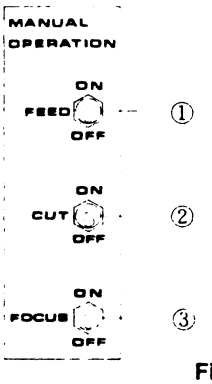


Fig. 8 Sub control panel

2. Vacuum Fan Switch
The vacuum fan switch is located on the right hand side of the photography section and allows independent operation of the fan
Use it when setting up the master or when rewinding the master, etc. With this switch in the OFF position, the machine will not start and the master end buzzer will not work Keep this switch in the ON position during normal use.

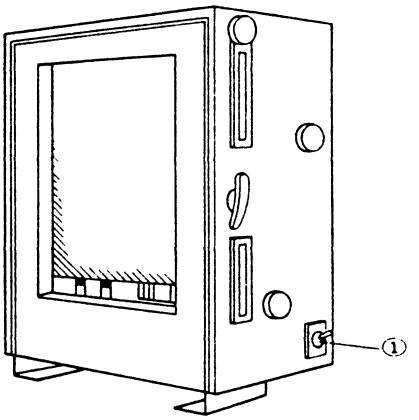


Fig. 9 Vacuum fan switch

3. Master Buzzer
①The master buzzer is situated on the right hand side of the lens board. The buzzer sounds when the master splice has just passed and at completion of the master
When the master has been completed, the buzzer will not work if the volume is turned into the 0 position or the vacumm fan switch is in the OFF position.
. The buzzer has a volume control which may be adjusted in accordance with the surrounding conditions

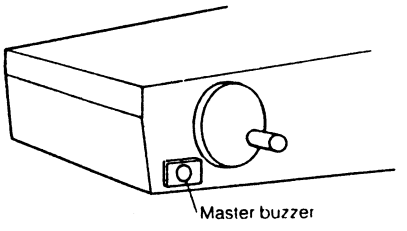


Fig. 10 Master buzzer

②After photographing, when a splice passes through the sensor, a warning buzzer will sound once, and then again after an interval. When the splice is contained entirely within the pre-set master feed length, the master will be cut, but if the join extends beyond the pre-set length, then the master is cut at the point where the two splice detection holes have passed. Thus there will be times when a master longer than the pre-set length will emerge — these are masters with joins and it is done to prevent the join from spreading over two plates. This longer length will be for one plate only. From the next plate on the length of the master will be as pre-set.

6. Copy Board

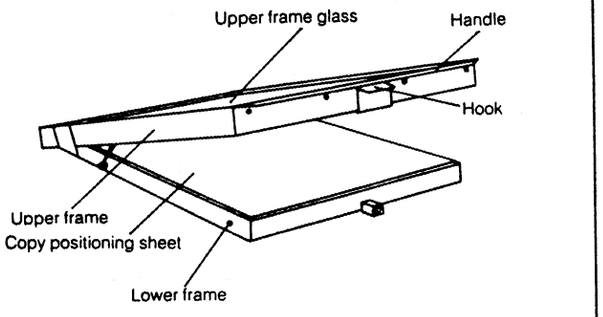


Fig. 11 Copy Board

1. Positioning of copy

The position of the lens changes with the degree of magnification of the exposure and therefore the area to be photographed will change. Accordingly, when positioning the copy one must place it in the correct position commensurate with the degree of magnification.

Lines indicating the extremes of the frame which will be photographed onto the master appears on the copy positioning sheet for every 5% of magnification. In other words, the extremes of the master effective image area which commences approximately 0.91" (23mm) from beginning of the master (amount needed for press machines) are indicated.

2. Placement of copy

①The upper frame will open up if the hook attached to it is taken off. When opening the upper frame, be careful to keep your hand on it, to open it gently and to avoid any rapid movement.

②Determine the copy position and place it in position.

③Close the upper frame gently, pushing down until the hook is definitely engaged.

3. Operation of copyboard

The copyboard is operated from the main control panel. If you push the ▲ button, the copyboard will move in an enlarging direction; if you push the ▼ button the copyboard will move downwards to a reduced magnification. To reduce the parallux when reading to magnification percent scales on the main control panel copyboard magnification indicator, take your reading at the point where the two cursor guide lines coincide.

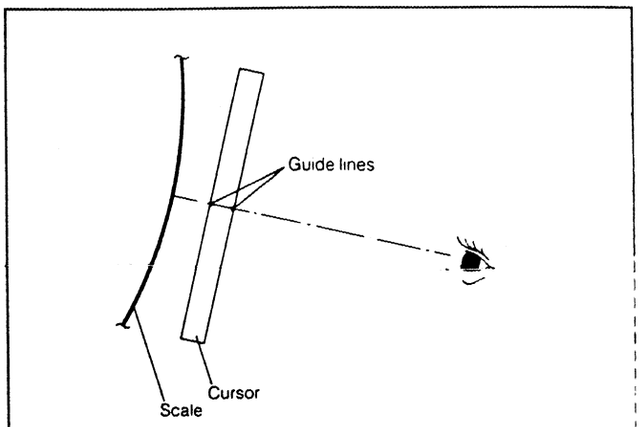


Fig. 12 Reading of magnification

4. Copyboard upper frame opening level

The level of opening of the copyboard upper frame is controllec by the Stopped. When you want to open the upper frame up wise for example to clean the copy positioning sheet or the uppe frame glass, you can do so by removing the Stopper. When doinç this, be careful that the copyboard glass does not hit the len board.

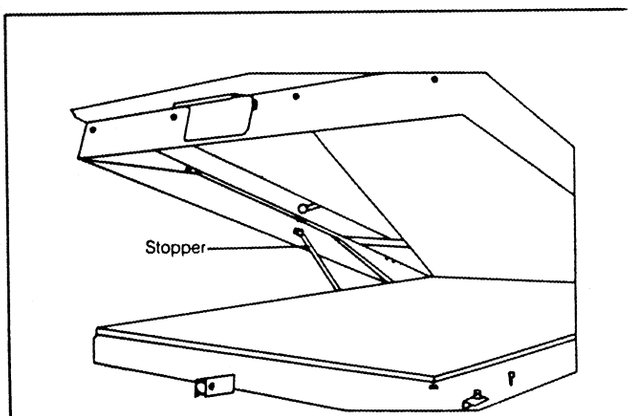


Fig. 13 Copyboard

7. Lens Board

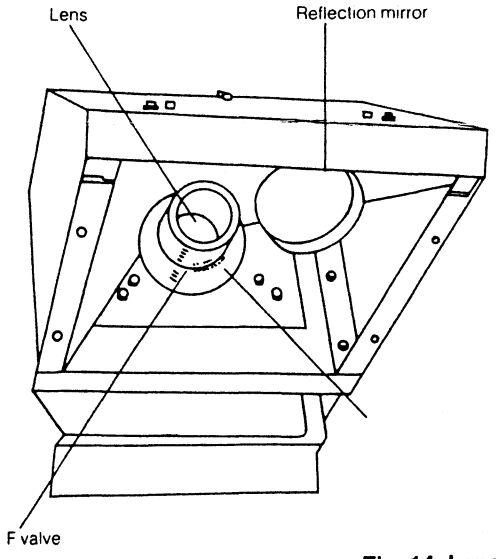


Fig. 14 Lens Board

1. Fixing of focus

F 22 is used for all normal standard photography. You rotate the focus ring so that the F value lines up with the focus mark.

2. Operation of lens board

The lens board is operated by means of the manually operated handle located on the main control panel. If rotated to the right, it will move in the enlargement direction, if to the left, in the reduction direction (see Fig. 15). To reduce the parallux when reading the magnification percent scale, take your reading at the point where the two cursor guide lines coincide.

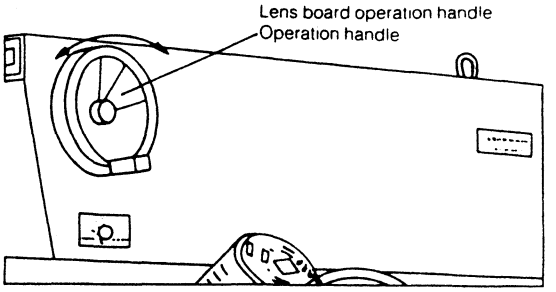


Fig. 15 Lens board operation handle

8. Photography Section

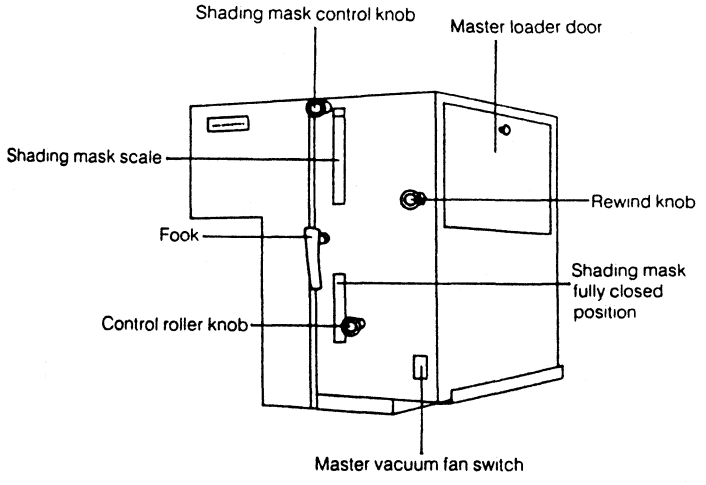


Fig. 16 Photography section

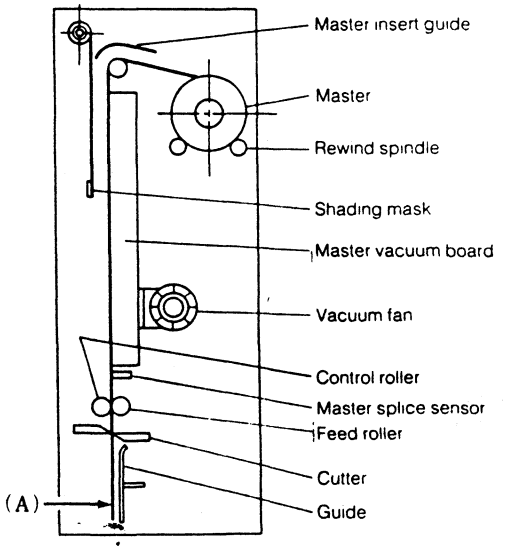


Fig. 17 Detailed breakdown of photopraphy section

1. Loading of master

①Turn the vacuum fan switch to the OFF position.

②Turn the shading mask knob as far as it will go to the left & to the fully open position — and open the master loading door.

③Release the fook and gently open the photography section.

④Loosen the set screw on the spool positioner and set it for the width of the master to be used 10", 11", 12", 15.9" (254, 279, 305, 404mm) (Fig. 18).

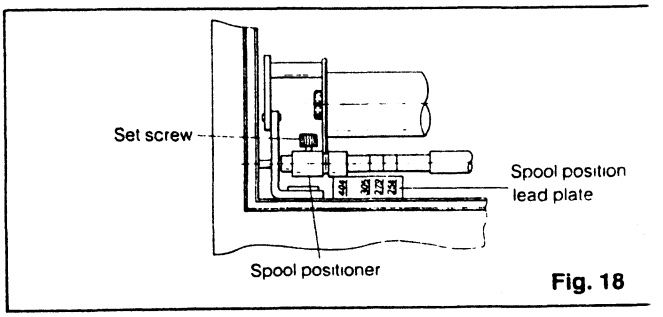


Fig. 18

⑤Take out the master, insert the spool in the master's paper core and tighten the sixing screw (Fig. 19).

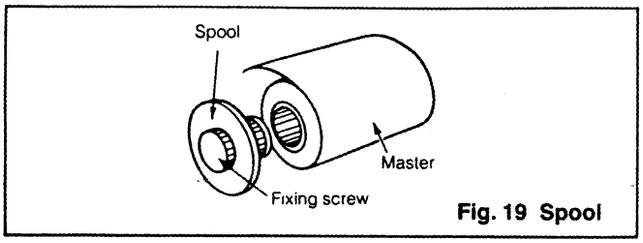


Fig. 19 Spool

⑥Set the spool so that it fits in the groove of the spool positioner.
⑦Take off the master tape and feed the master onto the master vacuum board, lining it up with the guides as you proceed. Close the master loading door.
⑧Turn the control roller knob to FREE. Pull the master through from the vacuum board, passing it between the control roller and the feed roller and between the two blades of the cutter; feed it through as far as the section marked "A".
⑨Hold the master around the section "A" in your hands and line the right-hand end of the master up with the guide line on the lower right hand side of the vacuum board (Fig. 20).

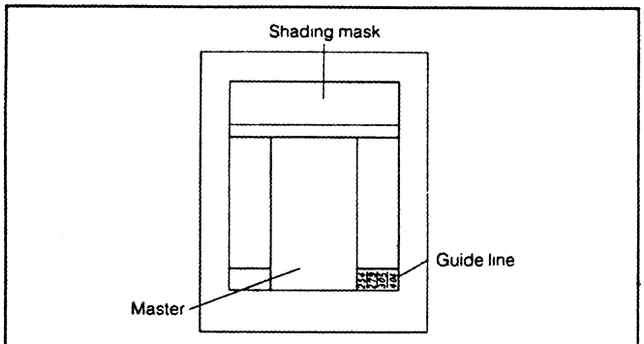


Fig. 20 Positioning of master

⑩At this point rotate the control roller knob to LOCK.
⑪Turn the shading mask knob to the right to the fully closed position.
⑫Turn the FAN (vacuum fan switch) on.
⑬Turn the FEED switch (master feed switch) to ON in order to feed off the section of master exposed to the light when setting up the master. Then turn the switch OFF.
⑭Turn the CUT switch to ON, cut the section of master fed off, and turn the switch OFF. Now the loading of the master is complete.

2. Rewind apparatus

①The rewind apparatus is located on the right hand side of the magazine. The master can be rewound by rotating the rewind knob to the left.

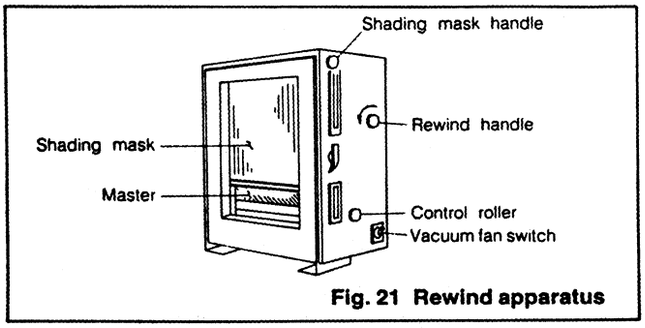


Fig. 21 Rewind apparatus

②When rewinding, turn the vacuum fan switch to OFF and the master control roller knob to FREE.

3. Operation of shading mask

①Opening and closing of the shading mask is controlled by the shading mask knob. Turn it to the left to open and to the right to close.
②The amount that the shading mask should be opened is connected to the master feed length. Set it so that the shading mask scale reading is the same as or slightly more than the master feed length.
③If the mask opening is less than the master feed length, a band of silver will appear on the photographed master. (Unexposed state)
④Conversely, if the mask opening is greater than the master feed length, the foremost edge of the photographed master will have a band-like over-exposed part, cutting into the exposed image.

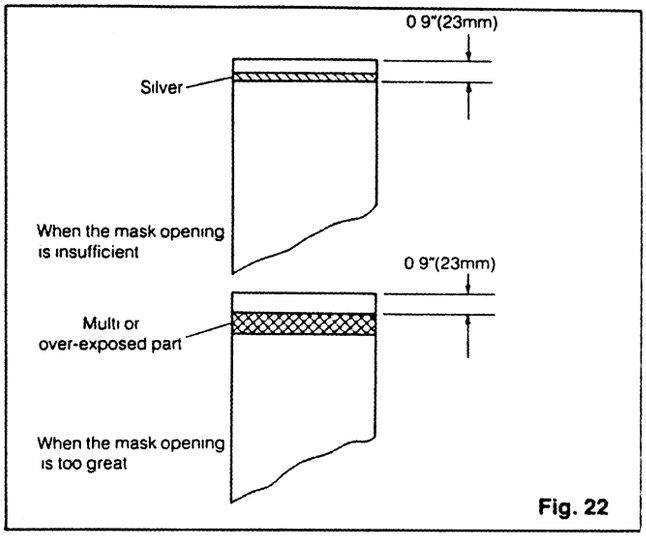


Fig. 22

9. Light Source Apparatus

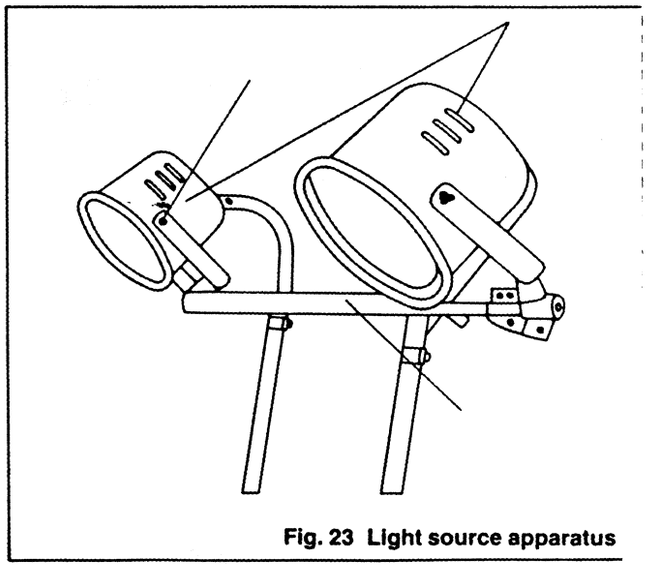


Fig. 23 Light source apparatus

1. Set the lamp house angle as same as the Fig. 24.

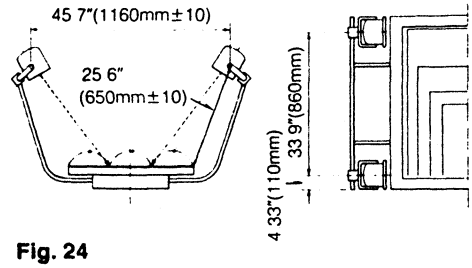


Fig. 24
Beam angles and positions of the light source

2. By assembling the lamp frame according to instruction 1, the lamp frame is now fixed for the range enlargement 125% — reduction 50% and there is no need for it to be moved
   This means actual exposure ratio over the range of enlargement/reduction are those tabled below.
   (The standard exposure is set at 100 percent enlargment)

Magnification	50%	60%	70%	80%	90%	100%	110%	120%	125%
Exposure ratio	0.56	0.64	0.72	0.81	0.90	1.00	1.10	1.21	1.27

3. Please utilize the red points of lamp positioning, collar and arm for reappearance of lamp position.

CHAPTER 3. PHOTOGRAPHY

1. Procedure of Photography

①Adjust the MASTER LENGTH (Master feed length dial) to the desired plate length.
②Adjust the shading mask setting (slightly longer than the length set for the master feed length dial) to the desired length.
③Set the exposure time with the EXPOSURE timer. For continuous platemaking under the same conditions step 1-3 need be carried out only once.
④Set the delivery tray at the appropriate position in accordance with the length of the master.
⑤Position the copy.
⑥Adjust the lens focus. For standard photography use the F:22 setting.
⑦Adjust the magnification scales for the lens board and copy board to the desired degrees of magnification, and then after checking the followings press the START button.

- LAMP (light source converter switch) is on AUTO
- EXPOSURE (exposure converter switch) is on NORMAL.
- The MASTER END indicator lamp is OFF.
- The HEATER (activator temperature) indicator lamp is on ON.
- The (vacuum) FAN is on ON.
- The START indicator lamp is lit up.

2. Multiple Photography

①Place the copy on the designated position (A).
②Shield the section of the copy board marked (B) (with black paper or some other material with a low reflection of light)
③Set the Exposure converter switch on MULTI and set the EXPOSURE timer. The exposure time should be set at about 10% less than for the appropriate time for a single exposure
④Press the START button and make the first exposure.
⑤Reposition the copy on B and apply the shield to section A. If the position of the shield overlaps with its previous position, the overlapping portion will be under exposed (silver discharge). Care is thus necessary when positioning the shield.
⑥For the final exposure, set the EXPOSURE converter switch to NORMAL and press the START button.

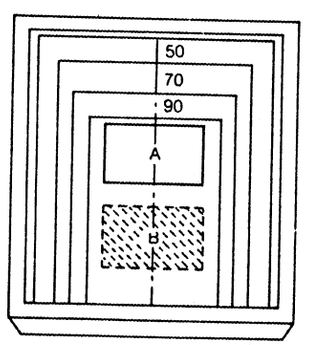


Fig. 25 Copy operation

3. How to Centre the Copy Imprinted on the Copy

1. 100% magnification centreline

A base line drawn slightly longer than other lines, is showr the 100% figure on 0.9" (23mm). Taking this as a base, ca the lateral sideline by dividing the length of the plate beinç below the base line becomes the copy lateral centrelin scale shown on the left and right sides is the same as that centreline, so when you actually draw the line, use this for racy.

2. How to establish the centreline when the magnificatic altered

When a magnification other than 100% is used, the centr must be moved, below the centreline used for 100% magni tion for enlargements and above for reductions
The calculation formula, taking the centreline for 100% mag cation as the baseline, is as follows·

$$X = \left| f(1-m) \right| + \left| 10.0"(253mm) - \frac{P\ell}{2} \right| \cdot \left| \frac{1}{m} - 1 \right|$$

f=focus distance 16.5"(420mm), m=degree of magnificat
Pℓ=master length

[Example]
If the master is 16.5"(420mm) long and the degree of magni tion is 50%, then

$$X = \left| f(1-m) \right| + \left| 253 - \frac{P\ell}{2} \right| \cdot \left| \frac{1}{m} - 1 \right|$$

$$= \left| 420(1-0.50) \right| + \left| 253 - \frac{420}{2} \right| \cdot \left| \frac{1}{0.50} - 1 \right|$$

$$= 210 + 43 \times 1 = 253mm$$

$$X = \left| f(1-m) \right| + \left| 10.0 - \frac{P\ell}{2} \right| \cdot \left| \frac{1}{m} - 1 \right|$$

$$= \left| 16.5(1-0.50) \right| + \left| 10.0 - \frac{16.5}{2} \right| \cdot \left| \frac{1}{0.50} - 1 \right|$$

$$= 8.25 + 1.75 \times 1 = 10.0"$$

X equal 10.0"(253mm) and so the point 10 0"(253mm) above the 100% magnification lateral centreline becomes the lateral centreline for 50% magnification.

3. How to work out centrelines which vary due to printi methods

Section 2 dealt with centrelines required for sideways master This time we look at how the original vertical centreline will mc due to magnification (other than 100% magnification) and a result of printing methods, such as for A4 and B4
In this case we determine the centreline for the prescribed pr paper size at 100% magnification by using the following formu and as illustrated in diagram.

$$\frac{W}{2} - a = y$$

W = master width
a = distance between edge of copy point from whict printing is to commence
y = copy edge base line

Measuring half the print paper size from this base line then yiel the centreline. the base line in cases of a magnification other th 100% is determined using the following formula: (page 23)

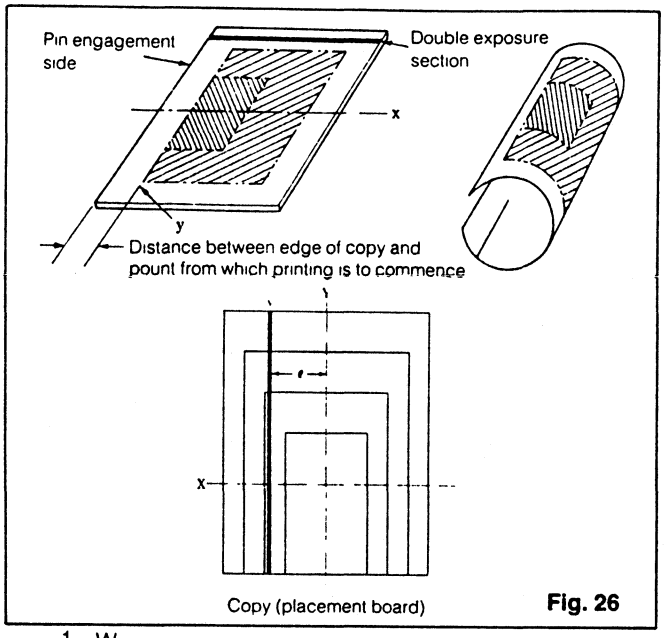


Fig. 26

$$\ell = \frac{1}{m}\left(\frac{W}{2} - a\right)$$

ℓ = distance between copy placement board centreline Y and point y
w = master width
a = distance between edge of copy and point from which printing is to commence
m = degree of magnification

[Example 1]

w = 15.9"(404mm), a = 1.6"(40mm), m = 100%

$$\ell = \frac{1}{m}\left(\frac{W}{2} - a\right) = \frac{1}{1.0}\left(\frac{404}{2} - 40\right) = 162\text{mm}$$

$$\frac{1}{1.0}\left(\frac{15.9}{2} - 1.6\right) = 6.4"$$

[Example 2]

w = 15.9"(404mm), a = 1.97"(50mm), m = 80%

$$\ell = \frac{1}{m}\left(\frac{W}{2} - a\right) = \frac{1}{0.8}\left(\frac{404}{2} - 50\right) = 190\text{mm}$$

$$\frac{1}{0.8}\left(\frac{15.9}{2} - 1.97\right) = 7.5"$$

4. Calculation of degree of change of magnification

The degree of copy magnification change can actually be calculated by measuring the length and deviding, but some typical magnification changes are given below:

A2 → A3	0 707	A2 → B4	0.612	A2 → A4	0.500
B3 → B3	0.816	B3 → B4	0.707	B3 → A4	0.577
A3 → B4	0.866	A3 → A4	0.707		
B4 → B5	0.707	B4 → A4	0.816		

5. Hole punching

In actual fact there is some deviation in the size of cut master, and so for those occasions when the master is turned sideways as with printers of A3 size or above, punching should be carried out with the front side (the side with the double exposed section) on the side with the position adjuster plate.

4. How to Determine Standard Exposure

Since the Silver Master RII is coated with silver-halide emulsion, its sensitivity may somewhat very among alots Each carton bears a lot number. Before using a new lot, check its sensitivity Under-exposure may cause thickened images or toning on backgrounds. Over-exposure may cause too thin images or lost images. Optimum exposure is essential for Silver Master RII to deliver the best performance

A. How to Determine Standard Exposure Time

①The CP-404II is supplied with test charts and standard print samples. Make an exposure of a test chart and compare it with the standard sample to determine standard exposure.

②Take an exposure with F:22 focus and 100% magnification (be sure to make an exact adjustment)
Adjust the exposure time so that silver deposit starts with the step marked with a circle in the test chart

③The corresponding exposure time is referred to as standard exposure time for the test chart.

④Using standard exposure time for the test chart as a guide, determine the optimum exposure time for each copy For such copies as clean proof (typed) and phototyped matter, increase the exposure time by 10% to 15%. For line work, decrease the exposure time.

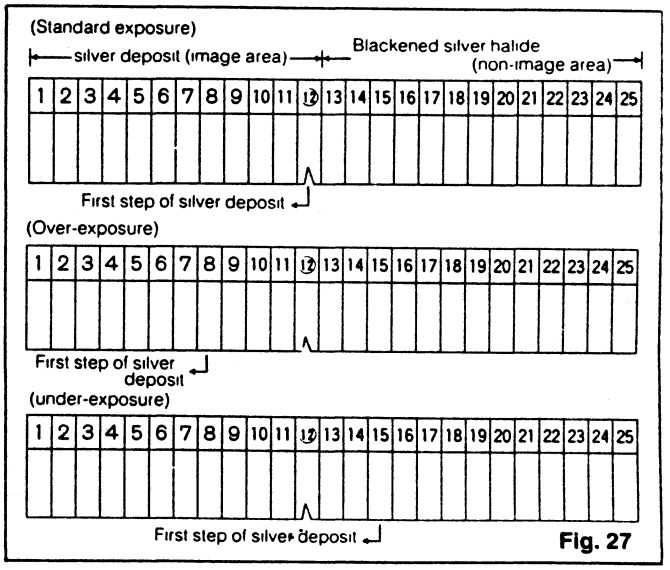


Fig. 27

B. Focus

The focus is thoroughly factory checked before shipment However, recheck it, when necessary, in accordance with the following.

①Make an exposure of the resolving power chart in the test chart.

②Make the exposure time a little longer than the standardcone

④The resolving power should be 10 lines/mm.
(This resolving power chart is a reproduction and does not indicate absolute values.)

CAUTION: The standard print samples may fade with time.
Keep them in a dark place such as a table drawer.

CHAPTER 4. MAINTENANCE

To enable the Silver Master CP-404II to demonstrate its functions and keep it always in its best condition, attention should be given daily to the following points.

1. Pre-operation inspection

①Turn the POWER switch ON.
②Check whether the fluid levels in the activator and stabilizer containers are correct and whether there is refill fluid in the activator and stabilizer bottles.
③Check whether the processor is revolving normally.
④Check whether the pilot lamp comes on when the HEATER switch is turned to ON.
⑤Remove the lens and mirror cover and check whether there is any dirt, dust or scratches or not.
⑥Check whether there is any dirt; dust or scratches on the copyboard glass surface.
⑦Check the operating condition of the copyboard.
⑧Check whether the FAN switch is on ON.
⑨Check whether the control roller knob is in the LOCK position.
⑩Adjust the shading mask to the set value.

2. Post-Operation Inspection

①Turn the POWER switch to OFF.
②Adjust the shading mask to the fully closed position (CLOSE).
③If the machine is not going to be operated for a long time, put covers on the lens mirror and the copyboard and cover the whole machine with vinyl, etc., to prevent accumulation of dust.

3. General Care

1. Replacement of fluids and cleaning of fluid containers.
The capacity of the activator and stabilizer fluids is 650 A3 size plates. Even if the number of plates treated is within the prescribed limit after a period of 4 weeks has passed, replace the fluids.
Since the fluid containers are located inside the machine they must be kept clean.
When replacing fluids or cleaning fluid containers, follow the order listed below:
①Turn the POWER switch to OFF.
②Open up the processor upper cover and the fluid drain door on the right side, then remove the rifill bottles from the refill fluid funnels.
③Put the fluid drain hoses in a container, such as a bucket or polyethylene tank, and open the fluid drain valve.
④Take the conveyor fingers, conveyor units and heaters out of the containers and wash them well. Remove any fluid sediment from all parts of the processor by wiping them clean with a damp cloth or sponge.
⑤As the artificial rubber used in the conveyor units rollers is not heat resistant, wash it at a temperature no greater than 104°F(40°C). On no account must an abrasive cleaner or polishing sand (pumice) be used.
⑥Wash the inside of the activator and stabilizer containers.
⑦If the conveyor guides are so dirty that the master w scratched as a result, sipe them dry after washing and apply some metal polish to a soft cloth and polish the surfa the guides over which the paper passes
Continue until surface grime has been completely remo and the surface is mirror-like. If the grime has been remo wash them well with a liquid cleanser (kitchen detergent, e and replace them in their original positions.
The measures described above are basic to the continu good quality platemaking. Therefore carry them out scrup ously.
⑧When all the fluid has been completely drained off into tl tanks, close the fluid drain valve and pour new fluid in
The activator fluid and stabilizer fluid have mutually opposi functions, so be careful not to mix them

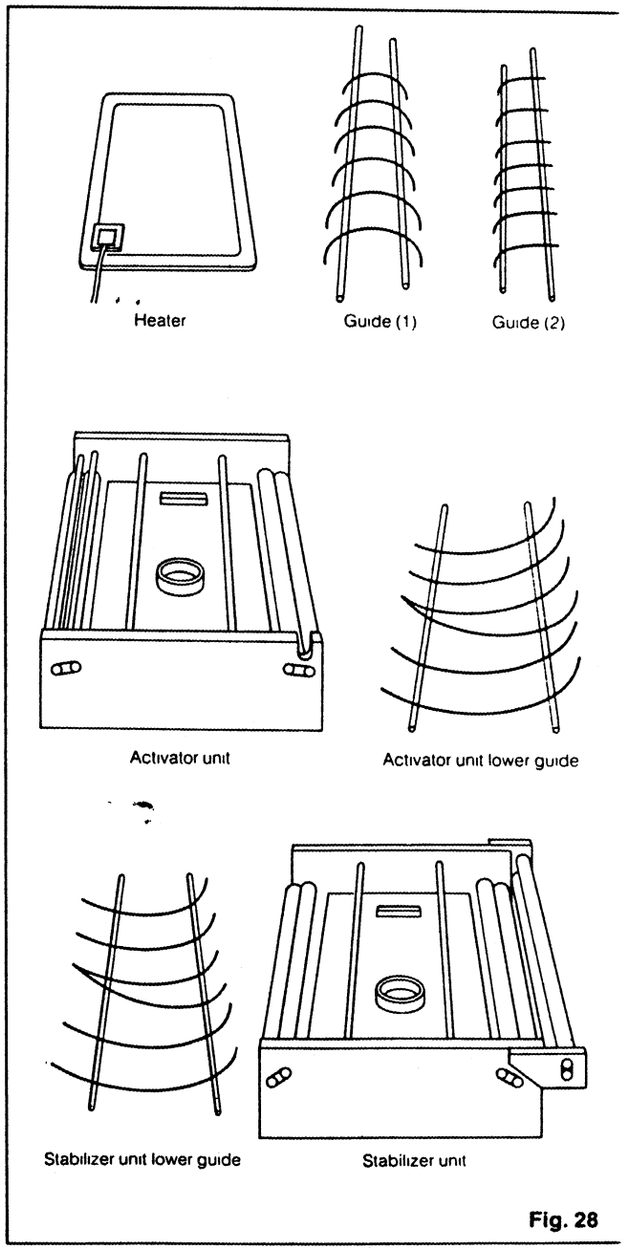


Fig. 28

2. Handing and care of lens and mirror

As the surface of the lens and mirror is very soft, ample care must be taken when handling to avoid scratches and soiling

Do not wipe unnecessarily. If the surface of the lens or mirror gets dirty with fingerprints, saliva, oil, chemicals, etc., it will affect the result of the photograph and the finish. When it is unavoidably necessary to wipe them, do it according to the following outline.

①Lightly brush off any dust and other matter on the surface with a soft brush (such as the blower brush sold at general camera stores)

②Apply a very small amount of industrial ethyl alcohol (marketed product) to lens paper (sold at general camera stores) and wipe off lightly.

Ample care must be taken, as strong rubbing and the forcible removal of matter on the surface will csuse scratching.

③When not in use for a long period of time, put the lens cap and the mirror cover on.

3. Replacement of halogen lamps

①Hold the bulb in a clean dry cloth. Do not hold it with your bare hands.

②There is a spring at the point of cantact, so pressing in one direction will reoease or hold the bulb in place as the case may be. When installing a lamp be sure that complete contact is made at the point of contact.

③If the lamp is used with fingermarks or oily smears on it, the glass will become opaque. If marked while in use, it should be cleaned by wiping lightly over the lens paper (available at general camera stores) to which has been applied a very small amount of industrial ethyl alcohol (marketed product)

④Make the lamp as horizontal as possible. Othewise it will cause breaking of halogen cycle and a shortening of the life

4. Care of copyboard pressure adhesive glass

It is easy for dust and fingermarks to accumulate on the pressure adhesive glass and so you should make a daily inspection When it is dirty, clean it by lightly wipeing over with a soft cloth and glass cleaner (marketed product). Be sure not to leave any glass cleaner on the glass

4. Lubrication

Lubrication will depend on the frequency of use, but the following should be taken as guides

①Lens board operation screw

Remove outer cover Once per month grease applied

②Copyboard operation screw

Remove front cover Once per month grease

③Copyboard operation rail

Remove front cover Once per month oil

④Magazine hinges

Once per month oil

⑤Porcessor operation chain

Use Shell Terrance No.27 or equivalent product

Remove side cover Once per month oil

⑥Cutter

Remove magazine rear cover Once per month oil

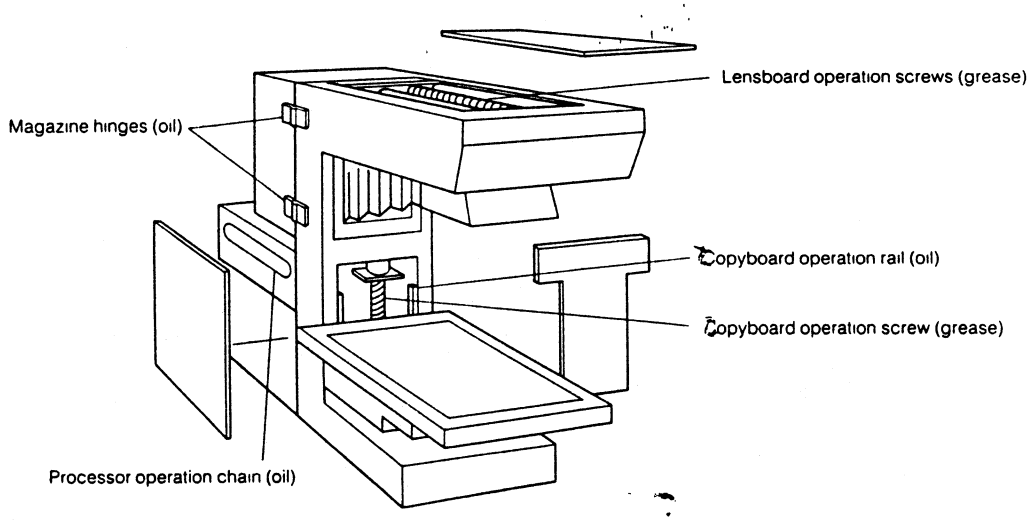


Fig. 29 Points of lubrication

5. Ordering and Replacement of Parts

There are many component parts. They are varied — some can be easily replaced by the customer once the part is obtained while others must be replaced by a serviceman. When ordering parts, please indicate the following:

1. Whether only the part is required or whether installation (replacement) is also required.
2. Details of entries in guarantee card or on plates affixed to machine body.

◎ Type of machine ◎ Machine No

3. Type and number of parts required, required delivery period

①Any part of the machine may be subject to alteration without advance notification, as a result of improvements.

Thus there may be times when the contents vary from this operation manual, for which we ask your pardon.

②It must be understood that, when the user makes his own improvements or when the machine is used in conjunction with products manufactured by other companies, the user bears the responsibility.

6. Troubles and Remedies

PROBLEM	COUNTERMEASURE
(Drive)	
1. Copyboard does not work. 2. Processor does not work	●Check the two 3A fuses operation circuity (Page 5, Fig. 5) ●Check the two Processor Motor circuit 3A fuses (Page 5, Fig 5). ●Check the connection of the connector of processor [J14] ●Check whether the activator container and the stabilizer container are surely set.
(Operation)	
1. Does not start even when the start button is pressed.	●Check the two Operation Circuit 3A fuses (Page 5, Fig. 5) ●Check the master end. ●Check whether the vacuum FAN switch is on ON (Page 7, Fig. 9). ●Push in the relay on the rear part of T1 (Exposure timer). ●Check whether the cutter has returned to its starting point (whether it is pressing down on the remitter).
2. Master is not fed on comletion of exposure.	●Check whether the EXPOSURE converter switch is in the NORMAL position (Page 6, Fig. 6). ●Push in the relay on the rear part of T1 (Exposure timer).
3. Cutting of master does not occur.	●Check whether the EXPOSURE converter switch has not been moved to MULTI during the feeding through of the master (Page 6, Fig 6). If this is the case, the master feed will stop at point. This can give rise to pulling, etc., between that point and the processor. ●As soon as the switch moves to MULTI the START PL lamp will come on and a restart is now possible ●Push in the relay on the rear part of T3 (Master feed length setting timer). ●Check whether the cutter is working. (If it is working, the blades are in need of adjustment).
4. Master length differs from indicated value.	●Adjust T2, inside the switchboard panel (Master feed length basic adjustment timer). (Page 5, Fig. 5).
(Light source)	
* Light source does not light up. 1. Some lamps do not light up when the FOCUS switch is activated.	●Check whether there is a bad socket contact. ●Check the lamp ●Check the connecting portion of the connector on the lower part of the frame (J16, J17, J18, J19).
2 Only one lamp light up when the light source converter switch is on MANUAL, but not when the switch is on AUTO.	●Check RY_1 and RY_2 (Replace RY_1 and RY_2).
(Photography)	
1. Fogginess on part of plate (partial image loss).	●Check whether the density of the part of the copy corresponding to the foggy part of the plate is not low. ●Check by shutting out lights near the camera and partial light from windows. ●After leaving it aside for a long time take a 1-2 second exposure. (If only partially blackened out light has penetrated mechanically.)
2. Out of focus, unsteady image.	●Check whether the magnification scale values for the lens board and the copyboard differ.
3. Partially out of focus, image unsteady.	●Check for dirt on copyboard glass mirror, lens, etc. (Page 9, Fig. 15).
(Plate manufacture)	
1. Scratches on master.	●Clean the master guide, activator unit lower guide, stabilizer unit lower guide, etc. (Page 14).
2. Activator fluid wears out quickly.	●Check the fluid surface in the activator tank and the fluid in the refill bottle. ●Check whether the fluid temperature is not too high. (Adjust the thermostat dial so that the temperature is between 82.4°F(28°C) and 87.8°F(31°C). (Page 5, Fig 4).
3 Activator fluid temperature does not rise to 82.4°F~87 8°F (28°C~31°C)	●Check whether the heaters are on (Heater switch) (Page 6, Fig. 6). ●Check whether the heater plugs have not come loose from the sockets (Page 5, Fig. 4). ●Check the two 10A heater fuses (Page 5, Fig. 5). ●Adjust the thermostat dial.

TABLE 1. CHART FOR CONVERSION OF CENTRELINE POSITIONS FOR DIFFERING MAGNIFICATIONS, CONTRASTED AGAINST 100% MAGNIFICATION CENTRELINE

$$X = \left| f(1-m) \right| + \left| 253 - \frac{P\ell}{2} \right| \cdot \left| \frac{1}{m} - 1 \right|$$

Magnification	$\lvert f(1-m) \rvert$ mm	$\lvert (\frac{1}{m} - 1) \rvert$ mm	Magnification	$\lvert f(1-m) \rvert$ mm	$\lvert (\frac{1}{m} - 1) \rvert$ mm
50	210.0	1.0	90	42.0	0 111
52	201.6	0.923	91	37.8	0.099
54	193.2	0.852	92	33.6	0.087
56	184.8	0.786	93	29.4	0.075
58	176.4	0.724	94	25.2	0.064
60	168.0	0.667	95	21.0	0.053
62	159.6	0.613	96	16.8	0.042
64	151.2	0.563	97	12.6	0.031
66	142.8	0.515	98	8.4	0.020
68	134.4	0.471	99	4.2	0.010
70	126.0	0.429	100	0.	0.
71	121.8	0.409	101	4.2	0.010
72	117.6	0.389	102	8.4	0.020
73	113.4	0.370	103	12.6	0.029
74	109 2	0.351	104	16.8	0.039
75	105 0	0.333	105	21.0	0.048
76	100.8	0.316	106	25.2	0.057
77	96.6	0.299	107	29.4	0.065
78	92.4	0.282	108	33.6	0.074
79	88.2	0.266	109	37.8	0.083
80	84.0	0.250	110	42.0	0.091
81	79.8	0.235	112	50.4	0.107
82	75.6	0.220	114	58.8	0.123
83	71.4	0.205	116	67.2	0.138
84	67.2	0.191	118	75.6	0.153
85	63.0	0.177	120	84.0	0.167
86	58.8	0.163	122	92.4	0.180
87	54.6	0.149	124	100.8	0.194
88	50.4	0.136	125	105.0	0.200
89	46.2	0.124			

Reduction side → inner side
Enlargement side → operation side

$$X = \left| f(1-m) \right| \pm \left| 10.0" - \frac{P\ell}{2} \right| \cdot \left| \frac{1}{m} - 1 \right|$$

Magnification	$\left\| f(1-m) \right\|$ in	$\left\| (\frac{1}{m} - 1) \right\|$ in	Magnification	$\left\| f1-m) \right\|$ in	$\left\| (\frac{1}{m} - 1) \right\|$ in
50	8.3	0.039	90	1.7	0.004
52	7.9	0.036	91	1.5	0.004
54	7.6	0.034	92	1.3	0.003
56	7.3	0.031	93	1.2	0.003
58	6.9	0.029	94	1.0	0.003
60	6.6	0.026	95	0.8	0.002
62	6.3	0.024	96	0.7	0.002
64	6.0	0.022	97	0.5	0.001
66	5.6	0.020	98	0.3	0.001
68	5.3	0.019	99	0.2	0.
70	5.0	0.017	100	0	0.
71	4.8	0.016	101	0.2	0.
72	4.6	0.015	102	0.3	0.001
73	4.5	0.014	103	0.5	0.001
74	4.3	0.014	104	0.7	0 002
75	4.1	0.013	105	0 8	0 002
76	4.0	0.012	106	1.0	0.002
77	3.8	0.012	107	1.2	0 003
78	3.6	0.011	108	1.3	0.003
79	3.5	0.010	109	1.5	0.003
80	3.3	0.010	110	1 7	0.004
81	3.1	0.009	112	2.0	0 004
82	3.0	0.009	114	2.3	0 005
83	2.8	0.008	116	2.6	0.005
84	2.6	0.008	118	3.0	0.006
85	2.5	0.007	120	3.3	0.007
86	2.3	0.006	122	3.6	0.007
87	2.1	0.006	124	4 0	0.008
88	2 0	0.005	125	4.1	0.008
89	1.8	0.005			

Reduction side → inner side
Enlargement side → operation side

TABLE 2. DISTANCE FROM 100% MAGNIFICATION CENTRELINE FOR MAJOR MASTER SIZE LENGTHS

P/ magni-fication	391 mm	394 mm	406 mm	420 mm	435 mm	445 mm	450 mm	467 mm	472 mm	483 mm
50	267.5	266.0	260.0	253.0	245.5	240 5	238.0	229 5	227.0	221.5
52	254.7	253.3	247.8	241.3	234.4	229.8	227.4	219.6	217.3	212.2
54	242.2	240.9	235.8	229.8	223.4	219.2	217.1	209.8	207.7	203.0
56	230.0	228.8	224.1	218.6	212.7	208.8	206.8	200.1	198.2	193.8
58	218.0	216.9	212.6	207.5	202.1	198.5	196.7	190.5	188.7	184.7
60	206.4	205.4	201.4	196.7	191.7	188.3	186.7	181.0	179.3	175.7
62	194.8	193.9	190.3	186.0	181.4	178.3	176.8	171.6	170.0	166.7
64	183.6	182.7	179.4	175.4	171.2	168.4	167.0	162.2	160.8	157.7
66	172.4	171.6	168.6	165.0	161.1	158.5	157.2	152.8	151.6	148 7
68	161.5	160.8	158.0	154.7	151.1	148.8	147.6	143.6	142.4	139.8
70	150.7	150.0	147.5	144.4	141.2	139.1	138.0	134.4	133.3	130.9
71	145.3	144.7	142.2	139.3	136.3	134.2	133.2	129.8	128.7	126.5
72	140.0	139.4	137.1	134.3	131.4	129.5	128.5	125.2	124.2	122.1
73	134.7	134.1	131.9	129.3	126.5	124.7	123.8	120.6	119.7	117.7
74	129.4	128.9	126.8	124.3	121.7	119.9	119.0	116.1	115.2	113 2
75	124.2	123.7	121.7	119.3	116.8	115.2	114.3	111.5	110.7	108.8
76	119.0	118.5	116.6	114.4	112.0	110.4	109.7	107.0	106.2	104.4
77	113.8	113.3	111.6	109.5	107.2	105.7	105.0	102.4	101.7	100.0
78	108.6	108.2	106.5	104.5	102.4	101.0	100.3	97.9	97.2	95 6
79	103.5	103.1	101.5	99.6	97.6	96.3	95.7	93.4	92.7	91.3
80	98.4	98.0	96.5	94.8	92·9	91.6	91.0	88.9	88.3	86.9
81	93.3	93.0	91.6	89.9	88.1	87.0	86.4	84.4	83.8	82.5
82	88.3	87.9	86.6	85.1	83.4	82.3	81.8	79.9	79.3	78.1
83	83.2	82.9	81.7	80.2	78.7	77.7	77.1	75.4	74.9	73.8
84	78.1	77.8	76.7	75.4	74.0	73.0	72.5	70.9	70.4	69.4
85	73.1	72.9	71.8	70.6	69.3	68.4	67.9	66.4	66.0	65.0
86	68.2	68.2	67.2	66.0	64.7	63.9	63.5	62.1	61.6	60.7
87	63.2	63.0	62.1	61.0	59.9	59.2	58.8	57.5	57.1	56.3
88	58 2	58.0	57.2	56.2	55.2	54.6	54.2	53 1	52.7	52.0
89	53.3	53.1	52.4	51.5	50.6	50.0	49.7	48.6	48.3	47.6
90	48.4	48.2	47.6	46.8	45.9	45.4	45.1	44.2	43.9	43.3
91	43.5	43.3	42.8	42.1	41.3	40.8	40.6	39.7	39.5	38.9
92	38.6	38.5	38.0	37.3	36.7	36.3	36.0	35.3	35.1	34 6
93	33.7	33.6	33.2	32.6	32.1	31.7	31.5	30.9	30.7	30.3
94	28.9	28.8	28.4	28.0	27.5	27.2	27.0	26.4	26.3	25.9

P/ magni-fication	391 mm	394 mm	406 mm	420 mm	435 mm	445 mm	450 mm	467 mm	472 mm	483 mm
95	24 0	24.0	23.7	23.3	22 9	22.6	22.5	22.0	21.9	21.6
96	19.2	19.2	18.9	18.6	18.3	18.1	18.0	17.6	17.5	17.3
97	14.4	14.3	14.2	13.9	13.7	13.6	13.5	13.2	13.1	13.0
98	9.6	9.5	9.4	9.3	9.1	9.0	9.0	8.8	8.7	8.6
99	4.8	4.8	4.7	4.6	4.6	4.5	4.5	4.4	4.4	4 3
100	0	0	0	0	0	0	0	0	0	0
101	4.8	4.8	4.7	4.6	4.6	4.5	4.5	4.4	4.4	4.3
102	9.6	9.5	9.4	9.2	9.1	9.0	8.9	8.8	8.7	8.6
103	14.3	14.2	14.1	13.9	13.6	13.5	13.4	13.2	13.1	12.9
104	19.0	18.9	18.7	18.4	18.2	18.0	17.9	17.6	17.5	17.2
105	23.8	23.7	23.4	23.1	22.7	22.5	22.3	21.9	21.8	21.6
106	28.5	28.4	28.1	27.7	27.2	26.9	26.8	26.3	26.2	25.9
107	33.1	33.0	32.7	32.2	31.7	31.4	31.2	30.7	30.5	30.2
108	37.9	37.7	37.3	36.8	36.2	35.9	35.7	35.0	34.9	34.5
109	42.6	42.5	42.0	41.4	40.8	40.3	40.1	39.4	39.2	38.8
110	47.2	47.1	46.6	45.9	45.2	44.8	44.6	43.8	43.6	43 1
112	56.6	56.4	55.8	55.0	54.2	53.7	53.4	52.5	52.2	51.6
114	65.9	65.7	65.0	64.1	63.2	62.6	62.2	61.2	60.9	60 2
116	75.1	74.9	74.1	73.1	72.1	71.4	71.1	69.9	69.6	68 8
118	84.4	84.2	83.3	82.2	81.0	80.3	79.9	78.6	78.2	77.4
120	93.6	93.4	92.4	91.2	89.9	89.1	88.7	87.3	86.8	85 9
122	102.8	102.5	101.4	100.1	98.8	97.9	97.4	95.9	95.5	94.5
124	112.0	111.7	110.5	109.1	107.7	106.7	106.2	104.6	104.1	103 0
125	116.5	116.2	115.0	113.6	112.1	111.1	110.6	108.9	108.4	107.3

Pℓ / magnification	15.4 in	15.5 in	16.0 in	16.5 in	17.1 in	17.5 in	17.7 in	18.4 in	18.6 in	19.0 in
50	10.5	10.5	10.2	10.0	9.7	9.5	9.4	9.0	8.9	8.7
52	10 0	10.0	9.8	9.5	9.2	9.0	9.0	8.6	8.6	8 4
54	9.5	9.5	9.3	9.0	8.8	8.6	8.5	8.3	8.2	8.0
56	9.1	9.0	8.8	8.6	8.4	8.2	8.1	7.9	7.8	7.6
58	8.6	8.5	8.4	8.2	8.0	7.8	7.7	7.5	7.4	7.3
60	8.1	8.1	7.9	7.7	7.5	7.4	7.4	7.1	7.1	6.9
62	7.7	7.6	7.5	7.3	7.1	7.0	7.0	6.8	6.7	6.6
64	7.2	7.2	7.1	6.9	6.7	6.6	6.6	6.4	6.3	6.2
66	6.8	6.8	6.6	6.5	6.3	6.2	6.2	6.0	6.0	5.9
68	6.4	6.3	6.2	6.1	5.9	5.9	5.8	5.7	5.6	5.5
70	5.9	5.9	5.8	5.7	5.6	5.5	5.4	5 3	5.2	5.2
71	5.7	5.7	5.6	5.5	5.4	5.3	5.2	5.1	5.1	5.0
72	5.5	5.5	5.4	5.3	5.2	5.1	5.1	4.9	4.9	4.8
73	5.3	5.3	5.2	5.1	5.0	4.9	4.9	4.7	4.7	4.6
74	5.1	5.1	5.0	4.9	4.8	4.7	4.7	4.6	4.5	4.5
75	4.9	4.9	4.8	4.7	4.6	4.5	4.5	4.4	4.4	4.3
76	4.7	4.7	4.6	4.5	4.4	4.3	4.3	4.2	4.2	4.1
77	4.5	4.5	4.4	4.3	4.2	4.2	4.1	4.0	4.0	3.9
78	4.3	4.3	4.2	4.1	4.0	4.0	3.9	3.9	3.8	3.8
79	4.1	4.1	4.0	3.9	3.8	3.8	3.8	3.7	3.6	3.6
80	3.9	3.9	3.8	3.7	3.7	3.6	3.6	3.5	3.5	3.4
81	3.7	3.7	3.6	3.5	3.5	3.4	3.4	3.3	3.3	3.2
82	3.5	3.5	3.4	3.4	3.3	3.2	3.2	3.1	3.1	3.1
83	3.3	3.3	3.2	3.2	3.1	3.1	3.0	3.0	2.9	2.9
84	3.1	3.1	3.0	3.0	2.9	2.9	2.9	2.8	2.8	2.7
85	2.9	2.9	2.8	2.9	2.7	2.7	2.7	2.6	2.6	2.5
86	2.7	2.7	2.6	2.6	2.5	2.5	2.5	2.4	2.4	2.4
87	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2
88	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.0
89	2.1	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9
90	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.7	1.7	1.7
91	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.6
92	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4
93	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2
94	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0

magnification \ Pf	15.4 in	15.5 in	16.0 in	16.5 in	17.1 in	17.5 in	17.7 in	18.4 in	18.6 in	19 0 in
95	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
96	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
97	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
98	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
99	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
100	0	0	0	0	0	0	0	0	0	0
101	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
102	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
103	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
104	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
105	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
106	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0
107	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2
108	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4
109	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
110	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7
112	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0
114	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4
116	3.0	3.0	2.9	2.9	2.9	2.8	2.8	2.7	2.7	2.7
118	3.3	3.3	3.3	3.2	3.2	3.2	3.1	3.1	3.1	3.1
120	3.7	3.7	3.7	3.6	3.5	3.5	3.5	3.4	3.4	3.4
122	4.1	4.0	4.0	3.9	3.9	3.8	3.8	3.8	3.8	3 7
124	4.4	4.4	4.3	4.3	4.2	4.2	4.2	4.1	4.1	4.1
125	4.6	4.6	4.5	4.5	4.4	4.4	4.3	4.3	4.3	4 2

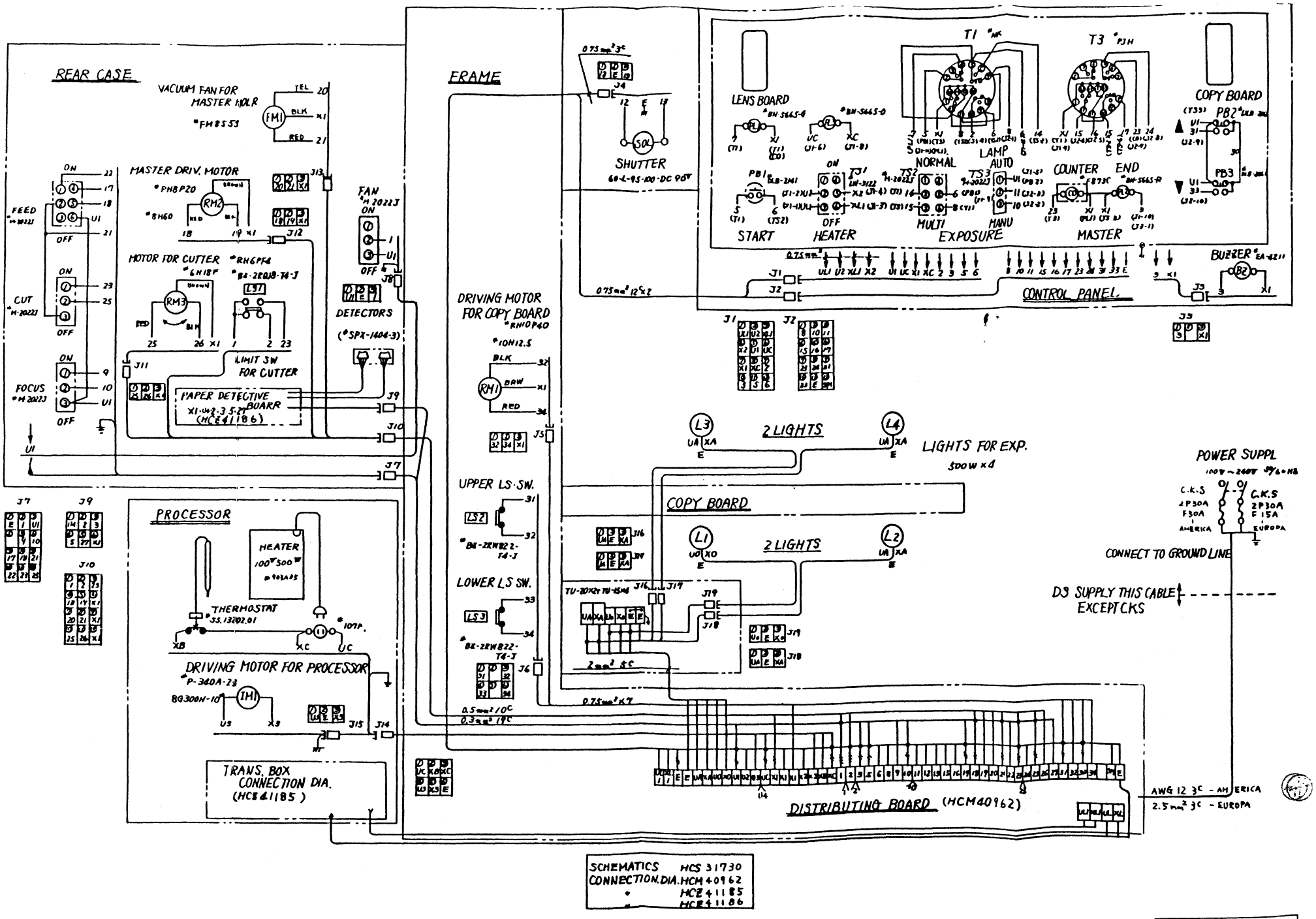
TABLE 3. DETERMINATION OF COPY POSITION-READY RECKONER

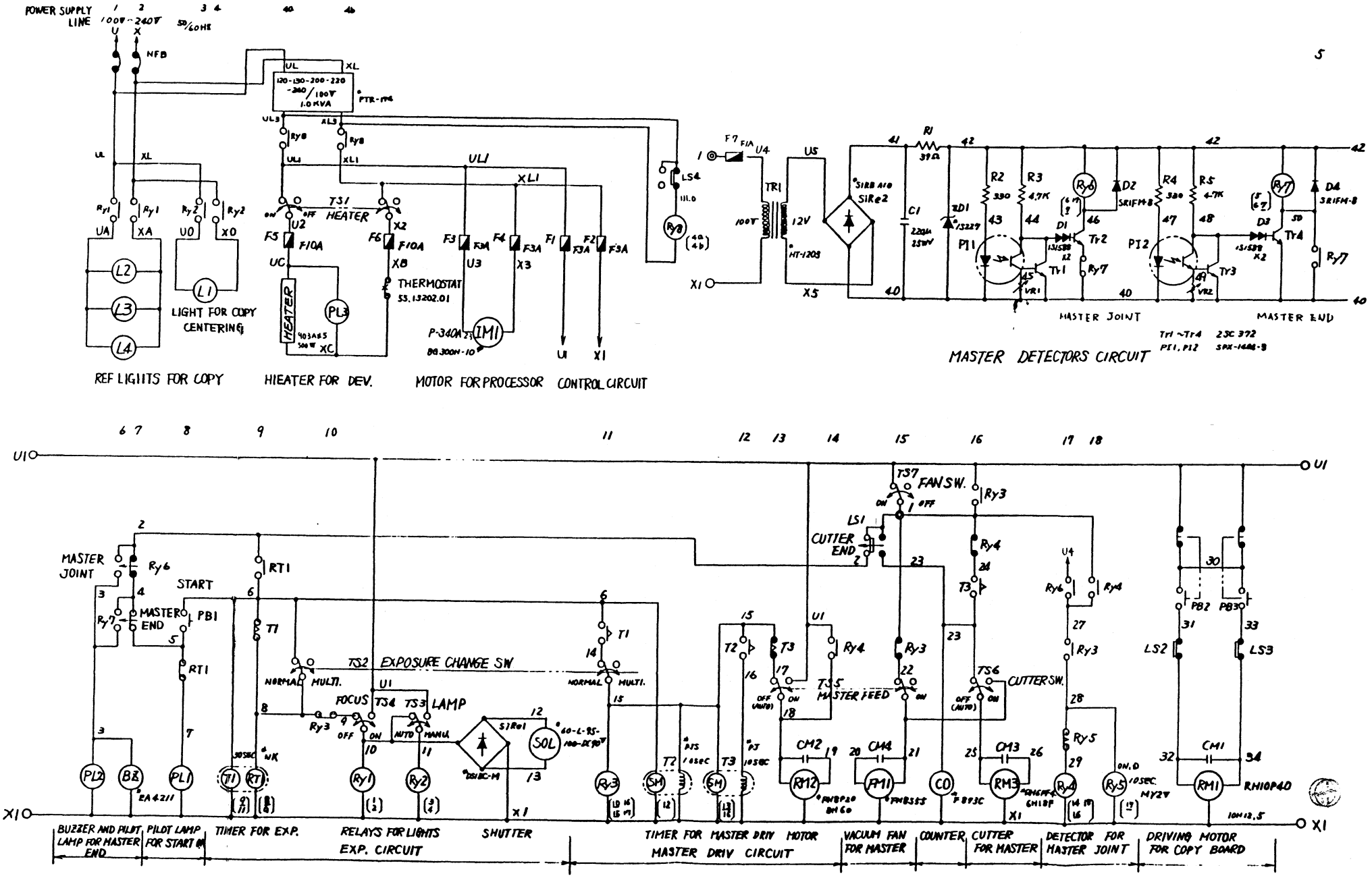
ℓ value

magni-fication (%)	distance between edge of copy and point at which printing is to commence (mm)					magni fication (%)	distance between edge of copy and point at which printing is to commence (mm)				
	30	40	50	60	70		30	40	50	60	70
50	344.0	324.0	304.0	284.0	264.0	88	195.5	184.1	172.7	161.4	150.0
51	337.3	317.7	298.0	278.4	258.8	89	193.3	182.0	170.8	159.6	148.3
52	330.8	311.6	292.3	273.1	253.9	90	191.1	180.0	168.9	157.8	146.7
53	324.5	305.7	286.8	267.9	249.1	91	189.0	178.0	167.0	156.0	145.1
54	318.5	300.0	281.5	263.0	244.4	92	187.0	176.1	165.2	154.3	143.5
55	312.7	294.6	276.4	258.2	240.0	93	185.0	174.2	163.4	152.7	141.9
56	307.1	289.3	271.4	253.6	235.7	94	183.0	172.3	161.7	151.1	140.4
57	301.8	284.2	266.7	249.1	231.6	95	181.1	170.5	160.0	149.5	139.0
58	296.6	279.3	262.1	244.8	227.6	96	179.2	168.8	158.3	147.9	137.5
59	291.5	274.6	257.6	240.7	223.7	97	177.3	167.0	156 7	146.4	136.1
60	286.7	270.0	253.3	236 7	220.0	98	175.5	165.3	155.1	144.9	134.7
61	282.0	265.6	249.2	232.8	216.4	99	173.7	163.6	153 5	143.4	133 3
62	277.4	261.3	245.2	229.0	212.9	100	172.0	162.0	152.0	142.0	132.0
63	273.0	257.1	241.3	225 4	209.5	101	170.3	160.4	150.5	140.6	130.7
64	268.8	253.1	237.5	221.9	206.3	102	168.6	158.8	149.0	139.2	129.4
65	264.6	249.2	233.8	218.5	203.1	103	167.0	157.3	147.6	137.9	128 2
66	260.6	245.5	230.3	215.2	200.0	104	165.4	155.8	146.2	136.5	126.9
67	256.7	241.8	226.9	211.9	197.0	105	163.8	154.3	144.8	135.2	125.7
68	252.9	238.2	223.5	208.8	194.1	106	162.3	152.8	143.4	134.0	124.5
69	249.3	234.8	220.3	205.8	191.3	107	160.8	151.4	142.1	132.7	123.4
70	245.7	231.4	217.1	202.9	188.6	108	159.3	150.0	140.7	131.5	122.2
71	242.3	228.2	214.1	200.0	185.9	109	157.8	148.6	139.5	130.3	121.1
72	238.9	225.0	211.1	197.2	183.3	110	156.4	147.3	138.2	129.1	120.0
73	235.6	221.9	208.2	194.5	180.8	111	155.0	146.0	136.9	127.9	118.9
74	232.4	218.9	205.4	191.9	178.4	112	153.6	144.6	135.7	126.8	117.9
75	229.3	216.0	202.7	189.3	176.0	113	152.2	143.4	134.5	125.7	116.8
76	226.3	213.2	200.0	186.8	173.7	114	150.9	142.1	133.3	124.6	115.8
77	223.4	210.4	197.4	184.4	171.4	115	149.6	140.9	132.2	123.5	114.8
78	220.5	207.7	194.9	182.1	169.2	116	148.3	139.7	131.0	122.4	113.8
79	217.7	205.1	192.4	179.8	167.1	117	147.0	138.5	129.9	121.4	112.8
80	215.0	202.5	190.0	177.5	165.0	118	145.8	137.3	128.8	120.3	111.9
81	212.4	200.0	187.7	175.3	163.0	119	144.5	136.1	127.7	119.3	110.9
82	209.8	197.6	185.4	173.2	161.0	120	143.3	135.0	126.7	118.3	110.0
83	207.2	195.2	183.1	171.1	159.0	121	142.2	133.9	125.6	117.4	109.1
84	204.8	192.9	181.0	169.0	157.1	122	141.0	132.8	124.6	116.4	108 2
85	202.4	190.6	178.8	167.1	155.3	123	139.8	131.7	123.6	115.5	107.3
86	200.0	188.4	176.7	165.1	153.5	124	138.7	130.7	122.6	114.5	106.5
87	197.7	186.2	174.7	163.2	151.7	125	137.6	129.6	121.6	113.6	105.6

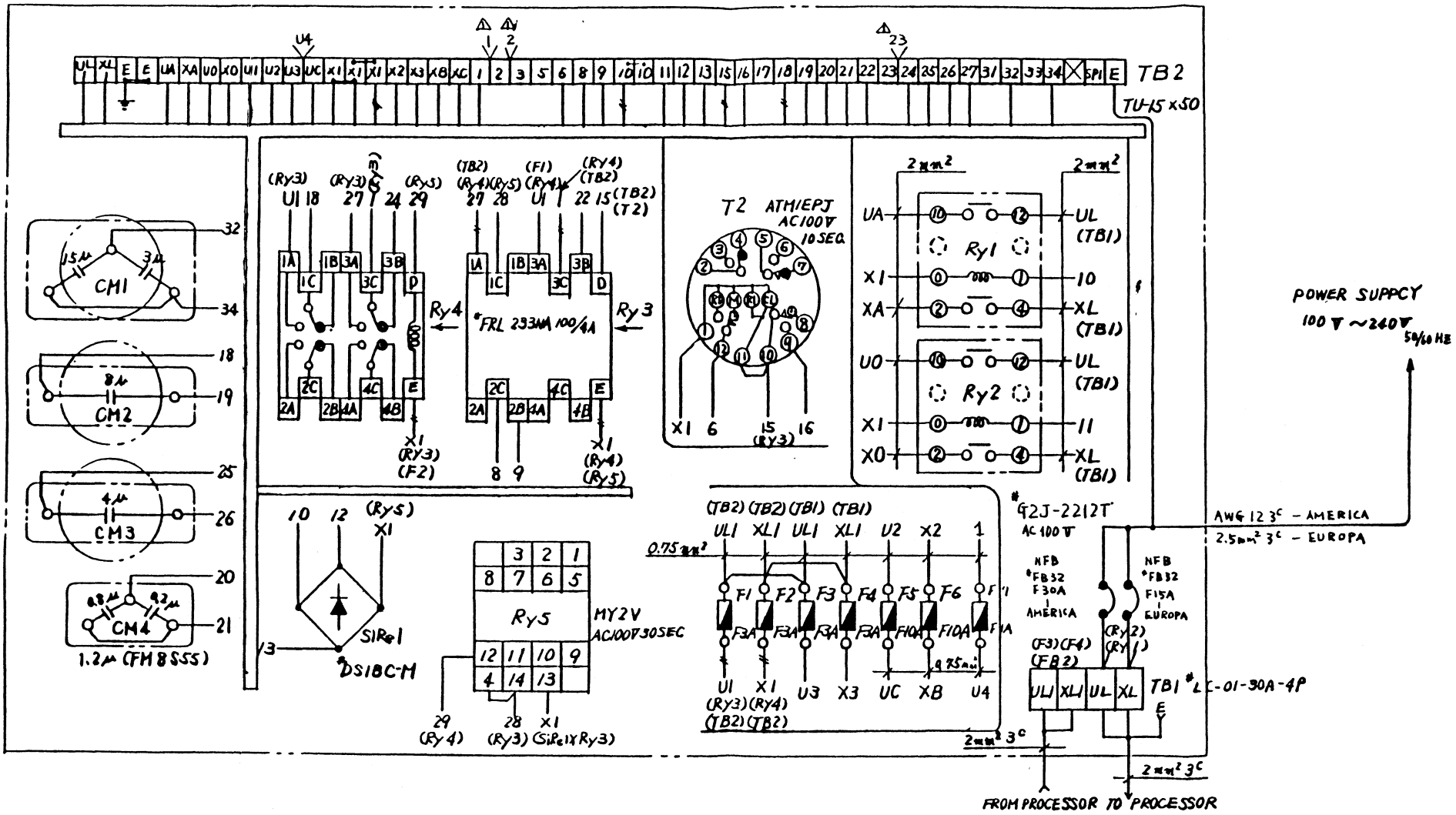
ℓ value

magnification (%)	distance between edge of copy and point at which printing is to commence (in)					magnification (%)	distance between edge of copy and point at which printing is to commence (in)				
	1.2	1.6	2.0	2.4	2.8		1.2	1.6	2.0	2.4	2.8
50	13.5	12.6	12.0	11.2	10.4	88	7.7	7.2	6.8	6.4	5.9
51	13.3	12.5	11.9	11.0	10.2	89	7.6	7.2	6.7	6.3	5.8
52	13.0	12.3	11.5	10.8	10.0	90	7.5	7.1	6.6	6.2	5.8
53	12.8	12.0	11.3	10.5	9.8	91	7.4	7.0	6.6	6.1	5.7
54	12.5	11.8	11.1	10.4	9.6	92	7.4	6.9	6.5	6.1	5.6
55	12.3	11.6	10.9	10.2	9.4	93	7.3	6.9	6.4	6.0	5.6
56	12.1	11.4	10.7	10.0	9.3	94	7.2	6.8	6.4	5.9	5.5
57	11.9	11.2	10.5	9.8	9.1	95	7.1	6.7	6.3	5.9	5.5
58	11.7	11.0	10.3	9.6	9.0	96	7.1	6.6	6.2	5.8	5.4
59	11.5	10.8	10.1	9.5	8.8	97	7.0	6.6	6.2	5.8	5.4
60	11.3	10.6	10.0	9.3	8.7	98	6.9	6.5	6.1	5.7	5.3
61	11.1	10.5	9.8	9.2	8.5	99	6.8	6.4	6.0	5.6	5.2
62	10.9	10.3	9.7	9.0	8.4	100	6.8	6.4	6.0	5.6	5.2
63	10.7	10.1	9.5	8.9	8.2	101	6.7	6.3	5.9	5.5	5.1
64	10.6	10.0	9.4	8.7	8.1	102	6.6	6.3	5.9	5.5	5.1
65	10.4	9.8	9.2	8.6	8.0	103	6.6	6.2	5.8	5.4	5.0
66	10.3	9.7	9.1	8.5	7.9	104	6.5	6.1	5.8	5.4	5.0
67	10.1	9.5	8.9	8.3	7.8	105	6.4	6.1	5.7	5.3	4.9
68	10.0	9.4	8.8	8.2	7.6	106	6.4	6.0	5.6	5.3	4.9
69	9.8	9.2	8.7	8.1	7.5	107	6.3	6.0	5.6	5.2	4.9
70	9.7	9.1	8.5	8.0	7.4	108	6.3	5.9	5.5	5.2	4.8
71	9.5	9.0	8.4	7.9	7.3	109	6.2	5.9	5.5	5.1	4.8
72	9.4	8.9	8.3	7.8	7.2	110	6.2	5.8	5.4	5.1	4.7
73	9.3	8.7	8.2	7.7	7.1	111	6.1	5.7	5.4	5.0	4.7
74	9.1	8.6	8.1	7.6	7.0	112	6.0	5.7	5.3	5.0	4.6
75	9.0	8.5	8.0	7.5	6.9	113	6.0	5.6	5.3	4.9	4.6
76	8.9	8.4	7.9	7.4	6.8	114	5.9	5.6	5.2	4.9	4.6
77	8.8	8.3	7.8	7.3	6.7	115	5.9	5.5	5.2	4.9	4.5
78	8.7	8.2	7.7	7.2	6.7	116	5.8	5.5	5.2	4.8	4.5
79	8.6	8.1	7.6	7.1	6.6	117	5.8	5.5	5.1	4.8	4.4
80	8.5	8.0	7.5	7.0	6.5	118	5.7	5.4	5.1	4.7	4.4
81	8.4	7.9	7.4	6.9	6.4	119	5.7	5.4	5.0	4.7	4.4
82	8.3	7.8	7.3	6.8	6.3	120	5.6	5.3	5.0	4.7	4.3
83	8.2	7.7	7.2	6.7	6.3	121	5.6	5.3	4.9	4.6	4.3
84	8.1	7.6	7.1	6.7	6.2	122	5.6	5.2	4.9	4.6	4.3
85	8.0	7.5	7.0	6.6	6.1	123	5.5	5.2	4.9	4.5	4.2
86	7.9	7.4	6.9	6.4	6.0	124	5.5	5.1	4.8	4.5	4.2
87	7.8	7.3	6.9	6.4	6.0	125	5.4	5.1	4.8	4.5	4.2

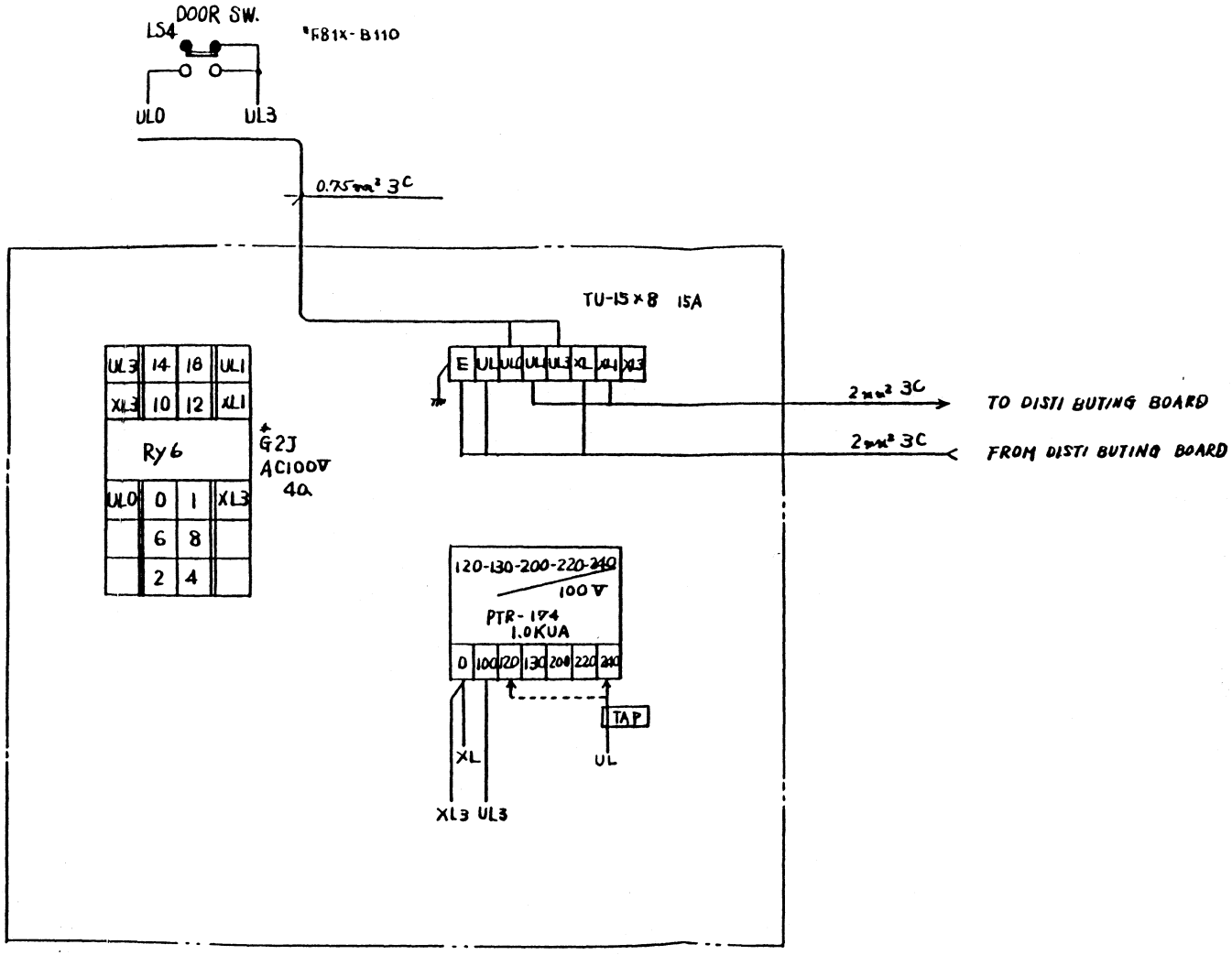

REAR CASE
FRAME
VACUUM FAN FOR MASTER HOLR
FM1
MASTER DRIV. MOTOR
RM2
MOTOR FOR CUTTER
RM3
LS1
LIMIT SW FOR CUTTER
FAN
DETECTORS
PAPER DETECTIVE BOARR
(HCE41186)
FEED
CUT
FOCUS
OFF
ON
DRIVING MOTOR FOR COPY BOARD
RM1
UPPER LS SW.
LS2
LOWER LS SW.
LS3
SHUTTER
SOL
PROCESSOR
HEATER
THERMOSTAT
DRIVING MOTOR FOR PROCESSOR
TRANS. BOX CONNECTION DIA. (HCE41185)
LENS BOARD
T1
T3
COPY BOARD
PB1
PB2
PB3
START
HEATER
NORMAL
LAMP
AUTO
MULTI EXPOSURE
MANU
COUNTER
END
MASTER
CONTROL PANEL
BUZZER
BZ
2 LIGHTS
L3
L4
LIGHTS FOR EXP.
500W x 1
COPY BOARD
L1
L2
2 LIGHTS
POWER SUPPL
100V ~ 240V 50/60Hz
C.K.S 2P30A F30A AMERICA
C.K.S 2P30A F15A EUROPA
CONNECT TO GROUND LINE
D3 SUPPLY THIS CABLE EXCEPT CKS
DISTRIBUTING BOARD (HCM40962)
AWG 12 3C - AMERICA
2.5mm² 3C - EUROPA
SCHEMATICS HCS 31730
CONNECTION DIA. HCM 40962
HCE 41185
HCE 41186
DWG NO. HCW31478



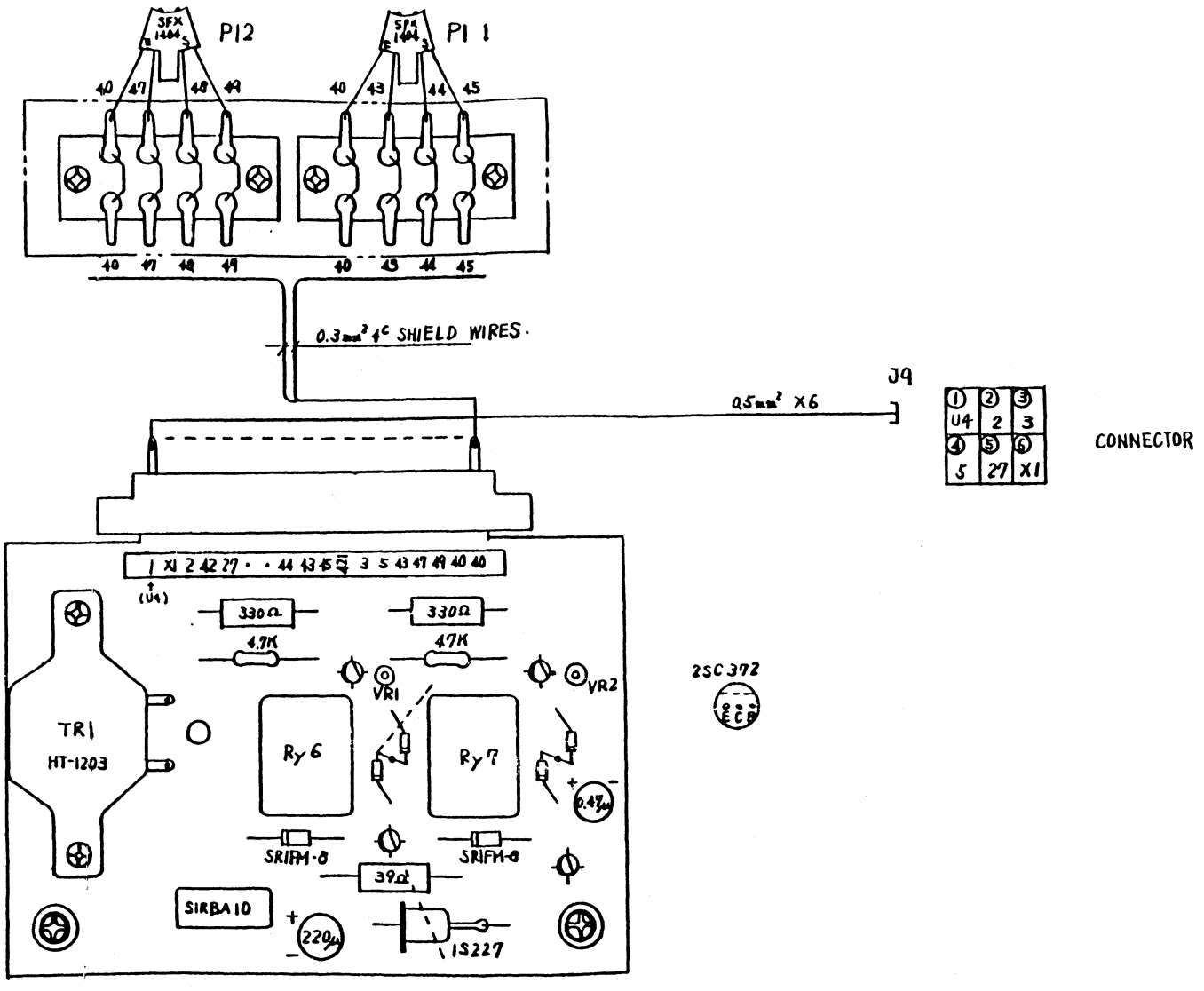
DWG NO. HCS31730



DWG NO. HCM40962



DWG NO. HCZ41185



DWG NO. HCZ41186