## Gestetner LANIER RICOM SaVII



# G060/G570/G082 SERVICE MANUAL 

# Gestetner <br> LANiER <br> RTCOM: <br> 52VII 



RICOH GROUP COMPANIES

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## © IMPORTANT SAFETY NOTICES

## PREVENTION OF PHYSICAL INJURY

1. Before disassembling or assembling parts of the printer and peripherals, make sure that the printer power cord is unplugged.
2. The wall outlet should be near the printer and easily accessible.
3. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
4. The printer drives some of its components when it completes the warm-up period. Be careful to keep hands away from the mechanical and electrical components as the printer starts operation.
5. The inside and the metal parts of the fusing unit become extremely hot while the printer is operating. Be careful to avoid touching those components with your bare hands.

## HEALTH SAFETY CONDITIONS

Toner and developer are non-toxic, but if you get either of them in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

## OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The printer and its peripherals must be serviced by a customer service representative who has completed the training course on those models.
2. The NVRAM module (option) installed on the controller has a lithium battery which can explode if replaced incorrectly. Replace the NVRAM only with an identical one. The manufacturer recommends replacing the entire NVRAM. Do not recharge or burn this battery. Used NVRAM must be handled in accordance with local regulations.
3. The optional fax and memory expansion units contain lithium batteries, which can explode if replaced incorrectly. Replace only with the same or an equivalent type recommended by the manufacturer. Do not recharge or burn the batteries. Used batteries must be handled in accordance with local regulations.

## SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Do not incinerate toner bottles or used toner. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner, the maintenance unit which includes developer or the organic photoconductor in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.

When keeping used lithium batteries in order to dispose of them later, do not put more than 100 batteries per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.
4. When keeping used lithium batteries in order to dispose of them later, do not put more than 100 batteries per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.

## LASER SAFETY

The Center for Devices and Radiological Health (CDRH) prohibits the repair of laser-based optical units in the field. The optical housing unit can only be repaired in a factory or at a location with the requisite equipment. The laser subsystem is replaceable in the field by a qualified Customer Engineer. The laser chassis is not repairable in the field. Customer engineers are therefore directed to return all chassis and laser subsystems to the factory or service depot when replacement of the optical subsystem is required.

| $\triangle$ WARNING |
| :--- | :--- |
| Use of controls, or adjustment, or performance of procedures other than <br> those specified in this manual may result in hazardous radiation exposure. |

WARNING
WARNING: Turn off the main switch before attempting any of the procedures in the Laser Optics Housing Unit section. Laser beams can seriously damage your eyes.

CAUTION MARKING:


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| INSTALLATION G060 |  |  |
| :--- | :--- | :---: |
|  | TWO-TRAY PAPER FEED UNIT G568 |  |
|  |  |  |
|  |  |  |


| PREVENTIVE MAINTENCE G060 |  |  |  |
| :--- | :--- | :---: | :---: |
| LARGE CAPACITY TRAY G569 |  |  |  |


| REPLACEMENT AND ADJUSTMENT G060 |  |  |  |  |
| :--- | :--- | :---: | :---: | :---: |
|  |  |  |  | TWO-TRAY FINISHER G565 |


| TROUBLESHOOTING G060 |  |  |  |  |
| :--- | :--- | :---: | :---: | :---: |
|  |  |  |  | FOUR-BIN MAILBOX G566 |


| SERVICE TABLES G060 |  |  |  |
| :--- | :--- | :---: | :---: |
| SPECIFICATIONS G060 |  |  |  |


| DETAILED DESCRIPTIONS G060 |  |  |  |  |
| :--- | :--- | :---: | :---: | :---: |
|  |  |  |  | COPIER FEATURE EXPANDER G570 |


| DUPLEX UNIT G571 |  |
| :--- | :--- |
| ARDF G564 |  |
|  |  |

ONE-TRAY PAPER FEED UNIT G567

INSTALLATION

## 1. INSTALLATION

### 1.1 INSTALLATION REQUIREMENTS

### 1.1.1 ENVIRONMENT

1. Temperature Range: $10^{\circ} \mathrm{C}$ to $32^{\circ} \mathrm{C}\left(50^{\circ} \mathrm{F}\right.$ to $\left.89.6^{\circ} \mathrm{F}\right)$
2. Humidity Range: $15 \%$ to $80 \%$ RH
3. Ambient Illumination: Less than 2,000 lux (do not expose to direct sunlight)
4. Ventilation: 3 times/hr/person or more
5. Avoid exposing the machine to sudden temperature changes, which include:
1) Direct cool air from an air conditioner
2) Direct heat from a heater
6. Avoid installing the machine in areas that might be exposed to corrosive gas.
7. Install the machine at a location lower than $2,500 \mathrm{~m}(8,200 \mathrm{ft}$.) above sea level.
8. Install the machine on a strong, level base. (Inclination on any side must be no more than 5 mm .)
9. Avoid installing the machine in areas that may be subjected to strong vibration.

### 1.1.2 MACHINE LEVEL

Front to back: Within $5 \mathrm{~mm}(0.2 \mathrm{C})$
Right to left: Within 5 mm (0.2")

### 1.1.3 MACHINE SPACE REQUIREMENT

Place the machine near the power source, providing clearance as shown.


A: Over 460 mm (18")
B: Over 100 mm (4")
C: Over 550 mm (22")
D: Over 700 mm (28")


### 1.1.4 POWER REQUIREMENTS

## . CAUTION

1. Insert firmly the plug in the outlet.
2. Avoid using an outlet extension plug or cord.
3. Ground the machine.
4. Input voltage level: $120 \mathrm{~V}, 60 \mathrm{~Hz}$ : More than 10 A
5. Permissible voltage fluctuation: $\pm 10 \%$
6. Do not put or place anything on the power cord.

### 1.2 OPTIONAL UNIT COMBINATIONS

| Item <br> No. | Options <br> 1 | PFU (1 Tray) | Alternative |
| :---: | :--- | :--- | :--- |

NOTE: Two memory DIMMs (up to 384 MB ) can be installed.


### 1.3 INSTALLATION FLOW CHART

The following flow chart shows how to install the optional units more efficiently.


Two-tray Finisher: Needs the duplex unit, HDD or at least 128 MB of memory, and a paper tray unit or LCT.
Punch Unit: $\quad$ Needs the finisher.
IEEE1394 Board: Needs the memory DIMM.

### 1.4 MACHINE INSTALLATION

Refer to the Operating Instructions for details.
If the customer has a service contract, change the settings of the following SP modes depending on the contract type.

| Item | SP No. | Function | Default |
| :---: | :---: | :---: | :---: |
| Meter charge | SP5-930-1 | Specifies whether the meter charge mode is enabled or disabled. <br> Meter charge mode enabled: <br> - The Counter menu appears immediately after the Menu key is pressed. <br> - The counter type selected by the counting method (SP5-045-1) can be displayed with the Counter menu. <br> - The counter values can also be printed with the Counter menu. <br> - The selected counter starts from a negative number. <br> Meter charge mode disabled: <br> - The Counter menu is not displayed. <br> - The total counter starts from 0. | Off |
| Counting method | SP5-045-1 | Specifies whether the counting method used in meter charge mode is based on developments or prints. <br> Important: <br> This SP can only be done before the negative counters are reset with SP7-825-001 | Developments |
| A3/11" x 17" double counting | SP5-104-1 | Specifies whether the counter is doubled for $A 3 / 11^{\prime \prime} \times 17^{\prime \prime}$ paper. | No: Single counting |
| PM warning display 1 | SP5-930-3 | Specifies whether the PM warning for PCUs and development units is displayed when the replacement time arrives. <br> Type 1: Displayed <br> Type 2: Not displayed | Type 1 |
| PM warning display 2 | $\begin{gathered} \text { SP5-930-4 } \\ \text { to } \\ \text { SP5-930-5 } \\ \hline \end{gathered}$ | Specifies whether the PM warning for the paper feed roller and transfer unit is displayed. | Off: |
| Fax No. setting | SP5-812-2 | Programs the service station fax number. <br> The number is printed on the counter list when the meter charge mode is selected, so that the user can fax the counter data to the service station. |  |


| Item | SP No. | Function | Default |
| :---: | :---: | :--- | :---: |
| Counter reset | SP7-825-1 | Resets the counters to 0. <br> Important: This must be done at <br> installation after all the above settings <br> have been finished. The negative <br> counters used in meter charge mode <br> will be reset to zero. |  |

NOTE: 1) The default setting for this machine is meter-charge mode off.
2) The meter-charge counter cannot be reset.

### 1.5 OPTIONAL UNIT INSTALLATION

### 1.5.1 LIST OF OPTIONS

The available options are listed below. The installation procedure for all the options (except the punch unit) can be found in the Set Up Guide. The installation procedure for the punch kit is on the following page

- Paper Feed Unit (500 sheets x 1)
- Paper Feed Unit (500 sheets x 2 )
- Large Capacity Tray
- Two-tray Finisher
- Punch Unit
- Four-bin Mailbox
- DIMM Memory (64/128/256 MB)
- IEEE1394 Board
- HDD
- NVRAM


## Note for Transporting the Machine

If it is difficult to slide the machine across the floor after installing the optional paper feed unit or LCT, remove the two stands with the following procedure.


1. Remove all trays in the optional paper feed unit or LCT.
2. Remove the front stand $[A]$ (
3. Remove the rear stand $[B]$ (

CAUTION: Reinstall the two stands in their original positions, or the machine might tip over when pulling out the paper trays and so on.

## OPTIONAL UNIT INSTALLATION

1.5.2 PUNCH UNIT INSTALLATION
Accessory Check
Check the quantity and condition of the accessories in the box against the followinglist:
Description Q'ty

1. Punch unit ..... 1
2. Sensor arm ..... 1
3. Hopper ..... 1
4. Step screw ..... 1
5. Spring ..... 1
6. Spacer (2 mm) ..... 1
7. Spacer (1 mm) ..... 1
8. Tapping screw ..... 1
9. Tapping screw ..... 2

## Installation Procedure


[B]

## $\triangle$ CAUTION

Switch off the main machine and unplug its power cord. If the two-tray finisher is installed, disconnect it and pull it away from the machine.

1. Unpack the punch unit and remove all tape and shipping retainers.
2. Open the front door and remove the rear cover $[A]$ ( $\hat{\xi} \times 4$ ).
3. Remove the bracket $[B]\left(\mathcal{E}^{2} \times 2\right)$ and paper guide $[C](\mathbb{\xi} \times 1)$.

4. Remove the hopper cover $[A]\left(\hat{\xi^{2}} \times 2\right)$.
5. Install the sensor bracket $[B]$ (stepped $\times 1$ ).
6. Install the spring [C].
7. Install the 2 mm spacer [D].
8. Install the punch unit [E] (

9. Connect the harnesses $[A]$ and clamp them as shown.
10. Slide in the hopper [B].
11. Fasten the two 1 mm spacers [C] to the rear frame for future adjustment.

NOTE: The spacers are used to adjust the horizontal positioning of the punch holes.
12. Reassemble the finisher and check the punch operation.

## PREVENTIVE MAINTENANCE

## 2. PREVENTIVE MAINTENANCE

### 2.1 USER MAINTENANCE

The following maintenance kits are available for the customer to do PM.

| Type A | Color (C/M/Y) PCU | 50 KP |
| :--- | :--- | ---: |
| Type B | Color (C/M/Y) Development Unit | 100 KP |
| Type C | Fusing Unit | 100 KP |
| Type D | Black Development Unit / Dust Filter | 100 KP |
| Type E | Waste Toner Bottle | 50 KP |
| Type F | Black PCU | 50 KP |
| Type G | Oil Supply Unit | 20 KP |
| Type H | Paper Feed Rollers | 150 KP |

Chart: A4(LT)/5\%
Mode: 5 prints/job
Environment: Normal temperature and humidity
Yield may change depending on circumstances and print conditions.
When the machine's default settings are used, an error message is displayed when a maintenance counter reaches the value in the PM table below, except for the items in maintenance kit H .

NOTE: To have the machine display the message for maintenance kit H also, set SP5-930-4 to 1.

After the user replaces the items in a maintenance kit, the machine automatically resets the counter for this maintenance kit, except for the items in kit H .
NOTE: Except for the items in kit H, the machine can automatically detect when new items have been installed.

The machine stops when the counters for parts in maintenance kits $C, E$ and $G$ reach the replacement value in the following table.
NOTE: To have the machine display the alert only for maintenance kits C , E , and G, set SP5-930-3 to 0 .

## USER MAINTENANCE

Symbol key: C: Clean, R: Replace, L: Lubricate, I: Inspect
Main Unit

| Item | 20K | 50K | 100K | 150K | EM | Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Black PCU |  | R |  |  |  | Included in maintenance kit F |
| Color (Y/M/C) PCU |  | R |  |  |  | Included in maintenance kit A |
| Black Development Unit |  |  |  | R |  | Included in maintenance kit D |
| Color (C/M/Y) Development Unit |  |  |  | R |  | Included in maintenance kit B |
| Fusing Unit Oil Supply Unit | R |  | R |  |  | Included in maintenance kit C Included in maintenance kit G |
| Waste Toner Bottle |  | R |  |  |  | Included in maintenance kit E |
| Dust Filter |  |  |  | R |  | Included in maintenance kit D |
| Pick-up Roller |  |  |  | R |  | Included in maintenance kit H |
| Feed Roller |  |  |  | R |  | Included in maintenance kit H |
| Separation Roller |  |  |  | R |  | Included in maintenance kit H |

## Punch Kit

| Item | 10K |  |  |  | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| Chads | 1 |  |  |  |  | Discard chads. |

### 2.2 SERVICE MAINTENANCE

NOTE: After replacing the transfer unit, make sure to reset the maintenance counter using SP7-804-16 and 7-804-27.
After replacing paper feed rollers, reset the maintenance counters for these also: By-pass tray (7-804-10), Tray 1 (7-804-11), Tray 2 (7-804-12), Tray 3/LCT (7-804-13), Tray 4 (7-804-14)

Symbol key: C: Clean, R: Replace, L: Lubricate, I: Inspect

## Main unit

| Item | 20K | 50 K | 100 K | 150 K | $1,000 \mathrm{~K}$ | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Transfer Unit |  |  |  |  | R |  |  |
| By-pass Feed Roller |  |  |  | R |  |  |  |
| By-pass Pick-up Roller |  |  |  | R |  |  |  |
| By-pass Separation Roller |  |  |  | R |  |  |  |

One-tray Paper Feed Unit (500 sheets x 1)

| Item | $\mathbf{2 0 K}$ | 50 K | $\mathbf{1 0 0 K}$ | 150 K | $\mathbf{1 , 0 0 0 K}$ | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Relay Roller |  |  |  |  |  | C | Damp cloth |
| Bottom Plate Pad |  |  |  |  |  | C | Damp cloth |

Two-tray Paper Feed Unit (500 sheets x 2)

| Item | 20 K | 50 K | 100 K | 150 K | $1,000 \mathrm{~K}$ | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Relay Roller |  |  |  |  |  | C | Damp cloth |
| Bottom Plate Pad |  |  |  |  |  | C | Damp cloth |

LCT (2000 sheets)

| Item | $\mathbf{2 0 K}$ | 50 K | 100 K | 150 K | $1,000 \mathrm{~K}$ | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Relay Roller |  |  |  |  |  | C | Damp cloth |
| Bottom Plate Pad |  |  |  |  |  | C | Damp cloth |

## Two-tray Finisher

| Items | $\mathbf{2 0 K}$ | 50 K | 100 K | 150 K | $\mathbf{1 , 0 0 0 K}$ | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :--- |
| Rollers |  |  |  |  |  | C | Damp cloth |
| Discharge Brush |  |  |  |  |  | C | Dry cloth |
| Sensors |  |  |  |  |  | C | Blower brush |
| Jogger Fences |  |  |  |  |  | I | Replace if required. |

## Four-bin Mailbox

| Item | 20 K | 50 K | 100 K | 150 K | $1,000 \mathrm{~K}$ | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Rollers |  |  |  |  |  | C | Damp cloth |
| Tray Paper Sensors |  |  |  |  |  | C | Blower blush or dry <br> cloth |

REPLACEMENT AND ADJUSTMENT

## 3. REPLACEMENT AND ADJUSTMENT

| $\triangle$ CAUTION |
| :--- |
| Turn off the main switch and unplug the machine before beginning any of <br> the procedures in this section. |

NOTE: This manual uses the following symbols.

- : See or refer to
刍: Screw
§川ll : Connector
(3) : Clip ring
(6) E ring


### 3.1 SPECIAL TOOLS

| Part Number | Part Name | Q'ty |
| :---: | :--- | :---: |
| A2309352 | Flash Memory Card - 4MB | 1 |
| G0219350 | Loop-back connector - Parallel | 1 |

### 3.2 IMAGE ADJUSTMENT

### 3.2.1 REGISTRATION

## Image Area

The image area shown in the illustration must be accurate. So make sure that the registration is within the adjustment standard range as described below.


## Leading Edge

Adjusts the leading edge registration for each paper type and process line speed.

## Side to Side

Adjusts the side to side registration for each paper feed station.
NOTE: The side to side registration for the optional paper feed unit, LCT, and duplex unit can be adjusted with SP mode or with the user tools (Maintenance menu).

## Adjustment Standard

- Leading edge (sub-scan direction): $3 \pm 0 \mathrm{~mm}$
- Side to side (main-scan direction): $2 \pm 0 \mathrm{~mm}$


## Paper Registration Standard

The registration in both main and sub-scan direction may fluctuate within the following tolerance.

## 1st side

- Sub-scan direction: $0 \pm 1.5 \mathrm{~mm}$
- Main-scan direction: $0 \pm 2 \mathrm{~mm}$


## 2nd side in duplex

- Sub-scan direction: $0 \pm 3 \mathrm{~mm}$
- Main-scan direction: $0 \pm 4 \mathrm{~mm}$


## Adjustment Procedure

1. Enter SP mode and access SP5-997.
2. Print out the pattern (14: 1-dot trimming pattern) with SP5-997.

NOTE: Registration may change slightly print by print as shown above.
Therefore print a few pages of the trimming pattern for step 3 and 4.
Average the leading edge and side-to-side registration values and adjust each SP mode accordingly.
3. Perform the leading edge registration adjustment.

1) Check the leading edge registration and adjust it with SP1-001.
2) Select the adjustment conditions (paper type and process line speed).
3) Input the value then press the [Escape] key.
4) Check the leading edge adjustment by generating the trim pattern.
4. Perform the side to side registration adjustment.
1) Check the side to side registration and adjust it with SP1-002.
2) Select the adjustment conditions (paper feed station).
3) Input the value then press the [Escape] key.
4) Check the side to side adjustment by generating the trim pattern.

### 3.2.2 COLOR REGISTRATION

## Line Position Adjustment

Normally, the automatic line position adjustment is executed under a specified condition to optimize the color prints. If a color registration shifts, execute "Auto Adjust" with the user tools (Maintenance menu - Color registration) or SP5-993-2 to do the forced line position adjustment. In addition, it is recommended to perform the line position adjustment under the following conditions:

- After transporting or moving the printer (if printers are pre-installed at the workshop and transported to the user location, forced line position adjustment should be done after printer installation is completed at the user location.)
- When opening the drum positioning plate
- When removing or replacing the motors, clutches, and/or gears related to the drum/development/transfer sections
- When removing or replacing the transfer belt or laser optical housing unit


## Adjustment for Line Speed of Fusing Unit

Optimize the line speed for the fusing unit when the color registration shifts more on the trailing edge compared with that on the leading edge, even after line position adjustment is executed. Adjust the speed of development motor-K with the following user tool in the Maintenance menu.
"Menu/Maintenance/Color Regist./Fuser Adjust/Custom Adjust"
Refer to Maintenance Guide 1 of the Operating Instructions for how to adjust this.

### 3.2.3 PRINTER GAMMA

NOTE: Normally, the printer gamma is enough to adjust the color balance to archive the optimum print output. The gamma correction is only required for fine-tuning to meet the user requirements.

## Adjustment Overview

Make the gradation scales on the printout smooth from the highlight to the shadow density. Adjust the CMY gradation scale at the top of the chart by balancing the density of the C, M, and Y gradation scales - the CMY gray scale should change smoothly from minimum to maximum, and there should be no coloration.
For each color, you can adjust 15 points between 0 (lowest density) and 255 (highest density).
The gradation scales marked 'Default Value' are printed according to the default gamma settings. The gamma adjustment changes the densities at the adjustable points in the gradation scale. The gradation scale marked "Current Value" shows the current settings.

During the adjustment procedure, compare the "Current Value" gradation scale with the 'Default Value'. Select the density for each of the 15 adjustable points, excluding points 0 and 255, from the 'Default Value' gradation scale.
The NVRAM holds three printer gamma settings, those saved this time (Current), those saved in the preceding adjustment (Previous), and the factory settings (Factory).

## Adjustment Procedure

1. Enter SP mode.
2. Select "1.Service".
3. Select "Data Recall" and load the settings that will serve as the base for the adjustment.
4. Select "Mode Selection", and select the print mode that you are going to adjust.
5. To review the image quality for these settings, choose "Test Page" to print out a color calibration test sheet.
6. Select "Gamma Adj.".
7. Adjust the color density at each of the 15 points for a color (CMY and K).
8. When the density setting is complete for all colors, print out a color calibration test sheet again and make sure that the gradation scale for each printed color is smooth and that the CMY gradation scale is gray. Repeat the adjustment if there is an anomaly.
9. If the adjustment results prove satisfactory, execute "Data Save".

### 3.3 EXTERIOR COVERS

### 3.3.1 REAR COVER AND UPPER REAR COVER

1. Rear cover $[A]$ (
2. Remove the optional mailbox if it is installed.
3. Upper exit cover [B] (1 hook), if the optional mailbox is not installed.
4. Open the upper right cover [C].
5. Upper rear cover [D] (会 $\times 4$ )


Replacement
and
Adjustment

### 3.3.2 PAPER EXIT TRAY

1. Paper exit tray $[A](\hat{\xi} \times 2)$

### 3.3.3 UPPER RIGHT COVER

1. Right cover $[A]\left({ }_{\xi} \times 2\right)$

NOTE: To loosen the screws, close the upper right cover; to remove the right cover, open the upper right cover.
2. Upper right cover [B]


## EXTERIOR COVERS

### 3.3.4 FRONT COVER

1. Front cover [A] (2 pins)


### 3.3.5 LEFT COVER AND REAR LEFT COVER

1. Remove the optional finisher from the printer if it is installed.
2. Remove the optional duplex inverter unit if it is installed.
3. Connector cover [A], if the optional duplex unit is not installed
4. Left cover $[B](\hat{\xi} \times 6)$

5. Open the left door [C].
6. Rear left cover [D] (臽 x 3)
[D]


### 3.3.6 UPPER LEFT COVER AND OPERATION PANEL

1. Open the front cover.
2. Open the upper light cover
3. Operation panel $[A](\hat{E} \times 2$, 気 $\mathrm{El} \times 2,2$ hooks)
4. Upper left cover $[B]$ ( $\times 2,1$ hook)


### 3.4 LASER OPTICS

## \. WARNING <br> Turn off the main switch and unplug the machine before beginning any of the procedures in this section. Laser beams can cause serious eye injury.

### 3.4.1 CAUTION DECAL LOCATIONS

Caution decals are placed as shown below.


## WARNING

Be sure to turn off the main switch and disconnect the power plug from the power outlet before beginning any disassembly or adjustment of the laser unit. This printer uses a class IIIb laser beam with a wavelength of 655 nm and an output of 7 mW . The laser can cause serious eye injury.

### 3.4.2 LASER OPTICS HOUSING UNIT

1. Rear cover ( 3.3 EXTERIOR COVERS)
2. Upper rear cover ( -3.3 EXTERIOR COVERS)
3. Paper exit tray (-3.3 EXTERIOR COVERS)
4. Right cover ( -3.3 EXTERIOR COVERS)
5. Securing screws for the toner supply unit [A] (鲁 x 4)
6. Securing screws for the laser optics housing unit $[B]$ ( $\hat{\xi}^{3} \times 2$ )

7. Hold the toner supply unit [C] up (1). Then, lower the unit (2).
NOTE: The pin [D] for the front and rear shafts holds the toner supply unit.

8. Connector cover $[E]\left(\hat{S}^{3} \times 1\right)$
9. Four flat cables [F]
10. Connector [G]

[G]
11. Flat cable bracket [G] ( $\hat{\left.\xi^{2} \times 1\right)}$
12. Cable (clamps $[\mathrm{H}]$ )


## 13. Duct [I]

14. Laser optics housing unit (

NOTE: Hold the unit with both hands and slowly lift up.
15. After reinstalling the laser optics housing unit, do the adjustments ( the procedures on the following page).

NOTE: When pulling the laser optics housing unit up, make sure that the flat cables from the laser diode
 board are not caught by the brackets. If you roughly remove the unit without paying attention to this point, the cables will be caught by bracket and the laser diode board may be damaged.
To ensure that the unit is removed carefully, remove the unit by placing a sheet of paper between the laser optic housing unit and the machine rear frame, in order to prevent the cables from being caught by the brackets.

After installing the laser optics housing unit, do forced line position adjustment (SP5-993-002 or 'Maintenance - Color Registration - Auto Adjust' in User Program mode).

## Adjustments after Replacing the Laser Optics Housing Unit

1. Enter SP mode.
2. Input the values printed on three decals on the new laser optics housing unit into the following SPs. Each decal contains two values.

|  | Value on the left | Value on the right | Function |
| :--- | :---: | :---: | :--- |
| Decal 1 | SP2-109-3 | SP2-109-2 | Laser beam pitch |
| Decal 2 | SP2-994-4 | SP2-994-3 | Main-scan registration <br> correction for black and cyan |
| Decal 3 | SP2-994-2 | SP2-994-1 | Main-scan registration <br> correction for magenta and <br> yellow |


3. Print out the following test pattern (17: cross-stitch main-scan) with SP5-997.
4. Check these test patterns. If the laser beam pitch is not correct, vertical black strips seem to appear.

- Cross-stitch pattern: The thin lines should be of uniform thickness (no striping effect should appear on the printout).

5. Adjust the laser beam pitch values in SP2-109-2 and -3 until the printout is correct, as shown below.

6. Execute SP5-993-2 or "Auto Adjust" with the Maintenance menu in the user tools.

## 3．4．3 POLYGON MIRROR MOTOR

1．Laser optics housing unit（ 3．1．2 LASER OPTICS HOUSING UNIT）
2．Cover $[A]\left(\mathcal{S}^{2} \times 4\right)$
3．Polygon mirror motor $[B]$（ $\times 4$ and （鳥 x 1）


## 3．4．4 LASER SYNCHRONIZING DETECTOR BOARDS

1．Laser optics housing unit（ 3．1．2
LASER OPTICS HOUSING UNIT）
2．Synchronizing detector boards［A］ （臽 $\times 1$ ，気 ${ }^{\|} \times 2$ ）


### 3.5 PCU AND DEVELOPMENT UNIT

NOTE: Do not touch the PCU development drum. Do not let any metal object touch the PCU development sleeve.

1. Open the front cover $[A]$.
2. To raise the drum positioning plate $[B]$, loosen the 2 screws.
3. Turn the release lever [C] counterclockwise.

4. Pull the required development unit [D] out.
5. Install a new development unit.
6. Check that the development units are installed in the proper color order (black $\rightarrow$ yellow $\rightarrow$ cyan $\rightarrow$ magenta moving from left to right).
NOTE: When the main switch is turned on, the newly installed development units are automatically initialized.

7. Release the lever and pull the PCU [E] out until the handle appears.
8. Grasp the handle [F] and pull the PCU out of the machine.

[F]

## PAPER FEED

### 3.6 PAPER FEED

### 3.6.1 PICK-UP, FEED, AND SEPARATION ROLLERS

## Tray 1 and Tray 2

1. Tray 1 and Tray 2
2. Pick-up roller [A] (1 hook)
3. Feed roller $[B]$ ( ( $35 \times 1$ )
4. Separation roller [C] ( ( 3$) \times 1$ )


## By-pass Tray

1. Open the right door.
2. By-pass tray cover $[A]$ ( 1 hook, $\times 1$ )
3. Raise the paper end sensor actuator.
4. Pick-up roller [B] (1 hook)

5. Feed roller [C] ( (3) $\times 1$ )
6. Separation roller [D] ( ( 3 ) $\times 1$ )


### 3.6.2 PAPER WIDTH DETECTION BOARD



1. Open the by-pass tray.
2. Center the side fences $[A]$.
3. By-pass tray cover $[B]$ ( $\hat{\xi}^{(1)} \times 2,2$ hooks)
4. There is a square hole [C] on each side of the tray. Insert a screwdriver into each of the holes.
5. Paper width detection board $[D]\left(\mathcal{F}^{(1)} \times 1\right.$, 氟 $\left.\times 1\right)$

### 3.6.3 VERTICAL TRANSPORT SENSOR



1. Open the right door.
2. Vertical transport cover $[A]\left(\mathcal{E}^{3} \times 4\right)$
3. Vertical transport sensor $[B](E$ 鳥 $x 1$ )

## PAPER FEED

### 3.6.4 RIGHT DOOR UNIT



1. Rear cover ( 3.3 EXTERIOR COVERS)
2. Upper rear cover (-3.3 EXTERIOR COVERS)
3. Upper right cover (-3.3 EXTERIOR COVERS)
4. Right rear cover $[A](\hat{\xi} \times 4)$
5. Open the right door.
6. Lift the vertical transport unit $[B]$ to remove it from its hinges ( $\mathrm{E}_{\mathrm{C}}^{\mathrm{Cl}} \times 3$, (3) $\times 1$ ).

## 3．6．5 REGISTRATION SENSOR AND RELAY SENSOR



1．Right door unit（ 3．3．4 RIGHT DOOR UNIT）
2．Registration guide $[\mathrm{A}]\left(\mathcal{E}^{2} \times 2\right)$
3．Registration sensor $[B]\left(\hat{\xi}^{3} \times 2, ~ E \# N 1\right)$
4．Relay sensor［C］（ $⿷ 匚 一 亅 ⿻ 川 ⿲ 丶 丶 丶 l y^{\text {x }} 1$ ）

## 3．6．6 PAPER FEED CLUTCHES

1．Paper Trays
2．Rear cover（－3．3 EXTERIOR COVERS）
3．Swing out the high voltage supply unit（－3．6．2 MOVING THE HIGH VOLTAGE SUPPLY UNIT－C，B OUT OF THE WAY）．
4．Clutch holder $[\mathrm{A}]$（ $\mathrm{B}^{\mathrm{B}} \times 2,1$ bearing $)$
5．Paper feed clutch for tray $1[\mathrm{~B}](\mathrm{E} \|$ x 1 ）

6．Clutch holder［C］（
7．Paper feed clutch for tray 2 ［D］（E\＃
 x 1 ）

## PAPER FEED

### 3.6.7 BY-PASS FEED CLUTCH

1. Right door unit (-3.3.4 RIGHT DOOR UNIT)
2. By-pass tray cover $[A](\hat{\xi} \times 1$, 1 hook)
3. Loosen the screw on the right door latch.
4. Turn the latch the opposite $[\mathrm{C}]$ direction.
5. Upper guide plate $[B](\underset{\xi}{(1)} \times 4)$
6. Support plate [C] ( $\& \times 2$ )
7. Relay gear [D] (1 hook)

8. By-pass feed clutch $[\mathrm{E}](\mathrm{E} \| \mathrm{l}$ x 1)

### 3.6.8 TRAY LIFT MOTOR



1. Rear cover ( -3.3 EXTERIOR COVERS)
2. Swing out the high voltage supply unit. (3.6.2 MOVING THE HIGH VOLTAGE SUPPLY UNIT - C, B OUT OF THE WAY)


### 3.7 TRANSFER AND PAPER TRANSPORT UNIT

### 3.7.1 TRANSFER UNIT

NOTE: When removing or installing the transfer unit, grasp the central areas of the front and rear frame. Do not touch the transfer belt [C]. Do not damage the entrance mylar [D].


1. Transfer unit lock bracket $[C]\left(\begin{array}{l}(\mathcal{B}\end{array} \times 1\right)$
2. Turn the release lever counterclockwise. ( -3.5 PCU AND DEVELOPMENT UNIT)
3. Pull out the transfer unit [D] until the entire unit is visible.
4. Grasp the transfer unit grips as shown above. Lift the unit to remove it.

NOTE: Grasp the front grip. Use caution not to damage the actuator on the rear.

After replacing the transfer unit:

- Execute SP3-920-5 (refresh mode),
- Execute line position adjustment (SP5-993-002 or "Auto Adjust" in the user program mode)
- Print the 1-dot grid pattern on $\mathrm{A} 3 / 11$ "x17" paper and check the color shift level ( 4.4.3 Color Shift After Transfer Unit Replacement).

[E]
[D]


NOTE: To minimize the amount of color shift, the position of the drive gears is controlled at the factory, to stabilize the rotation of the gears. Before installing the transfer unit, adjust the position of the gears according to the procdure below.

1) Rotate the transfer unit cleaning drive gear [A] counterclockwise until the mark $[\mathrm{B}]$ on the transfer unit drive gear aligns horizontally with the gear shaft [C]. After adjusting the gear position, check the position of the mark, keeping your eyes at the same height as the mark. Rotate the cleaning drive gear [ A ] either clockwise or counterclockwise for fine position adjustment.
2) Rotate the transfer belt drive gear [D] on the transfer unit clockwise until the mark [E] on the gear and the centers of the shafts are on a line [F] which is parallel to the lower edge of the left bracket [G].

After replacing the transfer unit:

- Perform forced line position adjustment (SP5-993-002 or 'Maintenance menu Color Registration - Auto Adjust' in User Program mode),
- Print the 1-dot grid pattern on $\mathrm{A} 3 / 11$ "x17" paper and check the color shift level ( 4.4.3 Color Shift After Transfer Unit Replacement).


### 3.7.2 TRANSFER BELT CLEANING UNIT



1. Turn the release lever counterclockwise ( -3.2 PCU AND DEVELOPMENT UNIT).
2. Pull out the transfer unit until the entire unit is visible. ( 3.7.1 TRANSFER UNIT).
3. Transfer cleaning unit $[A]$ ( $\mathcal{E}^{2} \times 1,3$ pins).

NOTE: When reassembling, check that the transfer unit lock bracket ( 3.7.1 TRANSFER UNIT) is installed and that the transfer unit release lever is put back to the original position ( 3.5 PCU AND DEVELOPMENT UNIT).

After replacing the transfer belt cleaning unit, perform forced line position adjustment (SP5-993-002 or "Maintenance menu - Color registration - Auto Adjust' in User Program mode).

### 3.7.3 CLEANING BLADE AND CLEANING ROLLER



1. Transfer belt cleaning unit (3.7.2 TRANSFER BELT CLEANING UNIT)
2. Front gear $[A]$ ( $\S x 1,1$ bearing with the bearing holder with the bias terminal)
3. Rear gear $[\mathrm{B}]$ (1 hook, 1 bearing)
4. Cleaning bias roller [C]
5. Idle gear [D]
6. Bushings $[E][F]$ (1 spring for each)

NOTE: The front and rear bushings have different springs.
Front: a long, thin, silvery spring
Rear: a short, thick, black spring
7. Cleaning blade [G] (1 bearing)

After replacing the cleaning blade, perform forced line position adjustment (SP5-993-002 or 'Maintenance menu - Color registration - Auto Adjust' in User Program mode).

### 3.7.4 TRANSFER BELT

NOTE: Do not touch the transfer belt during handling. When replacing the belt, hold the belt at its end.


1. Transfer unit ( 3.7.1 TRANSFER UNIT)
2. Transfer cleaning unit (-3.7.2 TRANSFER BELT CLEANING UNIT)
3. Release lever $[A]\left(\hat{\xi^{2}} \times 1\right)$
4. $\hat{\xi}[B] \times 1$
5. Transfer exit guide [C] ( $\hat{\xi}^{(1)} \times 1,1$ step screw)

NOTE: Make sure that the grounding plate $[\mathrm{E}]$ is in the correct position when reinstalling the left bracket.

6. High voltage wire $[F](\hat{\beta} \times 1)$

NOTE: When reassembling, secure the screw while pressing the wire down to prevent it from touching the PCUs.
8. Wire contact [G]
9. Transfer entrance guide $[\mathrm{H}](\hat{\xi} \times 2)$
10. Grounding plate $[I](\hat{\xi} \times 1)$
11. Right bracket $[J](\hat{\xi} \times 1)$

## Reassembly

(1) Set the transfer entrance guide in position.
(2) Hold up the transfer entrance guide.
(3) Screw the transfer entrance guide into position.


12. Two tension springs $[\mathrm{K}][\mathrm{L}]$

CAUTION: Be careful that the springs do not jump out when removing or reinstalling.
13. Unhook the gear [M] (1 spacer, 1 bushing)
14. Raise the actuator [ N ] and remove the roller-holder plate $[\mathrm{O}]$ ( $\& \times 1,1$ bushing)

NOTE: The front and rear roller-holder plates are greased. Do not touch the grease. If the grease has been wiped off, apply grease G-501 or Barrierta S552R to the same place.
15. Transfer belt roller [P] (§ x 1, 1 bushing, 1 gear)

## Reassembly

(1) Set the left end of the spring.
(2) Pull the transfer belt roller to the right.
(3) Set the right end of the spring.
(4) Check that the spring is straight.
(5) Press the front end of the gear shaft to properly set the gear on the shaft.

16. Lay the transfer unit on its side. Grasp the upper end of the transfer belt and pull the transfer belt [Q] up and out.
17. When reinstalling the belt, check that the end with the belt-lot number comes to the rear side of the machine.


NOTE: 1) If the transfer charge brushes are dirty, clean them with a vacuum cleaner.
2) If the drive rollers are dirty, clean them with a damp cloth.
3) When reassembling, check that the connector $[R]$ is outside the transfer belt.

After replacing the transfer belt, perform forced line position adjustment (SP5-993002 or 'Maintenance menu - Color registration - Auto Adjust' in User Program mode).

### 3.7.5 OTHERS

## Front Plate

Normally, you do not have to remove the front plate [A]. If, however, the front plate is removed, make sure that projections [B] fit in the screw holes [C] when reassembling. If not, the transfer belt moves to the rear or front end.


## Grounding Spring

When reassembling the transfer unit, make sure that the grounding spring [D] is in the correct position. If the spring is out of position and not in contact with the front plate, high voltage leak may occur, causing a malfunction.

## Drive Gear and Left Drive Roller



Normally, you do not have to remove the drive gear [A], the left drive roller [B], and the timing belt [C]. If, however, any of these is removed, make sure that the drive gear mark [D] and the left drive roller mark [E] are positioned at the top when reassembling. If the gear and roller are not positioned as shown, this may cause the transfer belt speed to fluctuate slightly, resulting in color shifts.

### 3.8 FUSING

| $\triangle$ CAUTION |
| :--- |
| 1. Be careful when handling the fusing unit. It is very hot. |
| 2. Take care not to spill silicone oil. |

### 3.8.1 FUSING UNIT



1. Detach the finisher from the printer if it is installed.
2. Open the duplex inverter unit if it is installed.
3. Fusing unit [A]

After replacing the fusing unit, optimize the line speed for fusing unit by adjusting the speed of development motor-K with the Maintenance menu in the user tools "Menu/Maintenance/Color Regist./Fuser Adjust/At Unit Replace".
This mode is automatically required after the machine detects a new fusing unit is installed. Refer to Maintenance Guide 1 of the Operating Instructions for how to adjust this.

### 3.8.2 OIL SUPPLY UNIT



1. Detach the finisher from the printer if it is installed.
2. Open the duplex inverter unit if it is installed.
3. Fusing unit ( 3.8.1 FUSING UNIT)
4. Oil supply Unit [A]

### 3.8.3 UPPER COVER



1. Oil supply unit [A]
2. $\mathrm{Knob}[\mathrm{B}]\left(\begin{array}{l}\text { 企 } \times 1\end{array}\right)$
3. Oil unit separation lever [C] ( $\left(\mathbb{Z}^{2} \times 1\right)$
4. Upper cover [D] (Step screw $\times 1, \hat{(1)} \times 3$ )

FUSING

### 3.8.4 FUSING BELT UNIT



1. Upper oil supply/cleaning unit $[A]$ (

NOTE: When reassembling, secure 3 screws temporarily first. Then, tighten the screws in the following order $(1) \rightarrow$ (2) $\rightarrow$ (3) $)$. If the screws are not tightened in this order, the drive gears are not properly engaged, causing mechanical noise.

2. Lower paper guide plate $[B]$ (Step screw $\times 1$, $\times 1$ )

NOTE: When reassembling, insert the hook [C] into the lower cover groove [D]. Otherwise, the plate bends slightly and the pick-off pawls may damage the pressure roller. After reinstalling the plate, push the central portion [E] down to make sure that the plate is in position.

3. Pressure springs [E]
4. Belt tension springs [F][G]
5. 令 $\times 4[H]$

6. Pressure brackets [I]

NOTE: If you have difficulty removing the brackets, press down one of the places indicated by the arrows $[\mathrm{J}][\mathrm{K}]$.

7. Heating roller fusing lamp $[L]\left(\mathcal{S}^{2} \times 2\right)$

NOTE: 1) The voltage and wattage are etched on the lamp terminals.
2) The fusing unit provided as a maintenance kit has the detection board [M]. The unit that comes with the machine does not have this.

8. Fuse terminal $[\mathrm{N}](\underset{\xi}{\mathrm{E}} \times 1)$
9. Thermistor connector [O] ( $\mathrm{E}_{\mathrm{H}} \times 1$ )
10. Pull the fusing belt unit [P] up and remove it.

### 3.8.5 PRESSURE ROLLER



1. Fusing belt unit ( 3.8.4 FUSING BELT UNIT)
2. Paper entrance guide [A] (

NOTE: When adjustment is not necessary, secure the two screws in the outer positions. When adjustment is necessary, secure them in the inner positions. Do not place the entrance guide at the upper position, or a paper jam will occur.
3. Gear holder $[B]$ ( $\times 1$ )
4. Gear [C] (§×1)

NOTE: When reassembling, check that the protruding part of the gear faces the inside.
5. Fuse stay [D] ( $\hat{\xi}^{7} \times 1$ )
6. Thermistor bracket [E] ( $(\underset{\xi}{ } \times 1)$

7. Pressure roller fusing lamp $[F]\left(\mathcal{S}^{2} \times 1\right)$

FUSING

8. Pressure roller unit [G] ( ${ }^{〔} \times 4$ )

9. Pressure roller stoppers $[H][1]$ (
10. C rings [J][K]
11. Bearings [L][M]
12. Pressure roller [N]

### 3.8.6 PAPER EXIT



1. Paper exit cover ( 3.3 EXTERIOR COVERS)
2. Exit upper limit sensor cover $[A](\hat{\xi} \times 2)$
3. Exit upper limit sensor [B]
4. Paper exit sensor [C]

### 3.9 ELECTRICAL COMPONENTS

### 3.9.1 MOVING THE CONTROLLER BOX OUT OF THE WAY

[B]



1. Rear cover ( 3.3 EXTERIOR COVERS)
2. Connector cover $[A](\hat{Z} \times 1)$
3. Four flat cables [B]
4. Connector [C]
5. Swing out the controller box [D] ( $\hat{\beta}^{(1)} \times 4$ ).

NOTE: When the controller box is swung out, free-run tests can still be done. However, because the LD cables are disconnected, no output appears.

### 3.9.2 MOVING THE HIGH VOLTAGE SUPPLY UNIT - C, B OUT OF THE WAY

1. Rear cover ( 3.3 EXTERIOR COVERS)
2. Swing out the high voltage supply unit [A] (象 x 2).


### 3.9.3 CONTROLLER AND BCU

NOTE: After replacing the BCU or controller, remove the NVRAM on the old board and install it on the new board.

1. Controller $[\mathrm{A}]\left(\mathrm{K}^{2} \times 2\right)$
2. Option bracket $[B](\hat{\xi} \times 2)$
3. Rear cover [C] (-3.3 EXTERIOR COVERS)

4. Cover bracket $[\mathrm{D}]\left(\hat{\beta}^{3} \times 3\right)$
5. Inner bracket [E] ( ${ }^{(1)} \times 2$ )

6. Connector cover $[F]\left(\mathcal{E}^{7} \times 1\right)$
7. $\mathrm{BCU}[\mathrm{G}]\left(\mathrm{E}^{3} \times 8\right.$, $\mathrm{E}=\mathbb{E} \times 23$ )

NOTE: After replacing the BCU or controller, remove the NVRAM on the old board and install it on the new board. The total counter information is held on the NVRAM board. If the old NVRAM is not installed on the new controller board, the total counter information will be inaccurate. If the NVRAM on the old board is defective, replace the NVRAM ( 3.6.4 NVRAM
 REPLACEMENT PROCEDURE).

## ELECTRICAL COMPONENTS

### 3.9.4 NVRAM REPLACEMENT PROCEDURE

Make sure you have the SMC report (factory settings) that comes with the printer before beginning the following procedure

## NVRAM for BCU

The NVRAM board for the BCU is located at IC20 on the BCU.

1. Enter SP mode and print out the SMC reports with SP5-990 if possible.
2. Turn off the main switch and unplug the power cord.
3. Replace the NVRAM on the BCU and reassemble the machine.
4. Execute the RAM clear for engine settings with SP5-801-2.
5. Contact your supervisor to enter the machine's device number and destination code.
6. Reset the settings for meter charge with SP5-930-1 to -5.
7. Enter the SP mode changes at the factory and the field.

## NVRAM for Controller

For a detailed location of the NVRAM board for the controller, see section 6.10.2 BOARD LAYOUT.

1. Enter SP mode and print out the SMC reports with SP5-990 if possible.
2. Turn off the main switch and unplug the power cord.
3. Replace the NVRAM on the controller and reassemble the machine.
4. Execute the RAM clear for controller settings and counters with SP5-801-3, -8, -11, and SP7-808-1.
5. Reset the total counter to 0 (SP 7-825-1) if meter charge mode (SP 5-930-1) is enabled.
6. Enter the SP mode changes at the factory and the field.

## NVRAMs for both BCU and Controller

1. Enter SP mode and print out the SMC reports with SP5-990 if possible.
2. Turn off the main switch and unplug the power cord.
3. Replace the NVRAM on the BCU and the controller, and reassemble the machine.
4. Execute the RAM clear with SP5-801-1 and SP7-808-1.
5. Contact your supervisor to enter the machine's device number and destination code.
6. Reset the settings for meter charge with SP5-930-1 to -5.
7. Reset the total counter to 0 (SP 7-825-1) if meter charge mode (SP 5-930-1) is enabled.
8. Enter the SP mode changes at the factory and the field.

### 3.9.5 REMOVING THE HIGH VOLTAGE SUPPLY BOARD - C, B



1. Rear cover ( 3.3 EXTERIOR COVERS)


### 3.9.6 PSU



1. Left cover (-3.3 EXTERIOR COVERS)
2. PSU [A] (

NOTE: Check that the interlock switches on the PSU work normally after reinstalling the PSU (open/close the left and front doors).

### 3.10 DRIVE UNIT

### 3.10.1 REGISTRATION CLUTCH



1. Rear cover ( -3.3 EXTERIOR COVERS)
2. Swing out the controller box (-3.9.1 MOVING THE CONTROLLER BOX OUT OF THE WAY).
3. $K, C$, and $M$ drum gears with the flywheels $[A] \sim[C]$ and color drum motor flywheel [D] (\$ 1 for each)

NOTE: Do not separate the flywheels from the gears. The flywheels are secured with nuts and screws. The nuts will drop in the rear side of the machine if they are not secured properly.

4. Lower gear guide ( 3.10.3 DEVELOPMENT DRIVE MOTOR - CMY)
5. Registration clutch [I] (级 x1, 気 El 1)

## $\Rightarrow$ <br> 3.10.2 DEVELOPMENT CLUTCHES



1. Rear cover ( -3.3 EXTERIOR COVERS)
2. Swing out the controller box ( 3.9.1 MOVING THE CONTROLLER BOX OUT OF THE WAY).
3. $K, C$, and $M$ drum gears, with the flywheels ( 3.10.1 REGISTRATION CLUTCH)
4. Y drum gear ( $\ddagger \times 1)(-3.10 .1$ REGISTRATION CLUTCH)
5. Lower gear guide ( 3.10.3 DEVELOPMENT DRIVE MOTOR - CMY)

NOTE: To remove the B, Y, and C development clutches, you do not have to remove the lower gear guide.

## DRIVE UNIT

6. Development clutches $[A]\left(\hat{\xi} \times 1\right.$ for each, 気 $\mathbb{E l}^{(1)} \times 1$ for each


NOTE: When reassembling the machine, please route the development clutch cables as shown in the bottom half of the illustration, or problems will occur. If the cables are routed as shown in Case 1, the black and yellow development clutch cables are connected the other way around, causing an abnormal image (no black or yellow). If the cables are routed as shown in Case 2, the power lines for the clutches are connected incorrectly, causing damage to the BCU board.

### 3.10.3 DEVELOPMENT DRIVE MOTOR - CMY



1. Rear cover ( 3.3 EXTERIOR COVERS)
2. Upper gear guide $[\mathrm{A}](\hat{\xi} \times 4)$
3. Lower gear guide $[B](\hat{\xi} \times 5)$
4. Development clutches (3.7.2 DEVELOPMENT CLUTCHES)
5. Three gears $[C] \sim[E]$
6. Timing belt [F]

7. Four gear drive holders [G]~[J] (


8. Development drive motor - CMY [L] (

### 3.10.4 DRUM DRIVE MOTOR - CMY AND DRUM DRIVE MOTOR - K



1. Rear cover ( 3.3 EXTERIOR COVERS)
2. Development clutch securing plate ( 3.10.3 DEVELOPMENT DRIVE MOTOR - CMY)
3. Drum drive motor - CMY $[A](\hat{\xi} \times 2)$
4. Drum drive motor $-K[B](\hat{\xi} \times 2)$

### 3.10.5 DEVELOPMENT DRIVE MOTOR - K



1. Rear cover ( 3.3 EXTERIOR COVERS)
2. Upper rear cover ( 3.3 EXTERIOR COVERS)

3. Upper duct $[\mathrm{B}]\left(\begin{array}{c}\text { 雨 } \times 2)\end{array}\right.$

NOTE: If you have difficulty removing the duct, remove the right duct [C].

5. Development clutch securing plate (-3.10.3 DEVELOPMENT DRIVE MOTOR - CMY)
6. Development drive motor $-\mathrm{K}[\mathrm{C}]\left(\mathrm{F}^{\boldsymbol{\beta}} \times 4, \mathrm{E} \| \mathrm{\#} \times 1\right)$

## TROUBLESHOOTING

## 4. TROUBLESHOOTING

### 4.1 PROCESS CONTROL ERROR CONDITIONS

### 4.1.1 DEVELOPER INITIALIZATION RESULT

SP-3-005-006 (Developer Initialization Result)

| No. | Result | Description | Possible Causes | Action |
| :---: | :---: | :---: | :---: | :---: |
| 0 | Not performed | Developer initialization is not performed. | When initializing only the black developer, the initialization result becomes "1000". | When done in SP mode, do the developer initialization again. If the result is the same, reinstall the engine main firmware. <br> When done at unit replacement: <br> - Check if a new unit is installed <br> - Check if the unit detection system is working <br> - Check if SP2-223-001 (auto initialization at unit replacement) is enabled. |
| 1 | Successfully completed | Developer initialization is successfully completed. |  | - |
| 2 | Forced termination | Developer initialization was forcibly terminated. | A cover was opened or the main switch was turned off during the initialization. | When done in SP mode, do the developer initialization again. If the result is the same, reinstall the engine main firmware. <br> When done at unit replacement, turn the main switch off and on. |
| 3 | Vt error | Vt is less than 0.5 V and "Reset development unit" is displayed. | 1. Check if the drum stay is properly set and secured. <br> 2. Check if the development unit is properly set. <br> 3. If the problem is still the same, check the following: <br> - Poor connection of connectors <br> - TD sensor defective <br> - Harness damage <br> - BCU board failure <br> - Firmware problem (engine main or MUSIC) |  |

## PROCESS CONTROL ERROR CONDITIONS

| No. | Result | Description | Possible Causes | Action |
| :---: | :---: | :---: | :---: | :---: |
| 8 | Toner supply error | During toner fill-up mode, Vt does not reach the target value. | 1. Check if the toner cartridge is properly set. <br> 2. Check if the amount of toner left in the toner cartridge is insufficient. <br> 3. Check if toner is coagulated. (If yes, shake the toner cartridge well.) <br> 4. Check if the connectors of the following parts are properly set, and/or replace the parts. Toner attraction pump / Air Pump / Valves <br> 5. Check if the toner supply tube is bent, caught, or damaged. |  |
| 9 | Failure | Vt cannot be adjusted within 3.0 $\pm 0.1 \mathrm{~V}$. SC370-373 will be displayed. Turning the main switch off and on clears this SC code. | 1. Shielding tape is not removed. | 1. Remove the shielding tape to supply developer to the unit. |
|  |  |  | 2. Development unit is not firmly installed, causing poor connection of the TD sensor connector. | 2. Reinstall the development unit. |
|  |  |  | 3. TD sensor defective. | 3. Replace the development unit. |

NOTE: When the machine detects new development units, it automatically starts developer initialization. If an error other than Error 8 occurs, developer initialization is automatically resumed by opening and closing the front door or turning the main switch off and on.

### 4.1.2 PROCESS CONTROL SELF-CHECK RESULT

SP3-975-001 (Process Control Self-check Result)

| No. | Result | Description | Possible Causes | Action |
| :--- | :--- | :--- | :--- | :--- |
| 0 | Not <br> performed | Process control self- <br> check is not done. | Do the process control <br> self-check again. |  |
| 1 | Successfully <br> completed | Process control self- <br> check successfully <br> completed. | ID sensor <br> adjustment <br> error | Vsg cannot be <br> adjusted within $4.0 \pm$ <br> 0.5 V. |

### 4.1.3 LINE POSITION ADJUSTMENT RESULT

SP5-993-007 (Line Position Adjustment Result)

| No. | Result | Description | Note |
| :---: | :---: | :---: | :---: |
| 01 | Successfully completed | Data sampling was correctly done and line position adjustment was successfully completed. |  |
| 02 | Out of adjustment range (over $\pm 2 \mathrm{~mm}$ ) | The calculated result for line position correction is greater than $\pm 2 \mathrm{~mm}$. |  |
| 03 | Calculation Error | Distance between the lines is greater than $\pm 2 \mathrm{~mm}$. |  |
| 04 | Sampling Error | Data sampling cannot be done properly. |  |
| 05 | Descending slope error | The ascending or descending slope of the ID sensor signal wave is out of specification. | (See Note 1) |
| 06 | Ascending slope error |  | (See Note 1) |
| 07 | Pattern lines mismatch (less than 64 lines) | The detected number of pattern lines is less than 64. | (See Note 1) |
| 08 | Sampling time-out | Data sampling cannot be done within the allocated time. |  |
| 09 | Sampling start error | The start mark cannot be detected within the allocated time. |  |
| 10 | Pattern length mismatch | The pattern length is shorter or longer than specified. | (See Note 1) |
| 11 | Pattern lines mismatch (over 64 lines) | The detected number of pattern lines is over 64. |  |
| 12 | Magnification mismatch | The calculated magnification value does not match any data in the laser power frequency adjustment data table. |  |
| 13 | Toner condition | The machine is in the toner near-end or toner end condition. |  |
| 17 | Not executed | The machine is not ready to do the line position adjustment manually from the user menu. |  |
| 18 | Potential control error | Line position adjustment cannot be done due to failed potential control. |  |

Note 1: Concerning the error codes ( $05,06,07$ or 10 ) which stop sampling data when either the front or rear ID sensor detect an error, the machine may display the error code for both ID sensors in some cases.

Possible causes of errors in the line position adjustment

| Possible Cause |  | Possible Error Code | Action |
| :---: | :---: | :---: | :---: |
| 1 | The pattern does not reach the proper density. |  |  |
|  | 1. Dirty ID sensor (toner, dust, or foreign material) | $\begin{aligned} & 04,05,06,07, \\ & 08,09,10 \end{aligned}$ | 1. Clean the ID sensors. |
|  | 2. Incorrect toner density <br> Low: ID sensor cannot detect the pattern lines. <br> High: Lines may be partially blank due to improper toner density and/or paper transfer current. |  | 2. Correct the toner density. |
|  | 3. Incorrect transfer current |  | 3. Correct the transfer current. |
| 2 | The ID sensors are affected by electrical noise or dirt/damage on the transfer belt. |  |  |
|  | 1. Scratched or damaged OPC drum | $\begin{aligned} & 02,03,04,05, \\ & 06,10,11,12 \end{aligned}$ | 1. Replace PCU |
|  | 2. Scratched or damaged transfer belt |  | 2. Replace transfer belt |
|  | 3. Dirty transfer belt |  | 3. Clean or replace transfer belt |
|  | 4. High voltage leak in transfer unit |  | 4. Fix the high voltage leak |
|  | 5. Residual image on transfer belt |  | 5. Check transfer belt cleaning and clean the belt |
|  | 6. Toner dropped from development unit |  | 6. Clean the development unit and adjust the toner density |
|  | 7. Carrier dropped from development unit |  | 7. Clean the development unit and adjust the toner density |
| 3 | The transfer belt is covered with toner. |  |  |
|  | Development does not work properly. | All error codes | Check all units and high voltage cable connectors. |
| 4 | None of the patterns are developed. |  |  |
|  | Development does not work properly. | 09, 04 | Check all units and high voltage cable connectors. |
| 5 | Some of the patterns are not developed; |  |  |
|  | Development does not work properly. | 07, 08 | Check all units and high voltage cable connectors. |
| 6 | The machine is not in the condition to execute the line position adjustment; |  |  |
|  | The machine is in the toner near end or end condition. | 13 | Replenish toner. |
|  | The machine is not ready to do the line position adjustment manually from the user menu. | 17 | Wait until machine becomes the ready condition from the energy saver or auto off mode. |
|  | Line position adjustment cannot be done due to failed potential control. | 18 | Fix the problem causing the potential control error. |
| 7 | The MUSIC CPU is abnormal (1) |  |  |
|  | No error code is displayed. However, the machine keeps displaying "execution" on the screen. In addition, the green LED on the BICU stays on or off under the following condition. <br> 1. The MUSIC CPU resets due to electrical noise generated by a high voltage leak on a damaged OPC drum. | - | 1. Fix the bias leak and/or replace PCU |


| Possible Cause |  | Possible <br> Error Code |
| :--- | :--- | :--- |
| 8 | The MUSIC CPU is abnormal (2) | Action |
| No error code is displayed. However, <br> the machine keeps displaying <br> "execution" on the screen. <br> The green LED on the BICU keeps <br> blinking faintly (this is normal) even <br> under one of the following conditions. <br> 1.Poor connection between the <br> toner cartridge detection board <br> and the memory chip on the toner <br> cartridge <br> The memory chip on the toner <br> cartridge fails. <br> 2. | 1.Check the connection between <br> the detection board and memory <br> chip. | 2.Replace the toner cartridge. |

### 4.2 SERVICE CALL CONDITIONS

### 4.2.1 SUMMARY

There are 2 levels of service call conditions.

| Level | Definition | Reset Procedure |
| :---: | :--- | :--- |
| A | Fusing unit SCs displayed on the <br> operation panel. The machine is disabled. <br> The user cannot reset the SC. | Turn the main switch off then on <br> before entering SP mode. Reset <br> the SC (set SP5-810 to 1), then <br> turn the main switch off then on <br> again. |
| B | Turning the operation switch or main <br> power switch off then on resets the SC. <br> Displayed on the operation panel. Re- <br> displayed if they occurred after the main <br> power switch is turned on again. | Turn the operation switch or <br> main power switch off and on. |

All SCs are logged.

- The number of SC codes detected can be checked with SP7-902.
- Printing logging data (SP5-990-004) in SP mode can check the latest 10 SC codes detected and total counters when the SC code is detected.

NOTE: 1) If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.
2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.

## SC Classification

SC codes are classified by section as shown in the following table:

| Class 1 | Section | SC Code | Detailed section |
| :---: | :---: | :---: | :---: |
| 1XX | Scanning | 190 - | Unique for a specific model |
| 2XX | Laser exposure | 200 - | Polygon motor |
|  |  | 220- | Synchronization control |
|  |  | 230- | FGATE signal related |
|  |  | 240- | LD control |
|  |  | 260- | Magnification |
|  |  | 280 - | Unique for a specific model |
| $3 X X$ | Image development 1 | 300 - | Charge |
|  |  | 330- | Drum potential |
|  |  | 350 - | Development |
|  |  | 380 - | Unique for a specific model |
| 4XX | Image development 2 | 400 - | Image transfer |
|  |  | 420- | Paper separation |
|  |  | 430 - | Cleaning |
|  |  | 440 - | Around drum |
|  |  | 460- | Unit |
|  |  | 480 - | Others |
| 5XX | Paper feed / Fusing | 500 - | Paper feed |
|  |  | 515 - | Duplex |
|  |  | 520 - | Paper transport |

## SERVICE CALL CONDITIONS

| Class 1 | Section | SC Code | Detailed section |
| :---: | :---: | :---: | :---: |
| 5XX | Paper feed/ Fusing | 530 - | Fan motor |
|  |  | 540 - | Fusing |
|  |  | 560 - | Others |
|  |  | 570 - | Unique for a specific model |
| 6XX | Communication | 600 - | Electrical counters |
|  |  | 620 - | Mechanical counters |
|  |  | 630 - | Account control |
|  |  | 640 - | CSS |
|  |  | 650 - | Network |
|  |  | 670 - | Internal data processing |
|  |  | 680 - | Unique for a specific model |
| 7XX | Peripherals | 700 - | Original handling |
|  |  | 710 - |  |
|  |  | 730 - | Mail box |
|  |  | 740 - | Finisher |
|  |  | 750 - | Stapler (1) |
|  |  | 760 - | Stapler (2) |
|  |  | 780 - | Unique for a specific model |
| 8XX | Controller | 800 - | Error after ready condition |
|  |  | 820 - | Diagnostics error |
|  |  | 860 - | Hard disk |
|  |  | 880 - | Unique for a specific model |
| 9XX | Others | 900 - | Counter |
|  |  | 920 - | Memory |
|  |  | 990 - | Others |

### 4.3 SC TABLE

| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \text { Related } \\ \text { SCs } \\ \hline \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC195 | Serial Number Mismatch | - Serial number stored in the memory does not consist of the correct code. | - EEPROM defective <br> - BCU replaced without original EEPROM |  | Open the front cover and turn on the main switch. Check the serial number with SP5-811-002. <br> If the stored serial number is incorrect, contact your product specialist for details of how to solve the problem. |  |
| SC201 | Polygon motor error | - The polygon mirror motor does not reach the targeted operating speed within 15 seconds after turning on. <br> - The lock signal does not become low within 15 seconds after turning off the polygon motor. . | - Polygon mirror motor error <br> - Abnormal GAVD behavior <br> - Cable disconnection |  | 1. Turn the main switch off and on. <br> 2. Check the cables. <br> 3. Replace the polygon motor. |  |
| SC220 | Synch. detection signal error 1 220-001: Y <br> 220-002: M <br> 220-003: C <br> 220-004: K0 <br> 220-005: K1 | The front (for K\&Y) or rear (for C\&M) laser synchronizing detector board, which is used to determine the start timing of laser writing, does not send a signal while the polygon motor is operating normally and the LD is on. | - Disconnection of the cable between front (K\&Y) or rear (C\&M) synchronizing detector board and the LD unit <br> - Incorrect installation of front (K\&Y) or rear (C\&M) synchronizing detector board (the beam does not target the photo detector.) <br> - Defective LD unit <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the cable connection between front (for K\&Y) or rear (for C\&M) synchronizing detector board and the LD unit. <br> 3. Check or reinstall the front (for K\&Y) or rear (for C\&M) synchronizing detector board. <br> 4. Replace the front (for K\&Y) or rear (for C\&M) synchronizing detector board. <br> 5. Replace the LD unit. <br> 6. Replace the BCU. |  |

SC TABLE

| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 221 | Synch. detection signal error 2 $\begin{aligned} & 221-001: Y \\ & 221-002: M \\ & 221-003: C \\ & 221-004: K \end{aligned}$ | Main scan length detection is not properly completed ten consecutive times. <br> The front (for C\&M) or rear (for K\&Y) laser synchronizing detector boards are used for the main scan length detection, which automatically corrects the main-scan magnification. | - Damaged or disconnected cable between front (C\&M) or rear (K\&Y) laser synchronizing detector board and the LD unit <br> - Incorrect installation of front (C\&M) or rear (K\&Y) synchronizing detector board (the beam does not target the photo detector.) <br> - Defective front (C\&M) or rear (K\&Y) synchronizing detector board <br> - Defective LD unit |  | After doing any of the following, print ten jobs or more to see if the same SC code is displayed: <br> 1. Turn the main switch off and on. <br> 2. Check or replace the cable connecting front (for C\&M) or rear (for K\&Y) synchronizing detector board and the LD unit. <br> 3. Check or reinstall the front (for C\&M) or rear (for K\&Y) synchronizing detector board. <br> 4. Replace the front (for C\&M) or rear (for K\&Y) synchronizing detector board. <br> 5. Replace the LD unit. <br> 6. Replace the BCU. <br> If a synch. detector board cannot be replaced, do the following as a temporary measure: <br> - Disable main scan length detection (SP 2-919-001) |  |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 230 | $\begin{aligned} & \text { FGATE error } \\ & \text { 230-001: Y } \\ & \text { 230-002: M } \\ & \text { 230-003: C } \\ & 230-004: \text { K } \end{aligned}$ | The BCU generates the FGATE signal based on the registration sensor ON timing. Then, it sends the signal to the LD units. The LD units send a feedback signal to the BCU. When the LD units start emitting laser beams, the feedback signal changes from High to Low. <br> The SC code is generated when the BCU receives no feedback signal (stays High) from the LD unit 1 second after paper reaches the position where the laser should start writing. | - Poor connection between BCU and LD units <br> - Defective BCU <br> - Defective LD unit |  | 1. Turn the main switch off and on. <br> 2. Check the cables between the LD units and the BCU. <br> 3. Replace the LD unit. <br> 4. Replace the BCU. |  |
| SC 231 | FGATE timeout 231-001: $Y$ 231-002: M 231-003: C 231-004: K | When LD units emit laser beams to print a job, the feedback signal stays Low and becomes High after laser exposure for a page is completed. The SC code is detected in the following cases: <br> - When the feedback signal stays Low 7 seconds after completing the laser exposure, or <br> - When the feedback signal stays Low until the laser exposure timing for the next page in multi-page print mode. | - Poor connection between BCU and LD units <br> - Defective BCU <br> - Defective LD unit |  | 1. Turn the main switch off and on. <br> 2. Check the cables between the LD units and the BCU. <br> 3. Replace the LD unit. <br> 4. Replace the BCU. |  |

SC TABLE

| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 240 | $\begin{aligned} & \text { LD over } \\ & \text { 240-001: } \mathrm{Y} \\ & \text { 240-002: M } \\ & \text { 240-003: C } \\ & 240-004: \mathrm{K} \end{aligned}$ | The power supply for the LD unit exceeds 67 mA . | - LD worn out (current/light output characteristics have changed.) <br> - LD broken (short circuit) |  | 1. Turn the main switch off and on. <br> 2. Replace the LD unit. |  |
| SC 260 | LD HP sensor not switched on (for K only) | During homing, it takes more than five seconds to switch the HP sensor on (the sensor actuator does not cover the sensor). | - Defective motor <br> - Defective sensor <br> - Mechanical problem when switching the actuator <br> - Brown fuse (FU81) on the Power supply unit |  | 1. Turn the main switch off and on. <br> 2. Check the sensor actuator position of the LD positioning motor. <br> 3. Replace the LD positioning motor. <br> 4. Replace the LD home position sensor. <br> 5. Check and/or replace the PSU. |  |
| SC 261 | LD HP sensor not switched off (for K only) | After the laser beam pitch was changed, it takes more than five seconds for the HP sensor to switch off. | - Defective motor <br> - Defective sensor <br> - Mechanical problem when switching the actuator <br> - Brown fuse (FU81) on the Power supply unit |  | 1. Turn the main switch off and on. <br> 2. Check the sensor actuator position of the LD positioning motor. <br> 3. Replace the LD positioning motor. <br> 4. Replace the LD home position sensor. <br> 5. Check and/or replace the PSU. |  |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 285 | Line position adjustment (MUSIC) error | Line position adjustment fails three consecutive times. | - Pattern sampling error due to insufficient image density of patterns used for the adjustment <br> - Inconsistency in the sampling line position adjustment pattern due to dust on the pattern, damage to the OPC drum, damage or toner dropped on the transfer belt, or a dirty or defective ID sensor |  | 1. Turn the main switch off and on. <br> 2. Check and fix the problem that causes low image density. . <br> 3. Clean or replace the transfer belt and/or the ID sensor. <br> 4. Replace the PCU or clean the development unit that causes toner to drop on the transfer belt. |  |
| SC 370 | TD sensor [K]: Adjustment error | During the developer initialization, the output value of the TD sensor is without the adjustment range ( $3.0 \pm 0.1 \mathrm{~V}$ ). | - Poor connection (TD sensor outputs is less than 0.5 V .) <br> - Defective TD sensor |  | 1. Turn the main switch off and on. <br> 2. Reset the related color development unit. <br> 3. Replace the related color development unit. |  |
| SC 371 | TD sensor [Y]: Adjustment error |  |  |  |  |  |
| SC 372 | TD sensor [C]: Adjustment error |  |  |  |  |  |
| SC 373 | TD sensor [M] : Adjustment error |  |  |  |  |  |
| SC 374 | Vt error [K] | During the image development, Vt value is less than 0.5 V . | - Poor connection (TD sensor outputs is less than 0.5 V .) <br> - Defective TD sensor |  | 1. Turn the main switch off and on. <br> 2. Reset the related color development unit. <br> 3. Replace the related color development unit. |  |
| SC 375 | Vt error [Y] |  |  |  |  |  |
| SC 376 | Vt error [C] |  |  |  |  |  |
| SC 377 | Vt error [M] |  |  |  |  |  |

SC TABLE

| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 380 | Black development motor error | When the motor speed is within the target level, the motor sends a lock signal (High to Low at CN214-5) to the BCU. <br> SC380 is detected under the following conditions: <br> - The Lock signal stays High 2 seconds after the motor turns on. <br> - The Lock signal stays Low 2 seconds after the motor turns off. <br> - The Lock signal stays High for more than 2 seconds while the motor is on. | - Defective motor <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Replace the motor. <br> 3. Replace the BCU. |  |
| SC 381 | Color development motor error |  |  |  |  |  |
| SC 385 | ID sensor VSG adjustment error | Vsg is the out of adjustment range during a process control self-check. <br> Adjustment range: $4.0 \pm 0.5 \mathrm{~V}$ | - Defective ID sensor <br> - Dirty ID sensor <br> - ID sensor disconnected <br> - Dirty drum (cleaning incomplete) |  | 1. Turn the main switch off and on. <br> 2. Clean the ID sensor and adjacent parts. <br> 3. Check the drum cleaning condition. <br> 4. Check the ID sensor connector. <br> 5. Replace the ID sensor. |  |
| SC 386 | Development gamma error K | Any of the following conditions happens three consecutive | - Unsuitable toner density |  | 1. Turn the main switch off and on . <br> 2. Check the process control self-check |  |
| SC 387 | Development gamma error Y | times: <br> - When the development | - Toner supply mechanism problem |  | result (SP3-975). If the result is not " 1 ", fix the problem according to the |  |
| SC 388 | Development gamma error C | gamma is out of the following range: $0.3 \leq \gamma \geq 6.0$ | - Laser exposure problem <br> - Image transfer |  | table in section 4.1.2. <br> 3. Print a full color image by disabling SC detection (SP5-809-001) and |  |
| SC 389 | Development gamma error M | - When Vk is out of the following range: $-150 \mathrm{~V} \leq \mathrm{Vk} \geq 150 \mathrm{~V}$ <br> - Development gamma calculation error |  |  | check if the image quality is OK. If the image quality is not OK, fix the problem. Then, enable the SC detection again. |  |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 390 | Development Bias output error | The high voltage supply board (C/B) monitors the circuit and detects abnormal conditions such as a voltage leak or no output condition. If this happens, the high voltage supply board sends an error signal (High to Low at CN204A18) to the BCU. <br> The BCU monitors this signal every 2 ms and generates this SC code when the error condition occurs 250 consecutive times. | - Loose connection <br> - Defective power pack C/B output <br> - Damaged cable <br> - Defective development unit <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check if the harness and cables are properly connected. <br> 3. Disconnect the high voltage supply cables from the bias terminals on the high voltage supply board C/B. <br> Measure the DC voltage using a multi-meter. <br> - Replace the high voltage supply board if no voltage is supplied. <br> 4. If the result is OK at step 2, check if the high voltage supply cable or development unit is grounded. <br> - Replace the high voltage supply cable if it damages. <br> - Replace the development unit if it damages. <br> 5. Check the PWM signals are sent to the high voltage supplied board from the BCU. Replace the BCU or harness between the BCU and high voltage supply board if the voltage is 0. |  |
| $\begin{array}{\|l\|} \hline \text { SC 391- } \\ 01 \end{array}$ | Charge AC: output error 391-01: K 391-02: Y 391-03: M 391-04: C | The high voltage supply board sends the feedback signal (CN228-2 to 5; MCYK). The BCU monitors these feedback signals every 8 ms . If the average of the sampled data is not within the control target 30 consecutive times, this SC code is generated. | - Power pack disconnected <br> - Charge receptacle or terminal <br> - Defective PCU bias input terminal <br> - Incorrect power pack B/C output <br> - Damaged cable <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the connector. <br> 3. Check the PCU charge voltage input (the spring/conducting shaft) or replace the PCU. <br> 4. Replace the power pack B/C. <br> 5. Replace the cable. <br> 6. Replace the BCU. |  |

## SC TABLE

| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { SC 460- } \\ & 001 \end{aligned}$ | Thermistor 1 error (open circuit) | When the temperature detected by thermistor 1 , which is at the left (fusing unit) side of the laser optics unit, is less than $-30^{\circ} \mathrm{C}$ for 10 seconds consecutively, the BCU determines that the circuit is opened and displays this SC code.. | - Thermistor 1 defective <br> - Cable connection error <br> - BCU defect |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Replace the thermistor. <br> 4. Replace the BCU. |  |
| $\begin{aligned} & \text { SC 460- } \\ & 002 \end{aligned}$ | Thermistor 1 error (short circuit) | When the temperature detected by the thermistor 1 , which is at the left (fusing unit) side of the laser optics unit, is higher than $70^{\circ} \mathrm{C}$ for 10 seconds consecutively, the BCU determines that the circuit is shorted and displays this SC code | - Thermistor 1 defective <br> - Cable connection error <br> - BCU defect |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Replace the thermistor. <br> 4. Replace the BCU. |  |
| $\begin{aligned} & \text { SC 461- } \\ & 001 \end{aligned}$ | Thermistor 2 error (open circuit) | When the temperature detected by the thermistor 2, which is at the right (paper feed section) side of the laser optics unit, is less than $-30^{\circ} \mathrm{C}$ for 10 seconds consecutively, the BCU determines that the circuit is opened and displays this SC code. | - Thermistor 2 defective <br> - Cable connection error <br> - BCU defect |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Replace the thermistor. <br> 4. Replace the BCU. |  |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \hline \text { SC 461- } \\ & 002 \end{aligned}$ | Thermistor 2 error (short circuit) | When the temperature detected by the thermistor 2, which is at the right (paper feed section) side of the laser optics unit, is higher than $70^{\circ} \mathrm{C}$ for 10 seconds consecutively, the BCU determines that the circuit is shorted and displays this SC code | - Thermistor 2 defective <br> - Cable connection error <br> - BCU defect |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Replace the thermistor. <br> 4. Replace the BCU. |  |
| SC 471 | Transfer belt H.P. error | The transfer belt HP sensor signal does not change from Low to High (home position) or vice versa 1 second after the transfer belt contact motor turns on. | - Transfer belt unit not set properly <br> - Defective transfer belt H.P. sensor and/or transfer belt set sensor <br> - Defective transfer belt contact motor <br> - Transfer belt unit problem |  | 1. Turn the main switch off and on. <br> 2. Reset the transfer belt unit. <br> 3. Clean or replace the transfer belt H.P. sensor and/or transfer belt set sensor. <br> 4. Replace the transfer belt contact motor. <br> 5. Check the contact and release mechanism of the transfer belt unit. |  |
| SC 490 | Transfer bias / paper attraction roller bias leak error | The high voltage supply board (T/PA/CL) monitors the circuit and detects current leaks. If this happens, the high voltage supply board sends a SC signal (High to Low at CN2138) to the BCU. <br> The BCU monitors this signal every 2 ms and generates this SC code when the error condition occurs 250 consecutive times. | - Defective high voltage supply board (T/PA/CL) <br> - Damaged transfer belt <br> - Transfer unit <br> - Damaged high voltage supply cables <br> - Damaged cables between the BCU and high voltage supply board <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the transfer unit and replace the belt and/or the transfer unit if any damage is found. <br> 3. Replace the high voltage supply board (T/PA/CL). <br> 4. Check and/or replace the high voltage supply cables. <br> 5. Check and/or replace the dc cables between the BCT and high voltage supply board. <br> 6. Replace the BCU. |  |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \hline \text { Related } \\ \text { SCs } \\ \hline \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 501 | Paper Tray 1 error | When the tray lift motor is turned on, if the upper limit is not detected within 10 seconds, the machine asks the user to reset the tray. If this condition occurs three consecutive times, the SC is generated. | - Defective paper lift sensor <br> - Defective tray lift motor <br> - Defective bottom plate lift mechanism |  | 1. Turn the main switch off and on. <br> 2. Check if the bottom plate smoothly moves up and down manually. <br> 3. Check and/or replace the paper lift sensor. <br> 4. Check and/or replace the tray lift motor. |  |
| SC 502 | $\begin{aligned} & \text { Paper Tray } 2 \\ & \text { error } \end{aligned}$ |  |  |  |  |  |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{array}{\|l} \hline \text { SC 503- } \\ 01 \end{array}$ | Tray 3 error (Paper Feed Unit or LCT) | For the paper feed unit: When the tray lift motor is turned on, if the upper limit is not detected within 18 seconds, the machine asks the user to reset the tray. If this condition occurs three consecutive times, the SC is generated. <br> For the LCT: <br> This SC is generated under the following conditions: <br> - If the upper or lower limit is not detected within 15 seconds when the tray lift motor is turned on to lift up or lower the tray <br> - If the paper stack is not transported within a specific number of pulses after the tray motor and stack transport clutch turn on to transport the paper stack <br> - If the end fence home position sensor stays ON for a specific number of pulses after the tray motor and stack transport clutch turn on to transport the paper stack. | For the paper feed unit: <br> - Defective tray lift motor or connector disconnection <br> - Defective lift sensor or connector disconnection <br> For the LCT: <br> - Defective stack transport clutch or connector disconnection <br> - Defective tray motor or connector disconnection <br> - Defective end fence home position sensor or connector disconnection <br> - Defective upper limit sensor or connector disconnection <br> - Defective tray lift motor or connector disconnection |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Check and/or replace the defective component. |  |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { SC 503- } \\ & 02 \end{aligned}$ | Tray 3 error (Paper Feed Unit or LCT) | - If the following condition occurs 3 consecutive times, this SC is generated. <br> For the paper feed unit: When the main switch is turned or when the tray is set and if the upper limit is already detected, the lift motor turns on to lower the bottom plate until the lift sensor goes off. If the motor turns on for 7 seconds or more, the machine asks the user to reset the tray. <br> For the LCT: <br> When the main switch is turned on or when the LCT is set, if the end fence is not in the home position (home position sensor ON), the tray lift motor stops. | For the paper feed unit: <br> - Defective tray lift motor or connector disconnection <br> - Defective lift sensor or connector disconnection <br> For the LCT: <br> - Defective stack transport clutch or connector disconnection <br> - Defective tray motor or connector disconnection <br> - Defective end fence home position sensor or connector disconnection |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Check and/or replace the defective component. |  |
| $\begin{array}{\|l} \hline \text { SC 504- } \\ 01 \end{array}$ | Tray 4 error (3 Tray Paper Feed Unit) | When the tray lift motor is turned on, if the upper limit is not detected within 18 seconds, the machine asks the user to reset the tray. If this condition occurs three consecutive times, the SC is generated. | - Defective tray lift motor or connector disconnection <br> - Defective lift sensor or connector disconnection |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Check and/or replace the defective component. |  |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{array}{\|l\|} \hline \text { SC 504- } \\ 02 \end{array}$ | Tray 4 error (3 Tray Paper Feed Unit) | When the main switch is turned or when the tray is set and if the upper limit is already detected, the lift motor turns on to lower the bottom plate until the lift sensor goes off. If the motor turns on for 7 seconds or more, the machine asks the user to reset the tray. If this condition occurs 3 consecutive times, this SC is generated. | - Defective tray lift motor or connector disconnection <br> - Defective lift sensor or connector disconnection |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Check and/or replace the defective component. |  |
| SC 530 | Fusing fan motor error | The BCU does not receive the lock signal (CN210-B5) 5 seconds after turning on the fusing fan. | - Defective fusing fan motor or connector disconnection <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the connector and/or replace the fusing fan motor. <br> 3. Replace the BCU. |  |
| SC 541 | Heating roller thermistor error | The temperature measured by the heating roller thermistor does not reach $7^{\circ} \mathrm{C}$ for ten seconds. | - Loose connection of the heating roller thermistor <br> - Defective heating roller thermistor <br> - Defective BCU |  | 1. Check if the heating roller thermistor is firmly connected. <br> 2. Replace the fusing unit. <br> 3. Replace the BCU. | A |
| SC 542 | Heating roller warm-up error | After the main switch is turned on or the cover is closed, the heating roller temperature does not reach the ready temperature within 60 seconds during fusing unit warm-up. | - Heating roller fusing lamp broken <br> - Defective heating roller thermistor <br> - Defective BCU |  | 1. Check if the heating roller thermistor is firmly connected. <br> 2. Replace the fusing unit. <br> 3. Replace the BCU. | A |
| SC 543 | Heating roller fusing lamp overheat | The detected fusing temperature stays at $200^{\circ} \mathrm{C}$ or more for five seconds. | - Defective PSU <br> - Defective BCU |  | 1. Replace the PSU. <br> 2. Replace the BCU. | A |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 544 | Heating roller fusing lamp low temperature error | During stand-by mode or a print job, the detected heating roller temperature stays at 50 ${ }^{\circ} \mathrm{C}$ or less for five seconds. | - Loose connection between the fusing unit and the main frame <br> - Defective heating roller thermistor <br> - Defective PSU <br> - Defective BCU |  | 1. Check the connection between the fusing unit and main frame. <br> 2. Replace the fusing unit. <br> 3. Replace the PSU. <br> 4. Replace the BCU. | A |
| SC 545 | Heating roller fusing lamp consecutive full power | When the fusing unit is not running in the Ready condition, the heating roller fusing lamp keeps on with full power for 30 consecutive seconds. | - Heating roller thermistor out of position |  | 1. Replace the fusing unit. | A |
| SC 546 | Heating roller fusing lamp temperature fluctuation | The heating roller temperature changes by $\pm 20^{\circ} \mathrm{C}$ or more in one second. This occurs three times in one minute or two consecutive times. | - Loose connection of the thermistor <br> - Loose connection between the fusing unit and main frame |  | 1. Check if the fusing unit is properly set and connected to the main frame. <br> 2. Check if the heating roller thermistor connector is firmly connected. <br> 3. Replace the fusing unit. | A |
| SC 551 | Pressure roller thermistor error | The measured pressure roller temperature does not reach $7^{\circ} \mathrm{C}$ for 30 seconds. | - Loose connection of pressure roller thermistor <br> - Defective pressure roller thermistor <br> - Defective BCU |  | 1. Check that the pressure roller thermistor is firmly connected. <br> 2. Replace the fusing unit. <br> 3. Replace the BCU. | A |
| SC 552 | Pressure roller warm-up error | After the main switch is turned on or the door is closed, the pressure roller temperature does not reach the ready temperature within 150 seconds during fusing unit warm-up. | - Pressure roller fusing lamp broken <br> - Defective pressure roller thermistor <br> - Defective BCU |  | 1. Check if the pressure roller thermistor is firmly connected. <br> 2. Replace the fusing unit. <br> 3. Replace the BCU. | A |
| SC 553 | Pressure roller fusing lamp overheat | The detected pressure roller temperature stays at $200^{\circ} \mathrm{C}$ or more for five seconds. | - Defective PSU <br> - Defective BCU |  | 1. Replace the fusing unit. <br> 2. Replace the PSU. <br> 3. Replace the BCU. | A |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 554 | Pressure roller fusing lamp low temperature error | During stand-by mode or printing, the detected pressure roller temperature stays at 50 ${ }^{\circ} \mathrm{C}$ or less for five seconds. | - Loose connection between the fusing unit and the machine <br> - Defective pressure roller thermistor <br> - Defective PSU <br> - Defective BCU |  | 1. Check the connection between the fusing unit and main frame. <br> 2. Replace the fusing unit. <br> 3. Replace the PSU. <br> 4. Replace the BCU. | A |
| SC 555 | Pressure roller fusing lamp consecutive full power | When the fusing unit is not running in the Ready condition, the pressure roller fusing lamp keeps ON with full power for 100 consecutive seconds. | - Pressure roller thermistor out of position |  | 1. Replace the fusing unit. | A |
| SC 556 | Pressure roller fusing lamp temperature fluctuation | The pressure roller temperature changes by $\pm 20$ ${ }^{\circ} \mathrm{C}$ or more in one second. This occurs three times in one minute or two consecutive times. | - Loose connection of the pressure roller thermistor <br> - Loose connection between the fusing unit and main frame |  | 1. Check if the fusing unit is properly set and connected to the main frame. <br> 2. Check if the pressure roller thermistor connector is firmly connected. <br> 3. Replace the fusing unit. | A |
| SC 560 | Zero cross error | When the main switch is turned on, the machine checks how many zero-cross signals are generated during 500 ms . If the number of zero-cross signal generated is either more than 66 or less than 45 and when this condition is detected 10 consecutive times, this code is displayed. | - Electrical noise in the supply from the power cord |  | 1. Replace the PSU. | A |



| SC No. | Item | Definition | Possible Cause | Related SCs | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 670 | No response from BCU at power on | When the main power is turned on or the machine starts warming up from energy-saving mode, the controller does not receive a command signal from the BCU. | - Loose connection <br> - Defective controller <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the BCU and controller. <br> 3. Replace the controller. <br> 4. Replace the BCU. | CTL |
| SC 680 | BCU/ MUSIC communication error | After the engine CPU sends a message, the Music CPU does not respond within five seconds three consecutive times. | - Toner cartridge memory chip loose connection <br> - Memory chip problem <br> - Memory chip cable wiring problem |  | 1. Turn the main switch off and on. <br> 2. Check if the toner cartridge is installed correctly. <br> 3. Replace the toner cartridge. <br> 4. Check if the harnesses are not damaged. <br> 5. Replace the BCU. |  |
| SC 687 | Memory address command error | The BCU does not receive a memory address command from the controller 60 seconds after paper is in the position for registration. | - Loose connection <br> - Defective controller <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check if the controller is firmly connected to the BCU. <br> 3. Replace the controller. <br> 4. Replace the BCU. |  |
| SC 722 | Finisher jogger motor error | - The jogger fences of the finisher donot return to home position within a specific time. <br> - The finisher jogger motor does not leave home position within a given time. | - Defective jogger H.P. sensor <br> - Loose connection <br> - Defective jogger motor |  | 1. Turn the main switch off and on. <br> 2. Check the connection of jogger H.P. sensor and jogger motor connectors <br> 3. Replace the jogger H.P. sensor. <br> 4. Replace the jogger motor. |  |
| SC 724 | Finisher staple hammer motor error | Stapling does not finish within 150 ms after the staple hammer motor turns on. | - Staple jam <br> - Loose connection <br> - Overload caused by stapling too many pages <br> - Defective staple hammer motor |  | 1. Turn the main switch off and on. <br> 2. Check if the staple hammer motor connector is properly connected. <br> 3. Check if the staple jam occurs. <br> 4. Replace the staple hammer motor. |  |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \hline \text { Related } \\ \text { SCs } \\ \hline \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 725 | Finisher stack feed-out motor error | The stack feed-out belt H.P. sensor does not activate within a specified time after the stack feed-out motor turns on. | - Defective stack feedout H.P. sensor <br> - Loose connection <br> - Stack feed-out motor overload <br> - Defective stack feedout motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the stack feed-out H.P. sensor and motor are properly connected. <br> 3. Replace the stack feed-out H.P. sensor. <br> 4. Replace the stack feed-out motor. |  |
| SC 726 | Finisher shift tray 1 lift motor error | - The upper stack height 1 sensor is activated consecutively (detecting paper) for 15 seconds after the shift tray starts moving up. <br> - The upper stack height sensor 1 is deactivated consecutively (not detecting paper) for 15 seconds after the shift tray starts moving down. <br> - When the upper tray moves from lower paper exit to the upper paper exit, the upper stack height 1 sensor is activated. | - Loose connection <br> - Defective upper stack height 1 sensor <br> - Defective shift tray 1 lift motor <br> - Motor overload |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the upper stack height 1 sensor. <br> 4. Replace the shift tray 1 lift motor. |  |
| SC 727 | Finisher stapler rotation motor error | The stapler cannot return to its home position within a specified time after the stapler rotation motor starts rotating. | - Loose connection <br> - Defective stapler rotation motor <br> - Motor overload |  | 1. Turn the main switch off and on. 2. Check if the stapler rotation motor connector is properly connected. <br> 3. Replace the stapler rotation motor. |  |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 729 | Finisher punch motor error | The punch home position is not detected within 250 ms after the punch clutch turns on. | - Loose connection <br> - Defective punch H.P. sensor <br> - Defective punch clutch <br> - Defective punch hole motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of sensor, clutch and/or motor are properly connected. <br> 3. Replace the punch H.P. sensor. <br> 4. Replace the punch clutch. <br> 5. Replace the punch hole motor. |  |
| SC 730 | Finisher stapler motor error | The stapler home position is not detected within a specified time after the staple motor turns on. | - Loose connection <br> - Defective stapler H.P. sensor <br> - Defective stapler motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the stapler H.P. sensor. <br> 4. Replace the stapler motor. |  |
| SC 731 | Finisher exit guide plate motor error | The exit guide plate open sensor is not activated within a specified time after the exit guide plate motor turns on. | - Loose connection <br> - Defective exit guide plate open sensor <br> - Defective exit guide plate motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the exit guide plate open sensor. <br> 4. Replace the exit guide plate motor. |  |
| SC 732 | Finisher tray 1 shift motor error | Tray 1 home position is not detected within a specified time after the tray 1 shift motor turns on. | - Loose connection <br> - Defective tray shift 1 sensor <br> - Defective tray 1 shift motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the tray shift 1 sensor. <br> 4. Replace the tray 1 shift motor. |  |
| SC 733 | Finisher tray 2 lift motor error | - The lower stack height 1 sensor is activated consecutively (detecting paper) for 15 seconds after the shift tray starts moving up. <br> - The lower stack height sensor 1 is deactivated consecutively (not detecting paper) for 15 seconds after the shift tray starts moving down. | - Loose connection <br> - Defective lower stack height 1 sensor <br> - Defective tray 2 lift motor <br> - Motor overload |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the lower stack height 1 sensor. <br> 4. Replace the tray 2 lift motor. |  |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 734 | Finisher tray 2 shift motor error | Tray 2 home position is not detected within a specified time after the tray 2 shift motor turns on. | - Loose connection <br> - Defective tray shift 2 sensor <br> - Defective tray 2 shift motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the tray shift 2 sensor. <br> 4. Replace the tray 2 shift motor. |  |
| SC 818 | Watch-dog error | While the system program is running, other processes do not operate at all. | - Defective controller <br> - Software error |  | 1. Turn the main switch off and on. <br> 2. Replace the controller. <br> 3. See NOTE 1 at the end of the SC table | CTL |
| SC 819 | Fatal error |  |  |  |  |  |
| [696E] | Process error | System completely down | - Defective RAM DIMM <br> - Defective ROM DIMM <br> - Defective controller <br> - Software error | 1. Turn the main switch off and on. <br> 2. Check and/or replace the RAM DIMM. <br> 3. Check and/or replace the ROM DIMM. <br> 4. Replace the controller. <br> 5. See NOTE at the end of the SC table. |  | CTL |
| [766D] | Memory error | Unexpected system memory size |  |  |  |  |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC820 | Self-diagnostics error: CPU [XXXX]: Detailed error code |  |  |  |  |  |
| $\begin{array}{\|l\|} \hline[0001] \\ \text { to } \\ {[06 F F]} \end{array}$ | CPU error | During the self-diagnostic, the controller CPU detects an error. There are 47 types of error code (0001 to 4005) depending on the cause of the error. The CPU detects an error and displays the specific error code with the program address where the error occurs). | - System firmware problem <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Reinstall the controller system firmware. <br> 3. Replace the controller. <br> When the problem cannot be fixed with the above procedure, the following information displayed on the screen needs to be fed back to a technical support center. <br> - SC code <br> - Detailed error code <br> - Program address | CTL |
| $\begin{aligned} & {[0702]} \\ & {[0709]} \\ & {[070 A]} \end{aligned}$ | CPU/Memory Error |  | - System firmware problem <br> - Defective RAM-DIMM <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Reinstall the controller system software. <br> 3. Replace the RAM-DIMM. <br> 4. Replace the controller. | CTL |
| $\begin{array}{\|l} \hline[0801] \\ \text { to } \\ {[4005]} \\ \hline \end{array}$ | CPU error | Same as [0001] |  |  |  | CTL |
| $\begin{aligned} & \text { SC 821 } \\ & \text { [OD05] } \end{aligned}$ | Self-diagnosis error: ASIC | The CPU checks if the ASIC timer works properly compared with the CPU timer. If the ASIC timer does not function in the specified range, this SC code is displayed. | - System firmware problem <br> - Defective RAM-DIMM <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Reinstall the controller system firmware. <br> 3. Replace the RAM-DIMM. <br> 4. Replace the controller board. | CTL |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC822 | Self-diagnostic error: HDD (Hard Disk Drive) [ |  | [ XXXX ]: Detailed error code |  |  |  |
| [3003] | Timeout error | When the main switch is turned on or starting the selfdiagnostic, the HDD stays busy for the specified time or more. | - Loose connection <br> - Defective HDD <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Check that the HDD is properly connected to the controller. <br> 3. Replace the HDD. <br> 4. Replace the controller. | CTL |
| [3004] | Command error |  |  |  |  |  |
| SC 823 | Self-diagnostic error: NIB [XXXX]: Detailed error code |  |  |  |  |  |
| [6101] | MAC address check sum error | The result of the MAC address check sum does not match the check sum stored in ROM. | - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Replace the controller. | CTL |
| [6104] | PHY IC error | The PHY IC on the controller cannot be properly recognized. |  |  |  |  |
| [6105] | PHY IC loopback error | An error occurred during the loop-back test for the PHY IC on the controller. |  |  |  |  |
| $\begin{aligned} & \text { SC } 824 \\ & \text { [1401] } \end{aligned}$ | Self-diagnosis error: <br> Standard <br> NVRAM | The controller cannot recognize the standard NVRAM installed or detects that the NVRAM is defective. | - Loose connection <br> - Defective standard NVRAM <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Check the standard NVRAM is firmly inserted into the socket. <br> 3. Replace the NVRAM. <br> Replace the controller. | CTL |
| SC 827 | Self-diagnostic error: Standard SRAM DIMM [XXXX]: Detailed error code |  |  |  |  |  |
| [0201] | Verification error | Error detected during a write/verify check for the standard RAM (SRAM DIMM). | - Loose connection <br> - Defective SRAM DIMM <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Replace the SRAM DIMM. <br> 3. Replace the controller. | CTL |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 828 | Self-diagnostic error : ROM [XXXX]: Detailed error code |  |  |  |  |  |
| [0101] | Check sum error 1 | The boot monitor and OS program stored in the ROM DIMM is checked. If the check sum of the program is incorrect, this SC code is displayed. | - Defective ROM DIMM <br> - Defective controller |  | 1. Turn the main switch on and off. <br> 2. Replace the ROM DIMM <br> 3. Replace the controller. | CTL |
| [0104] | Check sum error 2 | All areas of the ROM DIMM are checked. If the check sum of all programs stored in the ROM DIMM is incorrect, this SC code is displayed. |  |  |  |  |
| [0105] | ROM error | The ROM DIMM is not of the recognized type. |  |  |  |  |
| SC829 | Self-diagnosis error: optional RAM [XXXX]: Detailed error code |  |  |  |  |  |
| [0302] | Composition error (Slot 0) | The result of checking the composition data of the RAM in Slot 0 (CN5) on the controller is incorrect. | - Not specified RAM DIMM installed <br> - Defective RAM DIMM |  | 1. Turn the main switch off and on. <br> 2. Replace the RAM DIMM. <br> 3. Replace the controller board. | CTL |
| [0401] | Verification error (Slot 1) | The data stored in the RAM in Slot 1 does not match the data when reading. |  |  |  |  |
| [0402] | Composition error (Slot 1) | The result of checking the composition data of the RAM in Slot 1 (CN6) on the controller is incorrect. |  |  |  |  |
| $\begin{aligned} & \hline \text { SC } 833 \\ & \text { [OF21] } \end{aligned}$ | Self-diagnostic error: I/F error | The controller detects that the BCU is not properly connected. | - Loose connection <br> - Defective controller <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the BCU and controller. <br> 3. Replace the controller. <br> 4. Replace the BCU | CTL |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 835 | Self-diagnosis error: Centronics interface [XXXX]: Detailed error code |  |  |  |  |  |
| [1102] | Verification error | The controller detects that the loop-back connector is not properly connected. | - Loose connection <br> - Defective loop-back connector <br> - Defective Centronics connector <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the Centronics connector and loop-back connector. <br> 3. Reconnect the loop-back connector. <br> 4. Replace the controller. | CTL |
| [110C] | DMA verification error | A DMA data abnormality is detected even when the loopback connector is properly set. |  |  |  |  |
| [1120] | Loop-back connector error | The loop-back connector is not set when starting the detailed self-diagnostics. |  |  |  |  |
| $\begin{aligned} & \text { SC } 836 \\ & {[1601]} \end{aligned}$ | Self-diagnosis error: Font ROM (standard) | The data in the font ROM (standard ROM-DIMM) is damaged. . | - Defective standard ROM-DIMM |  | 1. Turn the main switch off and on. <br> 2. Replace the standard ROM-DIMM. | CTL |
| $\begin{aligned} & \text { SC 837 } \\ & {[1602]} \end{aligned}$ | Self-diagnosis error: Font ROM (option) | The data in the font ROM (optional ROM-DIMM) is damaged. | - Defective optional ROM-DIMM |  | 1. Turn the main switch off and on. <br> 2. Replace the optional ROM-DIMM. | CTL |
| SC 850 | Network interface error | The network is unusable. | - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Replace the controller. | CTL |
| SC 851 | IEEE1394 interface error | The 1394 interface is unusable. | - Defective IEEE1394 <br> - Defective controller. |  | 1. Turn the main switch off and on. <br> 2. Replace the IEEE1394 interface board. <br> 3. Replace the controller. | CTL |
| SC 860 | HDD: <br> Initialization error | The controller detects that the hard disk fails. | - HDD not initialized <br> - Defective HDD |  | 1. Turn the main switch off and on. <br> 2. Reformat the HDD. <br> 3. Replace the HDD. | CTL |
| SC 861 | HDD: Reboot error | The HDD does not become ready within 30 seconds after the power is supplied to the HDD. | - Loose connection <br> - Defective cables <br> - Defective HDD <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the HDD and controller. <br> 3. Check and replace the cables. <br> 4. Replace the HDD. <br> 5. Replace the controller. | CTL |


| SC No. | Item | Definition | Possible Cause | Related SCs | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 863 | HDD: Read error | The data stored in the HDD cannot be read correctly. | - Defective HDD <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Replace the HDD. <br> 3. Replace the controller. | CTL |
| SC 864 | HDD: CRC error | While reading data from the HDD or storing data in the HDD, data transmission fails. | - Defective HDD |  | 1. Turn the main switch off and on. <br> 2. Replace the HDD. | CTL |
| SC 865 | HDD: Access error | An error is detected while operating the HDD. | - Defective HDD |  | 1. Turn the main switch off and on. <br> 2. Replace the HDD. | CTL |
| SC 900 | Electric counter error | Abnormal data is stored in the counters. | - Defective NVRAM <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the NVRAM and controller. <br> 3. Replace the NVRAM. <br> 4. Replace the controller. | CTL |
| SC 990 | Software performance error | The software makes an unexpected operation. | - Defective software <br> - Defective controller <br> - Software error |  | 1. Turn the main switch off and on. <br> 2. Reinstall the controller and/or engine main firmware. <br> 3. See NOTE 1 at the end of the SC table. | CTL |
| SC 991 | Software Performance Error - Logged | The software performs an unexpected operation. <br> Note: Unlike SC990, the software/machine continue to function without requiring any action. | - Incorrect program argument or other parameter <br> - Insufficient working memory |  | This SC is not displayed on the LCD (logged only). | CTL |
| SC 998 | Application start error | No applications start within 60 seconds after the power is turned on. | - Loose connection of RAM-DIMM, ROMDIMM <br> - Defective controller <br> - Software problem |  | 1. Turn the main switch off and on. <br> 2. Check if the RAM-DIMM and ROMDIMM are properly connected. <br> 3. Reinstall the controller system firmware. <br> 4. Replace the controller. | CTL |
| SC 999 | Firmware error | See G570 SM page 4-43 for description of SC 999 |  |  |  |  |

NOTE 1: If a problem always occurs in a specific condition (for example. printer driver setting, image file), the problem may be caused by a software error. In this case, the following data and information needs to be sent back to your product specialist.

- Symptom / Possible Causes / Action taken
- Summary sheet (SP mode '1 Service', [Print Summary])
- SMC All (SP5-990-002)
- Logging (SP5-990-004)
- Printer driver settings used when the problem occurs
- All data displayed on the screen (SC code, error code, and program address where the problem is logged.)
- Image file which causes the problem, if possible


### 4.4 TROUBLESHOOTING GUIDE

### 4.4.1 IMAGE QUALITY

The table below shows the troubleshooting procedure for the following image problems.

- Smeared image for 4C thin lines or White lines in solid image areas
- Dirty background
- Fireflies
- Crow marks
- Image density change
- Toner blasting

| Subject | Symptom | Cause | Action |
| :--- | :--- | :--- | :--- |
| Smeared image for 4C <br> thin lines or white lines <br> in solid image areas | 4C thin lines become <br> smeared in the paper feed <br> direction or white lines <br> appear in solid image areas. | Spurs are located just before the fusing <br> section to prevent paper from touching <br> the fusing unit. When paper touches the <br> spurs and the spurs do not rotate, the <br> spurs scratch the mage. | Clean the edges of the spurs and change the <br> position of the spurs as shown below. <br> If 4C thin lines become smeared: |


| Subject | Symptom | Cause |  |
| :--- | :--- | :--- | :--- |
| Dirty background | $\begin{array}{l}\text { Dirty background may } \\ \text { continuously appear on the } \\ \text { left side (relative to paper } \\ \text { feed) under very low } \\ \text { temperature and humidity } \\ \text { conditions. }\end{array}$ | $\begin{array}{l}\text { When the developer has deteriorated or } \\ \text { when prints are made in a very low } \\ \text { humidity condition, dirty background may } \\ \text { appear continuously. }\end{array}$ | $\begin{array}{l}\text { Action } \\ \text { Perform forced toner refresh mode (SP3-921-001 }\end{array}$ |
| The machine automatically does this in the |  |  |  |
| following sequence. (It takes about 20 minutes to |  |  |  |
| complete this mode.) |  |  |  |
| 1. Consumes toner in the development unit |  |  |  |
| without toner supply until toner end is detected. |  |  |  |$\}$


| Subject | Symptom | Cause | Action |
| :---: | :---: | :---: | :---: |
| Crow marks | When making duplex prints in low temperature and humidity conditions, crow marks may appear on black images, especially in halftone areas on the $2^{\text {nd }}$ side. | A charge is applied to the paper at each color station in order to attract each toner onto the paper. Therefore, the initial toner colors will receive multiple charging as they pass each station, which increases the attractive force between the toner and paper. Since black is the last toner to be applied, the attractive force between it and the paper is lowest. Black toner moves on the paper during transport to the fusing section, due to discharge from the toner to the surrounding guide plates. | Using SP2-301 (Transfer Current), increase the paper transfer current for black in the mode in which the problem occurs. <br> NOTE: White dotted lines may appear on outputs if the transfer current is increased too much. Therefore, after adjusting the transfer current, it is necessary to check the results by making a solid or halftone image in duplex mode. |
| Image density change (1) | When the machine is tuned on in the morning (having been unused for a while), the ID of the initial outputs may be relatively low or high, in which case the machine needs to compensate by raising or lowering the ID during machine operation. | When the machine is off, the environmental conditions can begin to affect the machine's development capability. When the main switch is tuned on, the machine starts a process control self-check and adjusts the development parameters to achieve the proper development potential gap without adjusting the toner concentration. Over the course of the print operation, the ID will then get closer and closer to the target level. | If this is often pointed out by users who are very particular about image density, turn on Auto TD Adjustment (SP3-125-003) as a solution. <br> NOTE: It takes about 5 minutes to complete the self-check. |


| Subject | Symptom | Cause | Action |
| :---: | :---: | :---: | :---: |
| Image density change (2) | Image density is too low or high. | If the machine has never been turned off and Energy Saver 2 (Auto Off mode) is disabled, the machine has never performed the initial process control selfcheck, causing the image density to become low or high. | Change the settings of the following SP modes: <br> SP3-906-003 Non-use Time 1 <br> 0 (Default) to 500 <br> SP3-906-004 Non-use Time 2 <br> 30 (Default) to 480 <br> - If Energy Saver 1 is activated (Default: Off), the non-use time process control self-check will not function. Therefore, make sure that Energy Saver 1 is Off (SP5-101-3 or UP mode). <br> - With the above setting, the self-check automatically starts after 500 prints and after no prints have been made for 480 minutes ( 8 hours). Based on the average daily printing volume of 500 prints, self-check would be performed first thing every morning. These settings are suitable for machines, which are used during the day and then kept On in Ready status throughout the night. Therefore, this SP mode should be set based on the particular way the customer uses the printer. |
| Toner blasting | Toner may blast, causing smeared text characters and/or lines in 2C or process black mode (depending on the PDL setting or type of paper used.) | An excessive amount of toner is used for development. | Change the toner limit setting in SP mode. <br> - If toner blasted images appear for text or lines in 2C, decrease the setting for Text from 190\% to 150-170\%. <br> - If toner blasted images for text and lines recognized as pure image data (i.e. not processed as text/line data), decrease the setting for Photo from 260\% to 170-190\%. <br> NOTE: If the toner limit is lowered too much, it may cause the density of shadow areas to be not smooth. |

### 4.4.2 COLOR SHIFT

The following briefly explain the factors causing color shifts and what to do on the machine to correct it:

- Temperature change causes the optical components in the laser optics housing unit to contract, causing the main scan magnification to change. To correct the line position, the machine automatically does the line position adjustment when the temperature changes by $5^{\circ} \mathrm{C}$ since the last position adjustment. If the line position adjustment functions properly, no color shift occurs. If the line position adjustment fails (result: SP5-993-007), color lines may shift anywhere on the outputs.
- The process speed at each stage (registration roller, transfer belt, and fusing belt/roller) affects the paper transport speed. If the paper transport speed changes during image transfer of a color, the color line being transferred shifts with respect to the color line already transferred to the paper. The registration roller speed (adjusted by color development motor speed) and fusing belt/roller speed (adjusted by black development motor speed) are adjusted by the manufacturer.
Paper speed may slightly change due to the type of paper used or after replacing the parts related to the drive sections of the registration section, transport unit, and fusing unit. (After replacing the fusing unit, the speed adjustment should be done in the User Program mode.) Also, the position where color shift occurs depends on which section starts moving at the incorrect speed.
- Paper skew directly affects the color shift between the front and rear sides. There are several factors. One of them is the position of the side fences.

As explained on the previous page, there are several types of color shift problem. The following table shows the symptoms, factors, action required, and the page to see for details.

|  | Symptom | Factors | Action Required | Refer to \# |
| :---: | :---: | :---: | :---: | :---: |
| 1 | Color shift on entire image in main-scan and/or sub-scan directions | - Line position adjustment does not function properly. <br> - Transfer belt unit has just been replaced. | - Check the result of the line position adjustment (SP5-993-007) and solve the problem if an error was detected. <br> - Check which color lines are shifted from black line and adjust the SP modes for registration and magnification. | Page 4-4 <br> Main-scan <br> Page 4-42/43 <br> Sub-scan <br> Page 40/41 <br> Transfer Unit <br> Page 4-46 |
| 2 | Color shifts only at the leading edge area (sometimes causing shock jitter, magenta or cyan lines) | Registration roller speed is not appropriate. | Adjust the color development motor speed (SP1-004-4, 5, and SP1-005-003) depending on the process speed. | Page 4-40 |
| 3 | Color shifts only at the trailing edge area | Fusing belt/roller speed is not appropriate. | Adjust the black development motor speed (SP1-004-001, 002, and 007, or "Fuser Adjust" in the User Program mode) depending on the process speed. | Page 4-40 |
| 4 | Color shifts between the front and rear sides | Paper skew on transfer belt <br> - Side fences are not properly set. <br> - Pressure between the paper attraction roller and transfer belt is not even at the front and rear sides. | Reposition the side fences. Reposition the paper attraction roller unit. | Page 4-43 |

## Adjustment Standard: Max. $200 \mu m$

As a machine capability, maximum amount of color shift is $200 \mu \mathrm{~m}$. Adjusting the SP modes (motor speed, registration, and magnification) can improve the color shifts level; however, there is a limit.

## Preparation

When color shift is reported, the following procedure should be done before adjusting the machine and/or SP modes.

1. Print out the SMC sheets (SP5-990-002).
2. Do the forced line position adjustment (SP5-993-002 or 'Auto Adjust' in the User Program mode).

NOTE: Make sure that the result (SP5-993-007) is "0101". If not, solve the problem by referring to pages 4-2 and 4-3.
3. Print a 1 -dot grid pattern using $\mathrm{A} 3 / 11$ " $\times 17^{\prime \prime}$ paper. Refer to the following table for the detailed SP mode settings.

| Mode | SP5-997 (Test Pattern) Setting |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | Tray <br> selection | Pattern | Color mode | Resolution | Paper size <br> (By-pass) |
| Normal, color, 600 dpi | 2 | 05 | Full Color | $600 \times 600$ | - |
| Normal, color, 1200 dpi | 2 | 05 | Full Color | $1200 \times 1200$ | - |
| Thick paper | 0 | 05 | Full Color | $1200 \times 1200$ | A3/11x17 |

NOTE: When making prints on thick paper from the by-pass tray, the type of paper should be selected in the User Program mode. Any adjustment needs to be done by using the type of paper which the customer normally uses.
4. Check the tendency of color shift in the grid pattern printed in step 3. Sometimes, a magnification scope must be used to measure the amount of color shift between colors.
5. Take the required action explained in each section depending on the type of color shift.
6. Do the 'Auto Adjust' in the User Program mode after the adjustment is done in step 5, and check the result.
7. Repeat steps 3 to 6 until the color shift is acceptable.

| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Sub-scan | Leading edge | Color shift, especially 100 mm from the leading edge. <br> (Refer to pattern 1 on page 4-44 for the symptom.) | Registration roller speed is not suitable for the paper used. | Normal Paper <br> 1200 dpi$\|$Normal Paper <br> 600 dpi <br> Thick Paper <br> 1200 dpi <br> (by-pass feed) | SP1-004- <br> 004 <br> SP1-004- <br> 005 <br> SP1-005- <br> 003 | Check the magenta line position against the black line. If the registration roller is too fast or slow, the magenta line appears above or below the black line. <br> Above: Speed is too fast: Decrease speed <br> Below: Speed is too slow: Increase Speed <br> When adjusting the speed, change the setting in 0.1 steps, and check the result by printing the grid pattern. Then, repeat this until the shift between magenta and black is minimized. <br> NOTE: If the registration roller is too fast, magenta jitter may appear at 67 mm and/or cyan jitter at 165 mm from the trailing edge. This is caused by the mechanical shock when the trailing edge of the paper passes the registration rollers. |
|  | Trailing edge | Color shift, especially 100 mm from the trailing edge. <br> (Refer to pattern 2 on page 4-44 for the symptom.) | Fusing roller speed is not suitable for the paper used. | Normal Paper <br> 1200 dpi <br> Normal Paper <br> 600 dpi | $\begin{array}{\|l\|} \hline \begin{array}{l} \text { SP1-004- } \\ 001 \end{array} \\ \hline \begin{array}{l} \text { SP1-004- } \\ 002 \end{array} \\ \hline \end{array}$ | Check the magenta line position against the black line. If the fusing roller is too fast or slow, the magenta line appears above or below the black line. <br> Above: Speed is too fast: Decrease speed <br> Below: Speed is too slow: Increase Speed <br> When adjusting the speed, change the setting in 0.1 steps, and check the result by printing the grid pattern. Then, repeat this step until the shift between magenta and black is minimized. <br> NOTE: Fusing roller speed can be adjusted with ''Custom Adjust' in Fuser Adjust in the User Program Mode, instead of with SP mode. |
|  |  |  |  | Thick Paper <br> 1200 dpi <br> (by-pass feed) | $\begin{aligned} & \text { SP1-004- } \\ & 007 \end{aligned}$ |  |


| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Sub-scan | Entire image | Color shift on the entire image, and the amount of shift from leading to trailing edge is almost the same. | SP mode setting is not suitable for the paper used. | Normal Paper 600 dpi | $\begin{aligned} & \text { SP5-993- } \\ & 016 \text { (Y) } \\ & \text { SP5-993- } \\ & 017 \text { (M) } \\ & \text { SP5-993- } \\ & 018 \text { (C) } \end{aligned}$ | Measure the gap between the black line and other colors (YMC) using a magnification scope. <br> Convert the measured value from $[\mu \mathrm{m}]$ to [dots] with the following formula. Then, add or subtract the calculated dot value in the SP mode. <br> Correction [dots] = Measured value [ $\mu \mathrm{m}$ ] / 21.2 or 42.4 600 dpi mode: 1 dot $=42.4 \mu \mathrm{~m}$ |
|  |  |  |  | Normal Paper 1200 dpi | $\begin{aligned} & \text { SP5-993- } \\ & 019 \text { (Y) } \end{aligned}$ | 1200 dpi mode: 1 dot $=21.2 \mu \mathrm{~m}$ |
|  |  |  |  |  | $\begin{aligned} & \text { SP5-993- } \\ & 020 \text { (M) } \end{aligned}$ | above value to the current value. |
|  |  |  |  |  | $\begin{aligned} & \text { SP5-993- } \\ & 021 \text { (C) } \end{aligned}$ | subtract the above value from the current value. <br> Examples |
|  |  |  |  |  |  | - If the magenta line has shifted up in relation to black by $40 \mu \mathrm{~m}$ in 600 dpi mode, add 1 to the current setting of SP5-993-017. <br> Correction [dots] = +(40/42.4) = Approx. +1 <br> - If the magenta line has shifted down in relation to black by $70 \mu \mathrm{~m}$ in 600 dpi mode, subtract 2 from the current setting of SP5-993-17. <br> Correction [dots] $=-(70 / 42.4)=$ Approx. -2 |


| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Main-scan | Entire image | Color shifts on the entire image, and the amount of shift differs at front, center, and rear. <br> (Refer to pattern 3 on page 4-45 for the symptom.) | Main-scan magnification is not correctly adjusted. | - | $\begin{aligned} & \text { SP5-993- } \\ & 013 \text { (Y) } \\ & \text { SP5-993- } \\ & 014 \text { (M) } \\ & \text { SP5-993- } \\ & 015 \text { (C) } \end{aligned}$ | Measure the gap between the black line and other colors (YMC) using a magnification scope. <br> Convert the measured value [ mm ] to [\%] with the following formula. Then, add or subtract the calculated value in the SP mode <br> Correction [\%] = Measured value [mm] / $287 \times 10000$ <br> If the color line is enlarged in relation to black, add the correction value to the current setting. <br> If the color line is reduced in relation to black, subtract the correction value from the current setting. <br> NOTE: Line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program mode) should be done to check the result after changing the main-scan magnification data. This is because the changes will affect the line position adjustment. <br> Examples <br> - If the magenta line is enlarged by 0.1 mm in relation to the black line, add "4" to the current setting of SP5-993-014. <br> Correction [\%] $=(0.1 / 287) \times 10000=$ Approx. +4 <br> - If the magenta line is reduced by 0.05 mm in relation to the black line, subtract " 2 " from the current setting of SP5-993-014. <br> Correction [\%] $=-(0.05 / 287) \times 10000=$ Approx. -2 |



## How to measure the gap between color lines

When using a magnification scope, measure the gap $[A]$ between the two lines. Measure from the same place on each line. For example (see the illustration), measure between the left edges of the lines.


## Pattern 1

Color shift in the sub-scan direction at the leading edge

This illustration shows that the colored (dotted) line is above the black line. This means that the registration roller speed is too high for the paper used. Therefore, the registration roller speed needs to be reduced by decreasing the setting (percentage) of SP1-004-004, 005, and SP1-005-003 depending on the mode selected.

- SP1-004-004 Normal paper, Color mode, $1200 \mathrm{dpi}(62.5 \mathrm{~mm} / \mathrm{s})$

- SP1-004-005 Normal Paper,

Color mode, $600 \mathrm{dpi}(125 \mathrm{~mm} / \mathrm{s})$

- SP1-005-003 Thick Paper ( $62.5 \mathrm{~mm} / \mathrm{s}$ )


## Pattern 2

Color shift in the sub-scan direction at the trailing edge
This illustration shows that the colored (dotted) line is above the black line. This means that the fusing roller speed is too high for the paper used. Therefore, the fusing roller speed needs to be slower by decreasing the setting (percentage) of SP1-004-001, 002, or 007 depending on the mode selected.

- SP1-004-001 Normal paper,
 Color mode, $1200 \mathrm{dpi}(62.5 \mathrm{~mm} / \mathrm{s})$
- SP1-004-002 Normal Paper, Color mode, $600 \mathrm{dpi}(125 \mathrm{~mm} / \mathrm{s})$
- SP1-004-007 Thick Paper ( $62.5 \mathrm{~mm} / \mathrm{s}$ )


## Pattern 3

Color shift (magnification change) in the main-scan direction

Fig. 1 and 2 show that the colored (dotted line) has shifted away from the black line and the amount of shift differs at the front, center, and rear. Both Fig. 1 and Fig. 2 show the color grid is larger than the black grid. Yellow becomes larger from left to right in Fig. 1, but cyan and magenta become larger from right to left. This is because the laser writing direction for $\mathrm{B} \& \mathrm{Y}$ is different from $\mathrm{C} \& \mathrm{M}$.

Fig. 1 (Yellow)


## Pattern 4

Color shift (registration) in the mainscan direction

Colored line shifts in the main-scan direction and the amount of shift is the same at left, center, and right.
This is caused by incorrect color registration.

Fig. 2 (Cyan \& Magenta)


Trouble-
shooting


### 4.4.3 COLOR SHIFT AFTER TRANSFER UNIT REPLACEMENT

If the color shift level is not within the target range (max $200 \mu \mathrm{~m}$ ) after replacing the transfer unit and performing the forced line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program Mode), follow the procedure explained below.

## Check the color shift level

1. Make sure that OPC Refresh (SP3-920-005) has been done.
2. Print out the SMC sheets (SP5-990-002).
3. Print a 1 -dot grid pattern using $\mathrm{A} 3 / 11$ "x17" paper. Refer to the following table for detailed SP mode settings.

| Mode | SP5-997 (Test Pattern) Setting |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | Tray <br> selection | Pattern | Color mode | Resolution | Paper size <br> (By-pass) |
| Normal, color, 600 dpi | 2 | 05 | Full Color | $600 \times 600$ | - |
| Normal, color, 1200 dpi | 2 | 05 | Full Color | $1200 \times 1200$ | - |

NOTE: Any adjustment needs to be done by using the paper type which the customer normally uses.
4. Check the tendency of color shift in the grid pattern printed in step 3.

Sometimes, a magnification scope must be used to measure the amount of color shift between colors.
5. If the result is not within the target, go to the next step.

## Fusing/ Registration Roller Speed Adjustment

## SP mode (sub-scan registration) reset

1. Make sure that the SMC sheets (SP5-990-002) have been printed out.
2. Reset the setting of SP5-993-016 to 021 to " 0 ".

## Transfer belt aging

1. Remove all PCUs. Place them on clean sheets of paper and cover the drums with a few sheets of paper to prevent the drums from light fatigue. Then, secure the drum positioning plate ( 2 screws) and return the transfer unit release lever to the original position.
2. Perform the transfer belt idling with SP5-804-074 (Drum M H CW) for about 3 minutes. (This is to stabilize the transfer belt side-to-side movement.)
3. Reinstall the PCUs.
4. Perform the line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program mode).
5. Print a 1-dot grid pattern using $\mathrm{A} 3 / 11$ "x17" paper in 600 dpi mode.
6. If the color shift in the main-scan direction is not within the adjustment standard, follow the troubleshooting guide.

## Fusing roller speed adjustment

1. Perform the line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program mode).
2. Print a 1-dot grid pattern for each of the following modes using $\mathrm{A} 3 / 11$ " x 17 " paper.
(1) Normal, 600 dpi
(2) Normal, 1200 dpi
(3) Thick, 1200 dpi
3. If the color has shifted within 100 mm from the trailing edge, follow the troubleshooting procedure (Sub-scan/Trailing edge).
NOTE: Instead of steps 2 to 3 , you can adjust the fusing roller speed in the User Program mode (Maintenance/Fuser Adjust/Custom Adjust).

## Registration roller speed adjustment (for color mode)

1. Perform the line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program mode).
2. Print a 1-dot grid pattern for each of the following modes using $A 3 / 11$ " $x 17$ " paper.
(1) Normal, 600 dpi
(2) Normal, 1200 dpi
3. If the color has shifted within 100 mm from the leading edge, follow the troubleshooting procedure (Sub-scan/Leading edge).
NOTE: The registration roller speed for by-pass paper feed is the same as for normal 1200 dpi mode.

## Line position fine adjustment for sub-scan

1. Print a 1-dot grid pattern each for each of the following modes using A3/11"x17" paper.

| Mode | SP5-997 (Test Pattern) Setting |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | Tray <br> selection | Pattern | Color <br> mode | Resolution | Paper size <br> (By-pass) |
| Normal, color, 600 dpi | 2 | 05 | Full Color | $600 \times 600$ | - |
| Normal, color, 1200 dpi | 2 | 05 | Full Color | $1200 \times 1200$ | - |
| Thick paper | 0 | 05 | Full Color | $1200 \times 1200$ | A3/11x17 |

2. Check if there is any color which has shifted from the black line by the same amount all the way down the page from leading to trailing edge. If there is, follow the troubleshooting procedure (Sub-scan/Whole image).

## Registration roller speed adjustment (For B\&W mode)

1. Input the following values in the SP modes.

SP1-004-006 $=($ Value of SP1-004-005 $)$
SP1-005-002 $=($ Value of SP1-004-005 $)-0.2 \%$
2. Print a 2-dot pattern (pattern 12) using $\mathrm{A} 3 / 11$ " $\times 17$ " paper.

| Mode | SP5-997 (Test Pattern) Setting |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  | Tray <br> selection | Pattern | Single <br> Color | Color Mode | Resolution |
| Normal color 600 dpi | 2 | 12 | 6 (Black) | Single Color | $600 \times 600$ |

3. Depending on the paper used, a horizontal band may appear at $60 \mathrm{~mm}(2.76$ ") from the leading edge on A3 (11"x17") paper. If the horizontal band is observed on the 2-dot pattern, decrease the setting of SP1-004-006 in 0.1\% steps until the problem is solved.

### 4.5 ELECTRICAL COMPONENT DEFECTS

### 4.5.1 SENSORS

| Component | CN | Condition | Symptom |
| :---: | :---: | :---: | :---: |
| LD H.P. sensor | 220-B12 | Open | SC261 |
|  |  | Shorted | SC260 |
| TD sensor | $\begin{array}{\|l\|} \hline \text { K:208-A3 } \\ \text { Y:208-B10 } \\ \text { M:207-A19 } \\ \text { C:208-A9 } \end{array}$ | Open | SC370/371/372/373 |
|  |  | Shorted | $\begin{aligned} & \text { SC370/371/372/373 or } \\ & \text { SC374/375/376/377 } \end{aligned}$ |
| Transfer belt set sensor | 208-B2 | Open | SC471 |
|  |  | Shorted |  |
| Transfer belt H.P. sensor | 212-2 | Open | SC471 |
|  |  | Shorted |  |
| ID sensor | $\begin{aligned} & \text { Rear:213-11 } \\ & \text { Front:213-14 } \end{aligned}$ | Open | SC385 |
|  |  | Shorted |  |
| Paper end sensor | Tray1:202-A5 <br> Tray2:202-B7 <br> By-pass:207- <br> A15 | Open | The Paper End indicator lights even if paper is placed in the paper tray. |
|  |  | Shorted | The Paper End indicator does not light even if there is no paper in the paper tray. |
| Paper lift sensor | Tray1:202-A2 <br> Tray2:202-B4 | Open | The bottom plate of the paper feed unit is not lifted up. |
|  |  | Shorted | SC501/502 |
| Relay sensor | 202-A8 | Open | Paper Jam is detected whenever a print is made. |
|  |  | Shorted | Paper Jam is detected even if there is no paper. |
| Vertical transport sensor | 202-B10 | Open | Paper Jam is detected whenever a print is made. |
|  |  | Shorted | Paper Jam is detected even if there is no paper. |
| Registration sensor | 207-B2 | Open | Paper Jam is detected whenever a print is made. |
|  |  | Shorted | Paper Jam is detected even if there is no paper. |
| Fusing exit sensor | 210-A11 | Open | Paper Jam is detected whenever a print is made. |
|  |  | Shorted | Paper Jam is detected even if there is no paper. |
| Paper exit sensor | 210-B2 | Open | Paper Jam is detected whenever a print is made. |
|  |  | Shorted | Paper Jam is detected even if there is no paper. |
| Exit upper limit sensor | 210-A6 | Open | The paper overflow message is not displayed even when a paper overflow condition exists, causing paper jam. |
|  |  | Shorted | The paper overflow message is displayed. |

The CN numbers are the connector numbers on the BCU.

### 4.6 BLOWN FUSE CONDITIONS

| Fuse | Rating |  | Symptom when turning on the main switch |
| :---: | :---: | :---: | :---: |
|  | 115 V | 220-240 V |  |
| Power Supply Unit |  |  |  |
| FU1 | 15A/125V | --- | No response (No power is supplied to the electrical components.) |
| CB1 | --- | 8A/250V |  |
| FU2 | 10A/125V | 5 A/250V | No response (No DC power is supplied to the electrical components.) |
| FU81 | 3.15 A/250 V | 3.15A/250V | Only 12V DC power is not supplied. SC260 or SC261 may occur. <br> (This fuse is directly soldered on the PSU.) |

### 4.7 LEDS (BCU)

| LED | Status |  |
| :---: | :--- | :--- |
|  | Blinking | Stays OFF or ON |
| LED1 (RED) | The Main CPU functions <br> correctly. | The Main CPU does not function <br> properly. |
| LED (Green) | The MUSIC CPU functions <br> correctly. | The MUSIC CPU does not function <br> properly. |

## SERVICE TABLES

## 5. SERVICE TABLES

### 5.1 SERVICE PROGRAM MODE

| 1 CAUTION |
| :--- |
| Before accessing the service menu, do the following: |
| Confirm that there is no print data in the printer buffer (the Data In LED |
| must not be lit or blinking). |
| If there is some data in the buffer, wait until all data has been printed. |

### 5.1.1 ENABLING AND DISABLING SERVICE PROGRAM MODE



## Entering the Service Mode

There are two ways to enter the service mode.
Method 1: Turn the machine on while pressing the "On Line" key and "Escape" key together until the above message in the illustration appears on the display.
NOTE: If you switch the machine off, any jobs stored on the hard disk using the sample print and locked print features will be deleted.
Check first with the user tools to see if there are any jobs stored with these features
(Menu key - Sample Print, or Protected Print).

Method 2: Press the "Up/Down arrow" keys together for about 5 seconds, then press the "Enter" key.
The above message shown in the illustration appears on the display.
NOTE: The machine automatically goes off line when you enter the service mode.

## Accessing the Required Program

Use the "Up/Down arrow" keys to scroll through the menu listing.

1. Service Menu: Controller service modes
2. Engine Mainte: Engine service modes

3: End: Exit service mode
To select an item, press the "Enter" key. Then the sub-menu will appear.
Scroll through the sub menu items using the "Up/Down arrow" keys.
To go back to a higher level, press the "Escape" key.

## Inputting a Value or Setting for a Service Program

Enter the required program mode as explained above. The setting appearing on the display is the current setting.
Select the required setting using the "Up/Down arrow" keys, then press the "Enter" key. The previous value remains if the "Enter" key is not pressed.

## Exiting Service Mode

Select "3. End" from the service mode main menu, then press the "Enter" key.
NOTE: To make the following settings effective, you must turn the main switch off and on after exiting service mode.

| SP Modes Related to the Engine | SP Modes Related to the Controller |
| :--- | :--- |
| SP2-208-009 | SP5-009-001 |
| SP2-213-001 | SP5-961-001 |
| SP2-224-001 to 004 |  |
| SP5-930-001 to 005 |  |
| SP5-994-001 and 002 |  |
| SP7-905-007 and 009 |  |

NOTE: If the settings of SP modes 5-993-013 to 015 are changed, these changes will affect the next line position adjustment.

### 5.2 PRINTER CONTROLLER SERVICE MODE

### 5.2.1 REMARKS

## Display on the Control Panel Screen

Since the maximum number of characters which can be displayed on the control panel screen is limited ( 14 characters), the description of SP modes displayed on the screen needs to be abbreviated. The following are the major abbreviations used for the SP modes for which the full description is over 14 characters.

## Paper Type

N: Normal paper
TH: Thick paper
Color Mode [Color]
[K]: Black in B\&W mode
[Y], [M], or [C]: Yellow, Magenta, or Cyan in Full Color mode
[YMC]: Only for Yellow, Magenta, and Cyan
[FC]: Full Color mode
[FC, K], [FC, Y], [FC, M], or [FC, C]: Black, Yellow, Magenta, or Cyan in full color mode

## Paper Feed Station

P: Paper tray
B: By-pass table

## Fusing Section

H: Heating roller
P : Pressure roller

## Print Mode

S: Simplex
D: Duplex

## Process Speed

62.5, 125, 185

As shown in the following table, the process speed (mm/s) depends on the print mode (B\&W or Color), resolution, and/or type of paper selected. Some SP mode settings depend on the process speed.

| Mode | Resolution <br> $(\mathrm{dpi})$ | Line speed <br> $(\mathrm{mm} / \mathbf{s})$ | Print speed <br> $(\mathbf{p p m})$ |
| :---: | :---: | :---: | :---: |
| B/W | $600 \times 600$ <br> $1,200 \times 600$ | 185 | 38 |
|  | $1,200 \times 1,200$ | 125 | 28 |
|  | $600 \times 600$ <br> $1,200 \times 600$ | 125 | 28 |
|  | $1,200 \times 1,200$ | 62.5 | 14 |
| OHP/Thick | $600 \times 600$ <br> $1,200 \times 600$ <br> $1,200 \times 1,200$ | 62.5 | 10 |

## Others

The following symbols are used in the SP mode tables.

## FA: Factory setting

(Data may be adjusted from the default setting at the factory. Refer to the factory setting sheets enclosed, which is located underneath the jammed paper removal decal.)

DFU: Design / Factory Use only
Do not touch the SP mode in the field.
CF: Copier Feature (CF) Expander Unit
SP modes with "CF" can be seen on the screen when the CF expander unit is installed.
" P " in the right hand side of the mode number column means that this SP mode relates to the Printer Controller. If " P " is not in the column, this SP mode relates to the Printer Engine.
A sharp (\#) to the right hand side of the mode number column means that the main switch must be turned off and on to effect the setting change.
An asterisk (*) to the right hand side of the mode number column means that this mode is stored in the EEPROM (Engine) or NVRAM (Printer Controller). If you do a RAM clear, this SP mode will be reset to the default value.
The settings of each SP mode are explained in the right-hand column of the SP table in the following manner.
[ Adjustable range / Default setting / Step ] Alphanumeric
NOTE: If "Alphanumeric" is written to the right of the bracket as shown above, the setting of the SP mode is displayed on the screen using alphanumeric characters instead of only numbers. However, the settings in the bracket in the SP mode table are explained by using only the numbers.

### 5.2.2 SERVICE MODE MENU ("1. SERVICE")

| Mode No. (Class 1 and 2) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: |
| [Bit Switch] |  |  |  |
| 1 | Bit Switch 1 | *P | Adjusts bit switch settings. DFU <br> NOTE: Currently the bit switches are not being used. All data has to be set to " 0 ". |
| 2 | Bit Switch 2 |  |  |
| 3 | Bit Switch 3 |  |  |
| 4 | Bit Switch 4 |  |  |
| [Clear Setting] |  |  |  |
| 1 | Clear Setting | P | Initializes settings in the "System" menu of the user mode. |
| [Print Summary] |  |  |  |
| 1 | Print Summary | P | Prints the service summary sheet (a summary of all the controller settings). |
| [Disp. Version] |  |  |  |
| 1 | Disp. Version | P | Displays the version of the controller firmware. |
| [Data Recall] |  |  |  |
| 1 | Factory | *P | Recalls a set of gamma settings. This can be either a) the factory setting, b) the previous setting, or c) the current setting. |
| 2 | Previous |  |  |
| 3 | Current |  |  |
| [Mode Selection] |  |  |  |
| 1 | *1200x1200Photo | P | Selects the printing mode (resolution) for the printer gamma adjustment. When selecting a print mode, an asterisk ( ${ }^{*}$ ) is displayed in the front of the mode. |
| 2 | $600 \times 600$ Text |  |  |
| 3 | $1200 \times 600$ Text |  |  |
| 4 | $600 \times 600$ Photo |  |  |
| 5 | 1200x600Photo |  |  |
| [Test Page] |  |  |  |
| 1 | Gradation |  | Prints the test page to check the color balance before and after the gamma adjustment. |
| 2 | Color Pattern |  |  |
| [Gamma Adj.] |  |  |  |
| 1 | Black/Cyan/Magenta/Yellow 1 | *P | Adjusts the printer gamma for the mode selected in the "Mode Selection" menu. <br> [ 0 to $255 / 16 / 1 /$ step ] |
| 2 | Black/Cyan/Magenta/Yellow 2 |  | [ 0 to 255/32/1/step] |
| 3 | Black/Cyan/Magenta/Yellow 3 |  | [ 0 to 255/48/1/step] |
| 4 | Black/Cyan/Magenta/Yellow 4 |  | [ 0 to 255/64/1/step] |
| 5 | Black/Cyan/Magenta/Yellow 5 |  | [ 0 to $255 / 80 / 1 /$ step] |
| 6 | Black/Cyan/Magenta/Yellow 6 |  | [ 0 to 255/96/1/step] |
| 7 | Black/Cyan/Magenta/Yellow 7 |  | [ 0 to 255/112/1/step] |
| 8 | Black/Cyan/Magenta/Yellow 8 |  | [ 0 to 255/128/1/step] |
| 9 | Black/Cyan/Magenta/Yellow 9 |  | [ 0 to 255/144/1/step] |
| 10 | Black/Cyan/Magenta/Yellow 10 |  | [ 0 to 255/160/1/step] |
| 11 | Black/Cyan/Magenta/Yellow 11 |  | [ 0 to 255/176/1/step] |
| 12 | Black/Cyan/Magenta/Yellow 12 |  | [ 0 to 255/192/1/step] |
| 13 | Black/Cyan/Magenta/Yellow 13 |  | [ 0 to $255 / \underline{208 / 1 / s t e p]}$ |
| 14 | Black/Cyan/Magenta/Yellow 14 |  | [ 0 to 255/224/1/step] |
| 15 | Black/Cyan/Magenta/Yellow 15 |  | [ 0 to 255/240/1/step] |
| [Data Save] |  |  |  |
| 1 | Data Save | P | Stores the print gamma adjusted with the "Gamma Adj." menu item as the current setting. Before the machine stores the new 'current setting', it moves the data currently stored as the 'current setting' to the 'previous setting' memory storage location. |


| Mode No. (Class 1 and 2) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: |
| [Toner Limit] |  |  |  |
| 1 | Photo | *P | Adjusts the maximum toner amount for image development. <br> [ 100 to $400 / \underline{260 / 1 \% / s t e p]}$ ] |
| 2 | Text |  | [ 100 to $400 / 190 / 1 \% /$ step ] |

### 5.2.3 BIT SWITCH PROGRAMMING

$\Rightarrow$ NOTE: Currently, the bit switches are not being used except for Bit Switch 2 bit 3, (See PUB(C)-051 for details) and Bit Switch 3 bit 0 (See PUB(C)-045 for details).

1. Enter the SP mode, select "Service Menu", then press [Enter] twice.
```
<Service>
Bit Switch >>
```

2. Select \#1, \#2, \#3, or \#4 for the desired bit switch, then press [Enter].

- [ $\mathbf{A}][\mathbf{\nabla}]$ : Move to the next switch.

```
Bit Switch
Bit switch 1
```

3. Adjust the bit switch using the following keys.

- [ $\mathbf{\Delta}][\mathbf{\nabla}]$ : Move to the next bit.

```
Sw#1 00000000
bit0
```

- [Escape]: Exit without saving changes.
- [Enter]: Exit and save changes.

NOTE: The left digit on the display is bit 7 and the right digit is bit 0 .
4. Press [Enter] to save changes and exit.

### 5.3 PRINTER ENGINE SERVICE MODE

### 5.3.1 SERVICE MODE TABLE ("2. ENGINE")

SP1-XXX (Feed)


| 1 | Mode No. (Class 1 and 2) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 105 | [Data Save] |  |  |  |
|  | 1 | Data Save |  | Stores the print gamma adjusted with the "Gamma Adj." menu item as the current setting. Before the machine stores the new 'current setting', it moves the data currently stored as the 'current setting' to the 'previous setting' memory storage location. |
| 106 | [Toner Limit] |  |  |  |
|  | 1 | Toner Limit: Photo | $\stackrel{*}{\mathrm{CT}}$ | Adjusts the maximum toner amount for image development. <br> [ 100 to $400 / 260 / 1 \% /$ step ] |
|  | 2 | Toner Limit: Text |  | [ 100 to $400 / 190 / 1 \% /$ step ] |

### 5.3.2 BIT SWITCH PROGRAMMING

NOTE: Currently, the bit switches are not being used except for Bit Switch 2 bit 3, (See PUB(C)-051 for details) and Bit Switch 3 bit 0 (See PUB(C)-045 for details).

1. Press the numeral key $(0$ to 7$)$ corresponding to the bit number you wish to change.
Pressing the numeral key changes the setting to either " 0 " or " 1 ".
NOTE: The left digit on the display is bit 7 and the right digit is bit 0 .
2. Press [Enter] to save changes and exit.


| 1 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 105 | 11 | H:N[FC] D 125 | * | [ 100 to 190 / NA: $165 \mathrm{EU}: 170 / 5^{\circ} \mathrm{C} / \mathrm{step}$ ] |
|  | 12 | H:OHP [K] | * | [ 100 to $190 / 180 / 5^{\circ} \mathrm{C} /$ step] |
|  | 13 | H:OHP [FC] | * | [ 100 to $190 / 180 / 5^{\circ} \mathrm{C} /$ step] |
|  | 15 | P:N [K] S 125 | * | [ 0 to 190 / NA: $145 \mathrm{EU}: 155 / 5^{\circ} \mathrm{C} / \mathrm{step}$ ] |
|  | 16 | P:N [K] S 185 | * | [ 0 to $190 / \mathrm{NA}: 155 \mathrm{EU}: 160 / 5^{\circ} \mathrm{C} / \mathrm{step}$ ] |
|  | 17 | P:N [K] D 125 | * | [ 0 to $190 / \mathrm{NA}$ : $135 \mathrm{EU}: 145 / 5^{\circ} \mathrm{C} /$ step] |
|  | 18 | P:N [K] D 185 | * | [ 0 to $190 / \mathrm{NA}: 145 \mathrm{EU}: 155 / 5^{\circ} \mathrm{C} /$ step] |
|  | 19 | P:N[FC] S 62.5 | * | [ 0 to $190 / \mathrm{NA}: 125 \mathrm{EU}: 130 / 5^{\circ} \mathrm{C} / \mathrm{step}$ ] |
|  | 20 | P:N[FC] S 125 | * | [ 0 to $190 / \mathrm{NA}: 145 \mathrm{EU}: 160 / 5^{\circ} \mathrm{C} / \mathrm{step}$ ] |
|  | 21 | P:N[FC] D 62.5 | * | [ 0 to 190 / NA: 120 EU: $125 / 5^{\circ} \mathrm{C} /$ step] |
|  | 22 | P:N[FC] D 125 | * | [ 0 to 190 / NA: $135 \mathrm{EU}: 150 / 5^{\circ} \mathrm{C} /$ step] |
|  | 23 | P:OHP [K] | * | [ 0 to $190 / 160 / 5^{\circ} \mathrm{C} /$ step] |
|  | 24 | P:OHP [FC] | * | [ 0 to $190 / 160 / 5^{\circ} \mathrm{C} /$ step] |
|  | 25 | H:TH [K] | * | [ 0 to $190 / 175 / 5^{\circ} \mathrm{C} /$ step] |
|  | 26 | H:TH [FC] | * | [ 0 to $190 / 175 / 5^{\circ} \mathrm{C} /$ step] |
|  | 27 | P:TH [K] | * | [ 0 to $190 / 155 / 5^{\circ} \mathrm{C} /$ step] |
|  | 28 | P:TH [FC] |  | [ 0 to $190 / 155 / 5^{\circ} \mathrm{C} /$ step] |
|  | 29 | H:Envelop | * | [ 0 to $190 / 175 / 5^{\circ} \mathrm{C} /$ step] |
|  | 30 | P:Envelop | * | [ 0 to $190 / 155 / 5^{\circ} \mathrm{C} /$ step] |
|  | 31 | H: Slow Down | * | Sets the heating roller temperature for the printing start condition when changing the process speed. Fusing temperature must be decreased when the machine changes to a process speed that is slower than the current process speed (for example, when the speed changes from 185 $\mathrm{mm} / \mathrm{s}$ to $62.5 \mathrm{~mm} / \mathrm{s})$. The machine idles while reducing the fusing temperature. When the fusing temperature becomes lower than the ready temperature, the machine starts printing. Ready Temperature = Target temperature + Temperature specified in this SP mode. [ 1 to $20 / \underline{5} / 1^{\circ} \mathrm{C} /$ step] |
|  | 32 | P: Slow Down | * | Sets the pressure roller temperature for the printing start condition when changing the process speed. <br> [ 1 to $20 / 10 / 1^{\circ} \mathrm{C} /$ step] |
|  | 33 | H:SP 62.5 | * | [-20 to $\left.30 / \underline{0} / 1^{\circ} \mathrm{C} / \mathrm{step}\right]$ |
|  | 34 | H:SP 125 | * | [-20 to $\left.30 / \underline{0} / 1^{\circ} \mathrm{C} / \mathrm{step}\right]$ |
|  | 35 | H:SP 185 | * | [ $\left[-20\right.$ to $\left.30 / \underline{0} / 1^{\circ} \mathrm{C} / \mathrm{step}\right]$ |
|  | 36 | P:SP 62.5 | * | [ -20 to $30 / \underline{0} / 1^{\circ} \mathrm{C} / \mathrm{step}$ ] |
|  | 37 | P:SP 125 | * | [-20 to $\left.30 / \underline{0} / 1^{\circ} \mathrm{C} / \mathrm{step}\right]$ |
|  | 38 | P:SP 185 | * | [ $\left[-20\right.$ to $\left.30 / \underline{0} / 1^{\circ} \mathrm{C} / \mathrm{step}\right]$ |
| 106 | [Temp. Display] Fusing Temperature Display (Heating or Pressure) |  |  |  |
|  | 1 | H Roller |  | Displays the current temperature of the heating |
|  | 2 | P Roller |  | and pressure rollers. |
| 902 | [Paper Size] Tray Paper Size |  |  |  |
|  | 1 | Tray 1 A4/LT | * | Specifies the paper size for tray 1. [ 0 or 1/0/-] Alphanumeric 0 : A4 sideways, 1: LT sideways Tray 1 can only use these two sizes. US: 1 FA |


| 1 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 902 | 2 | Tray 2 B4/LG | * | Specifies the paper size for tray 2. <br> [ 0 or $1 / \underline{0} /$ - ] Alphanumeric <br> 0: B4 lengthwise, 1: LG lengthwise <br> This specifies which size is detected for a sensor output of 1101 (see section 6 for details). <br> US: 1 FA |
|  | 3 | Tray 2 A4/LT | * | Specifies the paper size for tray 2. <br> [ 0 or 1 / $\underline{0} /$ - ] Alphanumeric <br> 0: A4 lengthwise, 1: LT lengthwise <br> This specifies which size is detected for a sensor output of 0110 (see section 6 for details). <br> US: 1 FA |
|  | 4 | Tray 2 B5/LT | * | Specifies the paper size for tray 2. <br> [ 0 or $1 / \underline{0} /-$ ] Alphanumeric <br> 0: LT, 1: B5 lengthwise <br> This specifies which size is detected for a sensor output of 1011 (see section 6 for details). |
| 910 | [Idling Time] (Fusing Idling Time) |  |  |  |
|  | 1 | Idling Time | * | Specifies the timer for deciding whether to do fusing idling when receiving a print command. <br> When receiving a new job within the time specified in this SP mode after the last job is completed, fusing idling is not done because the fusing section was already warmed up during the last job. <br> [ 0 to $180 / \underline{1} / 1$ minute/step ] DFU |
| 912 | [Machine Temp.] Machine Temperature Correction Th: Threshold, Heating or Pressure roller |  |  |  |
|  | Corrects the fusing temperature depending on the temperature inside the machine. If the temperature inside the machine is too high or low, this may cause hot or cold offset image at the fusing section. To avoid the offset image, the fusing temperature is corrected depending on the temperature inside machine, which is monitored by the thermistor located on the right side of the laser optics housing unit. <br> If the temperature inside the machine is detected as high or low (based on the settings of SP1-912-001 or 002), the fusing temperature is decreased or increased by the temperature specified in SP1-912-003 to 006. |  |  |  |
|  | 1 | Th:High Temp | * | Sets the threshold for entering the high temperature condition. $\text { [ } \left.0 \text { to } 50 / \underline{30} / 1^{\circ} \mathrm{C} / \text { step }\right]$ |
|  | 2 | Th:Low Temp | * | Sets the threshold for entering the low temperature condition. <br> [ 0 to $50 / 17 / 1^{\circ} \mathrm{C} /$ step] |
|  | 3 | H:High Temp | * | Sets the fusing temperature decrease for the high temperature condition. <br> [ 0 to $15 / \underline{0} / 1^{\circ} \mathrm{C} /$ step] |
|  | 4 | P:High Temp | * | [ 0 to $15 / \underline{0} / 1^{\circ} \mathrm{C} /$ step] |
|  | 5 | H:Low Temp | * | Sets the fusing temperature increase for the low temperature condition. <br> [ 0 to $15 / \underline{5} / 1^{\circ} \mathrm{C} /$ step] |
|  | 6 | P:Low Temp | * | [ 0 to $15 / \underline{5} / 1^{\circ} \mathrm{C} /$ step] |


| 1 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 913 | [Temp. Cor. 1] Fusing Temperature Correction (Correction Timing) |  |  |  |
|  | 1 | Sheet Setting |  | Specifies the number of sheets to determine whether or not to apply the fusing temperature correction. <br> During a multi print job, the fusing temperature tends to slightly overshoot around the 10th sheet and then stabilize. Temperature overshooting may cause the glossiness to increase. <br> To minimize the overshooting, both fusing and pressure roller temperatures are decreased by the amount specified in SP1-914 at the number of sheets specified in this SP mode, until the end of the job. <br> [ 1 to $60 / 10 / 1$ sheet/step] |
| 914 | [Temp. Cor. 2] Fusing Temperature Correction (Temperature Setting) |  |  |  |
|  | 1 | Heating |  | Specifies the temperature to be subtracted from the targeted temperatures specified in SP1-105-3 to-24. <br> [ 0 to $30 / \underline{\left.10 / 5^{\circ} \mathrm{C} / \text { step ] }\right] ~}$ |
|  | 2 | Pressure | * |  |
| 915 | [Stand-by Time] |  |  |  |
|  | 1 | Job Receiving |  | Specifies the time to shift the machine into the stand-by mode when not receiving a print start command after receiving a print preparation command. <br> [ 0 to $180 / 60 / 10$ seconds/step ] <br> 0 : The machine does not shift to the stand-by mode. |
|  | 2 | Job End |  | Specifies the time to shift the machine into the stand-by mode after the last job is completed. [ 0 to 180 / $60 / 10$ seconds/step ] 0 : The machine does not shift to the stand-by mode. |
| 996 | [OHP/TH Fusing] OHP/Thick Paper Fusing Temperature Correction (Heating or Pressure Roller) |  |  |  |
|  | Specifies the temperature for starting a print job. <br> The fusing section is already warmed up when the last print job was completed. If prints are made on OHP or thick paper at this time, the fusing temperature tends to be higher than the target, causing exit roller marks or a paper jam in the fusing section. <br> To prevent this, the print job will not start if the heating and pressure roller temperatures are higher than the following: <br> (Target temperature specified by SP1-105-12, -13, -23, -24) - (Temperature specified by <br> this SP mode (default: $5^{\circ} \mathrm{C}$ for heating roller, $10^{\circ} \mathrm{C}$ for pressure roller)) |  |  |  |
|  | 4 | H:Print Temp |  | [ 0 to $20 / 5 / 1^{\circ} \mathrm{C} /$ step] |
|  | 5 | P:Print Temp | * | $\left[0\right.$ to $\left.20 / 10 / 1^{\circ} \mathrm{C} / \mathrm{step}\right]$ |

## SP2-XXX (Drum)



| 2 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 001 | 21 | AC U Limit[FC] |  | Sets the upper limit of the AC component adjustable range for color. <br> During machine initialization and process control self-check, the AC component of the charge roller bias is automatically adjusted within the range specified in the SP2-001-021 and 022. <br> [ 0 to 255 / 90 / 1/step ] DFU |  |
|  | 22 | AC L Limit[FC] |  | Sets the lower limit of the AC component adjustable range for color. [ 0 to 255 / 84 / 1/step] DFU |  |
| 103 | [LD Control] LD Power Control ([Color Mode, Color], Process Speed, K or Color mode) P: Power, M: Magnification |  |  |  |  |
|  | Adjusts the laser power by changing the current applied to LD. Laser power is automatically adjusted during process control; therefore, adjusting these data has no effect while Process Control (SP3-125 Default: ON) is activated. After deactivating Process Control with SP3-125, the values in these SP modes are used for printing. |  |  |  |  |
|  | 1 | PO:[FC,K] 62.5 |  | [ 0 to 1023/672/1/step] | DFU |
|  | 2 | PO:[FC,K] 125 |  | [ 0 to 1023/640 / 1/step ] | DFU |
|  | 4 | PO:[FC, Y] 62.5 |  | [ 0 to 1023 / 672 / 1/step] | DFU |
|  | 5 | PO:[FC,Y] 125 |  | 0 to 1023 / 640 / 1/step | DFU |
|  | 7 | PO:[FC,M] 62.5 | * | 0 to 1023 / 672 / / /step | DFU |
|  | 8 | PO:[FC,M] 125 |  | 0 to 1023 / 640 / 1/step | DFU |
|  | 10 | PO:[FC,C] 62.5 |  | 0 to 1023 / 672 / 1/step | DFU |
|  | 11 | PO:[FC,C] 125 |  | 0 to 1023 / 640 / $1 /$ step | DFU |
|  | 13 | P0:[K,K] 62.5 |  | 0 to 1023 / 672 / 1/step | DFU |
|  | 14 | PO:[K,K] 125 |  | 0 to 1023 / $672 / 1 /$ step | DFU |
|  | 15 | PO:[K,K] 185 |  | 0 to 1023 / 601 / 1 step | DFU |
|  | 25 | P1:[K,K] 62.5 |  | [ 0 to 1023 / 672 / 1/step] | DFU |
|  | 26 | P1:[K,K] 125 |  | [ 0 to 1023 / 672 / 1/step] | DFU |
|  | 27 | P1:[K,K] 185 | * | 0 to 1023 / 601 / $1 /$ step | DFU |
|  | Main Scan Magnification ([Color], Laser Exposure Frequency) |  |  |  |  |
|  | 55 | $\mathrm{M}:[\mathrm{K}] 64.3 \mathrm{MHz}$ | * | Displays the result of the latest line position adjustment. Changing this affects the main scan magnification; however, this will be automatically corrected at the next line position adjustment. If a fine adjustment is required, it can be done with SP5-993-013 to 015 (this affects the way that the adjustment is done, and will be effective from the next line position adjustment). <br> [ 0 to $280 / \underline{140 / 1 d o t / s t e p]} 1 \mathrm{dot}=20 \mu$ DFU NOTE: If the line position adjustment does not work properly, the line position can be adjusted manually with this SP mode as a temporary measure. In this case, the line position adjustment needs to be disabled with SP5-993-001. |  |
|  | 56 | $\mathrm{M}:[\mathrm{Y}] 64.3 \mathrm{MHz}$ | * |  |  |
|  | 57 | $\mathrm{M}:[\mathrm{M}] 64.3 \mathrm{MHz}$ | * |  |  |
|  | 58 | $\mathrm{M}:[\mathrm{C}] 64.3 \mathrm{MHz}$ |  |  |  |
|  | 59 | $\mathrm{M}:[\mathrm{K}] ~ 47.6 \mathrm{MHz}$ | * |  |  |
| 109 | [LD Beam Pitch] LD Beam Pitch |  |  |  |  |
|  | Sets the beam pitch for black in 1200 dpi or 600 dpi mode. <br> NOTE: After replacing the laser optics housing unit, the data printed on the decal attached to the new unit must be input with this SP mode. |  |  |  |  |
|  | 2 | Pitch 1200 |  | [ 0 to $255 / 50 / 50$ pulse/step] FA |  |
|  | 3 | Pitch 600 | * | [ 0 to 255/42/50 pulse/step]FA |  |
|  | 5 | Display 1200 |  | [ 0 to 255/-/1 pulse/step] |  |
|  | 6 | Display 600 |  | [ 0 to 255/-/1 pulse/step] |  |


| 2 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 112 | [Polygon OFF 1] Polygon Mirror Motor OFF Timing |  |  |  |
|  | 1 | Warming-up |  | The polygon mirror motor turns off if the machine receives no print start command for the time specified in this SP mode after receiving the print preparation command. <br> [ 0 to $60 / \underline{10 / 1}$ second/step ] <br> 0: Not turned off except for Energy Saver mode |
|  | 2 | Job End |  | The polygon mirror motor turns off if the machine receives no print job for the time specified in this SP mode after the previous job was completed. [ 0 to $60 / \underline{1} / 1$ second/step ] 0: Not turned off except for Energy Saver mode |
| 113 | [Polygon OFF 2] Polygon Mirror Motor OFF |  |  |  |
|  | 1 | Polygon OFF 2 |  | The polygon mirror motor does not turn on until the printer enters the ready condition even after receiving the print start command. <br> [ 0 or $1 / 1 / 1 /$ step ] <br> 0: Enable, 1: Disable <br> NOTE: When a user complains about high frequency noise, enabling this mode can minimize the noise. |
| 201 | [Dev. Bias] Development Bias ([Color], Process Speed) |  |  |  |
|  | 1 | [K] 62.5 |  | Adjusts the development bias. Development bias is automatically adjusted during process control; therefore, adjusting these settings has no effect while Process Control (SP3-125 Default: ON) is activated. <br> After deactivating Process Control with SP3-125, the values in these SP modes are used for printing. <br> [ 200 to 800 / 500 / 10 V/step ] DFU |
|  | 2 | [K] 125 | * |  |
|  | 3 | [K] 185 | * |  |
|  | 4 | [Y] 62.5 | * |  |
|  | 5 | [Y] 125 | * |  |
|  | 6 | [M] 62.5 | * |  |
|  | 7 | [M] 125 | * |  |
|  | 8 | [C] 62.5 | * |  |
|  | - | [C] 125 | * |  |
| 207 | [Forced Toner] Forced Toner Supply ([Color]) |  |  |  |
|  | 1 | [K] |  | Forces toner to be supplied to the development unit for the number of times specified by this SP mode. <br> 1 time: The toner supply clutch turns on for 0.7 s and off for 1.3 s . <br> [ 0 to $3 / \underline{\underline{2} / 1 / \text { step ] }}$ |
|  | 2 | [Y] | * |  |
|  | 3 | [M] | * |  |
|  | 4 | [C] | * |  |
| 208 | [Toner Mode] Toner Supply Method ([Color]) |  |  |  |
|  | 1 | [K] | * | Selects the toner supply method. <br> [ 0 to $2 / 1 / 1 /$ step ] Alphanumeric <br> 0 : Fixed supply (with the supply rates stored with SP2-208-5 to 8) <br> 1: Fuzzy control supply <br> 2: Proportional control supply (using the Vref values stored with SP2-224-5 to 8) |
|  | 2 | [Y] | * |  |
|  | 3 | [M] | * |  |
|  | 4 | [C] | * |  |
|  | 5 | Fixed Rate [ K ] |  | Sets the toner supply rate used when the toner supply method (SP2-208-1 to 4) is set to '0' (fixed supply mode). <br> [ 0 to 100 / $\underline{5} / 1 \% /$ step ] |
|  | 6 | Fixed Rate [Y] | * |  |
|  | 7 | Fixed Rate [M] | * |  |
|  | 8 | Fixed Rate [C] | * |  |


| 2 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 208 | 9 | Upper Limit | \# | Specifies the maximum possible toner supply, expressed as a percentage of the maximum amount of toner that can possibly be supplied for a sheet of paper. <br> If too much toner is supplied to the development unit especially for black or in the low humidity condition, this may cause dirty background due to insufficient agitation. This SP mode limits the maximum possible toner supply for black and only in the low humidity condition for color. [ 20 to 70 / 42 / 1 \%/step ] DFU <br> NOTE: The main switch must be turned off and on to effect the setting change. |
|  | 10 | LowCoverage[K] |  | Adjusts the toner supply amount (fixed rate) when making multiple prints of pages with low image ratio (coverage). <br> When printing with a low image ratio, toner concentration is controlled only with Vt outputs since pixel count is not done for low image ratios. This may cause the attraction force between toner and carrier to increase, resulting in low image density on outputs. To prevent this, the machine counts the number of pixels and supplies a fixed amount of toner if the accumulated number of pixels becomes greater than the specified level. [ 0 to $100 / \underline{g} / 1 \% /$ step ] DFU |
|  | 11 | LowCoverage[Y] |  | [ 0 to $100 / \underline{\text { g } / 1 \% / s t e p ~] ~ D F U ~}$ |
|  | 12 | LowCoverage[M] |  | [ 0 to $100 / \underline{5} / 1 \% /$ step ] DFU |
|  | 13 | LowCoverage[C] |  | [ 0 to $100 / \underline{\text { g }} 1 \mathrm{l}$ \%/step] DFU |
| 210 | [Toner Counter] Toner Supply Counter ([Color]) |  |  |  |
|  | 5 | [K] | * | Displays the total time that the toner supply clutch has been on. <br> This data is stored in the memory chip on each toner cartridge. <br> [ 0 to 5000 / - / 1 second/step ] |
|  | 6 | [Y] | * |  |
|  | 7 | [M] | * |  |
|  | 8 | [C] | * |  |
| 212 | [Toner Near/End] Toner Near End/End Detection Threshold ([Color]) |  |  |  |
|  | 1 | Start [K] | * | When the amount of toner amount left in the cartridge becomes less than this value, the machine starts monitoring the Vt values for toner near end detection. <br> [ 0 to $1000 / \underline{600 / 10 \mathrm{~g} / \mathrm{step} \text { ] }] ~}$ |
|  | 2 | Start [YMC] | * | [ 0 to $1000 / 300 / 10 \mathrm{~g} / \mathrm{step}$ ] |
|  | 5 | Near [K] | * | Specifies the threshold for toner near-end detection. <br> The machine detects toner near-end when the following happens 10 times consecutively. $\underline{V t}>\text { Vref }+ \text { Threshold }$ <br> [ 0 to $5.0 / 0.4 / 0.1 \mathrm{~V} /$ step ] |
|  | 6 | Near [YMC] | * |  |
|  | 7 | End [K] |  | Specifies the threshold for toner end detection. The machine detects toner end when the following happens 10 times consecutively. Then, the machine stops printing, even during a print job. $\text { Vt }>\text { Vref }+ \text { Threshold }$ <br> [ 0 to $5.0 / 0.8 / 0.1 \mathrm{~V} /$ step ] |
|  | 8 | End [YMC] |  |  |



| 2 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 223 | 3 | Toner Fill Up |  | Activates or deactivates the Toner Fill Up mode, which fills up the toner supply tube with toner during developer initialization. <br> This function is required only at machine installation. Although the default is "0", the factory setting is " 1 ". After toner fill-up occurs during machine installation, the setting is changed to " 0 " automatically. <br> [ 0 or $1 / \underline{0} /-$ ] Alphanumeric, DFU <br> 0 : Deactivate <br> 1: Activate |
| 224 | [Vent / Vref] Vent / Vref ([Color]) |  |  |  |
|  | Adjusts the Vent value manually. <br> The value in this SP mode is effective until after the next process control self-check. To always use this value for some reason, select proportional control supply mode with SP2- <br> 208-1 to 4. |  |  |  |
|  | 1 | Vcnt [K] | \# | [ 0 to 220 / $100 / 0.1 \mathrm{~V} / \mathrm{step}$ ] NOTE: The main switch must be turned off and on to effect the setting change. |
|  | 2 | Vont [Y] |  |  |
|  | 3 | Vont [M] |  |  |
|  | 4 | Vont [C] |  |  |
|  | Adjusts the Vref value manually. <br> The value in this SP mode is effective until the next process control self-check. To always use this value for some reason, select proportional control supply mode with SP2-208-1 to 4. |  |  |  |
|  | 5 | Vref [K] |  | [ 0 to $50 / \underline{28} / 0.1 \mathrm{~V} /$ step ] |
|  | 6 | Vref [Y] |  |  |
|  | 7 | Vref [M] |  |  |
|  | 8 | Vref [C] |  |  |
| 301 | [Transfer Cur.] Transfer Current <br> ([Color Mode, Color], Paper Tray or By-pass, Simplex or Duplex, Process Speed) <br> Paper Type -> TH: Thick Paper, SP: Special Paper <br> Adjusts the transfer current for each color and each print mode. <br> NOTE: If the transfer current is increased too much, image offset may occur especially in halftone areas. |  |  |  |
|  |  |  |  |  |  |  |
|  | 1 | [K]P S 125 |  | [ 0 to $50 / 16 / 1 \mu \mathrm{~A} /$ step ] |
|  | 2 | [K]P S 185 | * | [ 0 to $50 / \underline{24 / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 3 | [K]P D 125 |  | [ 0 to $50 / \underline{16} / 1 \mu \mathrm{~A} /$ step] |
|  | 4 | [K]P D 185 | * |  |
|  | 5 | [K]B S 62.5 | * | [ 0 to $50 / \underline{8} / 1 \mu \mathrm{~A} /$ step ] |
|  | 6 | [K]B S 125 | * | [ 0 to $50 / 16 / 1 \mu \mathrm{~A} /$ step ] |
|  | 7 | [K]B S 185 |  | [ 0 to $50 / \underline{24 / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 8 | [FC,K]P S 62.5 | * | [ 0 to $50 / \underline{\underline{6} / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 9 | [FC,K]P S 125 | * | [ 0 to $50 / \underline{13} / 1 \mu \mathrm{~A} /$ step ] |
|  | 10 | [FC, Y]P S 62.5 | * | [ 0 to $50 / \underline{\underline{6} / 1} \mathrm{\mu A} /$ step ] |
|  | 11 | [FC, Y]P S 125 |  | [ 0 to $50 / \underline{11 / 1} \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 12 | [FC,M]P S 62.5 | * | [ 0 to $50 / \underline{\underline{5} / 1 \mu \mathrm{~A} / \mathrm{step}]}$ |
|  | 13 | [FC,M]P S 125 | * | [ 0 to $50 / \underline{10} / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 14 | [FC,C]P S 62.5 | * | [ 0 to $50 / \underline{\underline{6} / 1} \mathrm{\mu A} /$ step ] |
|  | 15 | [FC,C]P S 125 |  |  |
|  | 16 | [FC,K]P D 62.5 | * | [ 0 to $50 / 8 / 1 \mathrm{~mA} / \mathrm{step}$ ] |
|  | 17 | [FC,K]P D 125 | * | [ 0 to $50 / 16 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 18 | [FC, Y] P D 62.5 | * | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 19 | [FC,Y]P D 125 |  | [ 0 to $50 / \underline{11 / 1 \mu \mathrm{~A} / \mathrm{step} \text { ] }}$ |


| 2 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 301 | 20 | [FC,M]P D 62.5 | * | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step ] |
|  | 21 | [FC,M]P D 125 | * | [ 0 to $50 / \underline{9} / 1 \mu \mathrm{~A} /$ step ] |
|  | 22 | [FC,C]P D 62.5 | * | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 23 | [FC,C]P D 125 | * | [ 0 to $50 / 10 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 24 | [FC,K]B S 62.5 | * | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 25 | [FC,K]B S 125 | * | [ 0 to $50 / \underline{12 / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 26 | [FC, Y]B S 62.5 | * | [ 0 to $50 / \underline{\text { 6/ } / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 27 | [FC, Y] B S 125 | * | [ 0 to $50 / \underline{11 / 1 \mu \mathrm{~A} / \mathrm{step} \text { ] }}$ |
|  | 28 | [FC,M]B S 62.5 | * | [ 0 to $50 / \underline{5} / 1 \mathrm{\mu A} /$ step ] |
|  | 29 | [FC,M]B S 125 | * | [ 0 to $50 / 10 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 30 | [FC,C]B S 625 | * | [ 0 to $50 / \underline{\text { 6/ } / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 31 | [FC,C]B S 125 | * | [ 0 to $50 / \underline{11 / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 32 | [K]OHP 62.5 | * | [ 0 to $50 / \underline{6} / 1 \mathrm{\mu A} /$ step ] |
|  | 33 | [FC,K]OHP 62.5 | * | [ 0 to $50 / 15 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 34 | [FC,Y]OHP 62.5 | * | [ 0 to $50 / 12 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 35 | [FC,M]OHP 62.5 | * | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 36 | [FC,C]OHP 62.5 | * | [ 0 to $50 / \underline{9} / 1 \mu \mathrm{~A} /$ step ] |
|  | 37 | [K]TH D62.5 | * | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 38 | [FC,K]TH D62.5 | * | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step ] |
|  | 39 | [FC,Y]TH D62.5 | * | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step ] |
|  | 40 | [FC,M]TH D62.5 | * | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step ] |
|  | 41 | [FC,C]TH D62.5 | * | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step ] |
|  | 42 | [K]SP S62.5 | * | [ 0 to $50 / \underline{9} / 1 \mu \mathrm{~A} /$ step ] |
|  | 43 | [K]SP S125 | * | [ 0 to $50 / 18 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 44 | [K]SP S185 | * | [ 0 to $50 / \underline{27} / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 45 | [FC,K]SP S62.5 | * | [ 0 to $50 / \underline{8} / 1 \mu \mathrm{~A} /$ step ] |
|  | 46 | [FC, Y] SP S62.5 | * | [ 0 to $50 / \underline{7} / 1 \mu \mathrm{~A} /$ step ] |
|  | 47 | [FC,M]SP S62.5 | * | [ 0 to $50 / \underline{\underline{6} / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 48 | [FC,C]SP S62.5 | * | [ 0 to $50 / \underline{\text { 7 }} / 1 \mu \mathrm{~A} /$ step ] |
|  | 49 | [FC,K]SP S125 | * | [ 0 to $50 / 15 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 50 | [FC, Y] SP S125 | * |  |
|  | 51 | [FC,M]SP S125 | * | [ 0 to $50 / \underline{12} / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 52 | [FC,C]SP S125 | * | [ 0 to $50 / 13 / 1 \mu \mathrm{~A} /$ step] |
|  | 57 | [K]TH S62.5 | * | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 58 | [FC,K]TH S62.5 | * | [ 0 to $50 / \underline{\text { 6 }} / 1 \mathrm{\mu A} /$ step ] |
|  | 59 | [FC, Y]TH S62.5 | * | [ 0 to $50 / \underline{\text { 6/ }} / 1 \mu \mathrm{~A} /$ step ] |
|  | 60 | [FC,M]TH S62.5 | * | [ 0 to $50 / \underline{\underline{6} / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 61 | [FC,C]TH S62.5 | * | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 62 | [K]SP D62.5 | * | [ 0 to $50 / \underline{\text { g } / 1 ~} 1 \mathrm{\mu} /$ /step ] |
|  | 63 | [K]SP D125 | * | [ 0 to $50 / 18 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 64 | [K]SP D185 | * | [ 0 to $50 / \underline{27} / 1 \mu \mathrm{~A} /$ step] |
|  | 65 | [FC,K]SP D62.5 | * | [ 0 to $50 / 10 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 66 | [FC,Y]SP D62.5 | * | [ 0 to $50 / \underline{\text { 7 } / 1 ~} 1 \mathrm{~A} /$ step ] |
|  | 67 | [FC,M]SP D62.5 | * | [ 0 to $50 / \underline{\text { 6/ }} / 1 \mu \mathrm{~A} /$ step ] |
|  | 68 | [FC,C]SP D62.5 | * | [ 0 to $50 / \underline{7} / 1 \mu \mathrm{~A} /$ step ] |
|  | 69 | [FC,K]SP D125 | * | [ 0 to $50 / 18 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 70 | [FC,Y]SP D125 | * | [ 0 to $50 / \underline{13} / 1 \mu \mathrm{~A} /$ step ] |
|  | 71 | [FC,M]SP D125 | * |  |
|  | 72 | [FC,C]SP D125 | * | [ 0 to $50 / \underline{12} / 1 \mu \mathrm{~A} /$ step ] |


| 2 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 309 | [Cur.Paper Size] Transfer Current - Paper Size Correction Paper Type -> N: Normal, TH: Thick, OHP |  |  |  |
|  | Corrects the transfer current for paper size. <br> When small paper is used for printing, the transfer current flows to the drum at the non image areas where the transfer belt touches the OPC drum. This may cause an abnormal image due to insufficient current at the image areas. <br> To increase the current by 1.5 times, set the SP mode to " 15 ". <br> NOTE: Increase only when an abnormal image (insufficient image transfer) occurs on a small paper size. However, increasing the current too much may cause image offset. |  |  |  |
|  | 5 | N LT SEF |  | [ 10 to $40 / 16 / 0.1 /$ step ] |
|  | 6 | N Post Card |  | [ 10 to $40 / 22 / 0.1 /$ step ] |
|  | 7 | TH LT SEF |  | [ 10 to $40 / \underline{12} / 0.1 /$ step ] |
|  | 8 | TH Post Card |  | [ 10 to $40 / 30 / 0.1 / \mathrm{step}$ ] |
|  | 9 | OHP LT SEF |  | [ 10 to $40 / \underline{22} / 0.1 /$ step ] |
|  | 10 | OHP Post Card |  | [ 10 to $40 / 40 / 0.1 /$ step ] |
| 801 | [PA Roller Cur.] Paper Attraction Roller Current ([Color], Simplex or Duplex, Process Speed): Current Adjustment (Paper or By-pass): Paper Size Correction |  |  |  |
|  | Adjusts the paper attraction roller current for color printing. <br> If paper misfeeds occur at the transfer unit in color mode, check and/or adjust the paper attraction roller current. <br> NOTE: The magenta development section is close to the paper attraction roller. <br> Decreasing the current may not cause paper misfeed. <br> If the current is increased too much, the following image problems may occur depending on the humidity. <br> High humidity: <br> Insufficient image transfer in magenta due to current flow to the magenta OPC drum Low humidity: <br> Offset image in magenta halftone areas due to paper charged positive too much When adjusting the current with this SP mode, the value should be lower than transfer current. |  |  |  |
|  | 6 | [FC] S 62.5 |  | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 7 | [FC] S 125 | * | [ 0 to $50 / 10 / 1 \mu \mathrm{~A} /$ step ] |
|  | 8 | [FC] D 62.5 | * | [ 0 to $50 / \underline{\underline{2}} / 1 \mu \mathrm{~A} /$ step ] |
|  | 9 | [FC] D 125 | * | [ 0 to $50 / 5 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 14 | [K] B TH S | * | [ 10 to $30 / \underline{5} / 0.1 /$ step ] |
|  | 15 | [FC] B TH S | * | [ 10 to $30 / \underline{0} / 0.1 / \mathrm{step}$ ] |
|  | 16 | [K] B OHP | * | [ 10 to $30 / 10 / 0.1 / \mathrm{step}$ ] |
|  | 17 | [FC] B OHP | * | [ 10 to $30 / 16 / 0.1 / \mathrm{step}$ ] |
|  | 18 | [K] B TH D | * | [ 10 to $30 / \underline{5} / 0.1 /$ step ] |
|  | 19 | [FC] B TH D | * | [ 10 to $30 / \underline{0} / 0.1 / \mathrm{step}$ ] |
|  | 20 | [K] SP S | * | [ 10 to $30 / \underline{5} / 0.1 /$ step ] |
|  | 21 | [K] SP D | * | [ 10 to $30 / 5 / 0.1 /$ step ] |
|  | 22 | [FC] SP S 62.5 | * | [ 10 to $30 / \underline{5} / 0.1 /$ step ] |
|  | 23 | [FC] SP S 125 | * | [ 10 to $30 / 10 / 0.1 /$ step ] |
|  | 24 | [FC] SP D 62.5 | * | [ 10 to $30 / \underline{2} / 0.1 /$ step ] |
|  | 25 | [FC] SP D 125 | * | [ 10 to $30 / \underline{5} / 0.1 /$ step ] |


| 2 | Mode No. |  |  | Function / [ Setting ] |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 802 | [PA Cur. Size] Paper Attraction Roller Current - Paper Size Correction Paper Type -> N: Normal, TH: Thick, OHP |  |  |  |  |
|  | Adjusts the correction, depending on the paper size. <br> When small-width paper is used for printing, the paper attraction roller current flows to the non-image areas of OPC drum where the transfer belt touches the drum. This may cause paper misfeed due to insufficient current. <br> To increase the current by 1.5 times, set the SP mode to " 15 ". <br> NOTE: Adjust only when a paper misfeed occurs with a small paper size. Increasing the current too much may cause image offset in magenta halftone areas. |  |  |  |  |
|  | 1 | N LT SEF |  | 10 to 40 / 15 / 0.1/step |  |
|  | 2 | N Post Card |  | 10 to $40 / 20 / 0.1 /$ step |  |
|  | 3 | TH LT SEF |  | 10 to $40 / 15 / 0.1 /$ step ] |  |
|  | 4 | TH Post Card |  | 10 to $40 / 20 / 0.1 /$ step ] |  |
|  | 5 | OHP LT SEF |  | 10 to 40 / $\underline{24} / 0.1 /$ step |  |
|  | 6 | OHP Post Card |  | 10 to $40 / 40 / 0.1 /$ step $]$ |  |
| 908 | [Mirror Motor] Mirror Positioning Motor ([Color]) |  |  |  |  |
|  | Displays the result of the latest line position adjustment. Changing this affects the mirror position, which corrects the optically skewed image; however, this will be automatically corrected at the next line position adjustment. <br> NOTE: If the line position adjustment does not work properly, the line position can be adjusted manually with this SP mode as a temporary measure. In this case, the line position adjustment needs to be disabled with SP5-993-001. |  |  |  |  |
|  | 2 | [C] |  | [ - 128 to 127/ / 11 pulse/step] DFU |  |
|  |  | [M] |  |  |  |
|  | 4 | [Y] |  |  |  |
| 909 | [Main-scan Reg.] Main-scan Registration ([Color]) |  |  |  |  |
|  | Displays the result of the latest line position adjustment. Changing this affects the main scan registration; however, this will be automatically corrected at the next line position adjustment. If a fine adjustment is required, it can be done with SP5-993-010 to 012 (this affects the way that the adjustment is done, and will be effective from the next line position adjustment. <br> NOTE: If the line position adjustment does not work properly, the line position can be adjusted manually with this SP mode as a temporary measure. In this case, the line position adjustment needs to be disabled with SP5-993-001. $1 \text { dot }=20 \mu$ |  |  |  |  |
|  | 1 | [Y] |  | [ -255 to 255 / 0 / 1 dot/step ] DFU |  |
|  | 2 | [M] |  |  |  |
|  | 3 | [C] |  |  |  |
|  | 4 | [K] |  |  |  |
| 916 | [Sub-scan Reg.] Sub-scan Registration ([Color Mode, Color], Resolution) |  |  |  |  |
|  | Displays the result of the latest line position adjustment. Changing this affects the sub scan registration; however, this will be automatically corrected at the next line position adjustment. If a fine adjustment is required, it can be done with SP5-993-016 to 021 (this affects the way that the adjustment is done, and will be effective from the next line position adjustment. <br> NOTE: If the line position adjustment does not work properly, the line position can be adjusted manually with this SP mode as a temporary measure. In this case, the line position adjustment needs to be disabled with SP5-993-001. <br> 600 dpi: 1 dot $=40 \mu, 1200 \mathrm{dpi}: 1 \mathrm{dot}=20 \mu$ |  |  |  |  |
|  | 1 | [K] 1200 |  | [ 0 to 20000 / 7510 / 1 dot | DFU |
|  | 2 | [FC,K] 1200 |  | [ 0 to 20000 / 15038 / 1 do | ] DFU |
|  | 3 | [FC, Y] 1200 |  | [ 0 to 20000/10402 / 1 do | ] DFU |
|  | 4 | [FC,M] 1200 |  | 0 to 20000 / 1136 / 1 dot | DFU |
|  | 5 | [FC,C] 1200 |  | 0 to $20000 / \underline{5762 / 1 ~ d o t] ~}$ | DFU |
|  | 6 | [K] 600 |  | 0 to 20000 / 3755 / 1 dot | DFU |


| 2 | Mode No. (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 916 | 7 | [FC,K] 600 |  | [ 0 to 20000 / 7519/1 dot ] DFU |
|  | 8 | [FC,Y] 600 |  | [ 0 to 20000 / 5201/1 dot ] DFU |
|  | 9 | [FC,M] 600 |  | 0 to 20000 / 568 / 1 dot] DFU |
|  | 10 | [FC,C] 600 |  | [ 0 to 20000 / 2881/1 dot ] DFU |
| 919 | [MScan Lgth Det] Main-scan Length Detection |  |  |  |
|  | 1 | MScan Lgth Det |  | Enables or disables the main-scan length detection. <br> [ 0 or 1 / 1 / - ] Alphanumeric <br> 0: Disable <br> 1: Enable |
| 994 | [MScan Reg Cor] Main-scan Registration Correction ([Color]) |  |  |  |
|  | Specifies the correction to the main-scan length. <br> Main-scan length differs for each machine due to variations in parts used in the laser optics housing unit. Fine adjustment of main-scan length is done at the factory on each unit. <br> This SP mode is DFU except for when replacing the laser optics housing unit. When replacing the unit, the data printed on the label attached to the new unit must be input with this SP mode. <br> NOTE: When fine adjustment is required, the adjustment should be done with SP5-993- $\begin{aligned} & 010 \text { to } 012 . \\ & 1 \text { dot }=20 \mu \end{aligned}$ |  |  |  |
|  | 1 | [Y] |  | [ -128 to $127 / 0 / 1$ dot/step ] FA DFU |
|  | 2 | [M] |  | [-128 to 127 / 1 / 1 dot/step ] FA DFU |
|  | 3 | [C] |  | [ -128 to $127 / 1 / 1$ dot/step ] FA DFU |
|  | 4 | [K] |  | [ -128 to $127 /$ / $/ 1$ dot/step] FA DFU |
| 995 | [Motor Reset] Mirror Positioning Motor Reset |  |  |  |
|  | 1 | Motor Reset |  | Rotates the mirror position motors (CMY) by 250 pulses clockwise; then by 125 pulses counterclockwise. This moves the mirrors back to the initial position. Then, the settings of SP2-908002 to 004 are reset to 0 . <br> When the line position adjustment fails, it is one of possible causes when the mirror position motor locks. Performing this SP mode can move the mirrors back to the original position if it locks. Then, do the forced line position adjustment (SP5-993-002). |

## SP3-XXX (Process)



| 3 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 120 | [Dev. g Target] Development Gamma Target ([Color]) |  |  |  |
|  | Adjusts the development gamma by changing the Vref value used for toner density control. <br> Vref is automatically corrected so that the gamma measured during the process control self-check becomes "the value set with this SP mode $\pm 0.15$ " |  |  |  |
|  | 1 | [K] |  | [ 100 to $300 / \underline{155} / 1 \mathrm{mg} / \mathrm{cm}^{2} / \mathrm{KV} / \mathrm{step}$ ] DFU |
|  | 2 | [Y] |  | [ 100 to $300 / \underline{125} / 1 \mathrm{mg} / \mathrm{cm}^{2} / \mathrm{KV} / \mathrm{step}$ ] DFU |
|  | 3 | [M] | * |  |
|  | 4 | [C] |  |  |
| 121 | [Dev. g Display] Development Gamma Display ([Color]) |  |  |  |
|  | Displays the development gamma measured during the process control self-check. |  |  |  |
|  | 1 | 1 [K] |  | [ 0 to $10000 /-/ 1 \mathrm{mg} / \mathrm{cm} 2 / \mathrm{KV} /$ step ] Normal Range: 1.00 to 2.00 |
|  |  | [Y] |  |  |
|  | 2 | [M] |  |  |
|  |  | [C] |  |  |
| 122 |  |  |  |  |
|  | 1 | [Vk Display] Vk Display ([Color]) |  | Displays the current Vk value.$[-255$ to $255 /-/ 1 /$ step $]$Normal Range: -50 to 50 |
|  |  | 2 [Y] |  |  |
|  | 3 | [M] |  |  |
|  |  | 4 [C] |  |  |
| 123 | [Vref Display] Current Vref Display ([Color]) |  |  |  |
|  | 1 | [K] |  | $\begin{aligned} & \text { Displays the current Vref value. } \\ & {[0.0 \text { to } 5.0 /-/ 0.1 \mathrm{~V} / \text { step }]} \end{aligned}$ |
|  |  | 2 [Y] |  |  |
|  | 3 | [M] |  |  |
|  | 4 [C] |  |  |  |
| 125 | [Process Contr.] Process Control |  |  |  |
|  | 1 | ON/OFF | * | Enables or disables process control. [ 0 or $1 / 1 / 1$ /step ] Alphanumeric 0 : OFF (Use the fixed values for VD, VL and VB set with SP2-001, SP2-103, and SP2-201.) 1: ON |
|  | 2 | LD Control | * | Selects the LD control mode. [ 0 to 2 / 1 / 1/step ] Alphanumeric 0: Fixed (at the value in SP2-103) <br> 1: Controlled by process control <br> 2: Controlled by LD power selection |
|  | 3 | Auto TD Adj. |  | Specifies when to perform the Auto Toner Density Adjustment. When performing the Auto Toner Density Adjustment, the machine supplies or consumes toner so that the development gamma is within $\pm 0.15$ of the gamma target. <br> [ 0 to 3 / $\underline{0}$ / 1/step ] Alphanumeric <br> 0: Disable <br> 1: Initial \& Non-use self-check <br> 2: Job end \& Non-use self-check <br> 3: Initial \& Job end \& Non-use self-check <br> Do not adjust unless advised by senior technical staff. |


| 3 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 125 | 4 | ACC | $\stackrel{*}{\mathrm{CF}}$ | Enables or disables the process control self-check before printing the ACC pattern. <br> [ 0 to $2 / \underline{2} / 1 /$ step ] <br> 0 : Disable <br> 1: Process Control Self-check <br> 2: Auto TD Adjustment \& Process Control Selfcheck <br> NOTE: <br> If color balance changes during multi-copy runs after ACC is performed, select 1 or 2 . Setting 2 can precisely adjust the image density; however, it takes about 6 minutes. Select 1 or 2 depending on the customer's requirement. |
| 126 | [Forced SelfChk] Forced Self-check |  |  |  |
|  | 1 | Forced SelfChk |  | Performs a forced process control self-check. |
|  | 2 | Forced TD Adj. |  | Performs a forced auto toner density adjustment. Do not use unless advised by senior technical staff. |
| 902 | [Pntr. Display] Pointer Table Display ([Color]) |  |  |  |
|  | 1 | Printer [K] |  | Displays the number in the pointer table that was selected during the latest process control selfcheck. <br> [ 1 to 30 / - / 1/step ] |
|  | 2 | Printer [Y] | * |  |
|  | 3 | Printer [M] | * |  |
|  | 4 | Printer [C] | * |  |
|  | 5 | CF [K] | ${ }^{*} \mathrm{CF}$ |  |
|  | 6 | CF [Y] | ${ }^{*} \mathrm{CF}$ |  |
|  | 7 | CF [M] | ${ }^{*} \mathrm{CF}$ |  |
|  | 8 | CF [C] | ${ }^{*} \mathrm{CF}$ |  |
| 903 | [M/A Target] M/A Target ([Color]) |  |  |  |
|  | Adjusts the M/A (Mass per Area, $\mathrm{mg} / \mathrm{cm}^{2}$ ) value used during the process control selfcheck. <br> Adjusting this changes the development bias. This causes the solid ID to increase or decrease. If developer capability causes an ID problem, toner density needs to be adjusted with SP3-120-1 to 4, depending on the color. |  |  |  |
|  | 1 | Printer [K] |  |  |
|  | 2 | Printer [Y] |  |  |
|  | 3 | Printer [M] | * |  |
|  | 4 | Printer [C] | * |  |
|  | 5 | CF [K] | *CF | [ 0 to $1.50 / \underline{0.60 / 0.01 ~ m g / c m ~} /$ /step ] DFU |
|  | 6 | CF [Y] | ${ }^{*} \mathrm{CF}$ |  |
|  | 7 | CF [M] | ${ }^{*} \mathrm{CF}$ |  |
|  | 8 | CF [C] | **F |  |
| 904 | [M/A for LD] M/A Target for LD Correction ([Color]) |  |  |  |
|  | Adjusts the M/A value used during the LD correction mode. This value is effective when SP3-125-2 "LD Control Selection" is set to " 2 ". <br> Adjusting this data effects the image reproduction especially in highlight areas. |  |  |  |
|  | 1 | Printer [K] | * | [ 0 to $1.00 / 0.10 / 0.01 \mathrm{mg} / \mathrm{cm} 2 / \mathrm{step}$ ] DFU |
|  | 2 | Printer [Y] | * | [ 0 to $1.00 / \underline{0.12 / 0.01 ~ m g / c m 2 ~} /$ step] DFU |
|  | 3 | Printer [M] | * |  |
|  | 4 | Printer [C] | * |  |
|  | 5 | CF [K] | ${ }^{*} \mathrm{CF}$ | [ 0 to $1.00 / 0.13 / 0.01 \mathrm{mg} / \mathrm{cm} 2 / \mathrm{step}$ ] DFU |
|  | 6 | CF [Y] | ${ }^{*} \mathrm{CF}$ | [ 0 to $100 / \underline{0.14 / 0.01 ~ m g / c m 2 ~} / \mathrm{step}$ ] DFU |
|  | 7 | CF [M] | ${ }^{*} \mathrm{CF}$ |  |
|  | 8 | CF[C] | ${ }^{*} \mathrm{CF}$ |  |


| 3 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 906 | [PC SelfChk] Process Control Self-checks |  |  |  |
|  | 1 | Job End |  | Specifies the execution timing of the job end process control self-check. <br> [ 0 to 999 / 200 / 1 print/step ] <br> The job end process control self-check is automatically done after a job is completed when 200 prints have been made since the last selfcheck. <br> The counter for the job end process control selfcheck resets when one of the following process control self-checks is done. <br> - Initial <br> - Interval: Interrupt <br> - Non-use Time <br> - During Toner End <br> When K prints are made, the number of prints is calculated with the K coefficient in SP3-906-5. |
|  | 2 | Interrupt | * | Specifies the execution timing of the interrupt process control self-check. <br> [ 0 to 999 / $\mathbf{0} / 1$ print/step ] <br> The interrupt process control self-check is automatically done if the number of prints in the job exceeds the number set in this SP mode. When the print job is completed, the counter is reset, even if the interrupt self check did not occur. When K prints are made, the number of prints is calculated with the K coefficient in SP3-906-5. |
|  | 3 | Non-use Time 1 | * | Specifies the executing timing of the non-use time process control self-check. <br> [ 0 to 999 / $\underline{0} / 1$ print/step ] <br> 0 : Disable <br> The non-use time process control self-check is automatically done after the number of prints set with this SP mode have been made and no prints have been made for the time set with SP mode 3-906-4 since the last print job. <br> If the conditions are met, the self-check will be done after the print job is completed. <br> The counter is reset when the initial process control self-checks is done or when a print is made. |
|  | 4 | Non-use Time 2 | * | Specifies the executing timing of the non-use time process control self-check. <br> [ 0 to 2550 / $30 / 10$ minutes/step ] <br> 0 : Disable |
|  | 5 | K Coefficient | * | Sets the coefficient to calculate the counter value for black-and-white prints. <br> [ 0 to $1.00 / 1.00 / 0.01 /$ step ] DFU <br> With the default setting (100), counters used for process control count up by 1 when 1 black-andwhite print has been made. |



| 3 | Mode No. (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 920 | 4 | Mode Set |  | Enables/disables refresh mode. <br> [ 0 to $2 / \underline{2} / 1$ /step ] Alphanumeric <br> 0 : Disabled <br> 1: Done at power on and toner end recovery <br> 2: Done at power on, toner end recovery, and after the specified number of prints. <br> NOTE: Refresh mode is done during the toner end recovery self-check after a new toner cartridge is installed. |
|  | 5 | Forced |  | Executes a forced refresh mode. <br> Use this mode when the image is smeared. It takes about 1 minute. <br> Also use after replacing the components of the transfer unit (see section 3). |
|  | 6 | Auto Tnr Ref (Auto Toner Refresh) |  | Performs a toner refresh during the OPC refresh mode by changing the development bias from 50 V to 400 V . <br> [ 0 or 1/0/-] <br> 0 : Disabled <br> 1: Enabled <br> Enable this SP mode when dirty background and/or firefly spots appear intermittently on prints with a low image area ratio. <br> While making prints with a low image area ratio, developer is agitated with less toner supplied. This may cause the toner-carrier attraction force to increase or toner to coagulate. <br> This sometimes causes firefly spots or dirty background when a large amount of toner is supplied. <br> NOTE: When enabling this SP mode, the following SP modes should be changed. <br> SP3-906-001 Job End Process Control Self-check $200 \text { (Default) -> } 100$ <br> SP3-920-003 OPC Refresh Mode / Prints $200 \text { (Default) -> } 100$ |
| 921 | [Forced Tnr Ref] Forced Toner Refresh |  |  |  |
|  | Perform forced toner refresh mode. <br> When the developer has deteriorated or when prints are made in a very low humidity condition, dirty background may appear continuously. <br> When this kind of dirty background appears, check whether or not the development gamma is within the target (SP3-120 and 121). If the development gamma is not within the target, do this SP mode. <br> The machine automatically does the toner refresh mode in the following sequence. <br> 1. Consumes toner in the development unit without toner supply until toner end is detected <br> 2. Starts toner recovery mode. <br> 3. Starts process control self-check. <br> NOTE: If toner is drastically consumed for a short time, this may cause carrier to flow out. To prevent this, toner is consumed over a long period of time. (It takes about 20 minutes to complete this toner refresh mode). |  |  |  |
|  | $\begin{array}{l\|l} \hline 1 & {[K]} \\ \hline 2 & \text { All Color } \\ \hline \hline \end{array}$ |  |  |  |



SP5-XXX (Mode)


| 5 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 801 | [Memory Clear 1] |  |  |  |
|  | 1 | All | P | Resets all the controller and engine settings to their defaults and the counters to 0 . <br> To clear the memory, enter this SP mode, press the Enter key, then turn the main switch off and on. <br> NOTE: All settings are reset to the defaults. SMC sheets should be printed out before doing a memory clear. <br> See NOTE 1 at the end of the SP table for a list of settings cleared. |
|  | 2 | ENG All |  | Clears all the engine settings and counters. Engine settings and engine counters can be cleared independently with SP5-998-001 and 002. |
|  | 3 | SCS | P | Clears the system settings. |
|  | 4 | IMH | P | Not used. |
|  | 5 | MCS | P |  |
|  | 8 | PRT | P | Clears the user mode system settings. |
|  | 11 | NCS | P | Clears the network settings. |
| 802 | EngineFreeRun |  |  |  |
|  | 1 | EngineFreeRun | P | Performs a free run on the printer engine. <br> NOTE: <br> - The machine starts free run in the same condition as the sequence of A4/LT printing from the 1st tray. Therefore, paper should be loaded in the 1st tray, but paper is not fed. <br> - The main switch has to be turned off and on after using the free run mode for a test. |
| 803 | [Input Check] |  |  | See section 5-3-2. |
| 804 | [Output Check] |  |  | See section 5-3-3. |
| 808 | [Destination] Destination Code Display |  |  |  |
|  | 1 | Destination | * | Displays the destination code. |
| 809 | [SC ON/OFF] SC Detection ON/OFF |  |  |  |
|  | 1 | SC ON/OFF |  | Enable or disables the service call detection (SC codes will be ignored if disabling this SP mode). <br> [ 0 or $1 / \underline{0} /-$ ] Alphanumeric <br> 0 : Enable <br> 1: Disable |
| 810 | [SC Reset] |  |  |  |
|  | 1 | SC Reset | * | Resets a type A service call condition. <br> NOTE: Turn the main switch off and on after resetting the SC code. |
| 811 | [SN Display] Serial Number Display |  |  |  |
|  | 2 | SN Display | * | Displays the machine serial number. |
| 812 | [FAX TEL No.] |  |  |  |
|  | 2 | FAX TEL No. | * | Sets the fax or telephone number for a service representative. This number is printed on the Counter List, which can be printed with the user's "Counter" menu if the Meter Charge mode is selected with SP5-930-1. <br> This can be up to 13 characters (both numbers and alphabetic characters can be input). |
| 832 | [HDD Init.] HDD Initialization |  |  |  |
|  | 1 | HDD Init. | P | Initializes the hard disk. Use this SP mode only in there is a hard disk error. |



| 5 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 930 | 3 | Menu | \# | Selects the method for displaying the alert when the life of the parts in a maintenance kit has almost ended. <br> [ 0 or 1/1/-] Alphanumeric <br> 0 : Click 2 <br> 1: Click 1 <br> The following table shows the machine condition when the near end or end condition of each maintenance unit is detected. <br> In this table, '-‘ means 'normal operation' |  |  |  |  |  |  |
|  |  |  |  | Setting: 1 (Click 1) |  |  |  | Setting: 0 (Click 2) |  |  |
|  |  |  |  |  | Near | End | Printing | Near | End | Printing |
|  |  |  |  | A |  | Alert |  |  |  |  |
|  |  |  |  | B |  | Alert |  |  |  |  |
|  |  |  |  | C | Alert | Alert | Stop | Alert | Alert | Stop |
|  |  |  |  | D |  | Alert |  |  |  |  |
|  |  |  |  | E | Alert | Alert | Stop | Alert | Alert | Stop |
|  |  |  |  | G | Alert | Alert | Stop | Alert | Alert | Stop |
|  |  |  |  | H |  | Note | Sop |  |  |  |
|  |  |  |  | A: Color PCU <br> B: Color Development Unit <br> C: Fusing Unit <br> D: Black Development Unit <br> E: Waste Toner Bottle <br> F: Black PCU <br> G: Oil Supply Unit <br> H: Paper Feed Rollers <br> NOTE: SP5-930-004 allows the alert for the paper feed roller to be displayed. |  |  |  |  |  |  |
|  | 4 | Paper Feed | \# | Determines whether to display the alert when the life of the paper feed rollers is nearly ended. <br> [ 0 or 1/ $\underline{0} /-$ ] Alphanumeric <br> 0 : No Alert <br> 1: Alert |  |  |  |  |  |  |
|  | 5 | Paper Trans. | \# | Determines whether to display the alert when the life of the transfer unit is nearly ended. <br> [ 0 or 1/0/-] Alphanumeric <br> 0: No Alert <br> 1: Alert |  |  |  |  |  |  |
|  | 6 | Factory Use |  | DFU |  |  |  |  |  |  |
| 961 | [Finisher Stack] Finisher Maximum Stack |  |  |  |  |  |  |  |  |  |
|  | 1 | Finisher Stack | * | Enables or disables maximum stack mode for the lower shift tray only in staple mode. <br> If this is enabled, the upper tray can be used for stacking 500 sheets but it stays at the upper exit (will not be used for stapling mode), and the lower tray is used for stacking up to 2,000 sheets. If this is disabled, the upper tray can be used for stacking 500 sheets and the lower tray for 1,500 sheets. <br> [ 0 or 1/1/-] <br> 0 : Disabled <br> 1: Enabled <br> NOTE: The main switch must be turned off and on to effect the setting change. |  |  |  |  |  |  |



| 5 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 993 | 5 | Stand-by | * | Enables or disables the line position adjustment during stand-by mode when the temperature differs by the amount specified in SP5-993-003 from the temperature at the last adjustment. <br> [ 0 or $1 / \underline{0} /$-] Alphanumeric <br> 0: Disabled <br> 1: Enabled |
|  | 6 | Job Start |  | Enables or disables the line position adjustment just before starting a color print job when the temperature differs by the amount specified in SP5-993-003 from the temperature when the machine woke up from energy saver mode. <br> [ 0 or $1 / 1 /-$ ] <br> 0: Disabled <br> 1: Enabled |
|  | 7 | Result | * | Displays the result of the latest line position adjustment in 4 digits. <br> First 2 digits: Error detected on the front ID sensor Last 2 digits: Error detected on the rear ID sensor Refer to the Troubleshooting section for more details about the two-digit codes. |
|  | 8 | Exe. Counter |  | Displays how many times the line position adjustment has been executed. <br> Counts up by +1 normally. <br> After a forced adjustment and a PCU replacement, it counts up +3 <br> Also includes adjustments done at the factory. |
|  | 9 | Error Counter | * | Displays how many times errors have been detected during the line position adjustment. |
|  | The way that the auto line position adjustment is done can be adjusted using the following SP modes (SP5-993-010 to 021). These are coefficients used for the adjustment. Normally, do not change except if the automatic adjustment gives poor results immediately after installing a new optics housing unit. Change the value then do a forced line position adjustment (SP 5-993-2) to check the effects of the changes. <br> Example: If magenta is always shifted one dot to the left, reduce 5-993-11 by 1. |  |  |  |
|  | 10 | M Reg. [Y] |  | $\begin{aligned} & \text { A fine adjustment to the main-scan registration. } \\ & {[-128 \text { to } 127 / 0 / 1 \text { dot/step }] \text { FA }} \\ & 1 \text { dot }=20 \mu \end{aligned}$ |
|  | 11 | M Reg. [M] | * |  |
|  | 12 | M Reg. [C] | * |  |
|  | 13 | M Mag. [Y] | * | A fine adjustment to the main-scan magnification. [ - 100 to $100 / \underline{0} / 0.01 \% /$ step ] FA <br> NOTE: The setting changes in this SP mode will be affect the next line position adjustment. |
|  | 14 | M Mag. [M] | * |  |
|  | 15 | M Mag. [C] | * |  |
|  | 16 | S Reg. 600[Y] | * | ```A fine adjustment to the sub-scan registration for each color (color registration). [ -128 to 127 / \(\underline{0} / 1\) dot/step ] FA 600dpi: 1 dot \(=40 \mu\) \(1200 \mathrm{dpi}: 1\) dot \(=20 \mu\)``` |
|  | 17 | S Reg. 600[M] |  |  |
|  | 18 | S Reg. 600[C] |  |  |
|  | 19 | S Reg. 1200[Y] | * |  |
|  | 20 | S Reg. 1200[M] |  |  |
|  | 21 | S Reg. 1200[C] | * |  |


| 5 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 993 | 22 | Interrupt 1 | * | Specifies the number of sheets to be printed before a line position adjustment is done during a print job. <br> [ 10 to 250 / $100 / 10$ sheets/step ] <br> SP 5-993-4 must be set to 'enabled'. <br> When the temperature difference meets the conditions specified in SP5-993-3, the machine starts counting the number of prints in the job. The machine interrupts the print job and does the line position adjustment if the number of prints exceeds the number specified in this SP mode. If the counted number of prints does not exceed the number specified, the machine resets the counter, then continues to monitor the temperature and does the line position adjustment next time. |
|  | 23 | Interrupt 2 |  | Performs the line position adjustment when the number of prints reaches the number specified in this SP mode regardless of the temperature change. <br> [ 0 to 350 / $200 / 50$ prints/step ] <br> 0: Disable |
|  | 24 | Mscan Lgth Det | * | Performs the main scan length detection when the polygon motor has operated consecutively for the time specified in this SP mode. <br> [ 100 to $990 / \underline{200} / 50 \mathrm{~s} /$ step ] |
| 994 | [Unit Set] Maintenance Unit Detection ON/OFF |  |  |  |
|  | 1 | Dev/PCU | * | Enables or disables PCU and development unit detection. <br> [ 0 or 1 / $\underline{0} /$ - ] Alphanumeric <br> 0 : Enable <br> 1: Disable <br> NOTE: If this mode is disabled, new unit detection also does not function. Use this mode as a temporary measure, only when the microswitches are defective. |
|  | 2 | Oil Unit | \# | This is for the oil supply unit only, and not the fusing unit <br> [ 0 or $1 / \underline{0} /$ - ] Alphanumeric <br> 0 : Enable <br> 1: Disable <br> NOTE: Use this mode as a temporary measure, only when the unit detection mechanism is defective. |
| 997 | [Test Pattern] |  |  |  |
|  | 1 | Tray Selection |  | Selects the tray for making a test print. <br> [ 0 to 4 / 1 / $1 /$ step ] <br> 0 : By-pass Table <br> 1: Tray 1 <br> 2: Tray 2 <br> 3: Tray 3 <br> 4: Tray 4 <br> NOTE: The machine makes a test pattern on the paper size loaded in the selected paper tray. |


| 5 | Mode No.(Class 1, 2, and 3) |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: |
| 997 | 2 | Pattern | Selects a test pattern [ 0 to 23 / $\underline{0} / 1 /$ step ] <br> 0 : None <br> 1: 1-dot sub-scan line <br> 2: 2-dot sub-scan line <br> 3: 1-dot main-scan line <br> 4: 2-dot main-scan line <br> 5: 1-dot grid pattern (fine) <br> 6: 2-dot grid pattern (fine) <br> 7. 1-dot grid pattern (rough) <br> 8. 2-dot grid pattern (rough) <br> 9. 1-dot slant grid pattern <br> 10. 2-dot slant grid pattern <br> 11. 1-dot pattern <br> 12. 2-dot pattern <br> 13. 4-dot pattern <br> 14. 1-dot trimming pattern <br> 15. 2-dot trimming pattern <br> 16. Cross stitch: sub-scan <br> 17. Cross stitch: main-scan <br> 18. Belt pattern <br> 19. Belt pattern (vertical) <br> 20. Checkered Flag <br> 21. Grey scale (vertical) <br> 22. Grey scale (Horizontal) <br> 23. Solid |
|  | 3 | Single Color | Selects the color for making a test pattern.[0 $6 / 6 / 6 / 1 /$ step Alphanumeric <br> 0: Red 1: Green <br> 2: Blue 3: Yellow <br> 4: Magenta 5: Cyan <br> 6: Black  |
|  | 4 | Color Mode | Selects the color mode for making a test print. [ 0 or 1 / $\underline{0}$ / 1/step] Alphanumeric <br> 0 : Full Color <br> 1: Single Color |
|  | 5 | Resolution | Selects the resolution for making a test print. <br> [0 to 2 / 1 / 1/step] Alphanumeric <br> 0: 600x600 <br> 1: $1200 \times 600$ <br> 2: $1200 \times 1200$ |
|  | 6 | By-pass P-size | Selects the paper size for making a test pattern from the by-pass table. <br> [0 to $3 / \underline{0} / 1 /$ step ] Alphanumeric <br> 0: A4 LEF 1: LT LEF <br> 2: A3 <br> 3: DLT |
|  | 7 | Print | Prints the test pattern with the settings specified with SP5-997-001 to 006. <br> NOTE: When exiting the SP mode, the test print mode is automatically canceled. |
| 998 | [Memory Clear 2] |  |  |
|  | 1 | ENG Setting | Clears the engine settings except for counters. |
|  | 2 | ENG Counter | Clears all counters. |

SP6-XXX (Peripherals)


SP7-XXX (Data Log)

| 7 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 003 | [M/C Counter] Meter Charge Counter (Print, Development) |  |  |  |
|  | 1 | P: Total | P | Displays the values of the color counters. [ -9999 to 9999999 / $\underline{0}$ / 1/step ] |
|  | 7 | P: B\&W |  |  |
|  | 8 | P: Full Color |  |  |
|  | 10 | D: Color |  | These SP modes are development counters for the meter charge mode. |
|  | 11 | D: B\&W |  |  |
|  | 14 | P: B\&W: Contact |  | Displays the number of $\mathrm{B} \& \mathrm{~W}$ prints made while the transfer belt contacted color PCUs in ACS mode. |
|  | 20 | P: Full Color |  | These SP modes are used for Japanese market only. |
|  | 21 | P: B\&W/Single |  |  |
|  | 22 | P: Single |  |  |
|  | 23 | P: B\&W |  |  |
|  | 25 | P: Full Color |  |  |
|  | 28 | P: Color |  | These SP modes are print counters for the meter charge mode. |
|  | 29 | P: B\&W |  |  |
|  | 30 | P: Color Total |  |  |
| 007 | [Other Counter] |  |  |  |
|  | 1 | Duplex | * | Displays counter values. [ 0 to 9999999 / $\underline{0} / 1$ sheet/step ] |
|  | 2 | A3/DLT/Over420 |  |  |
|  | 3 | Staple |  |  |
| 101 | [Size Counter] Paper Size Counter |  |  |  |
|  | 4 | A3 | P | Displays the counter values for each paper size. [ 0 to 9999999 / $\mathbf{0} / 1$ sheet/step ] |
|  | 5 | A4 |  |  |
|  | 6 | A5 |  |  |
|  | 13 | B4 |  |  |
|  | 14 | B5 |  |  |
|  | 32 | $11 \times 17$ |  |  |
|  | 36 | $81 / 2 \times 14$ |  |  |
|  | 38 | $81 / 2 \times 11$ |  |  |
|  | 44 | $51 / 2 \times 81 / 2$ |  |  |
|  | 128 | Others |  |  |
| 204 | [Feed Counter] Paper Feed Section Counter |  |  |  |
|  | 1 | Tray 1 | * P | Displays the number of sheets fed from each paper feed station. <br> [ 0 to 9999999 / $0 / 1$ sheet/step ] <br> NOTE: The LCT is counted as the 3rd feed station. |
|  | 2 | Tray 2 |  |  |
|  | 3 | Tray 3/LCT |  |  |
|  | 4 | Tray 4 |  |  |
|  | 5 | By-pass |  |  |
|  | 6 | Duplex |  |  |
| 209 | [Punch Counter] |  |  |  |
|  | 1 | Punch | * | Displays the number of times hole punching has been done. <br> [ 0 to 9999999 / $0 / 1 /$ step ] |
| 401 | [SC Counter] |  |  |  |
|  | 1 | SC Counter | * | Displays the number of SC codes detected. [ 0 to 9999 / $\mathbf{0} / 1 /$ step ] |


| 7 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 403 | [Latest10Sclog] |  |  |  |
|  | 1 | Latest | * | Logs the SC codes detected. <br> The 10 most recently detected SC Codes are not displayed on the screen, but can be seen on the SMC (logging) outputs. |
|  | 2 | Latest-1 |  |  |
|  | 3 | Latest-2 |  |  |
|  | 4 | Latest-3 |  |  |
|  | 5 | Latest -4 |  |  |
|  | 6 | Latest -5 |  |  |
|  | 7 | Latest -6 |  |  |
|  | 8 | Latest -7 |  |  |
|  | 9 | Latest -8 |  |  |
| 502 | [Total Jam] |  |  |  |
|  | 1 | Total Jam | * | Displays the total number of jams detected. [ 0 to 9999 / $0 / 1$ sheet/step ] |
| 504 | [Jam Location] <br> D: Duplex, MB: Mail Box, F; Finisher, E: External, I: Internal ON: On check, OFF: Off Check |  |  |  |
|  | 3 | Tray 1:ON |  | Displays the number of jams according to the location where jams were detected. <br> NOTE: The LCT is counted as the 3rd feed station. |
|  | 4 | Tray 2:ON |  |  |
|  | 5 | Tray 3/LCT:ON |  |  |
|  | 6 | Tray 4:ON |  |  |
|  | 8 | Regist.:ON |  |  |
|  | 9 | E Tray:ON |  |  |
|  | 10 | I Tray:ON |  |  |
|  | 11 | D:ON |  |  |
|  | 12 | D Exit 1:ON |  |  |
|  | 13 | D Exit 2:ON |  |  |
|  | 14 | D Exit 3:ON |  |  |
|  | 15 | D Feed: ON |  |  |
|  | 20 | MB Upper:ON |  |  |
|  | 21 | MB Lower:ON |  |  |
|  | 51 | Tray 1:OFF |  |  |
|  | 52 | Tray 2:OFF |  |  |
|  | 53 | Tray 3:OFF |  |  |
|  | 54 | Tray 4:OFF |  |  |
|  | 61 | Regist: OFF |  |  |
|  | 63 | E Tray:OFF |  |  |
|  | 64 | I Tray:OFF |  |  |
|  | 65 | D:OFF |  |  |
|  | 66 | D Exit 1:OFF |  |  |
|  | 67 | D Exit 2:OFF |  |  |
|  | 68 | D Exit 3:OFF |  |  |
|  | 69 | D Feed:OFF |  |  |
|  | 100 | F Entrance |  |  |
|  | 101 | F Shift Tray 1 |  |  |
|  | 102 | F Shift Tray 2 |  |  |
|  | 103 | F Staple |  |  |
|  | 104 | F Exit |  |  |
|  | 105 | F Drive |  |  |
|  | 106 | F Tray Up/Down |  |  |
|  | 107 | F Jogger |  |  |
|  | 108 | F Staple |  |  |
|  | 109 | F Exit |  |  |
|  | 110 | F Punch |  |  |
|  | 111 | F Jam Clear |  |  |


| 7 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 506 | [Jam Paper Size] |  |  |  |
|  | 4 | A3 | P | Displays the number of jams according to the paper size. <br> [ 0 to 9999 / $\underline{0} / 1$ sheet/step ] |
|  | 5 | A4 |  |  |
|  | 13 | B4 |  |  |
|  | 14 | B5 |  |  |
|  | 32 | $11 \times 17$ |  |  |
|  | 36 | $81 / 2 \times 14$ |  |  |
|  | 38 | $81 / 2 \times 11$ |  |  |
|  | 44 | $51 / 2 \times 81 / 2$ |  |  |
|  | 128 | Others |  |  |
| 507 | [Jam History] |  |  |  |
|  | 1 | Latest | P | Displays the 10 most recently detected paper jams. |
|  | 2 | Latest-1 |  |  |
|  | 3 | Latest-2 |  |  |
|  | 4 | Latest-3 |  |  |
|  | 5 | Latest-4 |  |  |
|  | 6 | Latest-5 |  |  |
|  | 7 | Latest-6 |  |  |
|  | 8 | Latest-7 |  |  |
|  | 9 | Latest-8 |  |  |
|  | 10 | Latest-9 |  |  |
| 801 | [Firmware Ver.] Engine Firmware Version |  |  |  |
|  | 1 | Engine P/N | * | Displays the part number of the firmware.Displays the firmware version. |
|  | 2 | Duplex |  |  |
|  | 3 | Finisher |  |  |
|  | 4 | PSU/LCT |  |  |
|  | 5 | Mail Box |  |  |
|  | 6 | MUSIC P/N |  | Displays the part number of the firmware. |
|  | 11 | MUSIC |  | Displays the firmware version. |
|  | 12 | Engine |  |  |
| 803 | [PM Counter] |  |  |  |
|  | (Sheets or Rotations, Unit, [Color]) <br> Dev.: Development Unit, PF: Paper Feed Rollers, Oil Supply: Oil Supply Unit, Fusing: <br> Fusing Unit, Transfer: Transfer Unit |  |  |  |
|  | 1 | $\mathrm{S}: \mathrm{PCU}[\mathrm{K}]$ | * | Displays the number of sheets printed for each current maintenance unit. <br> [ 0 to 9999999 / $\underline{0} / 1$ sheet/step ] <br> PM counters click up based on the number of A4 (LT) LEF size sheets printed. Therefore, the A3 (DLT) Double Count is activated. The Double Count cannot be deactivated. <br> When a unit is replaced, the machine automatically detects that the new unit is installed. Then, the current PM counter value is automatically moved to the PM Counter - Previous (SP7-906-1 to 9) and is reset to " 0 ". <br> The total number of sheets printed with the last unit replaced can be checked with SP7-906-1 to 9 <br> NOTE: The LCT is counted as the 3rd feed station. |
|  | 2 | S:PCU [Y] |  |  |
|  | 3 | S:PCU [M] |  |  |
|  | 4 | S:PCU [C] |  |  |
|  | 5 | S:Dev. [K] |  |  |
|  | 6 | S:Dev. [Y] |  |  |
|  | 7 | S:Dev. [M] |  |  |
|  | 9 | S:Oil Supply |  |  |
|  | 10 | PF By-pass |  |  |
|  | 11 | PF Tray 1 |  |  |
|  | 12 | PF Tray 2 |  |  |
|  | 13 | PF Tray 3/LCT |  |  |
|  | 14 | PF Tray 4 |  |  |
|  | 15 | S:Fusing |  |  |
|  | 16 | S:Transfer |  |  |



| 7 | Mode No. (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 816 | [Tray Clear] Paper Tray Counter Clear |  |  |  |
|  | 1 | Tray 1 | * | Clears the counters (SP7-204) for the number of sheets fed from the paper feed stations. <br> NOTE: The LCT is counted as the 3rd feed station. |
|  | 2 | Tray 2 |  |  |
|  | 3 | Tray 3/LCT |  |  |
|  | 4 | Tray 4 |  |  |
|  | 6 | Duplex |  |  |
| 825 | [Counter Reset] |  |  |  |
|  | 1 | Counter Reset | P | Rests the total counter values to " 0 ". <br> NOTE: This SP mode can be done only once, while the counter values are less than 0 . |
| 832 | [Diag. Result] Diagnostic Result |  |  |  |
|  | 1 | Diag. Result | P | Displays the result of the diagnostics. |
| 833 | [Coverage] Pixel Coverage Ratio \& No. of Toner Cartridges |  |  |  |
|  | 1 | Last [K] | * | Displays the pixel coverage ratio for each color of the last output.$\text { [ } 0 \text { to } 100.00 /-/ 0.01 \% / \text { step ] }$ |
|  | 2 | Last [C] |  |  |
|  | 3 | Last [M] |  |  |
|  | 4 | Last [Y] |  |  |
|  | 5 | Average [K] |  | Displays accumulated average value of image coverage ratio for each color. [ 0 to 100.00 / - / $0.01 \% /$ step ] |
|  | 6 | Average [C] |  |  |
|  | 7 | Average [M] |  |  |
|  | 8 | Average [Y] |  |  |
|  | 11 | Toner [K] |  | Displays the total number of toner cartridges replaced. <br> [ 0 to 65535 / - / 1 cartridge/step ] |
|  | 12 | Toner [C] |  |  |
|  | 13 | Toner [M] |  |  |
|  | 14 | Toner [Y] |  |  |
| 901 | [Asset Info] |  |  |  |
|  | 1 | File Name | P | Records the location where a problem is detected in the program. The data stored in this SP is used for problem analysis. DFU |
|  | 2 | \# of Lines |  |  |
|  | 3 | Location |  |  |
| 905 | [Alert Display] |  |  |  |
|  | 7 | Fusing: Alert | * | Specifies the timing for displaying the near-end condition. <br> With the default setting, near-end is detected and the alert lights on the panel 2.5 K prints before detecting the end condition. The unit life is 9303 K revolutions. <br> Increment: Delays the alert display timing. Decrement: Hastens the alert display timing. 1.0K prints = approximately 93K revolutions <br> [ 0 to 20000 / 9070 / 1 K revolutions/step ] |
|  | 9 | Oil: Alert | * | Specifies the timing for displaying the near-end condition. <br> With the default setting, near-end is detected and the alert lights on the panel 2.5 K prints before detecting the end condition. The unit life is 1860 revolutions. <br> Increment: Delays the alert display timing. Decrement: Hastens the alert display timing. <br> 1.0K prints $=93$ <br> [ 0 to 10000 / $1628 / 1 \mathrm{~K}$ revolutions/step ] |



| 7 | Mode No. (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 911 | [Firmware Ver.] |  |  |  |
|  | 1 | Controller | $P$ | Displays the firmware version. |
|  | 2 | Engine |  |  |
|  | 5 | ADF |  |  |
|  | 7 | Finisher |  |  |
|  | 9 | PFU |  |  |
|  | 11 | Mail Box |  |  |
|  | 13 | Duplex |  |  |
|  | 14 | MUSIC |  |  |
|  | 18 | NIB |  |  |
|  | 200 | Factory |  |  |
|  | 204 | Printer |  |  |
|  | 209 | Test |  |  |
|  | 210 | MIB |  |  |

NOTE 1: Memory Clear (SP5-801 \& 7-808)
The following tables list the items that are cleared. The serial number information, meter charge setting (SP5-930), and meter charge counters (SP7-003) are not cleared.

| 5 | Mode No.(Class 1, 2, and 3) |  |  | SP Modes or User Setting to be cleared |
| :---: | :---: | :---: | :---: | :---: |
| 801 | [Memory Clear] |  |  |  |
|  | 1 | All | P | All items cleared by SP5-801-002, 003, 004, 005, 008, 011, 015, and 016. |
|  | 2 | ENG All |  | All engine related SP modes except for the following: <br> - Serial number information <br> - SP5-930 |
|  | 3 | SCS | P | SP5-009, 101, 104, 305, 812, 833, 961, and 970 SP7-101, 204, 209, 401, 502, 504, 506, and 507 |
|  | 4 | IMH | P | No SP modes are cleared. But, all files stored in the HDD are cleared. |
|  | 5 | MCS | P | No SP modes are cleared. |
|  | 8 | PRT | P | The following service settings: <br> - Bit switches <br> - Gamma settings (User \& Service) <br> - Toner Limit <br> The following user settings: <br> - Tray Priority <br> - Menu Protect <br> - System Setting except for setting of Energy Saver <br> - I/F Setup (I/O Buffer and I/O Timeout) <br> - PCL Menu |
|  | 11 | NCS | P | All setting of Network Setup (User Menu) |
|  | 15 | ENG Setting |  | All engine related SP modes except for the following: <br> - Serial number information <br> - SP modes related to meter charge <br> - Counters and logging data |
|  | 16 | ENG Counter |  | All counters and logging data related to engine |


| 7 |  |  |  |
| :---: | :---: | :--- | :--- |
| 808 | [Counter Clear] |  |  |
|  | 1 | Counter Clear | P |

### 5.3.2 INPUT CHECK TABLE

When entering the Input Check mode, 8 digits display the result for a section. Each digit corresponds to a different device as shown in the table.

| Bit No. | $\mathbf{7}$ | $\mathbf{6}$ | $\mathbf{5}$ | $\mathbf{4}$ | $\mathbf{3}$ | $\mathbf{2}$ | $\mathbf{1}$ | $\mathbf{0}$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Result | 0 or 1 | 0 or 1 | 0 or 1 | 0 or 1 | 0 or 1 | 0 or 1 | 0 or 1 | 0 or 1 |


| $\begin{gathered} \hline \text { SP5-803 } \\ \text {-XXX } \end{gathered}$ | Bit | Description | Reading |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | 0 | 1 |
| 1 | Paper Tray 1 |  |  |  |
|  | 0 | Paper End Sensor | Paper end | Paper detected |
|  | 1 | Paper Lift Sensor | Deactivated | Activated (Actuator not inside sensor) |
|  | 2 | Paper Height Sensor 1 | See Table 1. |  |
|  | 3 | Paper Height Sensor 2 |  |  |
|  | 4 | Tray Set | Not set | Set |
| 2 | Paper Tray 2 |  |  |  |
|  | 0 | Paper End Sensor | Paper end | Paper detected |
|  | 1 | Paper Lift Sensor | Deactivated | Activated (Actuator not inside sensor) |
|  | 2 | Paper Height Sensor 1 | See Table 1.1: Activated(Actuator inside sensor) |  |
|  | 3 | Paper Height Sensor 2 |  |  |
|  | 4 | Paper Size Switch 1 | See Table 2. 1: Pushed |  |
|  | 5 | Paper Size Switch 2 |  |  |
|  | 6 | Paper Size Switch 3 |  |  |
|  | 7 | Paper Size Switch 4 |  |  |
| 3 | By-pass Table |  |  |  |
|  | 0 | Paper End Sensor | Paper end | Paper detected |
|  | 1 | Paper Size 1 | See Table 3. |  |
|  | 2 | Paper Size 2 |  |  |
|  | 3 | Paper Size 3 |  |  |
|  | 4 | Paper Size 4 |  |  |
| 4 | Doors |  |  |  |
|  | 0 | Front Door Switch | Opened | Closed |
|  | 1 | Left Door Switch | Opened | Closed |
|  | 2 | Right Door Switch | Opened | Closed |
|  | 3 | Vertical Transport Switch | Opened | Closed |
|  | 4 | Duplex Inverter Unit Switch | Opened | Closed |
|  | 5 | Right Door Switch (LCT/PFU) | Opened | Closed |
| 5 | Paper Feed |  |  |  |
|  | 0 | Relay Sensor | Paper not detected | Paper detected |
|  | 1 | Vertical Transport Sensor | Paper not detected | Paper detected |
|  | 2 | Upper Relay Sensor (PFU) | Paper not detected | Paper detected |
|  | 3 | Lower Relay Sensor (PFU) | Paper not detected | Paper detected |
|  | 4 | Registration Sensor | Paper not detected | Paper detected |
|  | 5 | Duplex Inverter Sensor | Paper not detected | Paper detected |
|  | 6 | Duplex Feed Sensor | Paper not detected | Paper detected |


| $\begin{gathered} \hline \hline \text { SP5-803 } \\ \text {-XXX } \end{gathered}$ | Bit | Description | Reading |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | 0 | 1 |
| 6 | Paper Exit |  |  |  |
|  | 0 | Fusing Exit Sensor | Paper not detected | Paper detected |
|  | 1 | Paper Exit Sensor | Paper not detected | Paper detected |
|  | 2 | Duplex Exit Sensor 1 | Paper not detected | Paper detected |
|  | 3 | Duplex Exit Sensor 2 | Paper not detected | Paper detected |
|  | 4 | Duplex Exit Sensor 3 | Paper not detected | Paper detected |
|  | 5 | Exit Upper Limit Sensor | Not full | Full |
| 7 | Fusing Unit |  |  |  |
|  | 0 | Fusing Unit (Set) | Not set | Set |
|  | 1 | Fusing Unit (New) | 0 to 1: New unit installed |  |
|  | 2 | Oil Supply Unit (Set) | Set | Not set |
|  | 3 | Oil Supply Unit (New) | 1 to 0 : New unit installed |  |
|  | Motor Lock Europe |  |  |  |
| 8 |  |  |  |  |  |
|  | 0 | Development Drive Motor - CMY | Not locked | Locked |
|  | 1 | Development Drive Motor - K | Not locked | Locked |
|  | 2 | - | - | - |
|  | 3 | - | - | - |
|  | 4 | - | - | - |
|  | 5 | Fusing Fan Motor | Locked (normal speed) | Low speed or not working |
|  | 6 | - | - | - |
|  | 7 | - | - | - |
| 9 | Dev. Unit/ PCU |  |  |  |
|  | 0 | Development Unit - K | Not set | Set |
|  | 1 | Development Unit - C | Not set | Set |
|  | 2 | Development Unit - M | Not set | Set |
|  | 3 | Development Unit - Y | Not set | Set |
|  | 4 | PCU - K | Not set | Set |
|  | 5 | PCU-C | Not set | Set |
|  | 6 | PCU - M | Not set | Set |
|  | 7 | PCU - Y | Not set | Set |
| 13 | Others |  |  |  |
|  | 0 | LD H.P. Sensor | Not H.P. | H.P. |
|  | 1 | Transfer Belt Set Sensor | Not contact | Contact |
|  | 2 | Transfer Belt H.P. Sensor | Not. H.P. | H.P. |
|  | 3 | Used Toner Sensor | Not full | Full |
|  | 4 | Used Toner Bottle Set Sensor | Not set | Set |
|  | 5 | - | - | - |
|  | 6 | PSU Thermistor | Not high | High |
| 15 | Mail Box 1 |  |  |  |
|  | 0 | Tray 1 Paper Overflow Sensor | Not full | Full |
|  | 1 | Tray 1 Paper Sensor | Paper not detected | Paper detected |
|  | 2 | Tray 2 Paper Overflow Sensor | Not full | Full |
|  | 3 | Tray 2 Paper Sensor | Paper not detected | Paper detected |
|  | 4 | Tray 3 Paper Overflow Sensor | Not full | Full |
|  | 5 | Tray 3 Paper Sensor | Paper not detected | Paper detected |
|  | 6 | Tray 4 Paper Overflow Sensor | Not full | Full |
|  | 7 | Tray 4 Paper Sensor | Paper not detected | Paper detected |


| $\begin{array}{\|c} \hline \hline \text { SP5-803 } \\ \text {-XXX } \end{array}$ | Bit | Description | Reading |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | 0 | 1 |
| 16 | Mail Box 2 |  |  |  |
|  | 0 | Vertical Transport Sensor 1 | Paper not detected | Paper detected |
|  | 1 | Vertical Transport Sensor 2 | Paper not detected | Paper detected |
|  | 2 | Door Safety Switch | Opened | Closed |

## Table 1: Paper Height Sensor

Low: Deactivated, High: Activated (actuator inside sensor)

| Remaining paper | Paper height sensor 1 | Paper height sensor 2 |
| :---: | :---: | :---: |
| Full | Low | Low |
| Nearly full | Low | High |
| Near end | High | High |
| Almost empty | High | Low |

Table 2: Paper Size Switch (Tray 2)
0 : Not pushed, 1: pushed

| Models |  | Switch Location |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| North America | Europe/Asia | $\mathbf{1}$ | $\mathbf{2}$ | $\mathbf{3}$ | $\mathbf{4}$ |
| $11^{\prime \prime} \times 17$ " SEF | $11^{\prime \prime} \times 17$ " SEF | 0 | 1 | 0 | 0 |
| A3 SEF | A3 SEF | 1 | 0 | 1 | 0 |
| $81 / 2^{\prime \prime} \times 14 "$ SEF *1 | B4 SEF *1 | 1 | 1 | 0 | 1 |
| $81 / 2^{\prime \prime} \times 11 "$ SEF *2 | A4 SEF *2 | 0 | 1 | 1 | 0 |
| $11 " \times 81 / 2^{\prime \prime}$ LEF *3 | $11 " \times 81 / 2^{\prime \prime}$ LEF *3 | 1 | 0 | 1 | 1 |
| A4 LEF | A4 LEF | 0 | 1 | 0 | 1 |
| B5 LEF | B5 LEF | 0 | 0 | 1 | 0 |
| A5 LEF | A5 LEF | 0 | 0 | 0 | 1 |

1: Pushed
NOTES:
*1: The machine detects either $81 / 2$ " $\times 14$ " SEF or B4 SEF, depending on the setting of SP 1-902-2
*2: The machine detects either 81/2" x 11 " SEF or A4 SEF, depending on the setting of SP 1-902-3
*3: The machine detects either 11 " x 81/2" LEF or B5 SEF, depending on the setting of SP 1-902-4

Table 3: Paper Size (By-pass Table)

| Models |  | Bit No. |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| North America | Europe/Asia | $\mathbf{4}$ | $\mathbf{3}$ | $\mathbf{2}$ | $\mathbf{1}$ |
| $11^{\prime \prime} \times 17$ " SEF | $11^{\prime \prime} \times 17 "$ SEF | 0 | 0 | 1 | 1 |
| A3 SEF | A3 SEF | 0 | 0 | 0 | 1 |
| - | B4 SEF | 0 | 0 | 1 | 0 |
| $81 / 2^{\prime \prime} \times 11^{\prime \prime}$ SEF | A4 SEF | 0 | 1 | 1 | 0 |
| $8 " \times 13 "$ SEF | F SEF | 0 | 1 | 0 | 0 |
| - | A5 SEF | 1 | 1 | 0 | 0 |
| $51 / 2^{\prime \prime} \times 181 / 2^{\prime \prime}$ SEF | B6 SEF | 1 | 0 | 0 | 0 |
| Post Card | Post Card | 0 | 0 | 0 | 0 |

### 5.3.3 OUTPUT CHECK TABLE

CH: Charge
PF: Paper Feed
TS: Toner Supply
CW: Clockwise
CCW: Counterclockwise
MB: 4-bin Mailbox
DI: Duplex Inverter

| $\begin{array}{\|c\|} \hline \text { SP5- } \\ 804-X X X \end{array}$ |  | Description |
| :---: | :---: | :---: |
| 7 | Regist CL | Registration Clutch |
| 8 | By-pass CL | By-pass Feed Clutch |
| 9 | Tray 1 PF CL | Tray 1 Paper Feed Clutch |
| 10 | Pick-up SOL | By-pass Pick-Up Solenoid |
| 11 | Tray 2 PF CL | Tray 2 Paper Feed Clutch |
| 12 | Lift M UP (1) | Tray 1 Lift Motor / UP |
| 13 | Lift M DOWN(1) | Tray 1 Lift Motor / DOWN |
| 14 | Lift M UP(2) | Tray 2 Lift Motor / UP |
| 15 | Lift M DOWN(2) | Tray 2 Lift Motor / DOWN |
| 17 | PSU Fan M | PSU Cooling Fan Motor |
| 19 | Fusing Fan M H | Fusing Fan Motor / High Speed |
| 20 | Fusing Fan M L | Fusing Fan Motor / Low Speed |
| 21 | Laser Fan H | Laser Optics Housing Cooling Fan Motor / High Speed |
| 22 | Laser Fan L | Laser Optics Housing Cooling Fan Motor / Low Speed |
| 23 | Junction SOL | Exit Junction Gate Solenoid |
| 24 | Oil Supply SOL | Oil Supply Unit Solenoid |
| 29 | K Dev CL | Development Unit Clutch - K |
| 30 | C Dev CL | Development Unit Clutch - C |
| 31 | M Dev CL | Development Unit Clutch - M |
| 32 | Y Dev CL | Development Unit Clutch - Y |
| 34 | Fusing Relay | Fusing Relay |
| 35 | Heat Lamp | Heating Roller Fusing Lamp |
| 36 | Pressure Lamp | Pressure Roller Fusing Lamp |
| 44 | CH DC [Y] 125 | Charge DC Bias for Yellow / $125 \mathrm{~mm} / \mathrm{s}$ |
| 45 | CH DC [M] 125 | Charge DC Bias for Magenta / $125 \mathrm{~mm} / \mathrm{s}$ |
| 46 | CH DC [C] 125 | Charge DC Bias for Cyan / $125 \mathrm{~mm} / \mathrm{s}$ |
| 47 | CH DC [K] 125 | Charge DC Bias for Black / $125 \mathrm{~mm} / \mathrm{s}$ |
| 48 | CH AC [YMC]125 | Charge AC Bias for Color / $125 \mathrm{~mm} / \mathrm{s}$ |
| 49 | CH AC [K] 125 | Charge AC Bias for Black / $125 \mathrm{~mm} / \mathrm{s}$ |
| 50 | DevDC [Y] | Development DC Bias for Yellow |
| 51 | DevDC [M] | Development DC Bias for Magenta |
| 52 | DevDC [C] | Development DC Bias for Cyan |
| 53 | DevDC [K] | Development DC Bias for Black |
| 54 | DevAC [YMC] | Development AC Bias for Color |
| 55 | DevAC [K] | Development AC Bias for Black |
| 56 | Transfer [Y] | Transfer Current for Yellow |
| 57 | Transfer [M] | Transfer Current for Magenta |
| 58 | Transfer [C] | Transfer Current for Cyan |
| 59 | Transfer [K] | Transfer Current for Black |


| $\begin{array}{\|c} \hline \text { SP5- } \\ 804-X X X \end{array}$ |  | Description |
| :---: | :---: | :---: |
| 60 | Cleaning Bias | Transfer Belt Cleaning Roller Bias |
| 61 | PA Roller Bias | Paper Attraction Roller Bias |
| 62 | TS CL [Y] | Toner Supply Clutch for Yellow |
| 63 | TS CL [M] | Toner Supply Clutch for Magenta |
| 64 | TS CL [C] | Toner Supply Clutch for Cyan |
| 65 | TS CL [K] | Toner Supply Clutch for Black |
| 67 | Air Supply [Y] | Air Pump Motor and Valve for Yellow |
| 68 | Air Supply [M] | Air Pump Motor and Valve for Magenta |
| 69 | Air Supply [C] | Air Pump Motor and Valve for Cyan |
| 70 | Air Supply [K] | Air Pump Motor and Valve for Black |
| 71 | ID Sensor LED | ID Sensor LED |
| 72 | Drum M L CW | Drum Drive Motors (K \& CMY) / Low Speed / Clockwise |
| 73 | Drum M M CW | Drum Drive Motors (K \& CMY) / Middle Speed / Clockwise |
| 74 | Drum M H CW | Drum Drive Motors (K \& CMY) / High Speed / Clockwise |
| 75 | PF M L CW | Paper Feed Motor / Low Speed / Clockwise |
| 76 | PF M M CW | Paper Feed Motor / Middle Speed / Clockwise |
| 77 | PF M H CW | Paper Feed Motor / High Speed / Clockwise |
| 78 | PF M Feed | Paper Feed Motor / Feed Speed / Clockwise |
| 79 | TD Vont | TD Sensor / Vant |
| 80 | CH AC[YMC]62.5 | Charge AC Bias for Color - 62.5 |
| 81 | CH AC [K]62.5 | Charge AC Bias for Black - 62.5 |
| 82 | CH AC [YMC]185 | Charge AC Bias for Color - 185 |
| 83 | CH AC [K]185 | Charge AC Bias for Black - 185 |
| 84 | Dev AC[YMC]62.5 | Development AC Bias for Color - 62.5 |
| 85 | Dev AC[K]62.5 | Development AC Bias for Black - 62.5 |
| 86 | Dev AC[YMC]185 | Development AC Bias for Color - 185 |
| 87 | Dev AC[K]185 | Development AC Bias for Black - 185 |
| 91 | PA Roller Bias | Paper Attraction Roller Bias |
| 92 | Memory Chip | Memory Chip / Power (5V) Supply |
| 97 | Belt M CW | Transfer Belt Contact Motor / Clockwise |
| 98 | Belt M CCW | Transfer Belt Contact Motor / Counterclockwise |
| 99 | Belt M Break | Transfer Belt Contact Motor / Break |
| 120 | PF CL PFU(3) | Paper Feed Clutch / Paper Feed Unit / Tray 3 |
| 121 | PF CL PFU(4) | Paper Feed Clutch / Paper Feed Unit / Tray 4 |
| 122 | Pick-upSOL LCT | Pick-up Solenoid / Large Capacity Tray |
| 125 | PFU M | Paper Feed Unit / Motor |
| 128 | Valve SOL [K] | Air Flow Valve solenoid for Black |
| 129 | Valve SOL [C] | Air Flow Valve solenoid for Cyan |
| 130 | Valve SOL [M] | Air Flow Valve solenoid for Magenta |
| 131 | Valve SOL [Y] | Air Flow Valve solenoid for Yellow |
| 132 | Air Pump M | Air Pump Motor |
| 135 | DevAC TRG[YMC] | Development AC Trigger for Color |
| 136 | DevAC TRG[K] | Development AC Trigger for Black |
| 137 | DevPWM TRG[K] | Development PWM Trigger for Black |
| 138 | DevPWM TRG[C] | Development PWM Trigger for Cyan |
| 139 | DevPWM TRG[M] | Development PWM Trigger for Magenta |


| $\begin{array}{\|\|c\|} \hline \text { SP5- } \\ 804-X X X \end{array}$ |  | Description |
| :---: | :---: | :---: |
| 140 | DevPWM TRG[Y] | Development PWM Trigger for Yellow |
| 141 | CHdcPWM TRG[K] | Charge DC PWM Trigger for Black |
| 142 | CHdcPWM TRG[C] | Charge DC PWM Trigger for Cyan |
| 143 | CHdcPWM TRG[M] | Charge DC PWM Trigger for Magenta |
| 144 | CHdcPWM TRG[Y] | Charge DC PWM Trigger for Yellow |
| 145 | CHac1 TRG[YMC] | Charge AC1 Trigger for Color |
| 146 | Chac2 TRG[YMC] | Charge AC2 Trigger for Color |
| 147 | Chac3 TRG[YMC] | Charge AC3 Trigger for Color |
| 148 | CHac1 TRG[K] | Charge AC1 Trigger for Black |
| 149 | Chac2 TRG[K] | Charge AC2 Trigger for Black |
| 150 | Chac3 TRG[K] | Charge AC3 Trigger for Black |
| 151 | MB M | 4-bin Mailbox Main Motor |
| 152 | MB SOL1 | 4-bin Mailbox Junction Gate Solenoid 1 |
| 153 | MB SOL2 | 4-bin Mailbox Junction Gate Solenoid 2 |
| 154 | MB SOL3 | 4-bin Mailbox Junction Gate Solenoid 3 |
| 155 | MB SOL4 | 4-bin Mailbox Junction Gate Solenoid 4 |
| 160 | Duplex SOL | Duplex Junction Gate Solenoid |
| 161 | DI M1 62.5CCW | Duplex Inverter Motor 1 / 62.5 / Counterclockwise |
| 162 | DI M1 65CCW | Duplex Inverter Motor 1 / 65 / Counterclockwise |
| 163 | DI M1 125CCW | Duplex Inverter Motor 1 / 125 / Counterclockwise |
| 164 | DI M1 130CCW | Duplex Inverter Motor 1 / 130 / Counterclockwise |
| 165 | DI M1 185CCW | Duplex Inverter Motor 1 / 185 / Counterclockwise |
| 166 | DI M1 193CCW | Duplex Inverter Motor 1 / 193 / Counterclockwise |
| 168 | DI M1 370CCW | Duplex Inverter Motor 1 / 370 / Counterclockwise |
| 169 | DI M1 370CW | Duplex Inverter Motor 1 / 370 / Clockwise |
| 170 | DI M1 450CW | Duplex Inverter Motor 1 / 450 / Clockwise |
| 171 | DI M2 62.5CCW | Duplex Inverter Motor 2 / 62.5 / Counterclockwise |
| 172 | DI M2 65CCW | Duplex Inverter Motor 2 / 65 / Counterclockwise |
| 173 | DI M2 125CCW | Duplex Inverter Motor 2 / 125 / Counterclockwise |
| 174 | DI M2 130CCW | Duplex Inverter Motor 2 / 130 / Counterclockwise |
| 175 | DI M2 185CCW | Duplex Inverter Motor 2 / 185 / Counterclockwise |
| 176 | DI M2 193CCW | Duplex Inverter Motor 2 / 193 / Counterclockwise |
| 178 | DI M2 370CCW | Duplex Inverter Motor 2 / 370 / Counterclockwise |
| 179 | DI M2 370CW | Duplex Inverter Motor 2 / 370 / Clockwise |
| 180 | DI M2 450CW | Duplex Inverter Motor 2 / 450 / Clockwise |
| 181 | DI M12 62.5CCW | Duplex Inverter Motor 1\&2 / 62.5 / Counterclockwise |
| 182 | DI M12 65CCW | Duplex Inverter Motor 1\&2 / 65 / Counterclockwise |
| 183 | DI M12 125CCW | Duplex Inverter Motor 1\&2 / 125 / Counterclockwise |
| 184 | DI M12 130CCW | Duplex Inverter Motor 1\&2 / 130 / Counterclockwise |
| 185 | DI M12 185CCW | Duplex Inverter Motor 1\&2 / 180 / Counterclockwise |
| 186 | DI M12 193CCW | Duplex Inverter Motor 1\&2 / 193 / Counterclockwise |
| 188 | DI M12 370CCW | Duplex Inverter Motor 1\&2 / 370 / Counterclockwise |
| 189 | DI M12 370CW | Duplex Inverter Motor 1\&2 / 370 / Clockwise |
| 190 | DI M12 450CW | Duplex Inverter Motor 1\&2 / 450 / Clockwise |
| 193 | Duplex M125CCW | Duplex Feed Motor / 125 / Counterclockwise |
| 197 | Duplex M230CCW | Duplex Feed Motor / 230 / Counterclockwise |
| 198 | Duplex M370CCW | Duplex Feed Motor / 370 / Counterclockwise |


| $\begin{array}{\|c\|} \hline \text { SP5- } \\ 804-X X X \end{array}$ |  | Description |
| :---: | :---: | :---: |
| 202 | DI M2 OFF | Duplex Inverter Motor 2 / OFF |
| 204 | K Dev M H | Development Motor - K / High Speed |
| 205 | K Dev M M | Development Motor - K / Middle Speed |
| 206 | K Dev M L | Development Motor - K / Low Speed |
| 207 | Color Dev M H | Development Motor - YMC / High Speed |
| 208 | Color Dev M M | Development Motor - YMC / Middle Speed |
| 209 | Color Dev M L | Development Motor - YMC / Low Speed |
| 210 | Polygon M 29 | Polygon Motor / 29.528 |
| 211 | Polygon M 21 | Polygon Motor / 21.850 |
| 212 | LD FC[K]62.5 | LD Power for Black in Color Mode / 62.5 |
| 213 | LD FC[K]125 | LD Power for Black in Color Mode / 125 |
| 214 | LD FC[Y]62.5 | LD Power for Yellow in Color Mode / 62.5 |
| 215 | LD FC[Y]125 | LD Power for Yellow in Color Mode / 125 |
| 216 | LD FC[M]62.5 | LD Power for Magenta in Color Mode / 62.5 |
| 217 | LD FC[M]125 | LD Power for Magenta in Color Mode / 125 |
| 218 | LD FC[C]62.5 | LD Power for Cyan in Color Mode / 62.5 |
| 219 | LD FC[C]125 | LD Power for Cyan in Color Mode / 125 |
| 220 | LD1 [K] 62.5 | LD1 Power for Black / 62.5 |
| 221 | LD1 [K] 125 | LD1 Power for Black / 125 |
| 222 | LD1 [K] 185 | LD1 Power for Black / 185 |
| 223 | LD2 [K] 62.5 | LD2 Power for Black / 62.5 |
| 224 | LD2 [K] 125 | LD2 Power for Black / 125 |
| 225 | LD2 [K] 185 | LD2 Power for Black / 185 |
| 226 | LD [K]62.5 | LD Power for Black / 62.5 |
| 227 | LD [K]125 | LD Power for Black / 125 |
| 228 | LD [K]185 | LD Power for Black / 185 |

### 5.3.4 TEST PATTERN (SP5-997)



### 5.4 FIRMWARE UPDATE PROCEDURE

### 5.4.1 TYPE OF FIRMWARE

There are four types of firmware as shown below.

| Type of firmware |  | Function | Number of IC cards <br> required |
| :--- | :--- | :--- | :--- |
| Printer Engine | 1. Main | Printer engine control | 1 card |
|  | 2. MUSIC | Line position adjustment | 1 card |
| Printer Controller | 3. System | Printer system firmware | 2 cards |
|  | 4. NIB | NIB firmware | 1 card |

Refer to section "5.4.3 Controller/Engine Firmware Upgrade for the procedure.
NOTE: When upgrading all four types of firmware at the same time, you can upgrade them in any order.

However, when upgrading the controller system firmware, use the cards in the correct order (see below).

Two IC cards are needed to upgrade the controller system firmware. One IC card is for the operating system, and the other is for the printer application. Always upgrade the operating system first, then the printer application.

### 5.4.2 ERROR RECOVERY

## Engine Firmware/Controller NIB Firmware

If a download attempt fails, try downloading the new firmware again using the procedure described in section 5.4.3.
NOTE: When a download fails, the error is logged in the NVRAM on the controller and the machine asks you to insert the appropriate IC card.
Even after replacing the BCU board to fix the problem, the same message will continue to be displayed. Turning off and on the main switch while holding down the Menu and Enter keys clears the error condition logged in the NVRAM on the controller.

## Controller System Firmware:

If a download attempt fails, you must boot up the machine from the IC card. To do this, DIP SW 1 on the controller board needs to be ON. The machine will automatically start upgrading the firmware.

### 5.4.3 CONTROLLER/ENGINE FIRMWARE UPGRADE

## $\triangle$ CAUTION

1. Turn off the main switch whenever inserting or removing IC card.
2. Open the front cover whenever updating the firmware.
3. Do not turn off the machine while downloading the firmware.


### 5.5 CONTROLLER SELF-DIAGNOSTICS

### 5.5.1 OVERVIEW

There are three types of self-diagnostics for the controller.

- Power-on self-diagnostics: The machine automatically starts the self-diagnostics just after the power has been turned on.
- Detailed self-diagnostics: The machine does the detailed self-diagnostics by using a loop-back connector (P/N G0219350)
- SC detection: The machine automatically detects SC conditions at power-on or during operation.
The following shows the workflow of the power-on and detailed self-diagnostics.



### 5.5.2 DETAILED SELF-DIAGNOSTICS

This detailed self-diagnostic test requires a loop-back connector (P/N: G0219350).

1. Turn off the machine and attach the loop-back connector to the parallel interface.
2. Turn on the machine while pressing the "On Line" key and "\# Enter" key together.
3. The machine automatically starts the self-diagnostics and prints the diagnostic report after completing the test.

- Refer to the diagnostics report for the detected errors. The errors detected during self-diagnostics can be checked with SP7-832-001 (Diag. Result).
- Refer to section 4.2 for details about the error codes.


### 5.6 USER PROGRAM MODE

Press the "Menu" button and use the "Up/Down arrow" keys to scroll through the menu listing. To go back to a higher level, press the "Escape" key. After changing the settings, press the "On Line" key. The user menu list can be printed using "Menu List" in the "List/Test Print" user mode.

## User Mode Tree

|  |  |
| :--- | :--- | :--- | :--- |

### 5.7 DIP SWITCHES

## Controller Board

| DIP SW No. | OFF | ON |
| :---: | :--- | :--- |
| 1 | Boot-up from flash ROM | Boot-up from IC card |
| 2 to 4 | Factory Use Only: Keep these switches OFF. |  |

NOTE: If a download attempt failed, you must boot up the machine from the IC card. To do this, DIP SW 1 on the controller board needs to be ON.
$\Rightarrow B C U$ Board

| DIP SW No. | OFF | ON |
| :---: | :--- | :--- |
| 1 to 3 | Factory Use Only: Keep these switches OFF. |  |
| 4 | Fusing clutch is not <br> installed | Fusing clutch is installed |

NOTE: A DIP switch has been added to the BCU board (P/N G0775069 or later). This setting is very important. If the switch is not set correctly, a paper jam or fusing problem will occur.

## DETAILED DESCRIPTIONS

## 6. DETAILED SECTION DESCRIPTIONS

### 6.1 OVERVIEW

### 6.1.1 COMPONENT LAYOUT



1. Fusing Unit
2. PCU (one for each color)
3. Development Unit
4. Laser Optics Housing Unit
5. Polygon Mirror Motor
6. Toner Cartridge
7. By-pass Feed Table
8. Tray 2
9. Tray 1
10. Waste Toner Bottle
11. Duplex Feed Unit
12. Transfer Unit
13. Transfer Belt Cleaning Unit
14. ID Sensor
15. Duplex Inverter Unit

### 6.1.2 PAPER PATH


[A]: By-pass Feed Table
[B]: Tray 1
[C]: Tray 2
[D]: Optional 1 Tray Paper Feed Unit, 2 Tray Paper Feed Unit, or LCT
[E]: Optional Duplex Unit
[F]: Optional Two-tray Finisher
[G]: External Tray
[H]: Optional Four-bin Mailbox
[I]: Standard Tray (Internal Tray)

The two-tray finisher requires the duplex unit, and either the one-tray paper feed unit, two-tray paper feed unit, or LCT. It also requires the HDD or additional memory DIMM (total 128MB or more).
The duplex unit has two exits for the two-tray finisher. When the one-tray paper feed unit is installed, paper feeds out to the two-tray finisher from the upper exit. When the two-tray paper feed unit or LCT is installed, paper feeds out to the twotray finisher from the lower exit.

### 6.1.3 DRIVE LAYOUT



1. Development drive motor-K

This drives the development unit for black, the fusing unit, and the paper exit section.
2. Development drive motor-CMY

This drives the development units for magenta, cyan, and yellow, and the registration roller and by-pass feed mechanism, and the waste toner collection coils from the PCUs.
3. Drum drive motor-K

This drives the PCU for black, the collection coil in the waste toner bottle, and the transfer unit.
4. Drum drive motor-CMY

This drives the PCUs for magenta, cyan, and yellow.
5. Paper feed motor

This drives the paper feed mechanisms for tray 1 and 2.
6. Transfer belt contact motor

This moves the transfer belt into contact and away from the color PCUs.
A flywheel on the drum drive gears ( $\mathrm{K}, \mathrm{M}$, and C ) stabilizes the gear rotation.

## OVERVIEW

### 6.1.4 BOARD STRUCTURE

## Overview



The BCU controls all the mechanical components. The IEEE1394 interface board, memory DIMM, and the HDD can be installed on the controller.
The controller connects to the BCU through a PCI bus.

## Descriptions

## 1. BCU (Base Engine Control Unit)

The BCU has two CPUs (Main and MUSIC). The CPUs control the following functions:

- Main CPU
- Engine sequence
- Machine and printer engine operation
- Timing for peripherals
- High voltage supply, laser, and fusing
- Sensors, motors, and solenoids
- MUSIC (Mirror Unit for Skew and Interval Correction) CPU
- TD sensor
- Line position adjustment
- Memory chip on the toner cartridge


## 2. Controller

The controller handles the following functions:

- Printer-to-host interface
- Operation panel interface
- Network interface
- Interfacing and control of the optional IEEE1394, HDD and DRAM DIMM


## 3. LD Drive Board

This is the laser diode drive circuit board.

## 4. IEEE1394 Interface (Option)

This allows computers to connect to this printer using an IEEE1394 interface.

## 5. HDD Unit (Option)

The HDD unit stores the data for the following.

- Additional soft fonts
- Collation
- Locked print
- Sample print
- Downloading forms for form overlay

6. Memory DIMM (Standard: 32MB DRAM, Option: 64/128/256MB DRAM)

This is for additional printer processing memory, used for collation and for soft fonts.

## 7. Operation Panel Board

Controls the display panel, the LED, and the keypad.

## 8. IEEE1284 Interface

This is a parallel printer port.

## OVERVIEW

### 6.1.5 PRINTING PROCESS



This machine uses four PCUs, four development units, and four laser beams for color printing. Each PCU consists of a drum, charge roller, cleaning brush, and blade. From the left, the PCU stations are black, yellow, cyan, and magenta.
A transfer belt feeds paper past the PCUs, and the toner image on each drum is transferred to the paper.
The paper path is inclined about 38 degrees to make the machine as compact as possible.

1) Drum charge:

The charge roller gives the drum a negative charge
2) Laser exposure:

The laser beam from the laser diode (LD) goes through the lens and mirrors and reaches the drum. Turning the laser beam on and off, and creates a latent image on the drum.
3) Development:

The development roller carries negatively charged toner to the latent image on the drum surface. This machine uses four independent development units (one for each color).
4) Image transfer:

The charge applied to the transfer brush attracts the toner from the drum to the paper. Four toner images are super-imposed onto the paper.
5) Cleaning for OPC drum:

The cleaning brush and blade remove any toner remaining on the drum surface after image transfer to the paper.
6) Quenching for OPC drum:

Quenching is done by illuminating the whole area of the drum with the laser at the end of every job.
7) Paper attraction:

Paper is attracted to the transfer belt by the charge applied to the paper attraction roller.
8) Separation:

Paper separates from the transfer belt when the belt curves away from it.
9) Cleaning and quenching for transfer belt:

The cleaning roller cleans the belt surface. The grounding roller inside the transfer belt unit removes the remaining charge on the belt.
10) ID sensor:

The ID sensor board contains two ID sensors (one at the front, and one at the rear). The ID sensor detects the density of the ID sensor pattern on the transfer belt. The ID sensor output is used for process control and for automatic line position, skew, and color registration adjustments for the latent image.

### 6.2 PROCESS CONTROL

### 6.2.1 OVERVIEW

This machine provides the following two forms of process control:

- Potential control
- Toner supply control

The process control facilities of this machine have the following features:

- Two ID (image density) sensors (front and rear). Only the front ID sensor is used for process control. The front and rear ID sensors are used for line positioning and other adjustments.
- TD (toner density) sensor.


### 6.2.2 POTENTIAL CONTROL

## Overview

Potential control controls development to maintain the density of the toner image on the drum. It does this by compensating for variations in drum chargeability and toner density.
The machine uses the ID sensor to measure the reflectivity of the transfer belt and the density of a standard sensor pattern. This is done during the process control self check.

The machine determines the following depending on the ID sensor output and a reference table in memory.

- VD: Drum potential without exposure - to adjust this, the machine adjusts the charge roller voltage.
- VB: Development bias
- VL: Drum potential at the strongest exposure - to adjust this, the machine adjusts the laser power
(In addition, VREF is corrected. This is used for toner supply control.)
This process controls the development potential so that the maximum amount of toner applied to the drum is constant. However, to control the development potential to improve reproduction of highlight parts of the image, the laser power control method can be changed. This depends on the setting of SP3-125-2. The default setting is 1 (normal control method). To change to the highlight range control method, set this SP to 2.

If SP3-125-1 is set to 0 (Off), the machine does not do the potential control, but uses the development bias adjusted with SP2-201-1 to -9, the charge roller voltage adjusted with SP2-001-1 to -9, and the laser power selected with SP2-103-1 to -27. However, these SPs should normally not be adjusted in the field.

## Process Control Self Check

This machine carries out potential control using a procedure called the process control self check. There are seven types of process control self check, categorized according to their execution times.

1. Forced

This is done when SP3-126-1 is used.
2. Initial

This starts automatically when the power is turned on, but only if the fusing unit pressure roller temperature is less than $60^{\circ} \mathrm{C}$.
3. Interval: Job End

This starts automatically at the end of a print job when the total print counter for this feature exceeds 200 (this can be changed with SP3-906-1). After any process control is done (except for forced process control), the counters are reset to 0 .
4. Interval: Interrupt (default: not done)

This interrupts printing and then starts automatically when the machine makes a certain number (A) of continuous color prints in the same job. After it is completed, the machine continues to make prints.
The value A can be adjusted with SP3-906-2 (default: off).
At this time, only VREF is corrected. Potential control (VD, VB, VL correction) is not done.
5. Non-use Time (default: not done)

This starts before the next print job if the machine has no job for a certain time $(\mathrm{M})$ after it makes more than a certain number ( N ) of prints.
M is adjusted with SP3-906-4 and N is adjusted with SP3-906-3.
6. After Toner End Recovery

This starts after recovery from a toner end condition.
7. After Developer Initialization

This starts after a developer initialization is done. Developer initialization occurs automatically after a new development unit has been installed.

### 6.2.3 PROCESS CONTROL SELF CHECK PROCEDURE



## Step 1: VsG Adjustment

This machine uses two ID sensors (direct reflection type). They are located at the front and rear of the transfer unit. Only the front ID sensor is used for process control. The ID sensor checks the bare transfer belt's reflectivity and the machine calibrates the ID sensor until its output (known as VSG) is as follows.

- VSG $=4.0 \pm 0.5$ Volts

This calibration compensates for the transfer belt's condition and the ID sensor condition, such as dirt on the surface of the belt or ID sensor.

## Step 2: ID Sensor Solid Pattern Generation



The machine agitates the developer for between 15 and 60 seconds until the fluctuation in TD sensor output becomes less than 0.3 V , and then makes a 10grade pattern ( $12 \mathrm{~mm} \times 15 \mathrm{~mm}$ ) on the transfer belt for each toner color. Each grade of the pattern is a solid color, and is made by changing the development bias and charge roller voltage. The difference between development bias and charge roller voltage is always the same.

## Step 3: Sensor Pattern Detection

The ID sensor detects the densities of the 10 solid patterns for each color. This data goes to memory.

## Step 4: Toner Amount Calculation

The amount of toner on the transfer belt ( $\mathrm{M} / \mathrm{A}$, mass per unit area, $\mathrm{mg} / \mathrm{cm}^{2}$ ) is calculated for each of the 10 grades of the sensor pattern from the ID sensor output value from each grade of the pattern.

## Step 5: VD, VB, VL Selection and Vref Adjustment



The machine determines the relationship between the amount of toner on the transfer belt and the development bias for each of the 10 grades. The machine now selects the development bias and charge roller voltages for the target M/A for each color by referring to a table in memory.
The way that the laser power $(\mathrm{VL})$ is selected depends on the setting of SP3-125-2.

## PROCESS CONTROL

- If it is set to 0, the LD power is fixed at the value of SP2-103-1, to -27.
- If it is set to 1 , LD power is selected using the same memory table as mentioned above.
- If it is set to 2 , LD power is determined by ID sensor highlight pattern generation (steps 6 to 8 later in this procedure).
The machine also adjusts VREF (toner density target) at the same time so that the development gamma detected by process control will be the value stored in SP3-120-1 to -4 (do not adjust in the field unless advised to do so).

After that, the machine cleans the transfer belt by applying a positive dc charge to the cleaning roller for three rotations of the belt. It does not use the cleaning blade.

## Allowable changes to $\mathrm{VD}, \mathrm{VB}$, and VL as a result of process control:

This depends on the process control type as follows.

- Forced : No limit
- Initial, After Developer Initialization: $\pm 80$ volts
- Interval (Job End/ Non-use Time/ During Toner End Recovery): $\pm 40$ volts
- Interval (Interrupt): Constant (The memory table is not used.)


## Steps 6 to 8 are carried out only if SP3-125-2 is set to 2. (Default: Steps 6 to 8 are not used)

## Step 6: ID Sensor Highlight Pattern Generation



The machine makes a 10-grade ( $12 \mathrm{~mm} \times 15 \mathrm{~mm}$ ) on the transfer belt for each toner color. The patterns are dot patterns, not solid colors like for the process in step 2. Each grade of the pattern is made using the bias and charge roller voltages selected above, and the various grades are made by changing the LD power.

## Step 7: Sensor Pattern Density Detection

The ID sensor detects the densities of the 10 patterns for each color. This data goes to memory.

## Step 8: VL (LD Power) Selection

The machine determines the relationship between the amount of toner on the transfer belt and the laser power for each of the 10 grades. The machine now selects the laser power to get the target M/A.

After that, the machine cleans the transfer belt by applying a positive dc charge to the cleaning roller for three rotations of the belt. It does not use the cleaning blade.


### 6.2.4 TONER SUPPLY CONTROL

## Overview

Toner supply control uses the following to determine the amount of toner to be supplied. This is done before every development for each color.

- Density of the toner in the developer (as detected by the TD sensor) - VREF, VT
- Pixel count

The image density is kept constant by adjusting the density of toner in the development unit, while accommodating to changes in the development conditions through the potential control mechanism. Environmental changes and the number of prints made are also used in the calculation.
The amount of toner supplied is determined by the 'on' time of the toner supply clutch. The total 'on' time for each toner supply clutch is stored in the memory chip for the relevant toner cartridge. The amount of toner supplied also depends on the process line speed for the current job. The machine supplies the calculated amount of toner for each color.

## Toner Supply Control Modes

This machine has three toner supply control modes. They are selected with SP2-208-1 to -4.

1. Fuzzy control mode

This is the default toner supply control mode. The TD sensor, ID sensor, and pixel count are used in this mode.
2. Proportional control mode

This mode is used when the ID sensor at the front becomes faulty. Only the TD sensor is used to control toner supply. The machine uses the VREF that is stored in SP2-224-5 to -8.
3. Fixed supply mode

This mode is used when the TD sensor becomes faulty. The amount of toner supply can be adjusted with SP2-208-5 to -8 if the image density is incorrect (the default setting is $5 \%$ ).

### 6.2.5 TONER NEAR END/TONER END DETECTION

## Introduction

The machine is always checking for a toner near end condition.

## Toner Near End Detection

When the following condition is detected for a toner color during a print job, the machine automatically stops the print job and performs toner end recovery. If the result of toner end recovery does not meet the condition described in Toner End Recovery below, the machine flags a "toner near end condition".

- VREF + 0.4 V < VT (ten times consecutively)


## Toner End Detection

The machine flags a "toner end condition" when one of the following conditions are detected for a toner color.

- Vref + 0.8 V < VT (ten times consecutively)
- The pixel counter counts up the equivalent of 5 A4 sheets of pixels (100\% coverage) since near-end was detected.
However, if fewer pages have been made since near-end than the number guaranteed with SP 2-212-11 (default: 10 pages), printing will continue.
NOTE: If one of the following conditions are detected 10 consecutive times, the machine flags a "toner end condition" regardless of the number of pages printed since near-end.
- VReF + $1.2 \mathrm{~V}<\mathrm{VT}^{2}$
- $\mathrm{VT}>4.8 \mathrm{~V}$

After the machine detects toner end for black, it cannot print until the toner cartridge is replaced. If toner end is detected for cyan, magenta or yellow, the machine can print with black and white only; color printing is disabled.

## Toner End Recovery

The machine detects that the toner cartridge has been replaced if the upper right cover is opened and closed when a near-end or end condition exists. The machine then starts to supply toner to the development unit. After supplying toner, the machine clears the toner end condition if the following conditions are detected.

- $\mathrm{Vt}[0]-\mathrm{Vt}[3]>0.5 \mathrm{~V}$
- Vt - Vref $>0.3 \mathrm{~V}$


## PROCESS CONTROL

### 6.2.6 DEVELOPER INITIALIZATION

When the machine detects that a new development unit has been installed, it initializes the developer.

To do this, the machine agitates the developer for about 90 seconds, and adjusts VCNT (control voltage for TD sensor) so that VT (TD sensor output) becomes $3.0 \pm$ 0.1 volts. The machine stores this VT as VREF .
$\mathrm{V}_{\text {CNT }}$ is corrected for the current humidity every print job. VCNT is also corrected for the total number of prints, to prevent the developer $Q / M$ from varying.
If the humidity correction is giving poor results (for example, if the humidity sensor is broken), it can be disabled with SP2-223-2. Then a value for VCNT must be input manually using SP2-224-1 to -4 (adjust by trial and error).
During developer initialization, the machine forcibly supplies toner because there is no toner inside the toner transport tube at installation. Then the machine does the process control self check.

### 6.3 LASER EXPOSURE

### 6.3.1 OVERVIEW



1. Synchronizing detector board-Y, K-E
2. LD unit-Y
3. LD unit-K
4. LD Mirror-M
5. LD unit-M
6. LD unit-C
7. F-theta lens-M, C
8. Synchronizing detector board-M, C-S
9. Synchronizing detector board-M, C-E
10. OPC drum-M
11.WTL
11. OPC drum-C
12. OPC drum-Y
13. OPC drum- K
14. Synchronizing detector board-Y, K-S
15. F-theta lens-Y, K
16. Polygon mirror motor
17. LD Mirror-K

This machine uses four LD units and one polygon mirror motor to produce a latent image on four OPC drums (one drum for each color toner).
There are two hexagonal mirrors. Each mirror reflects beams from two LD units. The LD unit for black has two laser diodes to do dual beam writing (this is only done for black-and-white printing; for full color printing, only one of the beams is used).
Laser exposure for magenta and cyan starts from the rear side of the drum, but for yellow and black it starts from the front side of the drum. This is because the units for magenta and cyan are on the other side of the polygon mirror from the units for yellow and black.

### 6.3.2 OPTICAL PATH



The laser beams for cyan $[A]$ and yellow $[B]$ are directed to the upper part of the polygon mirror [C], and those for magenta [D] and black [E] are directed to the lower part of the polygon motor. The LD mirrors (see the previous page) deflect the laser beams for magenta and black towards the lower polygon mirror.
The WTL [F] corrects the main scan line; without this component, the line bends out towards the middle of the main scan. The central bend of the WTL is adjusted in the factory.
The speed of the polygon mirror depends on the selected mode (see below).

| Mode | Resolution (dpi) | Polygon motor speed (rpm) | Process line speed ( $\mathrm{mm} / \mathrm{s}$ ) | Print speed (ppm) | Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: |
| B/W (except OHP/Thick paper) | $\begin{gathered} 600 \times 600 \\ 1,200 \times 600 \end{gathered}$ | 21,850 | 185 | 38 | Dual beam writing |
|  | 1,200 $\times 1,200$ | 29,528 | 125 | 28 |  |
| Color (except | $\begin{gathered} 600 \times 600 \\ 1,200 \times 600 \end{gathered}$ | 29,528 | 125 | 28 |  |
| OHP/Thick paper) | 1,200 $\times 1,200$ | 29,528 | 62.5 | 14 |  |
| OHP/Thick | $\begin{gathered} 600 \times 600 \\ 1,200 \times 600 \\ 1,200 \times 1,200 \end{gathered}$ | 29,528 | 62.5 | 10 |  |

### 6.3.3 LASER SYNCHRONIZING DETECTOR



## Overview

The machine has four laser synchronizing detector boards (LSD), one at each corner of the laser optics housing unit.
Each pair of boards detects two colors. The machine recognizes each color from the time that they are detected. The two LSDs [A] at the right are used for magenta and cyan, and the two $[B]$ at the left are used for yellow and black.

## Main Scan Start Detection

For magenta and cyan, the LSD at the rear detects the start of the main scan. For yellow and black, the LSD at the front detects the start of the main scan.

## Clock Frequency Adjustment

Each pair ensures that the number of laser clock pulses in the main scan is constant. If the count for one particular beam varies from normal, the LD clock frequency for that beam is adjusted.

If the board at the end position is defective, this cannot be detected. Switch the detection feature off with SP2-919-1.

### 6.3.4 DUAL BEAM WRITING

## Dual Beam Mechanism

The LD unit for black has two laser diodes. Each face of the polygon mirror writes two main scan lines. This only happens for black and white printing.

## Laser Beam Pitch Change Mechanism



The machine changes the main scan resolution between 600 and 1,200 dpi for black and white by rotating the LD unit [A], except for OHPs and thick paper.

Both LD unit positions are fixed distances from the LD home position sensor [B]. When the number of times that the resolution has changed reaches a certain number, the LD positioning motor moves the LD unit to the home position, and then to the proper position.
After the laser optics housing unit has been replaced, the beam pitch for 600 dpi and 1200 dpi must be adjusted (SP2-109-2, -3 ).

### 6.3.5 LD SAFETY SWITCH



A relay on the PSU ensures technician and user safety and prevents the laser beam from inadvertently switching on during servicing. This relay turns off when the front cover, upper left cover, or right cover is opened, and cuts the power ( +5 V ) supplied to the LD board for each color through the BCU.

Two safety switches are used to turn the relay off. One switch is used for the front cover and upper left cover. This safety switch is off when either the front cover or upper left cover is opened. Another safety switch is used for the right cover.

- E-MAC: Enhanced Modulation ASIC on CMOS
LDB: LD Drive Board
(included in the LD Unit)


## Front and Left Door Switch

Micro switch [A] on the PSU is activated or deactivated by the actuator $[B]$ when closing or opening the front and left doors as shown.


### 6.3.6 AUTOMATIC LINE POSITION ADJUSTMENTS

## Overview



The machine automatically adjusts the following items by drawing lines ( $1 \mathrm{~mm} \times 20$ mm ) on the transfer belt and measuring them using the two ID sensors (one at the front and one at the rear). The machine generates eight sets of these lines for each color on both sides (front and rear) of the transfer belt, and averages the results from measuring these sets.

1. Sub scan line position for YCM based on the line position for K (color registration)
2. Main scan line position for KYCM
3. Magnification ratio for KYCM
4. Skew for YCM based on the line position for K

The machine automatically executes the adjustment when it detects one of the following:

1. Depends on setting of SP5-993-1. The default is as follows:

- If a process control self check is done (except after toner end recovery and developer initialization)
- New PCU installed
- If the temperature measured by the sensor on the laser optics housing unit differs by $5^{\circ} \mathrm{C}$ from the temperature at the previous adjustment when a color printing job starts, or during a printing job, or at any time during standby mode.

2. When the user or technician starts the adjustment with a user tool or SP5-9932
NOTE: The skew adjustment is done only if a PCU is replaced with a new one or a forced image position adjustment is executed with SP5-993-2 or a UP mode.

After measuring the patterns, the machine cleans the transfer belt by applying a positive dc charge to the cleaning roller and turns the belt three full rotations.

If an error is detected three times consecutively, SC285 is generated.

## Sub Scan Line Position for YCM

The machine measures the gaps between lines of each color on the pattern on the transfer belt. If the gaps are not correct, the machine moves the image for the required color up or down the sub scan axis. To do this, it changes the laser write timing for that color.

## Main Scan Line Position for KYCM

If the machine detects that the image is out of position in the main scan direction, it changes the laser write start timing for each scan line.

## Magnification Adjustment

If the machine detects that magnification adjustment is necessary, it changes the LD clock frequency for the required color.

## LASER EXPOSURE

## Main Scan Skew Adjustment



The 3rd mirror positioning motors [A] for magenta, cyan, and yellow each adjust the angle of the 3rd mirror [B], based on the 3rd mirror position for black. This corrects main scan skew.

### 6.4 PHOTOCONDUCTOR UNIT

### 6.4.1 OVERVIEW



1. Cleaning brush roller
2. Charge roller (non-contact)
3. OPC drum
4. Cleaning brush
5. Waste toner collection auger
6. Cleaning blade

This machine has four independent PCUs, one for each color. Each PCU consists of an OPC drum, non-contact charge roller, cleaning brush, and cleaning blade. The diameter of the drum is 30 mm (circumference: about 94.25 mm ).

The photoconductor gap between PCU and development roller is determined by the drum positioning plate and the rear shaft, and is not adjustable in the field.

The push switches in the drum positioning plate detect when a new PCU has been installed.

### 6.4.2 DRIVE



The drum drive motor-K [A] drives the PCU for black. It also drives the transfer unit.
The drum drive motor- $\mathrm{CMY}[\mathrm{B}]$ drives the PCUs for magenta, cyan, and yellow. Using one motor to drive these three drums reduces CMY color misalignment.

### 6.4.3 DRUM CHARGE AND QUENCHING



This machine uses a non-contact charge roller [A] to reduce ozone. The noncontact charge roller gives the drum surface a negative charge. The high voltage supply board - C, B, which is located at the rear of the machine, applies a dc and ac voltage (at a constant current) to the roller. The ac voltage helps to ensure that the charge given to the drum is as uniform as possible.

The machine automatically controls the charge roller voltage, if automatic process control is enabled (i.e., if SP3-125-1 is set to 0 ). However, if process control is switched off, (i.e., if SP3-125-1 is set to 1), the dc voltage is the value stored in SP2-001-1 to -9 (do not adjust in the field unless advised to do so).
The diameter of the roller is 11.14 mm (circumference about 35 mm ). The gap between drum and charge roller is about $50 \mu \mathrm{~m}$.
The cleaning brush roller [B], which always contacts the charge roller, cleans the charge roller.
The charge roller can generate small amounts of nitrogen oxide gases (known as NOx), which may be absorbed by the surface of the drum. This can cause unfocused copies. As a result, the film of NOx is removed at power on, at the end of a job (if more than 200 prints), and when a toner cartridge has been replaced. SP3-920-1 to -4 determine when this procedure (known as 'refresh mode') is done. It can also be executed at any time if the prints are smeared (using SP3-920-5).
Quenching is done by illuminating the whole area of the drum with the laser at the end of every job.

### 6.4.4 DRUM CLEANING



The cleaning brush $[A]$ spreads out the waste toner remaining on the drum. The cleaning blade [B] then scrapes it off. The toner collection auger [C] transports the toner towards the waste toner collection bottle.

### 6.4.5 WASTE TONER COLLECTION



The waste toner from the collection augers in the four PCUs drops into the waste toner collection duct [A] at the rear of the PCU. The toner collection coils [B, C, D] in the duct transport this waste toner towards the waste toner bottle (M [E], C [F], Y [G], K [H]). The coils are driven by the development drive motor-CMY.
The toner [I] from the transfer unit drops directly into the waste toner bottle [J].
There are two holes in the waste toner collection duct. If the toner is unable to drop through the hole $[\mathrm{K}]$ at the centre of the bottle, it is transported to the end of the duct and drops into the bottle through the hole [L] at the end.

### 6.4.6 WASTE TONER BOTTLE FULL DETECTION



The waste toner bottle set switch [A] detects when the bottle is placed in the machine.

The waste toner sensor $[B]$ detects the weight of the bottle and informs when it is almost full.

When the bottle contains a certain amount of waste toner, the sensor is deactivated. The machine detects that the waste toner bottle is almost full and displays "Waste Toner is Almost Full".
After that, the machine can print 1,000 more sheets. After printing 1,000 sheets, it displays "Replace Waste Toner", and after the end of the job, the printer cannot be used until the bottle is replaced or emptied.

### 6.4.7 PCU DETECTION (DEVELOPMENT UNIT DETECTION)



The drum positioning plate $[A]$ contains eight push switches $[B]$. These detect when a new PCU or a new development unit has just been installed. They also detect if the PCUs and development units are in the machine.

Each PCU and each development unit includes a pin [C], which activates the switch when the drum positioning plate is closed. On a new unit, this pin does not activate the switch. When the unit is driven for the first time, the pin comes out and activates the switch.

After the machine is turned on or the front cover is closed, the machine checks each switch (result 1 in the table). Then the machine drives the PCUs and development units for 5 seconds and checks each switch again (result 2 in the table). The condition detected by the machine depends on the combination of results, as shown below.

| Result 1 | Result 2 | Detection | Action |
| :---: | :---: | :--- | :--- |
| OFF | OFF | The PCU or development unit is <br> not placed in the machine, or the <br> drum positioning plate is not <br> secured by the two screws. | The machine displays an <br> error message. |
| OFF | ON | A new PCU or development unit <br> has just been installed. | The machine resets the <br> counter for the PCU or <br> development unit. |
| ON | ON | The current PCU or <br> development unit is present. | The machine goes to standby <br> mode. |

NOTE: If some PCUs or development units are not installed, the machine displays error messages in the following order.
$(\mathrm{M} \mathrm{dev} \rightarrow \mathrm{M} \mathrm{PCU} \rightarrow \mathrm{C} \mathrm{dev} \rightarrow \mathrm{C} \mathrm{PCU} \rightarrow \mathrm{Y} \operatorname{dev} \rightarrow \mathrm{Y}$ PCU $\rightarrow \mathrm{K} \mathrm{dev} \rightarrow \mathrm{K}$ PCU)

### 6.5 DEVELOPMENT

### 6.5.1 OVERVIEW



1. Doctor blade
2. TD sensor
3. Developer hopper
4. Mixing auger (left)
5. Mixing auger (right)
6. Development roller

This machine has four independent development units, one for each color. Each contains 280 g of developer when new. The developer in each unit is supplied to the development roller by the two mixing augers and attracted onto the surface of the roller.

The photoconductor gap between PCU and development roller is determined by the drum positioning plate and the rear shaft, and is not adjustable in the field.

The push switches in the drum positioning plate detect when a new development unit has been installed, and detect whether the development unit is in the machine.

The TD sensor and front ID sensor control toner density. Each development unit has a TD sensor.

The diameter of the development roller is 18 mm (circumference about 56.5 mm ).

### 6.5.2 DRIVE


[B]


Detailed
Descriptions

The development drive motor-K [A] drives the development roller for black through gears and a clutch. This motor also drives the fusing unit and paper exit rollers. The gear trains are indicated in the diagram by dotted lines.
The development drive motor-CMY $[\mathrm{B}]$ drives the development unit for magenta, cyan, and yellow through gears and clutches. This motor also drives the registration roller and by-pass feed table.

## DEVELOPMENT

### 6.5.3 DEVELOPER AGITATION



Two mixing augers [ A and B ] circulate the developer forward and backward to agitate the developer.
This happens during the process control self check, during toner supply, and during development.

### 6.5.4 DEVELOPMENT BIAS



The high voltage supply board $-C, B[A]$ supplies development bias to the development roller via a receptacle $[B]$ at the rear of each development unit.
There are both ac and dc bias voltages. The ac bias improves toner transfer to the drum.

The machine automatically controls the dc bias, if automatic process control is enabled (i.e., if SP3-125-1 is set to 0). However, if process control is switched off, (i.e., if SP3-125-1 is set to 1 ), the dc bias is the value stored in SP2-201-1 to -9 (do not adjust in the field unless advised to do so).

The ac bias cannot be adjusted.

### 6.5.5 DEVELOPMENT UNIT DETECTION

This is the same as PCU detection. See "Photoconductor Unit - PCU Detection'.

### 6.5.6 TONER SUPPLY MECHANISM



## Overview

An air transport system agitates the toner in the toner cartridges [A]. Toner is transported from the toner cartridge to the development unit [B] by the toner attraction pump [C] (each cartridge has a separate pump). This provides a more stable way to transport a fine powder than previous methods.

## Toner Agitation

The air pump supplies air to the toner cartridge and air mixes with the toner and agitates all the toner in the cartridge. One air pump [D] and four valves [E] control the air flow.

The air pump turns on to supply air to the toner cartridge for one second at the following times:

- During normal operation, when the 'on' time for a toner supply clutch reaches a certain value
- When forced toner supply (SP2-207) is done
- When forced toner density adjustment (SP3-126-2) is done
- At toner end recovery
- Developer initialization

The filter [F] in the inner package of the toner cartridge ensures that the internal pressure does not become too high.
The toner mixed with air becomes a fluid, and passes part of the way along the transport tube towards the toner attraction pump. This pump draws the toner the rest of the way (see the next page).

## Toner Transport



Each toner attraction pump \# has the following mechanism.
The pump (toner attraction pump) [A], which consists of the toner supply clutch [B], rubber tube [C], and a rotor [D], attracts the toner in the toner transport tube [E] toward the development unit.

The toner supply clutch drives the rotor, which draws the toner in from the cartridge and passes it to the development unit. Each time the clutch comes on to supply toner, it turns on for 0.7 s and off for 1.3 s . The number of times that the clutch turns on depends on the amount of toner to be supplied, which depends on the results of toner supply control.

Motor drive comes from the development drive motors.

## Shutter Mechanism



The development unit and toner attraction pump each have a shutter mechanism. When the development unit is placed in the machine, the protrusion $[A]$ on the development unit opens the shutter [B] in the pump, and the protrusion [C] on the pump opens the shutter [D] in the development unit. When both shutters are open, toner can enter the development unit from the toner attraction pump.

When the development is removed, the shutter spring [ E and F ] pulls and closes the shutter.

### 6.5.7 TONER CARTRIDGE DETECTION



A memory chip [A] on each toner cartridge stores the total 'on' time of the toner supply clutch. This is used to calculate the amount of toner remaining in the toner cartridge. The chip also detects whether the cartridge is installed (if the cartridge is not installed, the machine does not detect a signal from the memory chip).

### 6.6 PAPER FEED

### 6.6.1 OVERVIEW



1. Pick-up roller - tray 1
2. Feed roller - tray 1
3. Separation roller - tray 1
4. Relay roller
5. Registration roller
6. Feed roller - By-pass feed
7. Pick-up roller - By-pass feed
8. By-pass feed table
9. Separation roller-By-pass feed
10. Transport roller
11. Vertical transport roller
12. Feed roller - tray 2
13. Separation roller - tray 2
14. Pick-up roller - tray 2
15. Paper tray 2
16. Paper tray 1

There are two paper trays (500 sheets each), and a by-pass feed table (100 sheets).
The paper feed mechanism uses an FRR system.
Tray 1 can only hold A4 or letter paper. Tray 2 can hold a range of sizes.

### 6.6.2 DRIVE - TRAYS 1 AND 2



The paper feed motor [A] drives the pick-up and feed mechanisms in both tray 1 [B] and 2 [C] using clutches and complex trains of gears (the locations of the gear trains are indicated by dotted lines in the above diagram).
When the paper tray is inside the machine, the pick-up roller [D] is always in contact with the top sheet of the paper stack. When the paper feed clutch [E] turns on, the pick-up, feed [F], and separation [G] rollers start rotating to feed the paper. The paper feed clutch stays on until shortly after the registration sensor activates.

### 6.6.3 PAPER LIFT - TRAYS $1 \& 2$



The tray 1 set switch [A] and tray 2 paper size switches [B] detect when the paper trays [C] are placed in the machine. When the machine detects that a tray has been placed in the machine, the tray lift motor [D] rotates and the coupling gear [E] on the tray lift motor engages the pin [F] on the lift arm shaft [G]. Then the tray lift arm $[\mathrm{H}]$ lifts the tray bottom plate [I] until the paper lift sensor for the tray detects that the top of the stack is at the paper feed position.

### 6.6.4 PAPER SIZE DETECTION - TRAYS $1 \& 2$



For tray 1 , there is no size switch. The paper size is fixed at either A4 or LT; this can be changed with SP1-902-1.
For tray 2, four paper size switches, working in combination, detect the paper size as shown in the table below. The actuators are on the side plate $[A]$. The side plate is moved by the end plate $[\mathrm{B}]$ through a cam [C].

| Models |  | Switch Location |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| North America | Europe/Asia | 1 [D] | 2 [E] | 3 [F] | 4 [G] |
| 11" x 17" SEF | $11 \mathrm{l} \times 17 \mathrm{C}$ SEF | 0 | 1 | 0 | 0 |
| A3 SEF | A3 SEF | 1 | 0 | 1 | 0 |
| 81/2" x 14" SEF *1 | B4 SEF *1 | 1 | 1 | 0 | 1 |
| 81/2" $\times 11{ }^{\text {² SEF *2 }}$ | A4 SEF *2 | 0 | 1 | 1 | 0 |
| 11" x 81/2" LEF *3 | 11" x 81/2" LEF *3 | 1 | 0 | 1 | 1 |
| A4 LEF | A4 LEF | 0 | 1 | 0 | 1 |
| B5 LEF | B5 LEF | 0 | 0 | 1 | 0 |
| A5 LEF | A5 LEF | 0 | 0 | 0 | 1 |

## 1: Pushed

Notes:
*1: The machine detects either $81 / 2^{\prime \prime} \times 14$ " SEF or B4 SEF, depending on the setting of SP 1-902-2
*2: The machine detects either $81 / 2^{\prime \prime} \times 11$ " SEF or A4 SEF, depending on the setting of SP 1-902-3
*3: The machine detects either 11 " x $81 / 2$ " LEF or B5 SEF, depending on the setting of SP 1-902-4
The machine disables paper feed from a tray if the paper size cannot be detected (if the paper size actuator is broken or no tray is installed).

### 6.6.5 PAPER HEIGHT DETECTION - TRAYS 1 \& 2



Two paper height sensors, working in combination, detect the amount of paper in the tray.
When the amount of paper decreases, the bottom plate pressure lever moves up and the actuator $[A]$ (on the pressure lever drive shaft) rotates.

| Remaining paper | Paper height sensor 2 [B] | Paper height sensor 1 [C] |
| :---: | :---: | :---: |
| Full | OFF | OFF |
| Nearly full | ON | OFF |
| Near end | ON | ON |
| Almost empty | OFF | ON |

OFF: No actuator

### 6.6.6 PAPER END DETECTION - TRAYS $1 \& 2$

If there is some paper in the paper tray, the paper stack raises the paper end feeler and the paper end sensor deactivates.

When the paper tray runs out of paper, the paper end feeler drops into the cutout in the tray bottom plate, and this activates the paper end sensor.

## PAPER FEED

### 6.6.7 REGISTRATION



The development drive motor - CMY [A] drives the registration roller [B] using a clutch and a complex train of gears (the location of the gear train is indicated by dotted lines in the above diagram).

The machine makes a paper buckle at the registration roller to correct paper skew. The paper buckle can be adjusted with SP1-003-1 to - 8 .

### 6.6.8 PAPER FEED LINE SPEED

This machine has three process line speeds (for feed from registration roller to fusing unit) depending on the selected resolution

| Mode | Resolution <br> (dpi) | Line speed <br> $(\mathbf{m m} / \mathbf{s})$ | Print speed <br> $(\mathbf{p p m})$ |
| :--- | :---: | :---: | :---: |
| B/W | $600 \times 600$ <br> $1,200 \times 600$ | 185 | 38 |
|  | $1,200 \times 1,200$ | 125 | 28 |
| Color | $600 \times 600$ <br> $1,200 \times 600$ | 125 | 28 |
|  | $1,200 \times 1,200$ | 62.5 | 14 |
| OHP/Thick | $600 \times 600$ <br> $1,200 \times 600$ <br> $1,200 \times 1,200$ | 62.5 | 10 |

During a monochrome print job, the machine changes the line speed if there is a page with color in the middle of the job. However, it will not change the line speed if there is a monochrome page in the middle of a color print job.

|  | Line speed (mm/s) |
| :--- | :---: |
| Paper feed from tray to registration roller | 230 |
| Fusing, paper exit to standard tray, and mailbox | A bit slower than "Process line speed" |
| Duplex invert and feed | 370 |
| Finisher | 450 |

## PAPER FEED

### 6.6.9 BY-PASS TRAY



The development drive motor - CMY [A] drives the by-pass tray using a clutch and a complex train of gears (the location of the gear train is indicated by dotted lines in the above diagram).

To feed paper, the by-pass pick-up solenoid (not shown in the diagram) moves the pick-up roller into contact with the top of the stack.

Paper size and end detection are done in the usual manner.

### 6.7 IMAGE TRANSFER AND PAPER SEPARATION

### 6.7.1 OVERVIEW



1. Transfer belt
2. Paper attraction roller
3. Back-up roller
4. Transfer charge brush
5. Toner collection auger

Paper is fed to the transfer belt before image transfer begins. The paper attraction roller charges the paper to ensure that the paper is attracted to the belt.

The magenta, cyan, yellow, and black color images transfer to the paper while the transfer belt feeds the paper past the drums towards the fusing unit. A positive charge is applied to the paper under the transfer belt, opposite each drum, to transfer the toner from the drums onto the paper. The back-up roller ensures that the contact area between the drum and belt is sufficient.

The cleaning unit in the transfer unit cleans the belt surface by applying a charge to a cleaning roller. The waste toner collected from the belt is transported to the waste toner bottle.

There are two ID sensors. Only the front one detects the image density of the patterns generated on the transfer belt for process control. The other function of the ID sensors is for automatic line position adjustment. Both sensors are used for this.

### 6.7.2 TRANSFER BELT DRIVE



The drum drive motor-K $[A]$ drives the transfer belt $[B]$ and the cleaning unit via some gears. The speed of transfer belt drive depends on the process line speed.

### 6.7.3 TRANSFER AND CLEANING CURRENT



The transfer charge brush [A] applies a current to transfer the toner to the paper [B].
The high voltage supply board - T, PA, CL [C] applies a current to the brush, paper attraction roller [D], and cleaning roller [E].

These currents, except for cleaning, are automatically corrected for paper size, temperature (measured by the thermistor on the right side of the laser optics housing unit), and humidity (measured by the humidity sensor).

Available adjustments are summarized below.

- The transfer brush current for each printing mode (color or B/W, resolution, paper type) can be adjusted with SP2-301-1 to -56. The by-pass tray settings are used when the duplex unit has not been installed and the user is making duplex prints manually from the by-pass tray. There is a correction for narrow-width paper with SP2-309-1 to -4.
- The current for paper attraction can be adjusted with SP2-801-1 to -9. There is a correction for narrow-width paper with SP2-801-10 to -13.
- The current for cleaning cannot be adjusted.

The back-up rollers [F] before the transfer charge brushes for each color make a wider contact area between the drum [G] and the belt. The other rollers are grounded to neutralize the belt surface.

### 6.7.4 TRANSFER BELT CLEANING



The transfer belt cleaning unit [A] removes toner on the belt after printing, the ID sensor patterns for process control, and the ID sensor patterns for automatic line position adjustment.
The cleaning roller [B] always contacts the transfer belt [C], and attracts waste toner from the belt (the cleaning roller is electrically charged). The blade [D] in the cleaning unit scrapes the toner off the cleaning roller. The toner collection auger [E] transports the toner towards the waste toner collection bottle.

### 6.7.5 TRANSFER BELT CONTACT

## Mechanism



The transfer belt contact and release mechanism improves the lifetime of the transfer belt and drums.
The drum for black always contacts the belt, but the transfer belt moves away from the other drums during monochrome printing.
In standby mode, the transfer belt contacts only the black drum. When the machine prints a color page, the machine waits until the previous page has gone through the transfer unit. Then the transfer belt contact motor [A] turns on and a cam [B] moves the lower end of the transfer belt upwards so that it contacts the other three drums.

The transfer belt home position [C] and contact [D] sensors detect the transfer belt positions, as follows:

$\left.$|  | B/W printing <br> (default position) | Moving to <br> color <br> printing <br> position |  | Color <br> printing | Moving <br> back to the <br> default <br> position <br> $\rightarrow$ |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | | Default |
| :---: |
| position | \right\rvert\,

Off: Actuator not inside sensor
The machine does not release the transfer belt from the color drums during the job, even if a monochrome page comes again. This is because the total printing speed reduces if the transfer belt changes position often.
To pull out the transfer belt, the user moves the release lever and the belt moves down and away from all four drums. Then the unit can be pulled out.

## ACS (Auto Color Sensing) Mode

ACS: On


ACS: Off


The machine can print in color or monochrome mode (selected with the printer driver). In color mode, ACS can be switched on or off with a user tool (default: on).

If ACS is on, the transfer belt stays in the default position (against the $K$ drum only) until a page with color data on it appears. The transfer belt then moves against all four drums and stays there until the end of the job, even if some $K$ only pages appear.
If ACS is off and color mode is selected, all data is printed with the transfer belt positioned against all four drums. The belt does not move even if a K only page appears, even if it is at the start of the job.

### 6.8 FUSING

### 6.8.1 OVERVIEW



1. Oil supply roller
2. Oil supply pad
3. Fusing belt
4. Heating roller thermistor
5. Heating roller thermostat
6. Heating roller
7. Heating roller fusing lamp
8. Pressure roller thermofuse
9. Pressure roller thermistor
10. Pressure roller fusing lamp
11. Pressure roller
12. Hot roller
13. Junction gate
14. Cleaning roller
15. Oil supply sub-roller

- A belt fusing system is used. This has a faster warm-up time than a conventional hot and pressure roller system.
- The heating roller is made of aluminum to increase the temperature of the fusing belt quickly.
- The hot roller is made of sponge, which flattens slightly, also increasing the fusing nip. This roller does not contain a fusing lamp.
- The heating and pressure rollers each have a fusing lamp.
- NA: 770W for the heating roller, 350W for the pressure roller
- EU: 700W for the heating roller, 325 W for the pressure roller
- The heating roller thermistor and pressure roller thermistor control the temperature of these lamps.
- Temperature is normally controlled by turning the fusing lamps on and off. To change between on/off control and phase control: SP1-104-1.
- The oil supply pad supplies oil to the fusing belt through the oil supply roller. The oil supply sub-roller spreads the oil on the oil supply roller evenly.

FUSING

### 6.8.2 FUSING UNIT DRIVE



- The development drive motor-K drives the pressure roller [A], hot roller [B], oil supply roller [C], oil supply sub-roller [D] and belt cleaning roller [E] through a gear train.
- The heating roller [F] is driven by the pressure with the fusing belt [G].


### 6.8.3 FUSING TEMPERATURE CONTROL

## Fusing Temperatures

When the main switch turns on, the CPU turns on the fusing lamp. The lamp stays on until the thermistor detects the standby temperature. Then the CPU raises the temperature to the printing temperature.

The fusing temperature for each mode is as follows.

| Mode | Resolution (dpi) | Temperature of Heating Roller | Temperature of Pressure Roller | Note |
| :---: | :---: | :---: | :---: | :---: |
| Energy saver level 1 |  | $100^{\circ} \mathrm{C}$ | $130^{\circ} \mathrm{C}$ |  |
| Standby mode |  | $170^{\circ} \mathrm{C}$ | $140^{\circ} \mathrm{C}$ | If SP1-104025 is set to 4 |
| Color | $1200 \times 1200$ | $150^{\circ} \mathrm{C}$ | $\begin{aligned} & \text { NA: } 125^{\circ} \mathrm{C} \\ & \text { EU: } 130^{\circ} \mathrm{C} \end{aligned}$ |  |
|  | $\begin{aligned} & \hline 1200 \times 600 \\ & 600 \times 600 \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { NA: } 175^{\circ} \mathrm{C} \\ & \text { EU: } 180^{\circ} \mathrm{C} \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { NA: } 145^{\circ} \mathrm{C} \\ & \text { EU: } 160^{\circ} \mathrm{C} \\ & \hline \end{aligned}$ |  |
| Black and white | $1200 \times 1200$ | $175^{\circ} \mathrm{C}$ | $\begin{aligned} & \text { NA: } 145^{\circ} \mathrm{C} \\ & \text { EU: } 155^{\circ} \mathrm{C} \end{aligned}$ |  |
|  | $\begin{aligned} & \hline 1200 \times 600 \\ & 600 \times 600 \end{aligned}$ | $\begin{aligned} & \text { NA: } 185^{\circ} \mathrm{C} \\ & \text { EU: } 180^{\circ} \mathrm{C} \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { NA: } 155^{\circ} \mathrm{C} \\ & \text { EU: } 160^{\circ} \mathrm{C} \end{aligned}$ |  |
| OHP | All | $180^{\circ} \mathrm{C}$ | $160^{\circ} \mathrm{C}$ |  |
| Thick | All | $175^{\circ} \mathrm{C}$ | $155^{\circ} \mathrm{C}$ |  |
| Color (duplex) | $1200 \times 1200$ | $145^{\circ} \mathrm{C}$ | $\begin{aligned} & \text { NA: } 120^{\circ} \mathrm{C} \\ & \text { EU: } 125^{\circ} \mathrm{C} \end{aligned}$ |  |
|  | $\begin{gathered} 1200 \times 600 \\ 600 \times 600 \end{gathered}$ | $\begin{aligned} & \text { NA: } 165^{\circ} \mathrm{C} \\ & \text { EU: } 170^{\circ} \mathrm{C} \end{aligned}$ | $\begin{aligned} & \text { NA: } 135^{\circ} \mathrm{C} \\ & \text { EU: } 150^{\circ} \mathrm{C} \end{aligned}$ |  |
| Black and white (duplex) | $1200 \times 1200$ | $165^{\circ} \mathrm{C}$ | $\begin{aligned} & \text { NA: } 135^{\circ} \mathrm{C} \\ & \text { EU: } 145^{\circ} \mathrm{C} \\ & \hline \end{aligned}$ |  |
|  | $\begin{aligned} & 1200 \times 600 \\ & 600 \times 600 \\ & \hline \end{aligned}$ | $175^{\circ} \mathrm{C}$ | $\begin{aligned} & \text { NA: } 145^{\circ} \mathrm{C} \\ & \text { EU: } 155^{\circ} \mathrm{C} \\ & \hline \end{aligned}$ |  |

The heating and pressure roller temperatures for fusing are stored in SP1-105-3 to -28.

When the machine is switched on, the fusing lamp temperatures increase to the those specified by SP1-104-25.
The print ready temperature is slightly less than the fusing temperature. The difference is specified by SP1-105-1 and -2.

FUSING

## Temperature Corrections

To prevent excessive glossiness caused by fusing temperature overshoot, there are the following SP modes:

- 1-913: Fusing temperature is reduced after this number of pages during the job.
- 1-914: This shows how much the temperature is reduced

If a job using OHP or thick paper starts while the fusing unit is still warm, the fusing temperature could be higher than the target for this type of paper, causing marks on the output. To prevent this problem, we have the following SP modes:

- 1-996-4, 5: These SPs specify a limit, above which printing will not start.


## Overheat Protection

- If the heating or pressure roller temperature becomes greater than $200^{\circ} \mathrm{C}$, the CPU cuts off the power to the fusing lamp. SC543 for the heating roller or SC553 for the pressure roller is generated.
- If thermistor overheat protection fails, there is a thermostat for the heating roller and a themofuse for the pressure roller in series with the common ground line of the fusing lamp.
- If the thermostat temperature becomes greater than $210^{\circ} \mathrm{C}$, the thermostat opens, removing power from the fusing lamp.
- If the thermofuse temperature becomes greater than $169^{\circ} \mathrm{C}$, the thermofuse opens, removing power from the fusing lamp.
- At this time, the machine stops operation.


### 6.8.4 OIL SUPPLY AND CLEANING



- The oil supply mechanism makes it easier for paper to separate from the fusing belt and roller after fusing.
- The oil $[A]$ from the oil supply pad $[B]$ is supplied to the oil supply roller [C]. The oil supply roller rotates and supplies a bit of oil to the fusing belt.

- The oil supply solenoid [A] moves the oil supply unit up and down. When a print job starts, the solenoid repeatedly turns on and off for the first few pages to apply the correct amount of oil to the oil supply roller. Then, for the remaining pages of the job, it stays in contact with the roller.
At other times, the unit stays away to reduce oil consumption.


### 6.8.5 NEW FUSING OIL SUPPLY UNIT DETECTION



The fusing oil supply unit $[A]$ contains a fuse $[B]$ in a circuit between the fusing unit and the BCU board. The fuse opens shortly after a new unit has been installed in the machine, and the power switched on. When the power is turned on or the left cover is closed, the BCU checks whether a new fusing oil supply unit is installed by checking the fuse condition. If the fusing oil supply unit has been replaced, the machine detects the new unit and automatically resets the counter for the unit.

Oil near-end is detected by counting the number of prints made. The machine indicates oil near-end 2,500 sheets before the life of the oil supply unit runs out. This timing can be changed with SP7-905-9.

### 6.8.6 NEW FUSING UNIT DETECTION



The new fusing unit contains a spring $[A]$ as part of a circuit connected to the BCU. After a new unit has been installed in the machine and the fusing pressure roller is driven for the first time, a pin [B] on the fusing pressure roller picks off the spring and the looped wire circuit opens.

When the power is turned on or the left cover is closed, the BCU checks whether the looped wire circuit is open or closed. If the fusing unit has just been replaced, the circuit is still closed, and the machine detects the new unit. It then automatically resets the counter for the unit.

The fusing unit's life is detected by counting the number of prints made. The machine indicates near-end 2,500 sheets before the life of the unit runs out. This timing can be changed with SP7-905-7.

### 6.8.7 ENERGY SAVER MODE

When the machine is not being used, the energy saver feature reduces power consumption by switching off the fusing lamp. This machine has two energy saver modes.

## Level 1 Energy Saver Mode

The default for level 1 energy saver mode is disabled. If the user enables it, energy saver level 1 mode starts 30 seconds after the machine has completed a print. In this mode, the fusing lamps are intermittently turned on and off to keep the heating roller at $100^{\circ} \mathrm{C}$ and pressure roller at $130^{\circ} \mathrm{C}$.
The machine leaves this mode when one of the following happens.

- Print command received from the PC
- Any cover opened and closed
- Any operation panel keys pressed


## Level 2 Energy Saver Mode

Level 2 energy saver mode starts after the machine has been idle for a certain time. This time is specified by a user tool. During level 2 energy saver mode, both lamps switch off.

- Off (energy saver mode never activates)
- 5 minutes
- 15 minutes
- 30 minutes
- 45 minutes
- 60 minutes (default)

When the machine is in this mode, the machine turns off $+24 \mathrm{~V},+12 \mathrm{~V}$, and +5 V lines. However, only +5 VE lines, for the controller and GAPCI (voltage monitoring ASIC) on the BCU, are still active.

The machine leaves energy saver mode when one of the following happens.

- Print command received from the PC
- Any operation panel keys pressed

NOTE: The machine does not leave level 2 energy saver mode when covers are opened and closed, because the CPU on the BCU is not active.

### 6.9 PAPER EXIT

### 6.9.1 OVERVIEW


[A]: To standard paper tray
[B]: To external paper tray
[C]: Junction gate
[D]: Paper exit sensor
[E]: Paper overflow sensor

- After fusing, the junction gate feeds paper to the standard paper tray or the external paper tray. The junction gate solenoid controls the junction gate as follows.
- To feed paper to the standard paper tray: The junction gate solenoid is off (default).
- To feed paper to the external paper tray: The junction gate solenoid is on.
- The development drive roller-K drives the exit rollers.


### 6.9.2 PAPER OVERFLOW DETECTION


[A]: Paper overflow sensor

- When the paper overflow sensor $[A]$ is activated, the machine detects that the paper stack height has exceeded a certain limit and stops printing.


### 6.10 CONTROLLER

### 6.10.1 OVERVIEW



The controller uses GW (Grand Workware) architecture.

1. CPU: QED RM7000 ( 250 MHz )
2. COMIC (Color Model IC): GW architecture ASIC. It uses a 100 MHz bus ( 64 bit) for interfacing with CPU and memory. It controls the interface with the CPU and also controls the following functions: memory, local bus, interrupts, PCI bus, video data, HDD, network, operation panel, IEEE1284, and image processing.
3. SDRAM DIMM (2 slots): 64 MB SDRAM (resident), expandable up to 384 MB with a $64 \mathrm{MB}, 128 \mathrm{MB}$, or 256 MB SDRAM.
4. Flash ROM: 2 MB flash ROM programmed for network applications
5. ROM DIMM ( $\mathbf{3}$ slots): The DIMM installed in the machine includes 8 MB flash ROM programmed for system, printer, PCL5c, PS3, and RPCS applications. This DIMM also includes 8 kB of Mask ROM for storing internal printer fonts. Currently the remaining two DIMM slots are not being used.
6. NVRAM: 8 kB NVRAM for storing the printer parameters, total counter, and logged data
7. IEEE1284 Interface: Supports compatible, nibble, and ECP modes
8. Network Interface: 100BASE-TX/10BASE-T
9. NVRAM board (option): 64 kB NVRAM used for storing a record of the number of pages printed under each "User Code".
10. IEEE1394 Interface (option): See the IEEE1394 Interface section.
11. HDD (option): A 3.5 " HDD ( 20.5 GB ) can be connected using the IDE interface. The hard disk is partitioned as shown below. The sizes cannot be adjusted.

| Partition | Size | Function | Comment |
| :--- | :---: | :--- | :--- |
| File System 1 | 500 MB | Downloaded fonts, forms. | Remain stored even after <br> cycling power off/on. |
| Image TMP | 9800 MB | Collation, sample print, <br> locked print. | Commonly used area for <br> applications, erased after <br> power off. |
| Job Log | 10 MB | Job log. | Remains stored even after <br> cycling power off/on. |

The system and application software for the following boards can be downloaded from the Controller IC Card.

- Controller (Flash ROM and flash ROM DIMM)
- BCU (Main CPU and MUSIC CPU)
- NIB

For details about downloading software from an IC card, see Service Tables Firmware Update Procedure.

### 6.10.2 BOARD LAYOUT



NOTE: The NVRAM board contains the total counter information for the machine it is currently installed in. If the controller board is replaced, you must reinstall the original NVRAM board on the new controller. Failure to do so will cause the total counter to be inaccurate.

## CONTROLLER

### 6.10.3 PRINT DATA PROCESSING

## RPCS Driver



## PCL5c Driver



## PS3 Driver



## CMS (Color Management System)

CMS optimizes the color print quality using a color profile that is based on the characteristics of the printer. With RPCS, the color profile is applied by the driver. With PS3 and PCL5c, the color profile is applied in the matching/CRD module on the controller except when using CMM/ICC/ICM profiles.
CMS is not used when the color profile setting in the printer driver is set to "Off."

## Gray Correction

Gray correction processes gray with K or CMYK toner depending on the driver settings.

## BG/UCR (Black Generation/Under Color Removal)

The RGB data is converted to CMYK data with BG/UCR. During CMYK conversion, some CMY data is replaced with K data by the BG/UCR algorithm.

## Gamma Correction

The printer gamma can be adjusted with controller SP mode (Gamma Adj.). For CMYK, there are15 points between 0 and $100 \%$. The corrected gamma data is stored in NVRAM.

CONTROLLER

## Toner Limitation

Toner limitation prevents toner from being scattered around text or printed lines.
Maximum values have been prepared independently for text and photo. They can be adjusted with controller SP mode (Toner Limit).

- Default: $190 \%$ for text, $260 \%$ for photo
- Adjustable range: $100 \%$ to $400 \%$


## Dither Processing and ROP/RIP

Dither patterns have been prepared for photo and text independently. Dithering converts the 8 -bit data to 1 -bit data. However, these dither patterns create the illusion of 256 gradations for high quality prints. The optimum dither pattern is selected depending on the selected resolution.
RIP: Raster Image Processing
ROP: Raster Operation

### 6.10.4 CONTROLLER FUNCTIONS

## Sample Print

This feature was formerly known as "Proof Print". It requires installing an optional HDD. This function gives users a chance to check the print results before starting a multiple-set print run.

- The size of the hard disk partition for the sample print feature is 5.8 GB. This partition is also used by the collation and locked print features.
- The partition can hold up to 30 files, including files stored using locked print.
- The partition can hold a log containing up to 20 errors, excluding jobs stored using locked print.
- The maximum number of pages is 2,000 , including jobs using locked print and collation.


## Locked Print

This feature requires installing an optional HDD. Using this feature, the print job is stored in the machine but will not be printed until the user inputs an ID at the machine's operation panel. This ID must match the ID that was input with the printer driver.

- Stored data is automatically deleted after it is printed.
- Stored data can be manually deleted at the operation panel.
- The partition can hold up to 30 files, including files stored using sample print.
- The partition can hold a log containing up to 20 errors, excluding logs stored using locked print.
- The maximum number of pages is 2,000 , including jobs using sample print and collation.
- Locked print uses the same hard disk partition as sample print and collation, which is 5.8 GB .


## Paper Source Selection

## Tray Priority (Auto Tray Select)

The "Tray Priority" setting determines the start of the tray search when the user selects "Auto Tray Select" with the driver. The machine searches for a paper tray with the specified paper size and type.

When no tray contains paper that matches the paper size and type specified by the driver, the controller stops printing until the user loads the correct paper.

The "Tray Priority" setting can be specified in the "Paper Input" menu. (Menu/ Paper Input/ Tray Priority)
NOTE: The by-pass feed table is not part of the tray search.


## Tray Lock

If "Tray Lock" is enabled for a tray, the controller skips the "locked" tray in the tray search process.

The "Tray Lock" setting can be specified in the "Paper Input" menu. (Menu/ Paper Input/ Tray Lock)
NOTE: The by-pass feed table cannot be unlocked (Tray Lock is always enabled).

## Manual Tray Select

If the selected tray does not have the paper size and type specified by the driver, the controller stops printing until the user loads the correct paper.

## Auto Continue

## Overview

When this function is enabled, the machine waits for a specified period ( $0,1,5,10$, 15 minutes) for the correct paper size and type to be set in the tray. If the timer runs out, the machine starts printing, even if there is no paper tray which matches the paper size and paper type specified by the driver.
The machine searches for a paper tray in the following way.

- The interval can be set with the "System" menu in the User Tools. (Menu/ System/ Auto Continue)
NOTE: The default setting for this feature is 'disabled'.


## Auto Tray Select

When there is no paper tray that matches the paper size and type specified by the driver, the machine searches for any tray that has paper, and prints from the first tray it finds. The start of the tray search is the tray selected as the "Priority Tray."


## Manual Tray Select

The machine prints from the selected tray even if the paper size and type do not match the setting specified from the driver.

If "Auto Continue" is disabled, the machine waits until the user loads the correct paper in the tray.

## Paper Output Tray

The output tray can be selected with the "Output Tray" setting in the "System" menu (Menu/ System/ Output Tray).

If a print job does not specify an output tray or if the driver specifies the default tray, the output tray selected with this user tool will be used.

## Output Tray Selected

- If the machine cannot print to the selected output tray, it prints to the default paper output tray.
- If paper overflow is detected at the selected output tray, the controller stops printing until the overflow detector goes off.


## Sequential Stacking

When the 4-bin mailbox is installed, "Auto Tray SW" is selected as the output tray in the "System" menu, and "Printer Default" is specified as the output tray in the driver, the machine automatically sends the output to the lowest tray. When that tray fills up, the machine sends the output to the next lowest tray. When that tray also fills up, the machine sends the output to the next lowest tray sequentially. This feature is called "Sequential Stacking."

- If a tray becomes full and paper is detected in the next tray, the machine displays an error and stops printing. When paper in the next tray is removed,
 the machine automatically resumes printing to the next tray.
- If all trays become full (overflow detected in all trays), the machine displays an error and stops printing. This time, all paper in all trays must be removed.


## Stapling

Stapling is available when the two-tray finisher is installed. The finisher has the following stapling positions.

2 Tray Finisher


- Depending on the paper orientation, the image may have to be rotated. The driver rotates the image. If the paper cannot be physically stapled as specified by the driver, it will not be stapled.
- There is a limit for the number of sheets which can be stapled. If a job has more than this number, it will not be stapled.
For A3, 11 " x 17", $81 / 2^{\prime \prime} \times 14$ " paper: 30 sheets
For $81 / 2 " \times 11$ ", A4, B5 paper: 50 sheets


## Punching

Punching is available only when the punch kit is installed with the two-tray finisher.
The number of holes ( 2,3 , or 4 holes) depends on the type of punch kit.

- There is only one punch position available, so the relationship between the punching position and the printed image depends on the paper feed orientation and image rotation.

2 Tray Finisher


### 6.11 IEEE1394 INTERFACE

### 6.11.1 SPECIFICATIONS

## Hardware Specification

Interface: IEEE1394 (6 pins)
(no power supply, cable power repeated, IEEE1394a-2000 compliant)
Ports: 2 ports
Data rates: 400Mbps/200Mbps/100Mbps

## System Requirements

PC: Windows PC with IEEE1394 port
OS: Microsoft Windows 2000 upgraded with service pack 1
Cable length: 4.5 m ( 15 ft )

### 6.11.2 IEEE1394

IEEE1394, also known as FireWire (a name patented by Apple), is an easy-to-use peer-to-peer networking technology allowing speeds of up to 400 Mbps .
The current standard contains the following features, which are supported in most devices:

- Hot swapping (cables can be connected and disconnected while the computer and other devices are switched on)
- Peer-to-peer networking (no hub required)
- No terminator or device ID is required, unlike SCSI
- Automatic configuration of devices upon start-up, or "plug and play."
- Real-time data transfer at 100, 200, and 400 Mbps
- Common connectors for different devices


The cable length is limited to 4.5 m (15ft). However, up to 16 cables and 63 devices can be connected to an IEEE1394 network.

IEEE1394 cables can be either 4-pin (data only) or 6-pin (data and power).
IEEE1394 allows either 6-pin or 4-pin connectors. However, this machine only uses the 6-pin connectors. The machine has two 6-pin ports.

### 6.11.3 BLOCK DIAGRAM



- PHY: Physical layer control device
- Link: Link layer control device
- EEPROM: 256-byte ROM


### 6.11.4 PIN ASSIGNMENT



| Pin <br> No. | Signal Description |
| :---: | :--- |
| 1 | Cable Power |
| 2 | GND |
| 3 | Receive strobe |
| 4 | Transmit data |
| 5 | Receive data |
| 6 | Transmit strobe |

### 6.11.5 REMARKS ABOUT THIS INTERFACE KIT

Note the following points about this unit.

- The machine does not print reports specifically for IEEE1394. Just print the Configuration Page at installation to check that the machine recognizes the card.
- There is no spooler or print queue. If a computer tries to print over the IEEE1394 while the printer is busy, the IEEE1394 interface card inside the printer will return a busy signal.
- After starting a job using IEEE1394, do not switch the printer off until the job has been completed. Even though the printer may appear to be dead, it may be in the middle of an IEEE1394 protocol exchange with the computer.
- When using IEEE1394, it is not possible to check the printer status from the computer with a utility such as Printer Manager for Client.


### 6.11.6 TROUBLESHOOTING NOTES

If there are problems printing using the IEEE1394 interface, check the following.

- Is the computer using Windows 2000 with service pack 1 ?
- Has the interface card been replaced recently? Each card has an individual address, similar to the MAC address in an Ethernet card. If the card was changed, the driver cannot find the old card. The new card is another device and a new printer appears in Windows Control panel, and this must be configured in the same way as the printer that was replaced (the old printer icon in Windows Control Panel should be deleted) has to be reconfigured.
- Is there a loop somewhere in the network? An IEEE1394 network must be a chain or a branched chain. There can be no loops.
- Try to find out where in the chain the problem is occurring. Test the machine one-to-one with the computer to determine if the printer is defective (when the printer's interface cable is plugged in, the computer should see 'Printer Ready'; when the cable is disconnected, the computer should see 'Offline').


## DUPLEX UNIT <br> G571

## 1. REPLACEMENT AND ADJUSTMENT

### 1.1 DUPLEX INVERTER UNIT

### 1.1.1 TOP COVER

1. External tray $[\mathrm{A}]$
2. Open the duplex left cover $[B]$
3. Top cover [C] ( $(\hat{\xi} \times 4)$


### 1.1.2 DUPLEX CONTROL BOARD



1. Top cover (1.1.1 TOP COVER)
2. Duplex unit $[A]$ (테 $\times 1$, (3) $\times 1$ )
3. Rear inner cover $[B]\left(\mathcal{K}^{2} \times 2\right)$


### 1.1.3 DUPLEX INVERTER MOTOR 1



1. Top cover ( 1.1.1 TOP COVER)

2. Duplex unit (1.1.2 DUPLEX CONTROL BOARD)
3. Duplex control board bracket $[A]\left(\hat{\xi} \times 2, \xi_{\#}^{〔} \times 8\right)$
4. Duplex inverter motor $1[B]\left(\mathcal{E}^{(1)} \times 2, \xi_{\mathrm{E}}^{\mathrm{N}} \times 1,1\right.$ timing belt)

### 1.1.4 DUPLEX INVERTER MOTOR 2 AND SWITCH



1. Top cover ( 1.1.1 TOP COVER)
2. Duplex unit (1.1.2 DUPLEX CONTROL BOARD)
3. Duplex control board bracket



### 1.1.5 EXIT SENSOR 3 AND DUPLEX INVERTER SENSOR

1. Open the duplex inverter unit $[A]$
2. Exit sensor $3[B]\left(\mathrm{E}_{\mathrm{U}}^{\mathrm{l}} \times 1\right.$ )



### 1.1.6 EXIT SENSOR 1 AND 2

1. Top cover (1.1.1 TOP COVER)
2. Open the duplex unit
3. Exit sensor $1[A](\hat{\xi} \times 1$, 気 $\mathrm{l} \times 1,1$ bracket $)$
4. Exit sensor $2[B]\left({ }_{\xi} \| x 1\right)$


### 1.2 DUPLEX FEED UNIT

### 1.2.1 DUPLEX DRIVE BOARD



1. Open the front cover
2. Duplex feed unit $[A](\hat{\xi} \times 1)$
3. Inner cover $[B](\hat{\xi} \times 1)$


### 1.2.2 DUPLEX FEED MOTOR

1. Duplex feed unit (1.2.1 DUPLEX DRIVE BOARD)
2. Inner cover $[A]\left(\hat{\xi}^{3} \times 1\right)$
 1, 1 timing belt)


### 1.2.3 DUPLEX FEED SENSOR



1. Duplex feed unit (1.2.1 DUPLEX DRIVE BOARD)
2. [A] Duplex feed sensor ( $\mathrm{E}_{\mathrm{ll}}^{\mathrm{D}} \mathrm{x} 1$ )

## 2. DETAILED DESCRIPTIONS

### 2.1 OVERVIEW



1. Exit sensor 1
2. Junction mylar 2
3. Junction gate
4. Exit sensor 3
5. Duplex feed sensor
6. Junction mylar 1
7. Duplex inverter sensor
8. Exit sensor 2
9. Junction mylar 3

- For duplex printing, the second page (rear side) is printed first.
- To print on the second side, the duplex inverter unit (on the side of the machine) inverts the paper from the fusing unit and feeds it to the duplex feed unit (inside the machine).
- The duplex feed unit feeds the inverted paper back to the paper feed section.
- When both sides have been printed, the duplex inverter unit feeds the paper out to the finisher.
- If the mailbox or standard exit tray (on top of the machine) was selected to receive the duplex copies, the print will not enter the duplex unit after the second side has been printed. The junction gate inside the printer directs it upwards to the selected tray.
- Duplex copies are not fed out to the external tray (on the left of the machine).


### 2.2 DUPLEX OPERATION

### 2.2.1 UP TO A4/LT(81/2" X 11") LEF

There are three sheets of paper in the paper feed path at the same time, using the interleave method.

Example: 8 pages. The number [A] in the illustration shows the order of pages. The number $[B]$ in the illustration shows the order of sheets of paper (if shaded, this indicates the second side).


### 2.2.2 LARGER THAN A4/LT(81/2" X 11") LEF

There is only one sheet of paper in the paper feed path at one time.
Example: 8 pages. The number [A] in the illustration shows the order of pages. The number $[B]$ in the illustration shows the order of sheets of paper (if shaded, this indicates the second side).

[B]

## DUPLEX INVERTER UNIT

### 2.3 DUPLEX INVERTER UNIT

### 2.3.1 DRIVE



The duplex inverter motor $1[A]$ drives the paper exit roller $1[B]$, paper transport roller [C], paper exit roller 2 [D], and upper inverter roller [E].
The duplex inverter motor 2 [F] drives the exit roller 3 [G], paper exit roller $4[H]$, and lower inverter roller [I].

### 2.3.2 FEED TO EXTERNAL EXIT TRAY (NON-DUPLEX MODE)



This shows how the machine feeds paper through the duplex unit to the external tray [A], when duplex mode has not been selected.
NOTE: The paper cannot be fed out to the external tray if duplex printing is selected.
The junction gate $[B]$ directs the paper from the fusing unit out to the external tray if thick paper or OHP mode is selected, or if the external tray is selected as the output tray with the printer driver.

### 2.3.3 FEED TO DUPLEX FEED UNIT


[B]

This shows how the machine feeds paper back into the machine after side 1 has been printed.

The junction gate [A] diverts the paper from the fusing unit to the lower part of the inverter unit. After the duplex inverter sensor [B] has been activated, the machine waits until the trailing edge has passed junction mylar 3 [C]. Then, the paper is switched back and junction mylar 3 directs the paper back into the machine for the second side.

The next page shows how the paper is fed out to the finisher after both sides have been printed.

### 2.3.4 FEED TO TWO-TRAY FINISHER

## With Optional One-Tray Paper Feed Unit


[C]

The paper is fed out to the finisher from the upper exit [A].
The junction gate $[B]$ diverts the paper from the fusing unit to the lower part of the inverter unit. After the duplex inverter sensor [C] has been activated, the machine waits until the trailing edge has passed junction mylar 1 [D]. Then, the paper is switched back and junction mylar 1 directs the paper out to the finisher.

## With Optional LCT or Two-Tray Paper Feed Unit



The paper is fed out to the finisher from the lower exit [A].
The junction gate $[B]$ diverts the paper from the fusing unit to the lower part of the inverter unit. After the duplex inverter sensor [C] has been activated, the machine waits until the trailing edge has passed junction mylar 2 [D], but before it passes junction mylar 3 [E]. Then, the paper is switched back and junction mylar 2 directs the paper out to the finisher.

### 2.4 DUPLEX FEED UNIT

### 2.4.1 DRIVE



The duplex feed motor [A] drives all paper transport rollers.

### 2.4.2 FEED-IN AND FEED-OUT



The duplex feed unit feeds the paper from the duplex inverter unit to the relay roller [A].

## ONE-TRAY PAPER FEED UNIT G567

## 1. REPLACEMENT AND ADJUSTMENT

### 1.1 COVER REPLACEMENT



G567R102.WMF

1. Rear cover $[A](\hat{\xi} \times 2)$

### 1.2 ROLLER REPLACEMENT

### 1.2.1 PAPER FEED, SEPARATION, AND PICK-UP ROLLERS



G567R101.WMF

1. Paper tray
2. Pick-up roller [A] (1 hook)
3. Paper Feed Roller [B] ((3) $\times 1$ )
4. Separation Roller [C] ( 3 ) $\times 1$ )

### 1.3 PAPER FEED MOTOR AND MAIN BOARD



G567R103.WMF

1. Rear cover ( 1.1 COVER REPLACEMENT)

2. Main board $[B]\left(\mathcal{F}^{2} \times 2\right)$

## 1．4 TRAY LIFT MOTOR

1．Rear cover（1．1 COVER REPLACEMENT）

2．Tray lift motor［A］（気县x 1，会 $\times 2$ ）


## 1．5 PAPER FEED CLUTCH

1．Rear cover（ 1．1 COVER REPLACEMENT）

2．Bracket $[B](\hat{\xi} \times 1)$
3．Bushing
4．Paper feed clutch［C］


### 1.6 PAPER FEED UNIT REPLACEMENT



G567R106.WMF

1. Right cover $[A]$
2. Paper feed unit $[B]\left(\hat{\xi} \times 2\right.$, $\left.\mathbb{E}^{\| l} \times 1\right)$

## 2. DETAILED DESCRIPTIONS

### 2.1 OVERVIEW

### 2.1.1 MECHANICAL COMPONENT LAYOUT



G567D001.WMF

1. Pick-up Roller
2. Paper Feed Roller
3. Relay Roller
4. Separation Roller
5. Tray

### 2.1.2 ELECTRICAL COMPONENT LAYOUT



G567D101.WMF

1. Paper Size Switch 1
2. Paper Size Switch 2
3. Paper Size Switch 3
4. Paper Size Switch 4
5. Main Board
6. Paper Feed Motor
7. Paper End Sensor
8. Lift Sensor
9. Paper Feed Clutch
10. Vertical Guide Switch
11. Tray Lift Motor
12. Relay Sensor
13. Paper Height 2 Sensor
14. Paper Height 1 Sensor

### 2.1.3 DRIVE LAYOUT



G567D102.WMF

1. Paper Feed Motor
2. Paper Feed Clutch
3. Paper Feed Roller
4. Separation Roller
5. Pick-up Roller

## TWO-TRAY PAPER FEED UNIT G568

## 1. REPLACEMENT AND ADJUSTMENT <br> 1.1 COVER REPLACEMENT



1. Rear cover $[A](\hat{\xi} \times 2)$

### 1.2 ROLLER REPLACEMENT

### 1.2.1 PAPER FEED, SEPARATION, AND PICK-UP ROLLERS



1. Paper tray
2. Pick-up roller $[A]$ (1 hook)

3. Separation Roller [C] ( $(\sqrt{3}) \times 1)$

### 1.3 PAPER FEED MOTOR AND MAIN BOARD



1. Rear cover (1.1 COVER REPLACEMENT)
2. Paper feed motor $[A](E \mathbb{E} \times 1, \hat{\xi} \times 3)$
3. Main board $[B]\left(\hat{\xi^{3}} \times 2\right)$

### 1.4 TRAY LIFT MOTORS

1. Rear cover (1.1 COVER REPLACEMENT)
2. Tray lift motor $[\mathrm{A}]\left(\mathrm{E}_{\mathrm{l}}^{\mathrm{l}} \times 1, \hat{\mathcal{E}^{2}} \times 2\right.$ )


### 1.5 PAPER FEED CLUTCHES

1. Rear cover ( 1.1 COVER REPLACEMENT)
2. Paper feed clutches $[A](\hat{\xi} \times 1,1$ bracket, 1 bushing)


### 1.6 PAPER FEED UNIT REPLACEMENT



1. Vertical transport cover $[A]$ (1 hook)
2. Paper feed unit $[B]\left(\hat{\xi} \times 2\right.$, 気 $\|^{\|} \times 1$ )

## 2. DETAILED DESCRIPTIONS

### 2.1 OVERVIEW

### 2.1.1 MECHANICAL COMPONENT LAYOUT



1. Upper Pick-up Roller
2. Upper Paper Feed Roller
3. Upper Relay Roller
4. Upper Separation Roller
5. Lower Relay Roller
6. Lower Paper Feed Roller
7. Lower Separation Roller
8. Lower Pick-up Roller
9. Lower Tray
10. Upper Tray

### 2.1.2 ELECTRICAL COMPONENT LAYOUT



1. Paper Size Switch 1
2. Paper Size Switch 2
3. Paper Size Switch 3
4. Paper Size Switch 4
5. Main Board
6. Upper Paper Height 1 Sensor
7. Paper Feed Motor
8. Upper Paper Height 2 Sensor
9. Upper Lift Sensor
10. Upper Paper Feed Clutch
11. Upper Paper End Sensor
12. Upper Tray Lift Motor
13. Lower Paper Feed Clutch
14. Vertical Guide Switch
15. Lower Lift Sensor
16. Lower Tray Lift Motor
17. Lower Paper End Sensor
18. Lower Relay Sensor
19. Lower Paper Height 2 Sensor
20. Lower Paper Height 1 Sensor
21. Upper Relay Sensor
22. Paper Size Switch 4
23. Paper Size Switch 2
24. Paper Size Switch 3
25. Paper Size Switch 1

OVERVIEW

### 2.1.3 DRIVE LAYOUT



1. Tray Motor
2. Upper Paper Feed Clutch
3. Lower Paper Feed Clutch
4. Lower Relay Roller
5. Lower Separation Roller
6. Lower Paper Feed Roller
7. Lower Pick-up Roller
8. Upper Separation Roller
9. Upper Relay Roller
10. Upper Paper Feed Roller
11. Upper Pick-up Roller

## LARGE CAPACITY TRAY G569

## 1. REPLACEMENT AND ADJUSTMENT

### 1.1 DETACHING THE TRAY FROM THE MAINFRAME

1. To draw the tray out, press the stopper $[A]$ on the guide rail.
2. To install the tray, set the tray on the guide rails, keep the tray level, and push the tray in.


### 1.2 REAR FENCE HP SENSOR

1. Pull out the large capacity tray.
2. Left tray rear side fence $[A]\left(\hat{\mathcal{E}^{2}} \times 2\right)$
3. Rear fence bracket $[B]\left(\begin{array}{l}\text { 舟 }\end{array} \times 1\right)$
4. Connector of the rear fence HP sensor [C]
5. Rear fence HP sensor [D] (臽 $\times 1$ )


### 1.3 CHANGING THE TRAY PAPER SIZE



1. Screws $[A][B]$
2. Change the position of the side fences.
3. Change the position of the rear fence HP sensor ( 1.2 REAR FENCE HP SENSOR).
4. Before securing the right tray side fence, load the paper in the right tray, and adjust the fence.

### 1.4 LEFT TRAY PAPER END SENSOR



1. Pull out the large capacity tray.
2. Left tray side fence $[A](\hat{\xi} \times 2)$
3. Rear fence bracket $[B]\left(\begin{array}{l}\text { ( }\end{array} \mathrm{x} 1\right)$
4. Left tray paper end sensor [C] (玉进 x 1)

### 1.5 TRAY LIFT MOTOR



1. Rear cover $[A]\left(\mathcal{E}^{2} \times 2\right)$


### 1.6 TRAY MOTOR AND STACK TRANSPORT CLUTCH



1. Rear cover (1.5 TRAY LIFT MOTOR)
2. Tray motor $[A]\left(\hat{\xi} \times 6, \xi^{〔} \times 1\right)$
3. Bracket $[B](\hat{\xi} \times 1)$
4. Stack transport clutch [C] (解 x 2, 2 bushings, 1 gear)

### 1.7 PAPER FEED CLUTCH



1. Rear cover ( -1.5 TRAY LIFT MOTOR)
2. Bracket $[\mathrm{A}](\hat{\xi} \times 1)$
3. Bushing
4. Paper feed clutch $[B]$

### 1.8 PAPER FEED UNIT



1. Stack transport clutch (1.6 TRAY MOTOR AND STACK TRANSPORT CLUTCH)
2. Paper feed clutch ( 1.7 REPLACEMENT AND ADJUSTMENT)
3. Paper feed unit cable $[A]$
4. Open the vertical transport guide plate $[\mathrm{B}]$.
5. Paper feed unit [C] ( $\mathcal{E}^{2} \times 2$ )

### 1.9 UPPER LIMIT, RIGHT TRAY PAPER END, AND RELAY SENSORS



1. Paper feed unit ( 1.8 PAPER FEED UNIT)
2. Sensors

- Upper limit [A]
- Relay [B] ( ${ }^{(1)} \times 1,1$ bracket)
- Right tray paper end [C]

NOTE: To remove the upper limit [A] or paper end sensor[C], press the lever [D] and hold it down.

### 1.10 PICK-UP/PAPER FEED/SEPARATION ROLLER



1. Paper tray unit
2. Pick-up roller [A] (1 hook)
3. Separation roller [B] ( (S) $\times 1$ )
4. Feed roller [C] ( (3) $x$ 1)

NOTE: If the rollers are incorrectly installed, the one-way clutch does not work.

## 2. DETAILED SECTION DESCRIPTIONS

### 2.1 OVERVIEW

### 2.1.1 MECHANICAL COMPONENT LAYOUT



1. Paper Height Sensors 5
2. Paper Height Sensors 4
3. Paper Height Sensors 1
4. Pick-up Roller
5. Upper Limit Sensor
6. Paper Feed Roller
7. Relay Sensor
8. Relay Roller
9. Separation Roller
10. Paper Height Sensors 2
11. Paper Height Sensors 3
12. Lower Limit Sensor
13. Left Paper End Sensor

### 2.1.2 ELECTRICAL COMPONENT LAYOUT



1. End Fence Home Position Sensor
2. Left Tray Paper End Sensor
3. Paper Height Sensor 4
4. Paper Height Sensor 5
5. Paper Size Sensor
6. Main Board
7. Side Fence Open/Closed Sensor
8. Tray Sensor
9. Tray Motor
10. Paper Height Sensors 1
11. Upper Limit Sensor
12. Paper Feed Clutch
13. Paper Height Sensor 2
14. Right Tray Paper End Sensor
15. Paper Height Sensor 3
16. Vertical Guide Switch
17. Lower Limit Sensor
18. Tray Lift Motor
19. Relay Sensor
20. Stack Transport Clutch

## PAPER FEED

### 2.2 PAPER FEED



- This product uses an FRR type paper feed mechanism.
- The paper feed unit consists of the pick-up roller [A], paper feed roller [B], separation roller [C], and relay roller.
- There is a torque limiter (ferrite powder type) in the back of the separation roller.


### 2.3 SEPARATION ROLLER AND PICK-UP ROLLER RELEASE



To prevent the paper from being torn when pulling out the paper feed tray, the separation and pickup rollers are set so that they release automatically.
When the paper tray [A] is not inside the machine, the separation roller [B] is away from the paper feed roller [C] and the pick-up roller [D] stays in the upper position.
When the paper tray is set into the machine, it pushes the release lever [E]. This causes the pick-up roller to go down into contact with the top sheet of paper and the separation roller to move up and contact the paper feed roller.

### 2.4 TRAY LIFT



When the paper feed tray is put in the machine, the tray sensor on the back face turns on and the tray lift motor [A] starts. The base plate lift shaft $[B]$ is coupled to the lift motor at shaft [C], so the base plate of the tray is lifted. After a short while, the top of the paper stack contacts the pick-up roller and lifts it up.

When this occurs, the actuator enters the upper limit sensor, the sensor turns off and the lift motor stops. When paper in the tray is used up, the pick-up roller is gradually lowered, and the actuator leaves the upper limit sensor (turning the sensor on). When this happens, the lift motor begins turning again. The tray will then be lifted until the actuator enters the upper limit sensor (turning the sensor off again).
When the tray is removed from the printer, the coupling between the lift motor and base plate lift shaft is broken and the base plate goes into a controlled free fall (using a damper [D] to slow the fall and prevent damage).

### 2.5 NEAR END/END DETECTION

This tray holds two stacks of paper, so the machine needs to monitor the status of both these stacks. There are seven sensors to do this.

In the right tray (paper feed side), three height sensors ([E] in the diagram on the previous page) measure the height of the stack, and an end sensor detects when all the paper is used up. As the amount of paper remaining in the tray decreases, the base plate rises and the actuator activates the paper height sensors. When paper runs out in the right tray, the stack in the left tray is moved across to the right tray.
There are also two height sensors ([F] in the diagram on the previous page) and an end sensor in the left tray (paper storage side) ([G] in the diagram on the previous page). When there is no paper in both trays, paper end is detected.
The machine determines the amount of remaining paper based on the sensor outputs, as shown in the following table.

|  | Amount of paper |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 100\% | 75\% |  | 50\% |  |  |  |  |  |
| Paper Height Sensor 1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | O |
| Paper Height Sensor 2 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ |
| Paper Height Sensor 3 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | - | $\bigcirc$ | - |
| Right Tray Paper End Sensor | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |
| Paper Height Sensor 4 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
| Paper Height Sensor 5 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
| Left Tray Paper End Sensor | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |


|  | Amount of paper |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 25\% |  |  |  |  | Near-end |  | End |
| Paper Height Sensor 1 | $\bigcirc$ | O | O | $\bigcirc$ | O | $\bigcirc$ | $\bigcirc$ | - |
| Paper Height Sensor 2 | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | - | - |
| Paper Height Sensor 3 | - | $\bigcirc$ | - | $\bigcirc$ | - | - | - | - |
| Right Tray Paper End Sensor | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |
| Paper Height Sensor 4 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |
| Paper Height Sensor 5 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - |
| Left Tray Paper End Sensor | $\bigcirc$ | O | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |

Right tray paper end sensor: $\mathrm{O}=$ Low (no paper), $\bigcirc$ = High (paper present)
Other sensors: $\mathrm{O}=$ Low (paper present), = High (no paper)
The following diagram is the sensor layout, as viewed from the front.

| Paper Storage Side | Paper Feed Side |
| :--- | :--- | :--- |
|  Paper End <br> Saper Height <br> Sensor 1 <br> Paper Height <br> Sensor 5  <br> Paper Height <br> Sensor 4 Paper Height <br> Sensor 2 <br> Paper End  <br> Sensor 2  | Paper Height <br> Sensor 3 |

### 2.6 PAPER STACK TRANSPORT MECHANISM



When the paper in the right tray is used up, the tray motor [A] and stack transport clutch [B] turn on. Then the rear fence [C] moves the stack of paper from the left tray to the right tray.

While the stack is being moved, it pushes the side fence aside, and the side fence open/closed sensor [D] detects that the fence is open.
After the stack has been moved across, a spring in the side fence moves the side fence back, and the sensor detects that the fence is closed. Then, the tray motor reverses until end fence home position sensor $[E]$ is deactivated.

### 2.7 RIGHT TRAY PAPER END DETECTION




The paper end sensor $[A]$ detects when copy paper in the right tray runs out.
When there is paper in the tray, the paper pushes up the paper end feeler [B] and causes the actuator to enter the sensor. When paper runs out, the feeler drops and the actuator leaves the sensor, and the machine detects that there is no paper in the tray.
When the tray is being pulled out, the lever [E] lifts the pick-up roller and this also lifts up the feeler.

## TWO-TRAY FINISHER G565

## 1. REPLACEMENT AND ADJUSTMENT

### 1.1 COVERS

### 1.1.1 EXTERNAL COVERS

1. Top cover $[A](\hat{\xi} \times 4)$

NOTE: If the shift tray below is blocking the screw hole, remove the shift tray.
2. Bracket $[B](\hat{\xi} \times 1)$
3. Front door [C]
4. Rear cover [D] (
5. Right cover $[E]\left(\mathcal{F}^{-1} \times 2\right)$


### 1.1.2 INNER COVER

1. Front cover (1.1.1 EXTERNAL COVERS)
2. Inner cover $[A](\hat{\xi} \times 3$, tabs $[B] \times 3)$


### 1.2 POSITIONING ROLLER

1. Open the front door.
2. Positioning roller $[\mathrm{A}]($ ( 3$) \times 1$ )
3. Belt $[B]$


### 1.3 TRAY 1 EXIT SENSOR

1. Top cover (1.1.1 EXTERNAL COVERS)
2. Open transport door $[\mathrm{A}]$

3. Tray 1 exit sensor [C]


## 1．4 ENTRANCE SENSOR／STAPLER TRAY ENTRANCE SENSOR

1．Entrance sensor bracket $[A]\left(\hat{E}^{2} \times 1, ~ 玉 \mathbb{E} \times 1\right)$
2．Entrance sensor $[B]\left(\hat{\xi}^{2} \times 1\right)$
3．Stapler tray entrance sensor bracket $[C](\hat{\beta} x$ 1，気异 $\times 1$ ）
4．Stapler tray entrance sensor［D］


## 1．5 STAPLER TRAY



1．External covers，front door，inner cover（1．1．1 EXTERNAL COVERS，1．1．2 INNER COVER）
2．Two clamps［A］
3．Harnesses［B］（ $\xi^{\| l}$ l $\times 8$ ）
4．Stapler tray［C］（
NOTE：At the front of the finisher，pull the stapler tray toward you and lift it out．

### 1.6 UPPER STACK HEIGHT SENSORS/TRAY 1 UPPER LIMIT SWITCH



1. External covers (1.1.1 EXTERNAL COVERS)
2. Place one hand under tray 2 (the lower tray), press in on the gear [A] to release the tray, and then support it with your hand as it descends.
3. Place one hand under tray 1 (the upper tray), press in on the gear [B] to release the tray, and then support it with your hand as it descends.
4. Tray 1 back fence [C] ( $\mathcal{E}^{3} \times 4$ )

5. Plastic bracket [E] (会 $\times 1$ )
6. Stack height sensors $[\mathrm{F}]$
7. Metal bracket [G] ( $\mathcal{E}^{2} \times 1$ )
8. Upper limit switch [H]

### 1.7 EXIT GUIDE PLATE MOTOR

1. Tray 1 back fence ( 1.6 UPPER STACK HEIGHT SENSORS/TRAY 1 UPPER LIMIT SWITCH)
2. Exit guide plate motor $[A]\left(\hat{\xi^{2}} \times 2\right.$, 気 $\|^{l}$ $\mathrm{x} 1)$
NOTE: Disengage the shaft of the exit guide plate motor from the ring.

### 1.8 LIFT MOTORS

1. Top cover and rear cover (1.1.1

EXTERNAL COVERS)
2. Tray 1 back fence $[A]$ 1.6 UPPER STACK HEIGHT SENSORS/TRAY 1 UPPER LIMIT SWITCH)
3. Sensor stay $[B]\left(\begin{array}{l}\text { 舟 } \times 4)\end{array}\right.$


5. Tray 1 lift motor [D] ( ${ }^{(1)} \times 2$, drive belt)
6. Tray 2 lift motor $[E]$ ( $\hat{\xi}^{(1)} \times 2$, drive belt)


### 1.9 LOWER EXIT SENSOR

1. Front door, external and internal covers. (1.1 COVERS)
2. Exit guide plate motor ( 1.7 EXIT GUIDE PLATE MOTOR)
3. Guide plate $[A]$ ( $(3) \times 1)$

NOTE: Pull the shaft toward you through the round hole.

4. Guide plate exit assembly $[B]\left(⿷_{\mathbb{\#}} \times 1\right.$, (3) $\times 1$ )

5. Anti-static brush $[C]\left(\hat{\xi}^{2} \times 2\right)$
6. Bracket guide exit [D] ( $\left.\mathcal{E}^{2} \times 2\right)$
7. Lower exit sensor $[E](\hat{\xi} \times 1$, 気 $ل$ l $\times 1$ )


### 1.10 LOWER STACK HEIGHT SENSORS

1. Stapler tray ( 1.5 STAPLER TRAY)
2. Sensor bracket $[A](\hat{8} \times 1$, 気 $\mathrm{Cl} \times 2)$
3. Bracket $[B](\hat{\xi} \times 1)$
4. Feeler [C]
5. Lower stack height sensors [D]
[B]

[C]


### 1.11 TRAY 2 SHUNT POSITION SENSOR

1. Stapler tray ( -1.5 STAPLER TRAY)
2. Sensor bracket $[A](\hat{Z} \times 1$, 気 $\mathrm{Cl} \times 1$ )
3. Tray 2 shunt position sensor $[B]\left(\mathcal{F}^{2} x\right.$ 1)


### 1.12 STAPLER UNIT

1. Open the front door

NOTE: Hold the stapler holder [B] with one hand as you remove the stapler. Do not twist or rotate the stapler bracket as you remove it.


### 1.13 STAPLER ROTATION HP SENSOR

1. Stapler unit ( 1.12 STAPLER UNIT)
2. Carefully rotate the stapler holder $[A]$.
3. Stapler cover $[B](\hat{E} \times 1)$
4. Sensor bracket [C] ( $\hat{\xi} \times 1$, 気 $\mathrm{El} \times 1$ )
5. Stapler rotation HP sensor [D]


### 1.14 TRAY 1 INTERIOR

### 1.14.1 TRAY 1 COVERS

1. Tray $1[A]\left(\hat{\xi}^{3} \times 1\right)$
2. Rear tray cover $[B](\mathbb{E} \times 1)$
3. Front tray cover [C] (
4. Bottom tray cover [D] ( $\hat{\xi} \times 2$ )

5. Bottom bracket [E] (


## 1．14．2 TRAY SHIFT SENSORS AND TRAY RELEASE SENSOR

1．Tray 1 covers（1．14．1 TRAY 1 COVERS）
2．Gear disk $[A](\mathbb{K}) \times 1)$
3．Tray shift sensors $[B]$（匛 $\times 1$ each）．
4．Tray release sensor［C］（ $⿷_{\text {亚 }} \times 1$ ）


## 1．14．3 TRAY 1 SHIFT MOTOR

1．Tray 1 covers（1．14．1 TRAY 1 COVERS）
2．Motor bracket $[A]\left(\mathcal{S}^{3} \times 3\right.$ ，気 $\left.\mathrm{E} \times 1\right)$
3．Tray 1 shift motor $[B]\left(\hat{\xi}^{3} \times 3\right.$ ，belt $\left.\times 1\right)$

［B］

## 1．14．4 BACK FENCE LOCK CLUTCH

1．Tray 1 covers 1．14．1 TRAY 1 COVERS）
 1）


### 1.15 FINISHER MAIN BOARD

1. Rear cover (1.1.1 EXTERNAL COVERS)



### 1.16 PUNCH HOLE POSITION ADJUSTMENT

To adjust the position of the punch holes in the paper feed direction, use the appropriate SP mode.
To adjust the horizontal position of the holes, use the spacers provided with the punch unit.

1. Rear cover (1.1.1

EXTERNAL COVERS)
2. Punch unit $[A](\hat{\xi} \times 3, \underline{E} \times 5)$
3. Spacers $[\mathrm{B}]$

The punch position can be adjusted by up to 4 mm using combinations of the 3 spacers provided with the finisher.


## 2. TROUBLESHOOTING

### 2.1 JAM DETECTION

| Mode |  |  | Jam | Content |
| :---: | :---: | :---: | :---: | :---: |
| Shift 1 | Shift 2 | Staple |  |  |
| $\checkmark$ | $\checkmark$ | $\checkmark$ | Entrance sensor: no detection | After the exit sensor in the main machine went off, the entrance sensor did not switch on for at least 2 s . |
| $\checkmark$ | $\checkmark$ | $\checkmark$ | Entrance sensor: no detection | After the entrance sensor switched on, it did not remain on for at least 150 ms . ${ }^{1}$ |
| $\checkmark$ |  |  | Upper exit sensor: no detection | After the entrance sensor switched on, the upper exit sensor did not remain on for at least 59 pulses. ${ }^{2}$ |
| $\checkmark$ |  |  | Upper exit sensor: jam | After the upper exit sensor switched on, it did not switch off within 150 ms . ${ }^{1}$ |
|  | $\checkmark$ |  | Lower exit sensor: no detection | After the entrance sensor switched on, the lower exit sensor did not switch on within 59 pulses. ${ }^{2}$ |
|  | $\checkmark$ |  | Lower exit sensor: jam | After the lower exit sensor switched on, it did not switch off within 150 ms . ${ }^{1}$ |
|  |  | $\checkmark$ | Stapler tray entrance sensor: no detection | After the entrance sensor switched off, the stapler tray entrance sensor did not switch on within 102 pulses. ${ }^{* 2}$ |
|  |  | $\checkmark$ | Stapler tray entrance sensor: jam | After the stapler tray entrance sensor switched on, it did not switch off within 59 pulses. ${ }^{* 1}$ |
|  |  | $\checkmark$ | Lower tray exit sensor: no detection | After the transport motor switched on, the lower tray exit sensor did not switch on within 1260 ms . |

${ }^{*}$ : Timing for A4 L (differs according to paper size).
*2: Counted by entrance motor pulses because timing differs for feed out.

## 3. SERVICE TABLES

### 3.1 DIP SWITCH SETTINGS

The DIP switches should not be set to any combination other than those described in the table below.

| DPS101 |  |  | Mode |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1}$ | $\mathbf{2}$ | $\mathbf{3}$ | $\mathbf{4}$ | Description |  |
| 0 | 0 | 0 | 0 | Default. |  |
| 1 | 1 | 1 | 0 | Free run. | No paper. |
| 0 | 0 | 0 | 1 | Transportation | See the note below. |

NOTE: The following procedure repositions the shift trays to the shipping position.

1) Make sure that the main switch is turned off.
2) Turn on DIP SW101-4 on the main board.
3) Turn on the main switch.
4) After the finisher completes the initialization, turn off DIP SW101-4.

Finisher automatically repositions the shift trays to the shipping position.

### 3.2 TEST POINTS

| No. | Label | Monitored Signal |
| :---: | :---: | :--- |
| TP101 | GND | Ground |
| TP102 | 5 V | 5 V |
| TP103 | RXD | Received command data |
| TP104 | TXD | Transmitted command data |

### 3.3 FUSES

| No. |  | Function |
| :---: | :--- | :--- |
| FU101 | Protects 24 V. |  |

## 4. DETAILED DESCRIPTIONS

### 4.1 GENERAL LAYOUT



1. Upper junction gate
2. Punch unit (option)
3. Stapler junction gate
4. Pre-stack tray
5. Stapler
6. Stapler tray
7. Tray 2
8. Tray 1

Tray junction gate: Directs paper either to the upper or lower exit. In staple mode, the stack always goes out to the lower exit.

Stapler junction gate: Directs paper either to the lower exit or to the stapler tray.
Pre-stack tray: When stapling multiple prints (A4 LEF, LT LEF, B5 LEF only) in the staple mode, the first sheet of the second print waits here for the next sheet to feed while the previous stack is stapled. After the second print is fed, the first and second sheets are fed together to the pre-stack tray. This delay allows enough time for the previous stack to be stapled without interrupting paper feed.

Shift trays: Tray 1 (upper) and tray 2 (lower) shift side to side in the sort mode, and raise and lower to receive ejected prints.

Stapler tray jogger: Employs positioning rollers and jogger fences to align stacks for stapling.
Punch unit. Punches holes in stacked prints.

### 4.2 DRIVE LAYOUT



1. Tray 1 lift motor
2. Entrance roller
3. Tray 2 lift motor
4. Upper exit roller
5. Tray 1 shift motor
6. Exit guide plate motor
7. Lower exit roller
8. Tray 2 shift motor
9. Exit motor
10. Lower transport motor
11. Pre-stack motor
12. Upper transport motor
13. Punch motor
14. Entrance motor
15. Stack feed-out motor
16. Jogger motor
17. Stapler motor
18. Stapler rotation motor

### 4.3 JUNCTION GATES

The two junction gates can direct paper to three destinations.
In sort/stack mode for tray 1, the tray junction solenoid [A] is on, and the prints go to the upper exit (tray 1 is at the upper exit for sort/stack mode).

In sort/stack mode for tray 2, both the tray junction gate solenoid [A] and stapler junction gate solenoid [B] are off, and prints go to the lower exit.


In staple mode, the tray junction solenoid [A] is off and the stapler junction gate solenoid $[B]$ is on, and prints go to the stapler tray.


### 4.4 TRAY SHIFTING

### 4.4.1 TRAY SHIFT MECHANISMS



Tray 1 (Upper Tray)
In sort/stack mode, tray $1[A]$ moves from side to side to separate the printed sets. The tray 1 shift motor [B], inside the shift tray, controls the horizontal position of tray 1 through the timing belt [C] and gear disk [D].

After one print set is delivered to tray 1, the shift motor turns on, driving the gear disk and the arm [E], and the tray drive unit moves to one side.

Two shift sensors [F] detect when to stop this side-to-side movement. There is a cut-out in the gear disk. The shift tray moves in one direction until one of the shift sensors detects the cut-out. Then the shift tray stops.
The next set of prints is then delivered, and the gear disk is turned in the opposite direction until the other shift sensor is activated.

## Tray 2 (Lower Tray)



In sort/stack mode, tray $2[A]$ moves from side to side to separate the sets of prints. The shift mechanism for tray 2 is similar to that used for tray 1 . However, when the tray 2 shift motor $[B]$ turns on, the arm [D] moves the entire end fence [C] from side to side (not just the tray).
After the gear disk has turned 180 degrees, the cut-out in the gear disk enters the tray half-turn sensor [E], and the motor stops. When the next set of prints is delivered, the motor turns on again, and moves the tray back to its previous position.

### 4.5 TRAY UP/DOWN MECHANISMS

### 4.5.1 TRAY 1



## Introduction

The tray 1 lift motor $[A]$ controls the vertical position of tray $1[B]$ through gears and timing belts [C].

## Normal and sort/stack modes

When the main switch is turned on, the tray is initialized at the upper position. To do this, the tray is moved up until upper stack height sensor 1 [D] is de-actuated.
During printing, if upper stack height sensor 2 [ $E]$ is actuated, the tray 1 lift motor lowers the tray for a specified time.

When the tray lowers during printing, the actuator [F] will pass through the tray 1 overflow 1 sensor [G]. When the actuator drops below the sensor (to deactivate the sensor), the machine detects that the paper stack height has exceeded the overflow limit.

The upper limit switch for tray $1[\mathrm{H}]$ prevents the drive gear from being damaged if the upper stack height sensor 1 should fail. If the tray is raised to the tray positioning roller [I], the switch will automatically cut the power to the tray 1 lift motor.

## Staple Mode



In staple mode, stapled stacks can be delivered to either tray, but they can only go to the lower exit. So, if tray 1 is selected, tray $1[A]$ moves down to the lower paper exit.
Tray 1 lowers until the actuator [B] enters the tray 1 lower limit sensor [C]. Tray 1 then lifts up until lower stack height sensor 1 [D] is activated.
When tray 1 is moved down to the lower exit, tray 2 must be moved down out of the way. So, tray $2[E]$ is also lowered until the tray 2 shunt position sensor [F] detects tray 2 (or the top of the paper stack in tray 2).

The method of paper height detection is the same as for the upper exit area.
When the tray lowers during printing, the actuator will enter the tray 1 overflow 2 sensor [G]. When this happens, the machine detects that the paper stack height has exceeded the overflow limit.

## Tray 1 release mechanism

When tray 1 is selected for staple mode, tray 1 must be moved down to the lower paper exit. However, to move past the sensors at the lower exit, the tray must be moved away from the finisher.

To do this, the tray 1 shift motor turns until the cut-out in the gear disk enters the tray release sensor [A]. At this time, the arm [B] has reached position [C], and is pushing against the plate [D], in towards the finisher. However, the plate is fixed, so the tray moves out away from the finisher.

Then, the tray 1 shift motor stops, then the tray 1 lift motor lowers tray 1.

When the tray 1 lower limit sensor is activated (as described on the previous page), the tray has moved past the sensors at the lower exit. The tray 1 shift motor turns on again until the gear disk activates the tray shift sensor [E]. This moves the tray back against the finisher.

Next, tray 1 lifts until the finisher detects that the tray is at the correct height.

When tray 1 is at the lower exit, the tray lock solenoid [F] is on, and the lever [G] locks the tray. This prevents the user from moving the tray out of position (the first tray has some play when it is at the lower position).
Before tray 1 goes back to the upper exit area, the tray lock solenoid [F] turns off to unlock the tray. In addition, the back fence lock clutch $[\mathrm{H}]$ turns on to hold the back fence [I]. This prevents the springs inside the back fence from suddenly contracting (these springs normally keep the tray steady during side-to-side shift).

Then, tray 1 is released and it moves up to the upper exit area.


### 4.5.2 TRAY 2



The tray 2 lift motor [A] controls the vertical position of tray $2[B]$ through gears and timing belts [C].

The paper height detection is the same as for tray 1.
When the tray lowers during printing, the tray is judged to be overflowing when the tray 2 overflow sensor 1 [D] is off and the tray 2 overflow sensor-2 [F] is on (see 'Normal Mode' in the above diagram).

In the multi-tray staple mode (selected by the service technician), the machine detects that the paper stack height has exceeded the overflow limit when the actuator [E] enters the tray 2 overflow 1 sensor [D].
The lower limit sensor [G] for tray 2 detects when tray 2 is at its lowest limit and stops the tray 2 lift motor.
The function of the tray 2 upper limit switch $[\mathrm{H}]$ is the same as for tray 1 .

### 4.5.3 PRE-STACK MECHANISM



NOTE: This feature is available only when using A4 L, LT L, and B5 L.
During stapling, the main machine must wait. This mechanism reduces the wait by holding the first two sheets of a job while the previous job is still being stapled. It only works during the second and subsequent sets of a multi-set print job.
The pre-stack junction gate solenoid [A] switches on after the first sheet activates the entrance sensor. This directs the sheet to the pre-stack tray [B].
The pre-stack feed roller [C] stops for a specified time after the trailing edge of the paper has passed through the entrance sensor and stops the paper from leaving the pre-stack tray.

At the same time, the pre-stack junction gate solenoid switches off, and the second sheet is sent to the paper guide [D]. The pre-stack feed roller (controlled by the pre-stack motor) starts to rotate again for a specified time after the trailing edge of the second page has been passed through the entrance sensor, and then both sheets are sent to the stapler tray together.

### 4.6 JOGGER UNIT PAPER POSITIONING MECHANISM



In staple mode, each sheet of print paper is vertically and horizontally aligned when it arrives in the stapler tray.

## Vertical Paper Alignment

After the trailing edge of the paper passes the stapler tray entrance sensor [A], the positioning roller solenoid $[B]$ is energized for a specified time to push the positioning roller [C] into contact with the paper.
The positioning roller rotates to push the paper back and align the trailing edge of the paper against the stack stopper [D].

## Horizontal Paper Alignment

When the start key is pressed, the jogger motor [E] turns on and the jogger fences [F] move to the waiting position, which is 8 mm wider on both sides than the selected paper.

When the trailing edge of the paper passes the stapler tray entrance sensor, the jogger motor turns on to move the jogger fences 5 mm towards the paper. After a short time, the jogger motor turns on again for the horizontal paper alignment then returns to the waiting position.

### 4.7 STAPLER MECHANISM

### 4.7.1 STAPLER MOVEMENT



The stapler can be moved from side to side or rotated according to the requirements of the selected stapling mode.

## Stapler Rotation

After the start key is pressed, the stapler rotation motor [A] rotates the staple unit $[B]$ until the stapler rotation HP sensor [C] is activated. Then, the stapler moves from front to rear of the finisher.
When oblique stapling at one position has been selected, after the stapler moves to the stapling position, the stapler rotation motor rotates the stapler 45 degrees (clockwise) at the stapling position before the stapler fires.

## Side-to-Side Movement

The stapler motor [D] moves the stapler from side to side. After the start key is pressed, the stapler moves from its home position to the stapling position.
The amount of movement required to reach the stapling position is determined by the size of the selected paper. If the two-staple mode is selected, the stapler moves to the front stapling position first, and then moves to the rear stapling position. However, for the next print set, it staples in the reverse order.
After the stapling job is finished, the stapler returns to its home position, determined by the stapler HP sensor [E].

### 4.7.2 STAPLER



The staple hammer is driven by the stapler hammer motor [A] inside the stapler.
As soon as the paper stack is aligned, the staple hammer motor starts. When stapling is finished, the staple hammer HP sensor [B] is turned on, and the staple hammer motor then stops.
The staple end sensor [C] detects the staple end condition and whether the staple cartridge is installed or not. If a stapler cassette is not installed, or after the stapler cassette runs out of staples, a message is displayed in the operation panel. If this condition is detected during a print job, the indicator will appear, but the print job will not stop.
The staple position sensor [D] detects if there is a staple sheet at the stapling position. After a new staple cartridge is installed, the staple hammer motor turns on to transfer the staple sheet until the staple position sensor is activated by the staple sheet.

If a staple jam occurs and overloads the motor, this causes a staple jam message to appear on the operation panel.

### 4.7.3 FEED OUT AND TRANSPORT



When stapling starts, the exit guide plate motor [A] switches on and opens the exit guide plate $[B]$, so that the stapled stack can exit to the tray. The exit guide plate sensor [C] detects when to switch off the exit guide plate motor.

After the prints have been stapled, the stack feed-out motor [D] starts. The pawl [E] on the stack feed out belt [F] lifts the stapled set and feeds it to the tray [G].
The exit guide plate closes at a specified interval after the stapled prints have started to feed out. Then the exit roller takes over the stack feed-out. The stack feed-out motor turns off when the pawl actuates the stack feed-out belt home position sensor [H].
When tray 1 is passing this area on its way back up to the upper exit, the exit guide safety switch [I] cuts power to the tray lift motor if the guide is opened too far. This prevents damage to the user's fingers if they are inside the lower exit when the tray is moving up.

### 4.8 PUNCH UNIT (OPTIONAL)

The punch unit punches holes in printed sheets, one by one. The punch unit is provided with a new punch mechanism to improve the accuracy of punching.


### 4.8.1 PUNCH DRIVE MECHANISM

The punch drive mechanism is driven by the punch motor [A]. Each sheet is positioned and punched by pressure from above. A certain time after the trailing edge of the paper passes through the finisher entrance sensor $[B]$, the punch motor turns on and the paper stops. Then the punch clutch [C] turns on to make the punch holes.
The home position is detected by the punch HP sensor [D]. When the cut-out in the punch shaft disk [E] enters the punch HP sensor, the punch clutch turns off.
When the finisher has received the command that changes the number of punch holes, the punch hole motor [F] turns on until the disk changes the status of the punch hole switch [G] (until it switches on or off). This indicates that the cover [H] and the punch cam [I] have moved to one side or the other to change the number of holes.

### 4.8.2 PUNCH WASTE COLLECTION



Waste punchouts are collected in the punch waste hopper [A] below the punch unit inside the finisher.

When the top of the punchout waste in the hopper reaches and actuates the hopper sensor [B], a message will be displayed on the operation panel after the current job is completed.
This sensor also detects whether the punchout waste hopper is installed. When the waste hopper is taken out, the arm [C] moves down and this will actuate the sensor and display a message in the operation panel. This message is the same as for the hopper full condition.

## FOUR-BIN MAILBOX <br> G566

## 1. REPLACEMENT AND ADJUSTMENT

### 1.1 EXTERIOR COVER REMOVAL



1. Trays [A] NOTE: To remove the trays, grasp the edges and lift.

2. Rear cover [C] (
3. Upper cover [D]

### 1.2 TRAY PAPER/OVERFLOW/VERTICAL TRANSPORT SENSORS



1. Trays
2. Bin cover [A]
3. Tray paper sensor $[\mathrm{B}]\left(\mathrm{E}^{\mathbb{D}} \mathrm{x} 1\right)$

Overflow sensor [C] (E\#ll $\times 1$ )
Vertical transport sensor [D] (匛 $\times 1$ )
4. Remove both the tray paper and overflow sensors as shown in the illustration. For the vertical transport sensor, lift up the locking pawls (slightly). Remove the sensor by rotating the bottom part upward.

### 1.3 MAIN MOTOR REPLACEMENT



1. Rear cover (1.1 EXTERIOR COVER REMOVAL)
2. Control board $[A]$ ( $\hat{\xi}^{2} \times 2$, all connectors)
3. Timing belt $[B]$
4. Main motor bracket [C]
5. Main motor $[\mathrm{D}]\left(\begin{array}{l}\mathrm{S}\end{array} \mathrm{x} 2\right)$

## 2. DETAILED DESCRIPTIONS

### 2.1 COMPONENT LAYOUT

### 2.1.1 MECHANICAL COMPONENT LAYOUT



1. 4th Tray
2. Turn Gates
3. 3rd Tray
4. Vertical Transport Roller
5. 2nd Tray
6. Tray Feed Out Roller
7. 1st Tray

### 2.1.2 DRIVE LAYOUT



1. Timing Belt
2. Main Motor

### 2.2 ELECTRICAL COMPONENT DESCRIPTIONS



1. Main control PCB
2. Main motor
3. Junction gate solenoid 3
4. Door sensor
5. Tray 4 paper overflow sensor
6. Tray 4 paper sensor
7. Tray 3 paper overflow sensor
8. Upper vertical transport sensor
9. Tray 2 paper overflow sensor
10. Lower vertical transport sensor
11. Tray 1 paper overflow sensor
12. Tray 1 paper sensor
13. Tray 2 paper sensor
14.Tray 3 paper sensor
14. Junction gate solenoid 4
15. Junction gate solenoid 1
16. Junction gate solenoid 2

### 2.3 BASIC OPERATION

The mailbox is connected to the main unit with a 10-pin connector.

When the leading edge of the paper activates the exit sensor in the printer's main body, the mailbox main motor turns on and the mailbox rollers begin to turn. The paper is then fed out to the tray that has been selected.

Solenoids [B] open and close junction gates as shown, to direct the paper to the selected tray. When the top tray (tray 4) [A] is selected, none of the solenoids are activated. When the last sheet is fed out and turns off the vertical transport sensor, both the mailbox motor and the junction gate solenoid of the selected bin turn off.

The mailbox normally feeds paper at the same speed as the printer: 62.5 to $185 \mathrm{~mm} / \mathrm{s}$. (The mailbox is capable of feeding paper at 62 to $260 \mathrm{~mm} / \mathrm{s}$.)

Junction gate solenoid 4 [C] controls the

junction gate [D] of the printer to direct paper either into the mailbox or to the standard output tray.


### 2.4 PAPER OVERFLOW DETECTION

Each tray has an overflow sensor. They monitor the trays so that the amount of paper on the tray does not exceed the tray capacity. If a printing job is done that exceeds the capacity of one or more of the trays, the main unit recognizes the overload, displays an error message and stops the printing job. However, if the excess paper is removed from the overloaded tray, the printing job will continue.

## SPECIFICATIONS

## SPECIFICATIONS

## 1. GENERAL SPECIFICATIONS

| Configuration: | Desktop |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Print Process: | Dry electrostatic transfer system |  |  |  |
| Printer Languages: | PCL5c <br> Adobe PostScript 3 <br> RPCS (Refined Printing Command Stream) |  |  |  |
| Resolution: | ```PCL5c: 600 x 600 dpi, 300 x 300 dpi Adobe PostScript 3: 1200 x 1200 dpi, 1200 x 600 dpi, 600 x 600 dpi RPCS: 1200 x 1200 dpi, 1200 x 600 dpi, 600 x 600 dpi``` |  |  |  |
| Gradation <br> Printing speed: | $1 \mathrm{bit/pixel}$ |  |  |  |
|  |  |  |  |  |
|  |  | Resolution | Plain paper | Thick/OHP |
|  | Monochrome | $600 \times 600 \mathrm{dpi}$ | 38 ppm | 10 ppm |
|  |  | $1200 \times 600 \mathrm{dpi}$ | 38 ppm | 10 ppm |
|  |  | $1200 \times 1200 \mathrm{dpi}$ | 28 ppm | 10 ppm |
|  | Color | $600 \times 600 \mathrm{dpi}$ | 28 ppm | 10 ppm |
|  |  | $1200 \times 600 \mathrm{dpi}$ | 28 ppm | 10 ppm |
|  |  | $1200 \times 1200 \mathrm{dpi}$ | 14 ppm | 10 ppm |
| Resident Fonts: | PCL5c: <br> 35 Intelli f <br> 10 TrueTyp <br> 1 bitmap <br> Adobe Post <br> 136 fonts | ts fonts nt cript 3: 4 Type 2 fonts, | 2 Type 14 f |  |
| Host Interfaces: | Bi-directiona Ethernet (100 IEEE1394: | IEEE1284 para Base-TX/10 Ba tional | x 1: Standar <br> -T): Standard |  |
| Network Protocols: | TCP/IP, IP | PX, NetBEUI, | leTalk |  |
| First Print Speed: | Color: 9 sec Monochrom | ds or less (from 7 seconds or le | ay 1) <br> (from tray 1) |  |
| Warm-up Time | Less than 1 | seconds (at 23 | /50\%) |  |
| Print Paper Capacity: | Standard tray By-pass tray Optional pap Optional LC | 500 sheets $\times 2$ <br> 100 sheets <br> r feed tray: 500 <br> 2000 sheets | eets $\times 1,500$ | heets $\times 2$, |

10 TrueType fonts
dobe PostScript 3:
136 fonts (24 Type 2 fonts, 112 Type 14 fonts)
Host Interfaces: Bi-directional IEEE1284 parallel x 1: Standard
Ethernet (100 Base-TX/10 Base-T): Standard IEEE1394: Optional
Network Protocols: TCP/IP, IPX/SPX, NetBEUI, AppleTalk
First Print Speed: Color: 9 seconds or less (from tray 1)
Monochrome: 7 seconds or less (from tray 1)
Warm-up Time Less than 120 seconds (at $23^{\circ} \mathrm{C} / 50 \%$ )
Print Paper
Capacity:
Standard tray: 500 sheets x 2
By-pass tray: 100 sheets
Optional LCT: 2000 sheets

## SPECIFICATIONS

Print Paper Size: (Refer to "Supported Paper Sizes".)

|  | Minimum | Maximum |
| :---: | :---: | :---: |
| Tray 1 | $\mathrm{A} 4 / 81 / 2^{\prime \prime} \times 11^{\prime \prime}(\mathrm{LEF})$ |  |
| Tray 2 | A5 $(\mathrm{LEF}) / 81 / 2^{\prime \prime} \times 11^{\prime \prime}$ | $\mathrm{A} 3 / 11 " \times 17 "$ |
| By-pass | $90 \times 148 \mathrm{~mm}$ | $305 \times 458 \mathrm{~mm} / 12^{\prime \prime} \times 18^{\prime \prime}$ |
| Optional Tray | A5 $(\mathrm{LEF}) / 81 / 2^{\prime \prime} \times 11^{\prime \prime}$ | $\mathrm{A} 3 / 11^{\prime \prime} \times 17 "$ |
| LCT | $\mathrm{A} 4 / 81 / 2^{\prime \prime} \times 11^{\prime \prime}(\mathrm{LEF})$ |  |

Printing Paper
Weight:

Output Paper
Capacity:
Memory:
Power Source:

Standard tray:
Optional paper tray:
By-pass tray:

60 to $105 \mathrm{~g} / \mathrm{m}^{2}$ (16 to 28 lb.$\left.\right)$
60 to $105 \mathrm{~g} / \mathrm{m}^{2}(16$ to 28 lb.$)$
60 to $163 \mathrm{~g} / \mathrm{m}^{2}$ (16 to 43 lb.$\left.\right)$

Standard exit tray: 500 sheets (face down)
External exit tray: 100 sheets (face up)
Standard 64 MB, up to 384 MB with optional DIMM
120 V, 60 Hz: More than 10 A (for North America)
220 V - $240 \mathrm{~V}, 50 / 60 \mathrm{~Hz}$ : More than 6.0 A (for Europe)
Power Consumption:

|  | $\mathbf{1 2 0 V}$ | $\mathbf{2 3 0 V}$ |
| :---: | :---: | :---: |
| Maximum | 1200 W or less | 1300 W or less |
| Energy Saver | 45 W or less | 45 W or less |

Noise Emission:
(Sound Power Level)

|  | Mainframe Only | Full System |
| :---: | :---: | :---: |
| Printing | 68 dB or less | 72 dB or less |
| Stand-by | 42 dB or less |  |
| Low power mode | 40 dB or less |  |

NOTE: The above measurements were made in accordance with Ricoh standard methodology.

Dimensions (W x D x H): $575 \times 678 \times 715 \mathrm{~mm}$ (22.6" x $\left.26.7^{\prime \prime} \times 28.2^{\prime \prime}\right)$
Weight:
Less than $82 \mathrm{~kg}(181 \mathrm{lb}$.

### 1.1 SUPPORTED PAPER SIZES

### 1.1.1 PAPER FEED

| Paper | Size (W x L) | North America |  |  | Europe/Asia |  |  | By-pass Tray |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Tray 1 | $\begin{aligned} & \text { Tray } \\ & 2 / 3 / 4 \end{aligned}$ | LCT | Tray 1 | $\begin{aligned} & \text { Tray } \\ & \text { 2/3/4 } \end{aligned}$ | LCT |  |
| A3 W | $1 \mathbf{c}^{\prime \prime} \times 18$ " | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| A3 SEF | $297 \times 420 \mathrm{~mm}$ | N | Y | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| A4 SEF | $210 \times 297 \mathrm{~mm}$ | N | $Y^{\#} / Y^{*}$ | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| A4 LEF | $297 \times 210 \mathrm{~mm}$ | $Y^{*}$ | Y | $\mathrm{Y}^{*}$ | Y | Y | Y | $\mathrm{Y}^{\#}$ |
| A5 SEF | $148 \times 210 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| A5 LEF | $210 \times 148 \mathrm{~mm}$ | N | Y | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| A6 SEF | $105 \times 148 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| B4 SEF | $257 \times 364 \mathrm{~mm}$ | N | $\mathrm{Y}^{\#} / \mathrm{Y}^{*}$ | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| B5 SEF | $182 \times 257 \mathrm{~mm}$ | N | $\mathrm{Y}^{\#} / \mathrm{Y}^{*}$ | N | N | $Y^{\#} / Y^{*}$ | N | $\mathrm{Y}^{\#}$ |
| B5 LEF | $257 \times 182 \mathrm{~mm}$ | N | Y | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| B6 SEF | $128 \times 182 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| Ledger | $11 \times 17$ " | N | Y | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| Letter SEF | $8.5 \times 1{ }^{\prime \prime}$ | N | Y | N | N | $Y^{\#} / Y^{*}$ | N | $\mathrm{Y}^{\#}$ |
| Letter LEF | $11 \times 8.5$ " | Y | Y | Y | $Y^{*}$ | Y | $Y^{*}$ | $\mathrm{Y}^{\#}$ |
| Legal SEF | $8.5 \times 14^{\prime \prime}$ | N | Y | N | N | $Y^{\#} / Y^{*}$ | N | $\mathrm{Y}^{\#}$ |
| Half Letter SEF | $5.5 \times 8.5$ " | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| Executive SEF | $7.25 \times 10.5$ " | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| Executive LEF | $10.5 \times 7.25$ " | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| F SEF | $8 \times 13$ " | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| Foolscap SEF | $8.5 \times 13^{\prime \prime}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| Folio SEF | $8.25 \times 13^{\prime \prime}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| 8K | $267 \times 390 \mathrm{~mm}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| 16K SEF | $195 \times 267 \mathrm{~mm}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| 16K LEF | $267 \times 195 \mathrm{~mm}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| Custom | Minimum: $90 \times 148 \mathrm{~mm}$ Maximum: $305 \times 458 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| Com10 Env. | $4.125 \times 9.5$ " | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| Monarch Env. | $3.875 \times 7.5$ " | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| C6 Env. | $114 \times 162 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| C5 Env. | $162 \times 229 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| DL Env. | $110 \times 220 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |

Remarks:

| Y | Supported: the sensor detects the paper size. |
| :---: | :--- |
| $\mathrm{Y}^{\#}$ | Supported: the user specifies the paper size. |
| $\mathrm{Y}^{*}$ | Supported: depends on a technician adjustment |
| N | Not supported |

## SPECIFICATIONS

### 1.1.2 PAPER EXIT

| Paper | Size (W x L) | Internal Tray (Face Down) | $\begin{gathered} \hline \text { External Tray } \\ \text { (Face Up) } \end{gathered}$ | Finisher | $\begin{gathered} \hline \text { 4-bin } \\ \text { Mailbox } \end{gathered}$ | Duplex |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A3 W | 1 " $^{\text {x } 18 " ~}$ | N | Y | N | N | N |
| A3 SEF | $297 \times 420 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| A4 SEF | $210 \times 297 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| A4 LEF | $297 \times 210 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| A5 SEF | $148 \times 210 \mathrm{~mm}$ | Y | Y | N | Y | N |
| A5 LEF | $210 \times 148 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| A6 SEF | $105 \times 148 \mathrm{~mm}$ | Y | Y | N | N | N |
| B4 SEF | $257 \times 364 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| B5 SEF | $182 \times 257 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| B5 LEF | $257 \times 182 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| B6 SEF | $128 \times 182 \mathrm{~mm}$ | Y | Y | N | N | N |
| Ledger | $11 \times 17$ " | Y | Y | Y | Y | Y |
| Letter SEF | $8.5 \times 11^{\prime \prime}$ | Y | Y | Y | Y | Y |
| Letter LEF | $11 \times 8.5$ " | Y | Y | Y | Y | Y |
| Legal SEF | $8.5 \times 14^{\prime \prime}$ | Y | Y | Y | Y | Y |
| Half Letter SEF | $5.5 \times 8.5$ " | Y | Y | N | Y | N |
| Executive SEF | $7.25 \times 10.5$ " | Y | Y | Y | Y | Y |
| Executive LEF | $10.5 \times 7.25$ " | Y | Y | N | N | N |
| F SEF | $8 \times 13^{\prime \prime}$ | Y | Y | Y | Y | Y |
| Foolscap SEF | $8.5 \times 13^{\prime \prime}$ | Y | Y | Y | N | Y |
| Folio SEF | $8.25 \times 13^{\prime \prime}$ | Y | Y | Y | N | Y |
| 8K | $267 \times 390 \mathrm{~mm}$ | Y | Y | Y | N | Y |
| 16K SEF | $195 \times 267 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| 16K LEF | $267 \times 195 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| Custom | Minimum: $90 \times 148 \mathrm{~mm}$ Maximum: $305 \times 458 \mathrm{~mm}$ | Y | Y | N | Y | N |
| Com10 Env. | $4.125 \times 9.5$ " | N | Y | N | N | N |
| Monarch Env. | $3.875 \times 7.5$ " | N | Y | N | N | N |
| C6 Env. | $114 \times 162 \mathrm{~mm}$ | N | Y | N | N | N |
| C5 Env. | $162 \times 229 \mathrm{~mm}$ | N | Y | N | N | N |
| DL Env. | $110 \times 220 \mathrm{~mm}$ | N | Y | N | N | N |

## Remarks:

| Y | Supported |
| :--- | :--- |
| N | Not supported |

## 2. SOFTWARE ACCESSORIES

The printer drivers and utility software are provided on one CD-ROM. An auto-run installer allows you to select which components to install.

### 2.1 PRINTER DRIVERS

| Printer Language | Windows <br> 95/98/ME | Windows NT4.0 | Windows 2000 | Macintosh |
| :---: | :---: | :---: | :---: | :---: |
| PCL 5c | Yes | Yes | Yes | No |
| PS3 | Yes | Yes | Yes | Yes |
| RPCS | Yes | Yes | Yes | No |

NOTE: 1) The printer drivers for Windows NT 4.0 are only for the Intel x86 platform. There is no Windows NT 4.0 printer driver for the PowerPC, Alpha, or MIPS platforms.
2) The PS3 drivers are all genuine AdobePS drivers, except for Windows 2000, which uses Microsoft PS. A PPD file for each operating system is provided with the driver.
3) The PS3 driver for Macintosh supports Mac OS 7.6 or later versions.

### 2.2 UTILITY SOFTWARE

| Software | Description |
| :--- | :--- |
| Agfa Font Manager 2000 <br> (Win95/98, 2000, NT4) | A font management utility with screen fonts for the printer. |
| SmartNetMonitor for Admin <br> (Win95/98, 2000, NT4) | A printer management utility for network administrators. NIB <br> setup utilities are also available. |
| SmartNetMonitor for Client <br> (Win95/98, 2000, NT4) | - A printer management utility for client users. <br> - A utility for peer-to-peer printing over a NetBEUI or TCP/IP <br> network. <br> - A peer to peer print utility over a TCP/IP network. This <br> provides the parallel printing and recovery printing features. |
| $\|$This software provides several convenient functions for printing <br> from Macintosh clients. |  |
| Printer Utility for Mac <br> (Mac) | This utility solves problems with Windows 2000. |
| (EEE1394 Utility <br> (Win2000) | DeskTopBinder V2 Lite itself can be used as personal document <br> management software and can manage both image data <br> (Win95/98, 2000, NT4) <br> (Winder V2 Lite <br> each client's PC. |

## 3. MACHINE CONFIGURATION



| Item | Machine <br> Code | No. | Remarks |
| :--- | :---: | :---: | :--- |
| Main Unit | G060 | A |  |
| Options | G565 | B | Requires the HDD or 128MB DIMM <br> memory, duplex unit and one of the <br> three paper feed options. <br> Finisher and mailbox cannot both be <br> installed. |
| Finisher | G566 | C | Finisher and mailbox cannot both be <br> installed. |
| Four-bin Mailbox | G567 | D | Install any one of these three units. |
| Paper Feed Unit (500 x 1) | G568 | E |  |
| Paper Feed Unit (500 x 2) | G569 | F |  |
| LCT | G5571 | G |  |
| Duplex Unit | G377 |  | Requires the finisher |
| Punch Unit | G579 |  |  |
| Internal Options | G580 |  |  |
| 64MB DIMM Memory | G581 |  |  |
| 128MB DIMM Memory | G311 |  | At least 64 MB of DIMM is required |
| 256MB DIMM Memory | G590 |  |  |
| NVRAM Memory | G308 |  |  |
| IEEE1394 I/F Board |  |  |  |
| HDD Type 1 |  |  |  |


| Item | Machine Code | No. | Remarks |
| :---: | :---: | :---: | :---: |
| Others |  |  |  |
| Maintenance Kit A | G763 |  | Includes CMY PCUs. |
| Maintenance Kit B | G764 |  | Includes CMY development units. |
| Maintenance Kit C | G765 |  | Includes the fusing unit. |
| Maintenance Kit D | G766 |  | Includes K development unit and dust filter. |
| Maintenance Kit E | G767 |  | Includes the used toner bottle. |
| Maintenance Kit F | G773 |  | Includes the K PCU. |
| Maintenance Kit G | G774 |  | Includes the fusing oil supply unit. |
| Maintenance Kit H | TBA |  | Includes the feed roller, pick-up roller, and separation roller. |

NOTE: All the above items are user installable except for the punch unit.

## 4. OPTIONAL EQUIPMENT

### 4.1 500-SHEET TRAY

Paper Size: Maximum: A3/11" x 17" (SEF) Minimum: A5 (LEF)/81/2" x 11"
Paper Weight: $\quad 60$ to $105 \mathrm{~g} / \mathrm{m}^{2}$ (16 to 28 lb .)
Tray Capacity: $\quad 500$ sheets $\left(80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}.\right)$
Paper Feed System: FRR system
Paper Height Detection: 3 steps (100\%, 50\%, Near End)
Power Source:
Power Consumption:
DC $24 \mathrm{~V}, 5 \mathrm{~V}$ (from the main unit)

Dimensions (W x D x H):
Weight
50 W
$540 \times 600 \times 172 \mathrm{~mm}\left(21.3^{\prime \prime} \times 23.7^{\prime \prime} \times 6.8^{\prime \prime}\right)$
$18 \mathrm{~kg}(39.7 \mathrm{lb}$.

### 4.2 1000-SHEET TRAY

| Paper Size: | Maximum: A3/11" $\times 17^{\prime \prime}(\mathrm{SEF})$ <br> Minimum: A5 (LEF) $/ 8^{1 / 2 "} \times 11^{\prime \prime}$ |
| :--- | :--- |
| Paper Weight: | 60 to $105 \mathrm{~g} / \mathrm{m}^{2}(16 \mathrm{to} 28 \mathrm{lb})$. |
| Tray Capacity: | 500 sheets $\times 2\left(80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}.\right)$ |
| Paper Feed System: | FRR system |
| Paper Height Detection: | 3 steps $(100 \%, 50 \%$, Near End $)$ |
| Power Source: | DC $24 \mathrm{~V}, 5 \mathrm{~V}$ (from the main unit) |
| Power Consumption: | 50 W |
| Dimensions (W x D x H): | $540 \times 600 \times 270 \mathrm{~mm}\left(21.3^{\prime \prime} \times 23.7^{\prime \prime} \times 10.7^{\prime \prime}\right)$ |
| Weight | $25 \mathrm{~kg} \mathrm{(55.2lb)}$. |

### 4.3 2000-SHEET LARGE CAPACITY TRAY

Paper Size:
Paper Weight:
Tray Capacity:
Paper Feed System:
Paper Height Detection: 5 steps (100\%, 75\%, 50\%, 25\%, Near End)
Power Source:
Power Consumption:
Dimensions (W x D x H): $540 \times 600 \times 270 \mathrm{~mm}\left(21.3^{\prime \prime} \times 23.7^{\prime \prime} \times 10.7^{\prime \prime}\right)$
Weight

A4/8½" x 11" (LEF)
60 to $105 \mathrm{~g} / \mathrm{m}^{2}$ (16 to 28 lb.$\left.\right)$
2000 sheets ( $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$.)
FRR system

DC $24 \mathrm{~V}, 5 \mathrm{~V}$ (from the main unit)
30 W
$25 \mathrm{~kg}(55.2 \mathrm{lb}$.

### 4.4 TWO-TRAY FINISHER \& PUNCH UNIT

| Print Paper Size: | ```No punch mode: A3/11" x 17" to A5 (LEF)/81/2" x 11" Punch mode: 2 holes: A3/11" x \(17{ }^{\prime \prime}\) to \(A 4 / 8^{1} 2^{\prime \prime} \times 11^{\prime \prime}\) (SEF) A4/81/2" \(\times 11^{\prime \prime}\) to A5 (LEF) 3 holes: A3, B4, 11" x 17" (SEF) A4, B5, 8½" x 11 " (LEF) 4 holes (Europe): A3, B4, 11" x 17" (SEF) A4, B5, \(81 / 22^{\prime \prime} \times 11\) " (LEF) 4 holes (North Europe): A3, B4, 11" x 17" (SEF) A4, B5, \(81 / 22^{\prime \prime} \times 11^{\prime \prime}\) (LEF) Staple mode: A3/11" x 17 " to \(B 5 / 81 / 2{ }^{\prime \prime} \times 11^{\prime \prime}\)``` |
| :---: | :---: |
| Paper Weight: | ```No punch mode: 60 to \(105 \mathrm{~g} / \mathrm{m}^{2}\) (16 to 28 lb .) Punch mode: 60 to \(105 \mathrm{~g} / \mathrm{m}^{2}\) (16 to 28 lb .) Staple mode: 64 to \(90 \mathrm{~g} / \mathrm{m}^{2}\) (17 to 23 lb .) Label/Thick paper/OHP cannot be stapled``` |
| Tray Capacity: | Upper tray: <br> 500 sheets: A4, $81 / 22^{\prime \prime} \times 11$ " , B5, A5 (LEF) <br> 250 sheets: $11^{\prime \prime} \times 17^{\prime \prime}$, A3, $8^{11 / 2 " ~} \times 14^{\prime \prime}$, B4 <br> Lower tray (default mode - stapled output only goes to tray 2): <br> 2000 sheets: A4, $81 / 2^{\prime \prime} \times 11 "($ LEF $)$ <br> 750 sheets: A3, B4, A4, B5, $8^{1 ⁄ 2} 2^{\prime \prime} \times 14^{\prime \prime}, 11^{\prime \prime} \times 17^{\prime \prime}$, $81 / 2^{\prime \prime} \times 11 "(\mathrm{SEF})$ <br> 500 sheets: A5 (LEF) <br> Lower tray (multi-tray staple mode - stapled output can go to either tray): <br> 1500 sheets: A4, $81 / 2^{\prime \prime} \times 11^{\prime \prime}$ (LEF) <br> 750 sheets: A3, B4, A4, B5, $81 / 2^{\prime \prime} \times 14{ }^{\prime \prime}, 11^{\prime \prime} \times 17^{\prime \prime}$, 81/2" x 11" (SEF) <br> 500 sheets: A5 (LEF) |
| Staple capacity: | Single size: <br> 50 sheets: A4, $8^{1 ⁄ 21} \times 11 "$, B5 <br> 30 sheets: A3, B4, $81 / 22^{\prime \prime} \times 14 ", 11^{\prime \prime} \times 17$ " <br> Mixed size: <br> 30 sheets: A 4 (LEF) \& A3, B5 (LEF) \& B4, $81 / 2^{\prime \prime} \times 11^{\prime \prime}($ LEF $) \& 11^{\prime \prime} \times 17^{\prime \prime}$ |
| Staple position: | 7 positions <br> 1-staple: 4 positions (Top Left, Top Right, Top Left-Oblique, Top Right-Oblique) <br> 2-staples: 3 positions (Left, Top, Right) |

Lower tray (multi-tray staple mode - stapled output can go to either tray):

1500 sheets: A4, $81 / 22^{\prime \prime} \times 11^{\prime \prime}$ (LEF)
750 sheets: A3, B4, A4, B5, $81 / 2^{\prime \prime} \times 14 ", 11$ " x 17", 81⁄2" x 11" (SEF)
500 sheets: A5 (LEF)
Single size:
50 sheets: A4, $81 / 2 "$ x 11" , B5
30 sheets: A3, B4, 8½" x 14", 11" x 17"
ixed size:
30 sheets: A 4 (LEF) \& A3, B5 (LEF) \& B4, $81 / 22^{\prime \prime} \times 11 "($ LEF $) \& 11 " \times 17 "$

7 positions
1-staple: 4 positions (Top Left, Top Right, Top Left-Oblique, Top Right-Oblique)
2-staples: 3 positions (Left, Top, Right)

## SPECIFICATIONS

| Staple replenishment: | Cartridge (5000 staples) |
| :--- | :--- |
| Power consumption: | 48 W |
| Dimensions (W x D x H): | $680 \times 620 \times 1030 \mathrm{~mm}\left(26.8^{\prime \prime} \times 24.4 " \times 40.6\right.$ ") |
| Weight | Without punch unit: $53 \mathrm{~kg}(116.9 \mathrm{lb})$. |
|  | With punch unit: $55 \mathrm{Kg}(121.3 \mathrm{lb})$. |

### 4.5 FOUR-BIN MAILBOX

Number of bins 4 bins

Stack Capacity: $\quad 125$ sheets $\times 4\left(80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}.\right)$
Paper Size for Trays: Maximum: A3/11" x 17" (SEF) Minimum: A5 (LEF)/81/2" x 11"
Print Paper Weight: $\quad 60$ to $105 \mathrm{~g} / \mathrm{m}^{2}$ (16 to 28 lb .)
Power Source:
DC $24 \mathrm{~V}, 5 \mathrm{~V}$ (from the main unit)
Power Consumption:
17 W
Dimensions (W x D x H): $540 \times 600 \times 400 \mathrm{~mm}\left(21.3^{\prime \prime} \times 23.6\right.$ " x 15.8")
(when installed in the machine)
Weight
7 kg ( 15.5 lb .)

# Gestetner LANIER RIMOM SaVII 

G570 SERVICE MANUAL

## COPIER FEATURE EXPANDER G570

## 1. INSTALLATION

### 1.1 INSTALLATION REQUIREMENTS

### 1.1.1 ENVIRONMENT

1. Temperature Range: $\quad 10^{\circ} \mathrm{C}$ to $32{ }^{\circ} \mathrm{C}\left(50^{\circ} \mathrm{F}\right.$ to $\left.89.6^{\circ} \mathrm{F}\right)$
2. Humidity Range: $15 \%$ to $80 \%$ RH
3. Ambient Illumination: Less than 2,000 lux (do not expose to direct sunlight)
4. Ventilation 3 times/hr/person or more
5. Avoid exposing the machine to sudden temperature changes, which include:
1) Direct cool air from an air conditioner
2) Direct heat from a heater
6. Avoid installing the machine in areas that might be exposed to corrosive gas.
7. Install the machine at a location lower than $2,500 \mathrm{~m}(8,200 \mathrm{ft}$.) above sea level.
8. Install the machine on a strong, level base. (Inclination on any side must be no more than 5 mm .)
9. Avoid installing the machine in areas that may be subjected to strong vibration.

### 1.1.2 MACHINE LEVEL

Front to back: Within $5 \mathrm{~mm}(0.2 \mathrm{C})$
Right to left: Within 5 mm (0.2")

### 1.1.3 MACHINE SPACE REQUIREMENTS

## CF Expander with Rack

A: Over 460 mm (18.1") from the printer mainframe
B: Over 100 mm (3.9") from the printer mainframe
C: Over 550 mm (21.7") from the printer mainframe
D: Over $700 \mathrm{~mm}\left(27.6^{\prime \prime}\right)$ from the printer mainframe


## CF Expander without Rack

A: Over 460 mm (18")
B: Over 100 mm (4")
C: Over 100 mm (4")
D: Over 100 mm (4")
E: Over 100 mm (4")
F: Over 700 mm (28")
G:Over 450 mm (17.7")


### 1.1.4 POWER REQUIREMENTS

## $\triangle$ CAUTION

1. Make sure the plug is inserted firmly into the outlet.
2. Avoid using an outlet extension plug or cord, except for an accessory power strip for the 230V machine.
3. Make sure the outlet the machine is plugged into is properly grounded.
4. Input voltage level: $120 \mathrm{~V}, 60 \mathrm{~Hz}$ : More than 10 A

$$
220 \mathrm{~V} \text { ~ } 240 \mathrm{~V}, 50 \mathrm{~Hz} / 60 \mathrm{~Hz} \text { : More than } 6 \mathrm{~A}
$$

2. Permissible voltage fluctuation: $\pm 10 \%$
3. Do not put anything on the power cord.

### 1.2 OPTIONAL UNIT COMBINATIONS

| Item <br> No. | Options | Alternative | Required | Remarks |
| :---: | :--- | :--- | :--- | :--- |
| 1 | CF expander |  | Item 4 or 5 | The optional tray for the <br> printer mainframe, item 2, and <br> item 3 are recommended. <br> a the note below. |
| 2 | 40GB HDD |  |  | Option for item 1 |
| 3 | Rack |  |  | Option for item 1 |
| 4 | ARDF | Item 5 |  | Option for item 1 |
| 5 | Platen cover | Item 4 |  | Option for item 1 |
| 6 | Multi-bin output tray | Finisher | Duplex unit | Option for item 1 |
| 7 | Fax unit |  |  | Option for item 1 |
| 8 | G3 additional unit | Item 9 |  | Option for item 7 |
| 9 | G4 unit | Item 8 |  | Option for item 7 |
| 10 | JBIG |  |  | Option for item 7 |
| 11 | Handset |  | Option for item 7 (U.S. model <br> only) |  |

NOTE: If the 40GB HDD is not installed, some copier functions such as duplex copying, sorting, and document server functions cannot be used.

### 1.3 INSTALLATION WORK FLOW



NOTE: Install the fax unit after making sure that the CF expander works properly. ("1. Installation" in the service manual for the fax option)

### 1.4 MACHINE INSTALLATION

If the customer has a service contract, change the settings of the following SP modes depending on the contract type.

| Item | SP No. | Function | Default |
| :--- | :--- | :--- | :--- |
| Meter charge | SP5-930-1 | Specifies whether the meter charge <br> mode is enabled or disabled. <br> Meter charge mode enabled: <br> - The Counter menu appears <br> immediately after the Menu key is <br> pressed. <br> The counter type selected by the <br> counting method (SP5-045-1) can be <br> displayed with the Counter menu. <br> The counter values can also be <br> printed with the Counter menu. <br> The selected counter starts from a <br> negative number. <br> Meter charge mode disabled: <br> The Counter menu is not <br> displayed. <br> - The total counter starts from 0. | Off |


| Item | SP No. | Function | Default |
| :---: | :---: | :--- | :---: |
| Counter reset | SP7-825-1 | Resets the counters to 0. <br> Important: This must be done at <br> installation after all the above settings <br> have been finished. The negative <br> counters used in meter charge mode <br> will be reset to zero. |  |

NOTE: 1) The default setting for this machine is meter-charge mode off.
2) The meter-charge counter cannot be reset.

### 1.5 MACHINE INSTALLATION

NOTE: The following is the procedure for installing the Copier Feature Expander in machines equipped with the optional rack. For the printer mainframe and printer option installation procedures, please refer to the Operating Instructions "Set-up Guide".

To avoid a possible build-up of ozone, make sure the machine is installed in a room that is well ventilated.


### 1.5.1 RACK

## Accessories Check List

Description
Quantity

1. Left Side Stand ..................................................................... 1
2. Right Side Stand ................................................................. 1
3. Table Board ......................................................................... 1
4. Backboard............................................................................. 1
5. Left Arm ................................................................................ 1
6. Right Arm ............................................................................. 1
7. Left Securing Bracket............................................................ 1
8. Right Securing Bracket ......................................................... 1
9. Grounding Wire..................................................................... 2
10. Grounding Bracket................................................................ 1
11. Large Thumb Screw............................................................... 4
12. Small Thumb Screw............................................................. 4
13. Spacer................................................................................... 2
14. Screw (M6 x 10)..................................................................... 14
15. Screw (M4 x 6)....................................................................... 4
16. Washer................................................................................... 4
17. Spring Washer ..................................................................... 4
18. Clamp................................................................................... 1

## Assembling the Rack

1. Insert a screw $[A]$ about half way into the center holes of both the left [B] and right [C] side stands.
2. Hook the center part of the backboard onto the 2 screws.
3. Make sure that the two side stands are parallel, insert the remaining screws, then tighten all 6 screws.

4. With the 2 square holes $[A]$ in the table board in front of you as shown, attach the left [B] and right [C] arms. When attaching the right arm, secure the ground wires [D] with screws [E] as shown.
NOTE: Make sure the square holes in the table board is facing you during this procedure.

5. Set the table board [F] on the stand as shown.
NOTE: 1) Please make sure that the screw holes for the scanner unit are positioned at the right rear and left front of the table board.
2) Recommended attachment positions for the table board:

- Machine with Two-tray Paper Supply Unit \& LCT: 2nd hole from the top

- Machine with One-tray Paper Supply Unit: 6th hole from the top

3) When attaching the table board at a lower position than the recommended one, make sure the upper right cover can be opened and toner cartridges (especially black) can be replaced. When attaching the table board below the recommended position, it is necessary to shift the printer mainframe 10 cm (3.9") toward the front so that the upper right cover can be opened for toner replenishment.
6. Secure the two grounding wires [G] ( ${ }^{(1)} \times 2$ each). There is a wire at the left side and one at the right side.
7. Attach the securing brackets $[\mathrm{H}]$ to the left and right arms as shown (1 thumb screw [I] for each).


## Docking the Rack and Printer Mainframe

NOTE: If the Finisher is going to be installed, the mounting bracket of the rail should be attached after docking the mainframe with the rack. In addition, the Finisher should be attached after docking is complete.

1. Remove the paper tray and front stand $[A]$ from the paper feed unit as shown ( $\hat{\xi}^{2} \times 2$ ).

2. Remove the brackets $[B]$ and rear stand [C] (会 $\times 1$ for each).
3. Reinsert the paper tray.

NOTE: Since the front and rear stands will no longer be necessary, dispose of them according to local regulations.
4. Place the assembled rack down in the area where the mainframe is to be installed.

5. Adjust the height of the side stand legs for stabilization if necessary.
CAUTION: The stand is designed to support objects placed on the table only after the rack and mainframe have been docked. Therefore, use caution in handling the assembled stand before docking, as it is relatively unstable.

6. Attach the right bridging bracket $[A]$ to the rack's right stand (2 screws [B]).
7. Attach the left bridging bracket [C] to the lower left corner of the paper feed unit (2 stepped screws [D], 2 spring washers [E] and 2 washers [F]).
8. Insert the printer in between the racks as shown and set it to the desired position.
9. Secure the right bridging bracket $[A]$ to the paper feed unit (2 stepped screws [G], 2 spring washers [H] and 2 washers [I]).
10. Secure the left bridging bracket [C] to the rack's left stand (
11. Remove the mailbox upper cover [K]. With a pair of pliers, remove the small square cutout [L] in the corner of the cover with a pair of pliers.

Then, set the grounding bracket [ M ] in the machine as shown and reattach the upper cover.


### 1.5.2 CF EXPANDER

## Accessories Check List

Description
Quantity

1. Scanner Unit ......................................................................... 1
2. Main Switch Cover ................................................................. 1
3. Screw (M3 x 6)..................................................................... 3
4. Screw (M3 x 6)..................................................................... 2
5. IPU Board .............................................................................. 1
6. NVRAM Board ..................................................................... 1
7. DIMM \#1 (SYSTEM) ............................................................. 1
8. DIMM \#2 (PRT/SCN) ........................................................... 1
9. 128 MB DIMM (for 230 V only).............................................. 1
10. Cushion ................................................................................. 1
11. Power Strip (for 230V only) ................................................... 1


CF Expander Installation

1. Remove the controller board $(\hat{\xi} \times 2)[A]$.

2. Replace the printer module [A] in the upper slot (CN7) with DIMM \#1 (SYSTEM) [B].
3. Insert DIMM \#2 (PRT/SCN) [C] into the center slot (CN8).
4. Insert the 128 MB memory [D].

NOTE: 1) It is not necessary to install the additional memory if the present memory is 192 MB or more.
2) Make sure that the modules are firmly set in their slots. If they are not, this will cause SC997.
5. Attach the NVRAM board [E] (令 $\times 1$ ).

NOTE: 1) It is not necessary to install this NVRAM board in machines that already contain the optional User Account Enhancement Unit Type B. However, if the P/N on the Unit Type B decal is G0606070 or G0606070A, it is necessary to use Timer Setting in UP Mode System Settings when adjusting the time zone setting (as SP5-302-2 in Copy SP mode will not function properly).
2) If replacing the Unit Type B (all P/N) with the NVRAM board, be sure to back up and re-enter the User Code data using SmartNetMonitor for Admin.

6. Remove the scanner connector cover [A].
7. Install the IPU board $[B](\hat{\xi} \times 2)$.
8. Reinsert the controller into the printer using the 2 screws ( $\mathrm{M} 3 \times 6$ ) enclosed as accessories instead of the original screws.
NOTE: Make sure that the IPU board is firmly connected to the controller board. If it is not, this will cause SC990.

9. Place the cushion $[A]$ on the table board $[B]$.
10. Place the scanner unit [C] on the table board so that the scanner unit legs [D] line up with the indents [E] in the table as shown.
11. Secure the scanner unit in place ( $\mathcal{S}^{2} \times 2[F]$ and spacers [G] enclosed as accessories for the optional rack).
12. Remove the shipping tape from the scanner cables.
13. Lead the scanner cable $[\mathrm{H}]$ along the inside of the rack as shown, then connect it to the IPU board on the controller frame.

14. Connect the printer power cord $[A]$ to the output port on the scanner, then plug the scanner power cord $[B]$ into the power outlet.
15. Attach the printer main switch cover.

NOTE: Make sure that the wall outlet is near the machine and freely accessible, so that in the event of an emergency the cord can be easily unplugged.
16. Select the language in the UP mode.
17. Set the date and time.
18. Enter SP Mode.
19. Clear the scanner settings by using SP5-801-9.
20. Clear the network application settings by using SP5-801-10.
21. Clear the IPU settings by using SP5-801-12.
22. Exit SP mode and turn the main power off/on.
23. Perform Auto Color Calibration (ACC).
24. Make some test copies in the following modes using a C4 Test Chart.

- Full color in Text Mode
- B\&W in Text Mode

25. Check the test copies to make sure each of the following is within standard values, making any necessary adjustments. ( 3.3 Image Adjustment)

- Leading edge registration
- Side-to-side registration
- Scanner sub-scan magnification
- Scanner leading edge registration
- Scanner side-to-side registration
- ARDF side-to-side registration
- ARDF sheet through registration

26. If necessary, perform the touch panel position adjustment. (3.6 Others)
27. If the customer has a service contract, change the meter charge SP mode settings accordingly.

### 1.5.3 40GB HDD

## Accessories Check List

Description Quantity

1. 40GB HDD ............................................................................ 1
2. Power Cable .......................................................................... 1
3. Harness................................................................................. 1
4. Screw (M3x6)......................................................................... 2
5. Key Top (Document Server) ................................................. 1

## 40 GB HDD Installation

1. Remove the controller board [A] (2 screws).
2. Mount the 40 GB HDD $[B]$ on the controller (2 connectors, 2 screws).
NOTE: If the CF expander has already been installed, remove the IPU board first, then install the HDD.
3. Reinsert the controller in the printer using the 2 screws (M3x6) enclosed in the CF expander, instead of the original screws.
NOTE: When installing the HDD and CF expander simultaneously, be sure to install both before performing the next step.
4. Make sure that the power cords are properly plugged in, then turn on the main switch. Format the HDD according to the instructions displayed on the touch panel. Print the configuration page and confirm that the HDD has been properly installed.

5. Remove the cover key top $[A]$ and replace it with the document box key top [B].

### 1.5.4 ARDF

## Accessories Check List

Description
Quantity

1. Stepped Screw .................................................................... 2
2. Screw ( $\mathrm{M} 4 \times 10$ ) ................................................................. 2
3. Knob Screw ......................................................................... 4
4. Decal - Attention .................................................................. 1
5. Installation Procedure ........................................................... 1

## ARDF Installation



1. Attach and tighten $[A]$ (
2. Mount the ARDF by aligning the screw keyholes $[B]$ in the ARDF support plate over the stud screws, and slide the ARDF toward the front of the machine.
NOTE: To avoid damaging the ARDF, hold it as shown in the illustration.
3. Secure the ARDF ( $\hat{\xi} \times 2$ [C]).

4. Attach the left $[A]$ and right $[B]$ stopper brackets with knob screws $[C](\hat{\xi} \times 4)$.
5. Connect the I/F cable [D] ( $⿷_{\mathbb{\#}} \times 1$ ) to the main machine.
6. Peel off the platen sheet [E] and place it on the exposure glass.

[B]
7. Line up the rear left corner of the platen sheet flush against corner [A] on the exposure glass.
8. Close the ARDF.
9. Attach the decal $[B]$ to the cover so that the arrow on the decal lines up with the groove [C] in the left scale as shown.
10. Turn on the main switch.
11. Check the ARDF operation and copy quality. Be sure to check and adjust the registration for the ARDF with the SP modes.

### 1.5.5 MULTI-BIN OUTPUT TRAY

## Accessories Check List

Description
Quantity

1. Front Tray Holder ................................................................. 1
2. Rear Tray Holder ................................................................... 1
3. Tray ..................................................................................... 2
4. Screw (3 x 14 ) ..................................................................... 4
5. Discharge Brush .................................................................... 2
6. Ground Plate for Left Cover.................................................... 1
7. Ground Plate for Upper Exit.................................................... 1
8. Ground Plate for Lower Exit................................................... 1

## Installing the Multi-Bin Output Tray

NOTE: Before installing the multi-bin output tray, you must install the duplex unit.

1. Open the left cover $[A]$ of the duplex unit.
2. Install the ground plate $[B]$ behind the magnet.
3. Install the ground plate [C] on the rear of the left cover.
4. Attach the ground plate to the top cover, aligning the bottom edges of the plate [D] and cover [E].

5. Attach the discharge brushes [F] and [G] to the upper edges of the paper exits, so that the ends of the brushes [H] and [I] touch the ground plates [C] and [D] respectively.
NOTE: Make sure the brushes do not obstruct paper coming from the exits.

6. Install the front $[A]$ and rear $[B]$ tray holders on the top cover ( $\hat{\xi}^{2} \times 2$ for each).
7. Install the upper [C] and lower [D] trays.
8. Turn the main switch on; select the SP mode menu, SP6-901-1; and change the multi-bin output tray setting.
NOTE: The multi-bin output tray is not automatically recognized by the printer mainframe. The multi-bin output tray cannot be used until
 you have changed this SP mode setting.

## 1．5．6 ANTI－CONDENSATION HEATER

1．Remove the rear scale $[A](\hat{\xi} \times 3)$ ．
2．Remove the exposure glass $[B]$ with the left scale［C］（ $\hat{\xi}^{3} \times 2$ ）．
NOTE：You do not have to remove the ADF exposure glass．If the glass is removed，position the glass marker ［D］at the rear－left corner when reattaching．

3．Remove the rear cover $[E](\hat{\xi} \times 3)$ ．
4．Remove the right cover $[F](\hat{\xi} \times 3)$ ．
5．Remove the left cover $[\mathrm{G}]\left(\begin{array}{l}\text { 为 } \times 3) \text { ．}\end{array}\right.$
6．Remove the rear frame $[H]\left(\hat{E}^{2} \times 12\right.$ ，気川 $\mathrm{x} 2)$ ．


7．Install the anti－condensation heater［I］ in the rear－left corner of the scanner unit（ ${ }^{2} \times 2$ ）．

8．Pass the cable through the opening［J］ in the rear rail and connect it to the connector $[\mathrm{K}]$ at the front－left corner of the power supply unit．
9．Reassemble the scanner unit．


## 2. PREVENTIVE MAINTENANCE

### 2.1 USER MAINTENANCE

The following maintenance kits are available for the customer to do PM's.

Type A: Color (C/M/Y) PCU
Type B: Color (C/M/Y) Development Unit
Type C: Fusing Unit
Type D: Black Development Unit / Dust Filter
Type E: Waste Toner Bottle
Type F: Black PCU
Type G: Oil Supply Unit
Type H: Paper Feed Rollers

50k copies
100k copies
100k copies
100k copies
50k copies
50k copies
20k copies
150k copies

Chart: A4(LT)/5\%
Mode: 5 copies/original
Environment: Normal temperature and humidity
Yield may change depending on circumstances and copy conditions.
When the machine's default settings are used, an error message is displayed when a maintenance counter reaches the value in the following PM table, except for the items in maintenance kit H .
NOTE: To have the machine display the message for maintenance kit H as well, set SP5-930-4 to 1.

After the user replaces the items in a maintenance kit, the machine automatically resets the counter for this maintenance kit, except for the items in kit H .
NOTE: Except for the items in kit H, the machine can automatically detect when new items have been installed.

The machine stops when the counters for parts in maintenance kits $\mathrm{C}, \mathrm{E}$ and G reach the replacement value in the following table.
NOTE: To have the machine display the alert only for maintenance kits C, E, and G, set SP5-930-3 to 0 .

Symbol key: C: Clean, R: Replace, L: Lubricate, I: Inspect
Printer Mainframe

| Item | 20k | 50k | 100k | 150k | EM | Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Black PCU |  | R |  |  |  | Included in maintenance kit F |
| Color (Y/M/C) PCU |  | R |  |  |  | Included in maintenance kit A |
| Black Development Unit |  |  | R |  |  | Included in maintenance kit D |
| Color (C/M/Y) Development Unit |  |  | R |  |  | Included in maintenance kit B |
| Fusing Unit |  |  | R |  |  | Included in maintenance kit C |
| Oil Supply Unit | R |  |  |  |  | Included in maintenance kit G |
| Waste Toner Bottle |  | R |  |  |  | Included in maintenance kit E |
| Dust Filter |  |  | R |  |  | Included in maintenance kit D |
| Pick-up Roller |  |  |  | R |  | Included in maintenance kit H |
| Feed Roller |  |  |  | R |  | Included in maintenance kit H |
| Separation Roller |  |  |  | R |  | Included in maintenance kit H |

## Punch Kit

| Item | 10k |  |  |  | EM | Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Chads | I |  |  |  |  | Discard chads. |

### 2.2 SERVICE MAINTENANCE

NOTE: After replacing the transfer unit, make sure to reset the maintenance counter using SP7-804-16 and 7-804-27.
After replacing paper feed rollers, reset the maintenance counters for these also: By-pass tray (7-804-10), Tray 1 (7-804-11), Tray 2 (7-804-12), Tray 3/LCT (7-804-13), Tray 4 (7-804-14)

Symbol key: C: Clean, R: Replace, L: Lubricate, I: Inspect
Printer Mainframe

| Item | 20k | 50k | 100k | 150k | 1000k | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Transfer Unit |  |  |  |  | $R$ |  |  |
| By-pass Feed Roller <br> By-pass Pick-up Roller <br> By-pass Separation <br> Roller |  |  |  | $R$ |  |  |  |

One-tray Paper Feed Unit (500 sheets x 1)

| Item | $\mathbf{2 0 k}$ | $\mathbf{5 0 k}$ | $\mathbf{1 0 0 k}$ | $\mathbf{1 5 0 k}$ | $\mathbf{1 0 0 0}$ | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Relay Roller |  |  |  |  |  | C | Damp cloth |
| Bottom Plate Pad |  |  |  |  |  | C | Damp cloth |

## Two-tray Paper Feed Unit (500 sheets x 2)

| Item | $\mathbf{2 0 k}$ | 50k | $\mathbf{1 0 0 k}$ | $\mathbf{1 5 0 k}$ | $\mathbf{1 0 0 0 k}$ | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Relay Roller |  |  |  |  |  | C | Damp cloth |
| Bottom Plate Pad |  |  |  |  |  | C | Damp cloth |

LCT (2000 sheets)

| Item | 20k | 50k | 100k | 150k | 1000k | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Relay Roller |  |  |  |  |  | C | Damp cloth |
| Bottom Plate Pad |  |  |  |  |  | C | Damp cloth |

Two-tray Finisher

| Items | 20k | 50k | 100k | $\mathbf{1 5 0 k}$ | $\mathbf{1 0 0 0 k}$ | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :--- |
| Rollers |  |  |  |  |  | C | Damp cloth |
| Discharge Brush |  |  |  |  |  | C | Dry cloth |
| Sensors |  |  |  |  |  | C | Blower brush |
| Jogger Fences |  |  |  |  |  | I | Replace if <br> required. |

## SERVICE MAINTENANCE

CF Expander

| Item | $\mathbf{2 0 k}$ | $\mathbf{5 0 k}$ | $\mathbf{1 0 0 k}$ | $\mathbf{1 0 0 0 k}$ | EM | Remarks |
| :--- | :---: | :---: | :---: | :---: | :---: | :--- |
| 1st Mirror |  |  |  |  | C | Optics cloth |
| 2nd Mirror |  |  |  |  | C | Optics cloth |
| 3rd Mirror |  |  |  |  | C | Optics cloth |
| APS Sensor |  |  |  |  | C | Dry cloth |
| Xenon Exposure Lamp |  |  |  |  | C | Dry cloth |
| Exposure Glass (Sheet <br> through) |  |  |  |  | C | Dry cloth or alcohol |

ARDF

| Item | 400k |  |  |  | EM | Remarks |
| :--- | :---: | :--- | :--- | :--- | :---: | :--- |
| Pick-up Roller | R |  |  |  | C | Damp cloth or alcohol |
| Feed Belt | R |  |  |  | C | Damp cloth or alcohol |
| Separation Roller | R |  |  |  | C | Damp cloth or alcohol |
| Sensors | C |  |  |  | C | Blower brush |
| Platen Sheet Cover |  |  |  |  | C | Damp cloth or alcohol. <br> Replace platen sheet if <br> required. |
| White Plate |  |  |  |  | C | Dry or damp cloth |
| Drive Gear | L |  |  |  |  | Grease, G501 |

NOTE: 400k copies (= 80 k originals $\times 5$ copies/original)

## 3. REPLACEMENT AND ADJUSTMENT

| $\triangle$ CAUTION |
| :--- |
| Turn off the main power switch and unplug the machine before attempting <br> any of the procedures in this section. |

NOTE: This manual uses the following symbols.

- : See or Refer to 媳: Screws Connectors


### 3.1 SPECIAL TOOLS

| Part Number | Description | Q'ty |
| :---: | :--- | :---: |
| A0069104 | Scanner Positioning Pin (4 pcs/set) | 1 |
| A2309352 | Flash Memory Card - 4MB | 1 |
| A0929503 | C4 Color Test Chart (3 pcs/set) | 1 |
| C4019503 | 20X Magnification Scope | 1 |

### 3.2 LUBRICANTS

| Part Number | Description | Q'ty |
| :---: | :---: | :---: |
| 52039501 | Silicone Grease G501 | 1 |

NOTE: This is only used for the optional ARDF.

### 3.3 IMAGE ADJUSTMENT

### 3.3.1 PRINTING

## Leading edge registration

See the service manual for the printer mainframe.

## Side-to-side registration

See the service manual for the printer mainframe.

### 3.3.2 SCANNING

Before doing the following scanner adjustments, perform or check the printing registration/side-to-side adjustment and the blank margin adjustment.
NOTE: Use a C4 test chart to perform the following adjustments.

## Scanner sub-scan magnification

1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the magnification ratio. Use SP4-008 to adjust if necessary.
Standard: $\pm 1.0 \%$.


## Scanner leading edge and side-to-side registration

1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the leading edge and side-to-side registration, and adjust them with the following SP modes if necessary. Standard: $0 \pm 2 \mathrm{~mm}$.

|  | SP mode |
| :--- | :---: |
| Sub-scan | SP4-010 |
| Main-scan | SP4-011 |



A: Leading Edge Registration
B: Side-to-side Registration

## Main scan dot position correction

NOTE: Before adjusting the scanner, adjust the printer registration.

1. Enter the SP mode and open SP4-010 and SP4-011.
2. Check that each value corresponds to the factory-set value.
3. Press the Interrupt key and copy the C-4 chart in the full-color photo mode.

NOTE: Be sure to copy in the photo mode. This is because color displacement cannot be checked properly in text mode.
4. Check the yellow and cyan vertical lines. (Use a Magnification Scope to do this.) If they exactly overwrite the black line at the edges of the copy, exit the SP mode to end the adjustment. If the yellow and cyan lines significantly extend beyond the black line, proceed to the next step.
5. Press the Interrupt key to return to the SP mode and open SP4-932. Compare the current values against the table.

| SP4-932-1 | Dot correction R left edge |
| :--- | :--- |
| SP4-932-2 | Dot correction R right edge |
| SP4-932-3 | Dot correction B left edge |
| SP4-932-4 | Dot correction B right edge |

### 3.3.3 ARDF

## ARDF side-to-side and leading edge registration



Make a temporary test chart as shown above using $11 \times 17$ paper.

1. Place the temporary test chart on the ARDF and make a copy from one of the feed stations.
2. Check the registration, and adjust using the following SP modes if necessary.

| SP Code | What It Does | Adjustment Range |
| :---: | :--- | :---: |
| SP6-006-1 | Side-to-Side Registration | $\pm 1.0 \mathrm{~mm}$ |
| SP6-006-2 | Leading Edge Registration (Simplex) | $\pm 2.0 \mathrm{~mm}$ |
| SP6-006-3 | Leading Edge Registration (Duplex: Front) | $\pm 4.2 \mathrm{~mm}$ |
| SP6-006-4 | Leading Edge Registration (Duplex: Back) | $\pm 4.2 \mathrm{~mm}$ |

### 3.3.4 PRINTER GAMMA CORRECTION

NOTE: Normally, the ACC is enough to adjust the color balance to achieve the optimum print output. The printer gamma correction is only required for fine-tuning to meet user requirements.
The printer gamma curve created during ACC can be modified using SP modes. The gamma data for highlight, middle, shadow areas, and IDmax can be adjusted. The adjustable range is from 0 to 30 ( 31 steps).

## Printer Mode

There are six adjustable modes:

- $1200 \times 1200$ photo mode (select this mode with printer SP1-102-1)
- $600 \times 600$ text mode (select this mode with printer SP1-102-2)
- $1200 \times 600$ text mode (select this mode with printer SP1-102-3)
- $600 \times 600$ photo mode (select this mode with printer SP1-102-4)
- $1200 \times 600$ photo mode (select this mode with printer SP1-102-5)
- $1200 \times 1200$ text mode (select this mode with printer SP1-102-6)

|  | K | C | M | Y |
| :--- | :---: | :---: | :---: | :---: |
| Highlight | SP1-104-1 | SP1-104-21 | SP1-104-41 | SP1-104-61 |
| Middle | SP1-104-2 | SP1-104-22 | SP1-104-42 | SP1-104-62 |
| Shadow | SP1-104-3 | SP1-104-23 | SP1-104-43 | SP1-104-63 |
| IDmax | SP1-104-4 | SP1-104-24 | SP1-104-44 | SP1-104-64 |

## Adjustment Procedure

1. Do an ACC for the printer mode.
2. Turn the main power off and on.
3. Enter SP mode.
4. Select "Printer SP".
5. Select SP1-102 and select the print mode that you are going to adjust.
6. To review the image quality for these settings, choose SP1-103-1 to print out a tone control test sheet.
7. Adjust the color density with SP1-104 as shown below comparing the tone control test sheet with the C 4 test chart.
NOTE: Adjust the density in order from "ID Max", "Shadow", "Middle", and then "Highlight".
8. Save the adjusted settings with SP1-105.

## Adjustment Reference For Gamma Correction

The following tables show the adjustment reference for gamma correction in the photo mode. The tables show the level of the color scale on the C4 test chart and on the tone control test sheet printed in the printer SP mode.
For example, for K at $1200 \times 1200$ dpi, grade 12 on the tone control test sheet should be the same as grade 8 on the C4 chart.
Normally, it is not necessary to adjust the gamma data as shown in the table since ACC adjusts the gamma curve automatically. The fine-tuning of color balance by gamma data adjustment will be required only when the result from ACC and Color Calibration does not meet the customer's requirements.

|  |  | est chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| K | Test sheet | $600 \times 600$ | - | 1 | 3 | 5 | 6 | 9 | 10 | 11 | 16 | - |
| K |  | $1200 \times 600$ | - | 1 | 3 | 5 | 6 | 8 | 10 | 11 | 16 | - |
|  |  | $1200 \times 1200$ | - | 1 | 3 | 4 | 6 | 8 | 10 | 12 | 15 | 16 |


| C | C4 test chart |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Test sheet | $600 \times 600$ | - | 1 | 3 | 5 | 6 | 9 | 10 | 12 | 13 | 14 |
|  |  | $1200 \times 600$ | - | 1 | 3 | 5 | 6 | 8 | 10 | 11 | 12 | 13 |
|  |  | $1200 \times 1200$ | - | 1 | 3 | 4 | 5 | 8 | 10 | 11 | 12 | 13 |


| M | C4 test chart |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Test sheet | $600 \times 600$ | - | 1 | 4 | 6 | 8 | 11 | 12 | 14 | 16 | - |
|  |  | $1200 \times 600$ | - | 1 | 4 | 6 | 8 | 11 | 12 | 15 | 16 | - |
|  |  | $1200 \times 1200$ | - | 1 | 4 | 6 | 7 | 10 | 12 | 14 | 16 | - |


| Y | C4 test chart |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Test sheet | $600 \times 600$ | 1 | 3 | 4 | 9 | 11 | 12 | 14 | 15 | 16 | - |
|  |  | $1200 \times 600$ | 1 | 3 | 5 | 8 | 10 | 11 | 14 | 15 | 16 | - |
|  |  | $1200 \times 1200$ | 1 | 3 | 5 | 8 | 10 | 11 | 14 | 15 | 16 | - |

## Copy Mode

## KCMY Color Balance Adjustment

The adjustment uses only "Offset" values.
NOTE: Never change "Option" values (default value is 0 ).

| Highlight (Low ID) | Levels 2 through 5 in the C4 chart 10-level scale |
| :---: | :--- |
| Middle (Middle ID) | Levels 3 through 7 in the C4 chart 10-level scale |
| Shadow (High ID) | Levels 6 through 9 in the C4 chart 10-level scale |
| ID max | Level 10 in the C4 chart 10-level scale (affects the entire image <br> density.) |
| Offset | The higher the number in the range associated with the low ID, <br> middle ID, high ID, and ID max, the greater the density. |

There are four adjustable modes:

- Color text mode
- Color photo mode
- B/W text mode
- B/W photo mode

|  |  | K | C | M | Y |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Text mode | Highlight | SP4-910-1 | SP4-911-1 | SP4-912-1 | SP4-913-1 |
|  | Middle | SP4-910-2 | SP4-911-2 | SP4-912-2 | SP4-913-2 |
|  | Shadow | SP4-910-3 | SP4-911-3 | SP4-912-3 | SP4-913-3 |
|  | ID max | SP4-910-4 | SP4-911-4 | SP4-912-4 | SP4-913-4 |
| Photo mode | Highlight | SP4-915-1 | SP4-916-1 | SP4-917-1 | SP4-918-1 |
|  | Middle | SP4-915-2 | SP4-916-2 | SP4-917-2 | SP4-918-2 |
|  | Shadow | SP4-915-3 | SP4-916-3 | SP4-917-3 | SP4-918-3 |
|  | ID max | SP4-915-4 | SP4-916-4 | SP4-917-4 | SP4-918-4 |
| B/W text mode | Highlight | SP4-914-1 |  |  |  |
|  | Middle | SP4-914-2 | - | - | - |
|  | Shadow | SP4-914-3 | - | - | - |
|  | ID max | SP4-914-4 |  |  |  |
| B/W photo mode | Highlight | SP4-909-1 | - | - | - |
|  | Middle | SP4-909-2 |  |  |  |
|  | Shadow | SP4-909-3 |  |  |  |
|  | ID max | SP4-909-4 |  |  |  |

## Adjustment Procedure

1. Copy the C-4 test chart in the mode that you are going to adjust.
2. Enter the SP mode.
3. Select "Copy SP".
4. Select SP4-9xx that you are going to adjust.
5. Adjust the offset values until the copy quality conforms to the standard (he table below).

NOTE: 1) Never change "Option" value (default value is 0 ).
2) Adjust the density in order from "ID Max", "Middle", "Shadow", and then "Highlight".

## - Standard Copy Quality in Color Text/Photo Mode -

| Standard Copy Quality in Color Text/Photo Mode |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Step | Item to Adjust | Level on the C-4 chart |  |  |  |  |  |  |  |  |  | Adjustment Standard <br> Adjust the offset value so that the density of level 10 matches that of level 10 on the C-4 chart. |
| 1 | ID max: (K, C, M, and Y) |  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  |
| 2 | Middle (Middle ID) (K, C, M, and Y) |  | 2 | 3 | 4 | 5 |  | 7 | 8 | 9 |  | Adjust the offset value so that the density of level 6 matches that of level 6 on the C-4 chart. |
| 3 | Shadow (High ID) (K, C, M, and Y) |  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  | Adjust the offset value so that the density of level 8 matches that of level 8 on the C-4 chart. |
| 4 | Highlight (Low ID) (K, C, M, and Y) |  | 2 |  |  | 5 | 6 | 7 | 8 | 9 | 10 | Adjust the offset value so that dirty background is not visible on the copy and the density of level 3 is slightly lighter that of level 3 on the C-4 chart. |
| 5 | K Highlight (Low ID) (C, M, and Y) <on the full color copy> only for Photo |  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Adjust the offset value so that the color balance of black scale levels 3 through 5 in the copy is seen as gray. |

## <Standard Copy Quality in B/W Text/Photo Mode>

| Standard Copy Quality in B/W Text/Photo Mode |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Step | Item to Adjust | Level on the C-4 chart (K) |  |  |  |  |  |  |  |  | Adjustment Standard |
| 1 | ID max: $(\mathrm{K})$ |  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | $\begin{array}{\|l\|l\|} \hline 9 & 10 \\ \hline \end{array}$ | Adjust the offset value so that the density of level 10 matches that of level 10 on the C-4 chart. |
| 2 | Middle (Middle ID) (K) |  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9810 | Adjust the offset value so that the density of level 6 matches that of level 6 on the C-4 chart. |
| 3 | Shadow (High ID) (K) |  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | $\begin{array}{l\|l\|} \hline 9 & 10 \\ \hline \end{array}$ | Adjust the offset value so that the density of level 8 matches that of level 8 on the C-4 chart. |
| 4 | $\begin{aligned} & \text { Highlight (Low ID) } \\ & \text { (K) } \end{aligned}$ |  | $2$ | 3 |  | 5 | 6 | 7 | 8 | $\begin{array}{\|l\|l\|} \hline 9 & 10 \\ \hline \end{array}$ | Adjust the offset value so that dirty background is not visible on the copy and the density of level 3 is slightly lighter that of level 3 on the C-4 chart. |

NOTE: After adjusting 'shadow' as explained above, text parts of the test pattern may not be printed clearly. If this happens, check whether the 5 line/mm pattern at each corner is printed clearly. If it is not, adjust the offset value of 'shadow' again until it is.

## 3．4 REPLACEMENT

## 3．4．1 EXPOSURE GLASS

1．Rear scale $[A]\left(\mathcal{E}^{2} \times 3\right)$
2．Exposure glass with left scale $[B]$ （臽 $\times 2$ ）
3．ARDF exposure glass［C］
NOTE：When reattaching the exposure glass and ARDF exposure glass，position the glass marker［D］at the rear－ left corner．


## 3．4．2 ORIGINAL LENGTH／WIDTH SENSOR

1．Exposure glass with left scale（ 3．4．1）
2．Original length sensors［A］ （金 $\times 2$ ，剄 l 2）
3．Original width sensor 1 ［B］ （食 $\times 1$ ，気監 x 1 ）


### 3.4.3 SENSOR BOARD UNIT (SBU)

1. Open the ARDF/platen cover
2. Rear cover ( 3.1.6)
3. Right cover $[A](\hat{\xi} \times 3)$
4. Inner cover $[B]\left(\begin{array}{c}\text { 雨 } \times 4)\end{array}\right.$

 4)

5. After replacing the sensor board unit, adjust the following SP modes 3.3.12):

- SP4-008 (Scanner leading edge magnification)
- SP4-010 (Scanner leading edge registration)
- SP4-011 (Scanner side-to-side registration)

NOTE: The settings above are stored in the NVRAM on the SBU.

### 3.4.4 EXPOSURE LAMP STABILIZER

1. Exposure glass with left scale 3.4.1)
2. Sensor board unit (-3.1.3)
3. Exposure lamp stabilizer $[A](\hat{\xi} \times 2$,



### 3.4.5 XENON LAMP

1. Exposure glass with left scale (-3.4.1)
2. Rear cover (-3.1.6)
3. Right cover $[A]\left(\hat{\xi}^{7} \times 3\right)$
4. Left cover $[B](\hat{B} \times 3)$
5. Operation panel [C] ( 1)
[B]

6. Left frame [D] ( $\mathrm{E}^{\mathrm{E}} \times 4$ )
7. Front frame $[E]\left(\mathcal{E}^{2} \times 5\right)$

8. Xenon lamp (2 clamps)


## Reassembling

1. Take up the cable slack.
2. Adjust the cable clamp position [G] if necessary.


### 3.4.6 SCANNER POWER SUPPLY UNIT (PSU)

1. Rear cover $[A](\hat{\xi} \times 3)$
2. Right cover $[B]\left(\hat{S}^{3} \times 3\right)$
3. Left cover [C] ( $\hat{\boldsymbol{E}} \times 3$ )
4. Rear frame [D] (

5. Scanner power supply unit [E] ( x10, $\mathcal{E}^{\boldsymbol{E}} \times 7$, Ground wire screw x 2 )


### 3.4.7 SCANNER MOTOR

1. Scanner PSU (-3.1.6)
2. Scanner motor [A] (Spring $\times 1, \hat{Z} \times 7$,鳥 C 1)
3. Timing belt $[B]$


### 3.4.8 FRONT SCANNER WIRE

1. Front frame (-3.1.5)
2. Front scanner wire clamp $[\mathrm{A}]$
3. Front scanner wire bracket $[B]$ (会 $\times 1$ )
4. Front scanner wire and scanner drive pulley [C] ( $(\hat{\xi} \times 1)$

[B]

## Reassembling the Front Scanner Wire

1. Position the center ball [A] in the middle of the forked holder.
2. Pass the right end (with the ring) $[B]$ through the square hole, and the left end (with the ball) [C] through the notch.
3. Wind the right end clockwise (viewed from the machine's front) three times; wind the left end counterclockwise five times.


NOTE: The two red marks [D] should meet when you have finished. Secure the wire to the pulley with tape, so you can handle the assembly easily during installation.
4. Install the drive pulley on the shaft [E].

NOTE: Do not secure the pulley to the shaft with the screw yet.
5. Insert the left end of the wire into the slit [F], with the end going via the rear track of the left pulley [G] and the rear track of the movable pulley [H].

6. Hook the right end of the wire onto the front scanner wire bracket [l], with the end going via the front track of the right pulley [J] and the front track of the movable pulley [K].

NOTE: Do not secure the scanner wire bracket with the screw yet.

7. Remove the tape from the drive pulley.
8. Insert a scanner positioning pin [L] through the 2nd carriage hole [M] and the left holes [ N ] in the front rail. Insert another scanner positioning pin [O] through the 1st carriage hole [P] and the right holes in the front rail [Q].
9. Insert two more scanner positioning pins in the holes in the rear rail.

10. Screw the drive pulley to the shaft [R].
11. Screw the scanner wire bracket to the front rail [S].
12. Install the scanner wire clamp [T].
13. Pull out the positioning pins.

NOTE: After removing the positioning pins, make sure the 1st and 2nd carriages move smoothly. If they do not, repeat steps 8 through 13.

### 3.4.9 REAR SCANNER WIRE

1. Rear frame (-3.1.6)
2. Rear rail frame $[A](\hat{\xi} \times 5)$

[C]
[B]
3. Rear scanner wire clamp [B]
4. Rear scanner wire bracket $[C]\left(\hat{\xi^{3}} x\right.$ 1)
5. Scanner motor gear [D] ( $\hat{\xi} \times 1$ )
6. Rear scanner wire and scanner drive pulley [E] ( $\mathcal{F}^{(1)} \times 1$ )


## Reassembling the Rear Scanner Wire

1. Position the center ball [A] in the middle of the forked holder.
2. Pass the left end (with the ball) $[B]$ through the drive pulley notch, and the right end (with the ring) [C] through the drive pulley hole.
3. Wind the left end counterclockwise (viewed from the machine's front) five times; wind the right end clockwise three times.


NOTE: The two red marks [D] should meet when you have finished. Secure the wire to the pulley with tape, so you can handle the assembly easily during installation.
4. Install the drive pulley on the shaft.

NOTE: Do not secure the pulley on the shaft with the screw yet.
5. Install the wire.

NOTE: The winding of the wire on the three pulleys at the rear of the scanner should be the same as the winding on the three pulleys at the front, except that it should appear as a mirror image.
Example: At the front of the machine, the side of the drive pulley with the three windings should face the front of the machine. At the rear of the machine, it should face the rear.
6. Perform steps 7 through 13 in the "Reassembling the Front Scanner Wire" Section.

### 3.4.10 NVRAM REPLACEMENT PROCEDURE

Make sure you have the SMC report (factory settings) that comes with the printer before beginning the following procedure.

## NVRAM on the Controller (IC9)

1. Enter SP mode and print out the SMC reports with SP5-990-1 if possible.
2. Turn off the main switch and unplug the power cord.
3. Replace the NVRAM on the controller and reassemble the machine.
4. Enter the SP and UP mode changes that were made at the factory and in the field.
5. Perform ACC for the copier application.
6. Perform ACC for the printer application.
7. Reset the total counter to 0 (SP 7-825-1) if meter charge mode (SP 5-930-1) is enabled.

## NVRAM Expansion Board on the Controller (CN13)

1. Enter SP mode and print out the SMC reports with SP5-990-1 if possible.
2. Export the User Codes from the NVRAM board by using SmartNetMonitor for Admin if the customer has stored them.
3. Turn off the main switch and unplug the power cord.
4. Replace the NVRAM board on the controller and reassemble the machine.
5. Execute a RAM clear for the system settings with SP5-801-3.
6. Execute a RAM clear for the scanner application settings with SP5-801-9.
7. Execute a RAM clear for the network application settings with SP5-801-10.
8. Execute a RAM clear for the IPU settings with SP5-801-12.
9. Reset the system settings.
10. Enter the SP and UP mode changes that were made at the factory and in the field.
11. Import the User Codes to the NVRAM board by using SmartNetMonitor for Admin if the customer has stored them.
12. Perform ACC for the copier application.
13. Perform ACC for the printer application.

## NVRAM on the BCU (IC20)

1. Enter SP mode and print out the SMC reports with SP5-990-1 if possible.
2. Turn off the main switch and unplug the power cord.
3. Replace the NVRAM on the BCU and reassemble the machine.
4. Contact your supervisor for details on how to enter the machine's device number and destination code.
NOTE: SC999 or "Fusing Unit Setting Error" may be displayed until the machine's device number and destination code is programmed properly.
5. Turn the main switch off/on.
6. Reset the settings for meter charge with SP5-930-1 to -5.
7. Enter the SP and UP mode changes that were made at the factory and in the field.
8. Execute the process control self-check.
9. Perform ACC for the copier application.
10. Perform ACC for the printer application.

### 3.4.11 REQUIRED ACTIONS WHEN REPLACING ITEMS

| ITEMS | BEFORE REPLACING | AFTER REPLACING |
| :--- | :--- | :--- |
| Scanner unit | None | 1. Adjust the registration for the <br> scanner and ARDF. <br> 2. Do ACC for the copier application. <br> 3. Do ACC for the printer application. |
| Printer mainframe | None | 1. Do ACC for the copier application. <br> 2. Do ACC for the printer application. |
| NVRAM expansion <br> board on the <br> controller | 1. Print out the SMC report. <br> 2. Export the User Codes. | 1. Execute SP5-801-3. <br> 2. Execute SP5-801-9. <br> 3. Execute SP5-801-10. |
|  |  | 4. Execute SP5-801-12. <br> 5. Reset the system settings. <br> 6. Enter the SP and UP mode values <br> from the SMC report. |
|  |  | 7. Import the User Codes. |
|  |  | 8. Do ACC for the copier application. <br> 9. Do ACC for the printer application. |
| NVRAM on the | Print out the SMC report. | 1. Enter the SP and UP mode values <br> from the SMC report. |
| controller |  |  |

### 3.5 PRINTER ENGINE

### 3.5.1 TONER SUPPLY UNIT

CAUTION: 1) Do not touch the PCU development drums or the transfer belt. Do not let any metal object touch the PCU development sleeves.
2) Having removed the PCUs, cover them with paper or cloth. Keep them in a dark place.

## Preparation

1. Front cover ( '3. Removal \& Adjustment' in the service manual for the printer mainframe)
2. All development units
3. All PCUs
4. Transfer unit lock bracket
5. Transfer unit
6. Right, rear, and upper rear covers
7. Paper exit tray
8. Laser optics housing unit
9. Development clutch securing plate

## M Toner Supply Unit

1. Right inner cover with the drum positioning plate $[\mathrm{A}]$ (会 $\times 3$ )
2. $M$ development unit plate $[B](\hat{\xi} \times 1)$


3. Development unit left guide $[C](\hat{\xi} \times 1)$
4. Registration upper stay [D] ( $\hat{\xi}^{2} \times 4$ )


CAUTION: 1) When you remove a toner supply pipe, some toner spills out. Before removing it, place some paper or cloth beneath the toner supply unit and waste toner collection path.
2) After removing a pipe, close it with a paper clip or tape.
5. Toner path cover $[E](\hat{\xi} \times 2)$
6. Toner supply pipe [F]



1. Wind the harness $[A]$ on the shaft.
2. Insert the toner collection pipe [B].

NOTE: Check that the pipe does not come off the unit.

3. Remove the toner supply unit bushing [C].

[E]
4. Install the unit [D] and secure it with the screws.
5. Unwind the harness and connect it.
6. Install the bushing.
7. Connect the toner supply pipe and the waste toner collection pipe [E].
8. Check that the pipes [F] do not come off the unit.
9. Attach the toner path cover and secure it with screws.
10. Reassemble the machine.


## K, C, and Y Toner Supply Units



1. Development unit plate and development unit guide ( $-M$ toner Supply Unit)
2. PCU 3 C guide rail $[\mathrm{A}](\hat{\xi} \times 1)$

NOTE: Pull the front plate $[B]$ slightly.

3. Branch toner path cover [C] (
4. Toner path cover, toner supply pipe, and toner supply unit ( $\sim$ Toner Supply Unit)

### 3.5.2 BCU

NOTE: 1) After replacing the BCU, remove the NVRAM on the old board and install it on the new board.
2) A DIP switch setting is required, if the new board has a DIP switch. (-Following page - DIP Switch Settings)

1. Option bracket $[A]\left(\mathcal{S}^{2} \times 2\right)$
2. Rear cover $[B](\underset{\xi}{(1)} \times 4)$

3. Cover bracket [C] (会 $\times 3$ )
4. Inner bracket [D] (

5. Connector cover $[E]\left(\begin{array}{l}\text { 为 } \times 1)\end{array}\right.$

NOTE: After replacing the BCU, remove the NVRAM on the old board and install it on the new board. If the NVRAM on the old board is defective, replace the NVRAM (-3.1.10 NVRAM Replacement Procedure).


## DIP switch settings

NOTE: This setting is very important. If the switch is not set correctly, a paper jam or fusing problem will occur (Caution below)

DIP switch settings (service parts default: All OFF)

| DIP SW No. | OFF |
| :---: | :--- |
| $\mathbf{y}$ | ON |
| $\mathbf{4}$ to 3 | Fusing clutch is not installed. |
|  | Factory Use Only: Keep these switches OFF. |

## Setting Procedure:

1. Make sure all DIP switches on the new BCU board are OFF.
2. If the board already installed in the machine has no DIP SW, simply install the new board as is, i.e. with the DIP SW OFF.
3. However if the board already installed has a DIP SW, set the SW on the new board to match the setting on the old board before installing.
4. After installing the BCU board, make sure the machine is able to normally print out the configuration page.


CAUTION: 1) If the switch is mistakenly turned OFF in machines that have the clutch, a paper jam will occur near the fusing unit entrance, since the machine cannot drive the clutch.
2) Similarly, if the switch is mistakenly turned $\mathbf{O N}$ in machines that do not have the new clutch, fusing problems will occur. This will cause the machine to think that there is a clutch installed. The machine will then release the "Clutch Off" signal to stop the drive to the fusing components, whenever they are not needed. When it does this, the PM counters for the fusing unit and oil supply unit will not count up, even though the parts are actually moving (as the clutch is not there to stop them). As a result, the message for the End of the PM period will come too late, overstressing these parts.

### 3.6 OTHERS

### 3.6.1 TOUCH PANEL POSITION ADJUSTMENT

NOTE: It is necessary to calibrate the touch panel in the following cases:

- When the operation panel is replaced.
- When the NVRAM expansion board is replaced.
- When the touch panel detection function is not working correctly

NOTE: Do not attempt to use items [2] to [9] on the Self-Diagnostic Menu. These items are for design use only.

1. Press $\widehat{\Omega}$, press (1)(9)(3) and then press (0) 5 times to open the SelfDiagnostics menu.

2. On the touch screen press "Touch Screen Adjust" (or press (1)).
3. Use a pointed (not sharp!) tool to press the upper left mark ${ }^{\circ} \mathbf{K}$.
4. Press the lower right mark ${ }_{\circ}$ after it appears.
5. Touch a few spots on the touch panel to confirm that the marker (+) appears exactly where the screen is touched.

If the + mark does not appear where the screen is touched, press Cancel and

```
O}\quad\mathrm{ TouchScreen Adjust
```

Touch the upper left mark and then the lower right mark of the panel using a pointed tool.

Press the [C] key to quit
Re-input is available using [./*] key.
repeat from Step 2.
6. When you are finished, press [\#] OK on the screen (or press \#).
7. Touch [\#] Exit on the screen to close the Self-Diagnostic menu and save the calibration settings.

## $\Rightarrow$ 3.6.2 G367 TO G570 MODIFICATION

## Background

Use the following procedure when attaching a G367 Copy Feature Expander (G080) to a G060 printer.

## Preparation

Items needed for conversion.
DIMM \#1 for G570 Copy Feature P/N: G5706691 (See TSB G060/G570 - 036)
Flashcards loaded with the following G570 Copy Feature Expander firmware:
CF NIB, Scanner Application, Fax Application and Operation Panel (LCDC)

## Procedure

Turn the main power switch OFF.

1. Remove the controller ( 2 screws) $[A]$.

2. Remove the printer DIMM (Slot 1) $[B]$
3. Insert DIMM \#1 for the G570 into the upper slot [C].
4. Insert DIMM \#2 for the G570 (included) into the center slot [D].
5. Turn controller board DIP SW1 ON.

6. Install the CF Expander into the G060 mainframe.

NOTE: Note: Do not turn the main power on at this time. If it is turned on SC672/990 will be displayed but will not affect the update.
7. Upgrade to the G060 firmware as follows.

Firmware needed:
CF NIB, Scanner Application, Fax Application
Follow the five steps below (in roman numerals) and upgrade the CF NIB, Scanner Application, and Fax Application. After all three are completed, continue with step 7.
I. Make sure the main power switch is OFF.
II. Remove the IC card cover [D].
III. Fully insert the IC card [E] containing the required firmware into the IC card slot on the controller.
IV. Turn the main power ON. The upgrade will begin automatically.
V. After the firmware update is completed, "Update done" or "Power Off On" will be displayed. Turn OFF the main power and remove the IC card.

8. Turn controller board DIP SW 1 OFF.

NOTE: Please do not turn the main power on at this time. If it is turned on characters on the panel will appear garbled, but this will not affect the update.
9. Upgrade to the G570 LCD firmware (Operation Panel).

NOTE: During the LCD firmware update, the Operation Panel will not function. The Start Key will flash RED. Do not power off unit the Start Key flashes GREEN.
I. Make sure that the main switch is OFF.
II. Fully insert the IC card containing the Operation Panel firmware into the IC card slot on the controller.
III. Turn the main switch ON. After the following message is displayed, press the button for the firmware you are updating (Operation Panel, Engine, etc.).

IV. Pressing the Update button starts the firmware update. To indicate the progress, bars change to asterisks one by one.

V. After the firmware update is completed, "Update done" or "Power Off On" will be displayed. Turn OFF the main switch and remove the IC card.


Start key status indication

- When the above message disappears, the Start key will blink red. This indicates that the machine has started the firmware update. The total time for the update is approximately 5 minutes.
- When the firmware update is completed, the Start key will blink green.

10. If updating any other firmware, repeat the procedure from Step 8.

This completes the G367 to G570 modification.

## 4. TROUBLESHOOTING

### 4.1 PROCESS CONTROL ERROR CONDITIONS

### 4.1.1 DEVELOPER INITIALIZATION RESULT

SP-3-005-6 (Developer Initialization Result)

| No. | Result | Description | Possible Causes | Action |
| :---: | :---: | :---: | :---: | :---: |
| 0 | Not performed | Developer initialization is not performed. | When initializing only the black developer, the initialization result becomes "1000". | When done in SP mode, do the developer initialization again. If the result is the same, reinstall the engine main firmware. <br> When done at unit replacement: <br> - Check if a new unit is installed <br> - Check if the unit detection system is working <br> - Check if SP2-223-1 (auto initialization at unit replacement) is enabled. |
| 1 | Successfully completed | Developer initialization is successfully completed. | - | - |
| 2 | Forced termination | Developer initialization was forcibly terminated. | A cover was opened or the main switch was turned off during the initialization. | When done in SP mode, do the developer initialization again. If the result is the same, reinstall the engine main firmware. <br> When done at unit replacement, turn the main switch off and on. |
| 3 | Vt error | Vt is less than 0.5 V and "Reset development unit" is displayed. | 1. Check if the drum s <br> 2. Check if the develop <br> 3. If the problem is stil <br> - Poor connection <br> - TD sensor defect <br> - Harness damage <br> - BCU board failure <br> - Firmware problem | ay is properly set and secured. ment unit is properly set. the same, check the following: of connectors ve <br> (engine main or MUSIC) |

## PROCESS CONTROL ERROR CONDITIONS

| No. | Result | Description | Possible Causes | Action |
| :--- | :--- | :--- | :--- | :--- |
| 8 | $\begin{array}{l}\text { Toner supply } \\ \text { error }\end{array}$ | $\begin{array}{l}\text { During toner fill-up } \\ \text { mode, Vt does not } \\ \text { reach the target } \\ \text { value. }\end{array}$ | $\begin{array}{l}\text { 1. Check if the toner cartridge is properly set. } \\ \text { 2. Check if the amount of toner left in the toner cartridge } \\ \text { is insufficient. } \\ \text { 3. Check if toner is coagulated. (If yes, shake the toner } \\ \text { cartridge well.) }\end{array}$ |  |
| 4. Check if the connectors of the following parts are |  |  |  |  |
| properly set, and/or replace the parts. |  |  |  |  |
| Toner attraction pump / Air pump / Valves |  |  |  |  |$\}$| 5. Check if the toner supply tube is bent, caught, or |
| :--- |
| damaged. |

NOTE: When the machine detects new development units, it automatically starts developer initialization. If an error other than Error 8 occurs, developer initialization is automatically resumed by opening and closing the front door or turning the main switch off and on.

### 4.1.2 PROCESS CONTROL SELF-CHECK RESULT

SP3-975-1 (Process Control Self-check Result)

| No. | Result | Description | Possible Causes | Action |
| :---: | :---: | :---: | :---: | :---: |
| 0 | Not performed | Process control selfcheck is not done. | - | Do the process control self-check again. |
| 1 | Successfully completed | Process control selfcheck successfully completed. |  |  |
| 2 | ID sensor adjustment error | Vsg cannot be adjusted within $4.0 \pm$ 0.5 V . | 1. Dirty ID sensor (toner, dust, or foreign material) | 1. Clean the ID sensor. |
|  |  |  | 2. Dirty transfer belt | 2. Check the belt cleaning, and clean or replace the transfer belt. |
|  |  |  | 3. Scratched or damaged transfer belt | 3. Replace the transfer belt. |
|  |  |  | 4. Defective ID sensor | 4. Replace the ID sensor. |
| 3 | Vmin error | Vmin is not within the specified range. | Vmin is calculated during the self-check. Even when the calculated Vmin value is out of the specified range, an optimum value is automatically used instead. Therefore, this error code does not usually occur. If no problem is observed with image density and/or development gamma, nothing needs to be done. If an image problem such as low image density is observed, check the following points: <br> Transfer belt / Belt guide plate / ID sensor |  |
| 4 | Sampling data error | Not enough data can be sampled. | 1. ID sensor pattern density is too high or low. <br> 2. Residual image on transfer belt <br> 3. Toner dropped from development unit <br> 4. Scratched or damaged transfer belt | 1. Check the image development process and correct toner density if necessary. <br> 2. Check the transfer belt cleaning unit. <br> 3. Clean the development unit and correct toner density. <br> 4. Replace the transfer belt. |
| 5 | Gamma error | Gamma is out of range. <br> $0.3>$ Gamma, or <br> 6.0 < Gamma |  |  |
| 6 | Vk error | Vk is out of range. $-150>$ Vk or $150<$ Vk |  |  |
| 7 | Vt error | Vt is out of range. $0.5>\mathrm{Vt}$ or $4.8<\mathrm{Vt}$ | 1. Development unit not properly installed. | 1. Check. |
|  |  |  | 2. Toner density is too low or high. | 2. Check and/or correct toner density. |
|  |  |  | 3. TD sensor defective. | 3. Replace development unit. |
| 8 | Sampling data error during LD power correction | Not enough data can be sampled during the LD power correction (if SP3-$125-2$ is set to " 2 "). | See the possible causes and action for error codes 4, 5 , and 6. |  |
| 9 | Forced termination | Process control selfcheck was forcibly terminated. | A cover was opened or the main switch was turned off during the self-check. | Do the process control self-check again. |

### 4.1.3 LINE POSITION ADJUSTMENT RESULT

SP5-993-7 (Line Position Adjustment Result)

| No. | Result | Description | Note |
| :---: | :--- | :--- | :--- |
| 01 | Successfully <br> completed | Data sampling was correctly done and line position <br> adjustment was successfully completed. |  |
| 02 | Out of adjustment <br> range <br> (over $\pm 2 \mathrm{~mm})$ | The calculated result for line position correction is <br> greater than $\pm 2 \mathrm{~mm}$. |  |
| 03 | Calculation Error | Distance between the lines is greater than $\pm 2 \mathrm{~mm}$. |  |
| 04 | Sampling Error | Data sampling cannot be done properly. | (- Note below) |
| 05 | Descending slope <br> error | The ascending or descending slope of the ID sensor <br> signal wave is out of specification. |  |
| 06 | Ascending slope <br> error | Pattern lines <br> mismatch <br> (less than 64 lines) | The detected number of pattern lines is less than 64. |
| 08 | Sampling time-out | Data sampling cannot be done within the allocated <br> time. | ( |

Note: Concerning the error codes ( $05,06,07$ or 10 ) which stop sampling data when either the front or rear ID sensor detect an error, the machine may display the error code for both ID sensors in some cases.

Possible causes of errors in the line position adjustment

| Possible Cause |  | Possible Error Code | Action |
| :---: | :---: | :---: | :---: |
| 1 | The pattern does not reach the proper density. |  |  |
|  | 1. Dirty ID sensor (toner, dust, or foreign material) | $\begin{aligned} & 04,05,06,07, \\ & 08,09,10 \end{aligned}$ | 1. Clean the ID sensors. |
|  | 2. Incorrect toner density Low: ID sensor cannot detect the pattern lines. High: Lines may be partially blank due to improper toner density and/or paper transfer current. |  | 2. Correct the toner density. |
|  | 3. Incorrect transfer current |  | 3. Correct the transfer current. |
| 2 | The ID sensors are affected by electrical noise or dirt/damage on the transfer belt. |  |  |
|  | 1. Scratched or damaged OPC drum | $\begin{aligned} & 02,03,04,05, \\ & 06,10,11,12 \end{aligned}$ | 1. Replace PCU |
|  | 2. Scratched or damaged transfer belt |  | 2. Replace transfer belt |
|  | 3. Dirty transfer belt |  | 3. Clean or replace transfer belt |
|  | 4. High voltage leak in transfer unit |  | 4. Fix the high voltage leak |
|  | 5. Residual image on transfer belt |  | 5. Check transfer belt cleaning and clean the belt |
|  | 6. Toner dropped from development unit |  | 6. Clean the development unit and adjust the toner density |
|  | 7. Carrier dropped from development unit |  | 7. Clean the development unit and adjust the toner density |
| 3 | The transfer belt is covered with toner. |  |  |
|  | Development does not work properly. | All error codes | Check all units and high voltage cable connectors. |
| 4 | None of the patterns are developed. |  |  |
|  | Development does not work properly. | 09, 04 | Check all units and high voltage cable connectors. |
| 5 | Some of the patterns are not developed; |  |  |
|  | Development does not work properly. | 07, 08 | Check all units and high voltage cable connectors. |
| 6 | The machine is not in the condition to execute the line position adjustment; |  |  |
|  | The machine is in the toner near end or end condition. | 13 | Replenish toner. |
|  | The machine is not ready to do the line position adjustment manually from the user menu. | 17 | Wait until machine becomes the ready condition from the energy saver or auto off mode. |
|  | Line position adjustment cannot be done due to failed potential control. | 18 | Fix the problem causing the potential control error. |
| 7 | The MUSIC CPU is abnormal (1) |  |  |
|  | No error code is displayed. However, the machine keeps displaying "execution" on the screen. In addition, the green LED on the BICU stays on or off under the following condition. <br> 1. The MUSIC CPU resets due to electrical noise generated by a high voltage leak on a damaged OPC drum. | - | 1. Fix the bias leak and/or replace PCU |


| Possible Cause Possible <br> Error Code <br> 8 The MUSIC CPU is abnormal (2) <br> No error code is displayed. However, <br> the machine keeps displaying <br> "execution" on the screen. <br> The green LED on the BICU keeps <br> blinking faintly (this is normal) even <br> under one of the following conditions. <br> 1. Poor connection between the toner <br> cartridge detection board and the <br> memory chip on the toner cartridge - <br> 2. The memory chip on the toner <br> cartridge fails. 1. Check the connection between <br> the detection board and memory <br> chip. <br> 2. Replace the toner cartridge.  |  |
| :--- | :--- | :--- |

### 4.2 SCANNER TEST MODE

### 4.2.1 VPU TEST MODE

To make sure the scanner VPU control is functioning, output the VPU test pattern with SP4-907. After you have set the SP mode settings and pressed the start key, the VPU test pattern is printed out.

## SP4-907-1 VPU Test Pattern: R

## SP4-907-2 VPU Test Pattern: G

## SP4-907-3 VPU Test Pattern: B

- If the copy is abnormal and the VPU test pattern is normal, the CCD on the SBU board may be defective.
- If the copy is normal and the VPU test pattern is abnormal, the harness may not connected properly between SBU and IPU, or the IPU or SBU board may be defective.


### 4.2.2 IPU TEST MODE

You can check the IPU board with the SP mode menu, SP4-904-1 or 2.
If no error is detected, the test ends, and the completion code appears in the operation panel display. If an error is detected, the test is interrupted and an error code is displayed. The table below lists the completion and error codes.

SP4-904-1 Register Write/Read Check Result

|  | Code | Defective ASIC |
| :--- | :---: | :--- |
| Normal end | 00 | - |
| Abnormal end | 11 | ASIC 1 |
|  | 12 |  |
|  | 13 |  |
|  | 14 | ASIC 3 |
|  | 15 | ASIC 2 |

## SP4-904-2 Image Path Check Result

|  | Code | Error detected in the image data path |
| :--- | :---: | :--- |
| Normal end | 00 | - |
| Abnormal end | 21 | ASIC $1 \rightarrow$ Field memory |
|  | 22 | ASIC $1 \rightarrow$ ASIC $2 \rightarrow$ ASIC $1 \rightarrow$ Field memory |
|  | 23 | ASIC $1 \rightarrow$ ASIC 3 |
|  | 24 | ASIC 3 $\rightarrow$ ASIC $1 \rightarrow$ ASIC $2 \rightarrow$ ASIC $1 \rightarrow$ Field memory |

Errors may be caused by the following problems:

1) Short circuit on the signal lines

- When the IPU board is installed, one or more pins on the ASIC is damaged.
- Some conductive matter or object is trapped among the pins.
- Condensation

2) Destruction of circuit elements

- Overcurrent or a defective element has broken the circuit.

3) Abnormal power supply

- The required voltage is not supplied to the devices.

4) Overheat/overcooling

- The board (the scanner unit) is in an inappropriate environment.

5) Static electricity

- Static electricity of a high voltage occurred during the test.

6) Others

- Error code 13 may be detected if the write/read check is performed after the image path check. Turn the main switch off and on after the image path check.
- For codes 21 to 24

The connector between the scanner unit and the IPU board is not connected, or the LSYNC signals are not input to the IPU board.

### 4.3 SERVICE CALL CONDITIONS

### 4.3.1 SUMMARY

There are 2 levels of service call conditions.

| Level | Definition | Reset Procedure |
| :---: | :--- | :--- |
| A | Fusing unit SCs displayed on the <br> operation panel. The machine is disabled. <br> The user cannot reset the SC. | Turn the main switch off then on <br> before entering SP mode. Reset <br> the SC (set SP5-810 to 1), then <br> turn the main switch off then on <br> again. |
| B | Turning the operation switch or main <br> power switch off then on resets the SC. <br> Displayed on the operation panel. Re- <br> displayed if they occurred after the main <br> power switch is turned on again. | Turn the operation switch or <br> main power switch off and on. |

All SCs are logged.

- The number of SC codes detected can be checked with SP7-902.
- Printing the logging data (SP5-990-4) in SP mode can check the last 10 SC codes detected and total counters when the SC code is detected.

NOTE: 1) If the problem is related to electrical circuit boards, first disconnect, then reconnect the connectors before replacing the PCBs.
2) If the problem is related to a motor lock, first check the mechanical load before replacing motors or sensors.

## SC Classification

SC codes are classified by section as shown in the following table:

| Class 1 | Section | SC Code | Detailed section |
| :---: | :---: | :---: | :---: |
| 1XX | Scanning | 190 - | Unique for a specific model |
| 2XX | Laser exposure | 200 - | Polygon motor |
|  |  | 220 - | Synchronization control |
|  |  | 230 - | FGATE signal related |
|  |  | 240 - | LD control |
|  |  | 260 - | Magnification |
|  |  | 280 - | Unique for a specific model |
| 3XX | Image development 1 | $300-$ | Charge |
|  |  | 330 - | Drum potential |
|  |  | 350 - | Development |
|  |  | 380 - | Unique for a specific model |
| 4XX | Image development 2 | 400 - | Image transfer |
|  |  | 420 - | Paper separation |
|  |  | 430 - | Cleaning |
|  |  | 440 - | Around drum |
|  |  | 460 - | Unit |
|  |  | 480 - | Others |
| 5XX | Paper feed / Fusing | 500 - | Paper feed |
|  |  | 515 - | Duplex |
|  |  | 520 - | Paper transport |

SERVICE CALL CONDITIONS

| Class 1 | Section | SC Code | Detailed section |
| :---: | :---: | :---: | :---: |
| 5XX | Paper feed / Fusing | 530 - | Fan motor |
|  |  | 540 - | Fusing |
|  |  | 560 - | Others |
|  |  | 570 - | Unique for a specific model |
| 6XX | Communication | 600 - | Electrical counters |
|  |  | 620 - | Mechanical counters |
|  |  | 630 - | Account control |
|  |  | 640 - | CSS |
|  |  | $650-$ | Network |
|  |  | 670 - | Internal data processing |
|  |  | 680 - | Unique for a specific model |
| 7XX | Peripherals | $700-$ | Original handling |
|  |  | 710 - |  |
|  |  | 730 - | Mail box |
|  |  | 740 - | Finisher |
|  |  | $750-$ | Stapler (1) |
|  |  | 760 - | Stapler (2) |
|  |  | 780 - | Unique for a specific model |
| 8XX | Controller | $800-$ | Error after ready condition |
|  |  | 820 - | Diagnostics error |
|  |  | 860 - | Hard disk |
|  |  | 880 - | Unique for a specific model |
| 9XX | Others | $900-$ | Counter |
|  |  | 920 - | Memory |
|  |  | 990 - | Others |

### 4.4 SC TABLE

NOTE: "CF" in the SC number column indicates a code related to the CF expander.

| SC No. | Item | Definition | Possible Cause | Related SCs | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { SC } 101 \\ \text { (CF) } \end{gathered}$ | Exposure lamp error | - The standard white level is not properly detected when scanning the shading plate. (The shading data peak does not reach the specified threshold.) | - Exposure lamp defective <br> - Lamp stabilizer defective <br> - Exposure lamp connector defective <br> - Standard white plate dirty <br> - Scanner mirror or scanner lens out of position or dirty <br> - SBU defective |  | 1. Turn the main switch off and on. <br> 2. Turn the power key off and on. <br> 3. Check and clean the scanner mirror(s) and scanner lens. <br> 4. Check and clean the shading plate. <br> 5. Replace the exposure lamp. <br> 6. Replace the lamp stabilizer. <br> 7. Replace the scanner mirror(s) or scanner lens. <br> 8. Replace the SBU. | B |
| $\begin{gathered} \text { SC } 120 \\ \text { (CF) } \end{gathered}$ | Scanner home position error 1 | - The scanner home position sensor does not detect the on condition during scanning. | - Scanner PSU or SBU defective <br> - Scanner motor defective <br> - Harness between scanner PSU and scanner motor disconnected <br> - Scanner HP sensor defective <br> - Harness between SBU and HP sensor disconnected <br> - Scanner wire, timing belt, pulley, or carriage defective | $\begin{aligned} & \text { SC } 121 \\ & \text { and } 122 \end{aligned}$ | 1. Turn the main switch off and on. <br> 2. Check the cable connection between the scanner PSU and scanner motor. <br> 3. Check the cable connection between the SBU and HP sensor. <br> 4. Replace the SBU or scanner PSU. <br> 5. Replace the scanner motor. <br> 6. Replace the HP sensor. <br> 7. Replace the scanner wire, timing belt, pulley, or carriage. | B |


| SC No. | Item | Definition | Possible Cause | Related SCs | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { SC } 121 \\ \text { (CF) } \end{gathered}$ | Scanner home position error 2 | - The scanner home position sensor does not detect the off condition during scanning. | - Scanner PSU or SBU defective <br> - Scanner motor defective <br> - Harness between scanner PSU and scanner motor disconnected <br> - Scanner HP sensor defective <br> - Harness between SBU and HP sensor disconnected <br> - Scanner wire, timing belt, pulley, or carriage defective | $\begin{aligned} & \text { SC } 120 \\ & \text { and } 122 \end{aligned}$ | 1. Turn the main switch off and on. <br> 2. Check the cable connection between the scanner PSU and scanner motor. <br> 3. Check the cable connection between the SBU and HP sensor. <br> 4. Replace the SBU or scanner PSU. <br> 5. Replace the scanner motor. <br> 6. Replace the HP sensor. <br> 7. Replace the scanner wire, timing belt, pulley, or carriage. | B |
| $\begin{aligned} & \text { SC } 122 \\ & \text { (CF) } \end{aligned}$ | Scanner home position error 3 | - The scanner home position sensor does not detect the home position during initialization. | - Scanner PSU or SBU defective <br> - Scanner motor defective <br> - Harness between scanner PSU and scanner motor disconnected <br> - Scanner HP sensor defective <br> - Harness between SBU and HP sensor disconnected <br> - Scanner wire, timing belt, pulley, or carriage defective | $\begin{aligned} & \text { SC } 120 \\ & \text { and } 121 \end{aligned}$ | 1. Turn the main switch off and on. <br> 2. Check the cable connection between the scanner PSU and scanner motor. <br> 3. Check the cable connection between the SBU and HP sensor. <br> 4. Replace the SBU or scanner PSU. <br> 5. Replace the scanner motor. <br> 6. Replace the HP sensor. <br> 7. Replace the scanner wire, timing belt, pulley, or carriage. | B |


| SC No. | Item | Definition | Possible Cause | Related SCs | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { SC142 } \\ \text { (CF) } \end{gathered}$ | White level detection error | - The white level cannot be adjusted within the target during auto gain control. | - Dirty exposure glass or optics section <br> - SBU board defective <br> - IPU board defective <br> - Exposure lamp defective <br> - Lamp stabilizer defective |  | 1. Turn on the main switch off and on. <br> 2. Clean the exposure glass, white plate, mirrors, and lens. <br> 3. Check if the exposure lamp is lit during initialization. <br> 4. Check the harness connection between SBU and IPU. <br> 5. Replace the exposure lamp. <br> 6. Replace the SBU board. <br> 7. Replace the IPU board | B |
| $\begin{gathered} \hline \text { SC } 161 \\ \text { (CF) } \end{gathered}$ | IDU error | - After the command is written into the DFID selfdiagnosis startup register, the correct value is not stored in the register in the specified duration. NOTE: This error is detected when the main switch is turned on. <br> - After the negate interruption of FGATE occurs, IDU is not recognized in the specified duration. NOTE: This error is detected during scanning operations. | - IPU board defective (defective connection between ASIC and DFID, or Defective LSYNC) |  | 1. Turn the main switch off and on. <br> 2. Replace the IPU board. | B |
| SC195 | Serial Number Mismatch | - Serial number stored in the memory does not consist of the correct code. | - NVRAM defective <br> - BCU replaced without original NVRAM |  | Open the front cover and turn on the main switch. Check the serial number with SP5-811-2. <br> If the stored serial number is incorrect, contact your product specialist for details of how to solve the problem. | B |

SC TABLE

| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC201 | Polygon motor error | - The polygon mirror motor does not reach the targeted operating speed within 15 seconds after turning on. <br> - The lock signal does not become low within 15 seconds after turning off the polygon motor. . | - Polygon mirror motor error <br> - Abnormal GAVD behavior <br> - Cable disconnection |  | 1. Turn the main switch off and on. <br> 2. Check the cables. <br> 3. Replace the polygon motor. | B |
| SC220 | Synch. detection signal error 1 $220-1: ~ Y$ $220-2: ~ M$ $220-3: ~ C$ $220-4:$ K0 $220-5:$ K1 | The front (for K\&Y) or rear (for C\&M) laser synchronizing detector board, which is used to determine the start timing of laser writing, does not send a signal while the polygon motor is operating normally and the LD is on. | - Disconnection of the cable between front (K\&Y) or rear (C\&M) synchronizing detector board and the LD unit <br> - Incorrect installation of front (K\&Y) or rear (C\&M) synchronizing detector board (the beam does not target the photo detector.) <br> - Defective LD unit <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the cable connection between front (for K\&Y) or rear (for C\&M) synchronizing detector board and the LD unit. <br> 3. Check or reinstall the front (for K\&Y) or rear (for C\&M) synchronizing detector board. <br> 4. Replace the front (for K\&Y) or rear (for C\&M) synchronizing detector board. <br> 5. Replace the LD unit. <br> 6. Replace the BCU. | B |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 221 | Synch. detection signal error 2 221-1: Y <br> 221-2: M <br> 221-3: C <br> 221-4: K | Main scan length detection is not properly completed ten consecutive times. <br> The front (for C\&M) or rear (for K\&Y) laser synchronizing detector boards are used for the main scan length detection, which automatically corrects the main-scan magnification. | - Damaged or disconnected cable between front (C\&M) or rear (K\&Y) laser synchronizing detector board and the LD unit <br> - Incorrect installation of front (C\&M) or rear (K\&Y) synchronizing detector board (the beam does not target the photo detector.) <br> - Defective front (C\&M) or rear (K\&Y) synchronizing detector board <br> - Defective LD unit |  | After doing any of the following, print ten jobs or more to see if the same SC code is displayed: <br> 1. Turn the main switch off and on. <br> 2. Check or replace the cable connecting front (for C\&M) or rear (for K\&Y) synchronizing detector board and the LD unit. <br> 3. Check or reinstall the front (for C\&M) or rear (for K\&Y) synchronizing detector board. <br> 4. Replace the front (for C\&M) or rear (for K\&Y) synchronizing detector board. <br> 5. Replace the LD unit. <br> 6. Replace the BCU. <br> If a synch. detector board cannot be replaced, do the following as a temporary measure: <br> - Disable main scan length detection (SP 2-919-1) | B |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 230 | $\begin{aligned} & \text { FGATE error } \\ & 230-1: \mathrm{Y} \\ & 230-2: \mathrm{M} \\ & 230-3: \mathrm{C} \\ & 230-4: \mathrm{K} \end{aligned}$ | The BCU generates the FGATE signal based on the registration sensor ON timing. Then, it sends the signal to the LD units. The LD units send a feedback signal to the BCU. When the LD units start emitting laser beams, the feedback signal changes from High to Low. <br> The SC code is generated when the BCU receives no feedback signal (stays High) from the LD unit 1 second after paper reaches the position where the laser should start writing. | - Poor connection between BCU and LD units <br> - Defective BCU <br> - Defective LD unit |  | 1. Turn the main switch off and on. <br> 2. Check the cables between the LD units and the BCU. <br> 3. Replace the LD unit. <br> 4. Replace the BCU. | B |
| SC 231 | $\begin{aligned} & \text { FGATE timeout } \\ & \text { 231-1: } \mathrm{Y} \\ & 231-2: \mathrm{M} \\ & \text { 231-3: } \mathrm{C} \\ & \text { 231-4: } \mathrm{K} \end{aligned}$ | When LD units emit laser beams to print a job, the feedback signal stays Low and becomes High after laser exposure for a page is completed. The SC code is detected in the following cases: <br> - When the feedback signal stays Low 7 seconds after completing the laser exposure, or <br> - When the feedback signal stays Low until the laser exposure timing for the next page in multi-page print mode. | - Poor connection between BCU and LD units <br> - Defective BCU <br> - Defective LD unit |  | 1. Turn the main switch off and on. <br> 2. Check the cables between the LD units and the BCU. <br> 3. Replace the LD unit. <br> 4. Replace the BCU. | B |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 240 | $\begin{aligned} & \text { LD over } \\ & 240-1: Y \\ & 240-2: \mathrm{M} \\ & 240-3: C \\ & 240-4: \mathrm{K} \end{aligned}$ | The power supply for the LD unit exceeds 67 mA . | - LD worn out (current/light output characteristics have changed.) <br> - LD broken (short circuit) |  | 1. Turn the main switch off and on. <br> 2. Replace the LD unit. | B |
| SC 260 | LD HP sensor not switched on (for K only) | During homing, it takes more than five seconds to switch the HP sensor on (the sensor actuator does not cover the sensor). | - Defective motor <br> - Defective sensor <br> - Mechanical problem when switching the actuator <br> - Brown fuse (FU81) on the Power supply unit |  | 1. Turn the main switch off and on. <br> 2. Check the sensor actuator position of the LD positioning motor. <br> 3. Replace the LD positioning motor. <br> 4. Replace the LD home position sensor. <br> 5. Check and/or replace the PSU. | B |
| SC 261 | LD HP sensor not switched off (for K only) | After the laser beam pitch was changed, it takes more than five seconds for the HP sensor to switch off. | - Defective motor <br> - Defective sensor <br> - Mechanical problem when switching the actuator <br> - Brown fuse (FU81) on the Power supply unit |  | 1. Turn the main switch off and on. <br> 2. Check the sensor actuator position of the LD positioning motor. <br> 3. Replace the LD positioning motor. <br> 4. Replace the LD home position sensor. <br> 5. Check and/or replace the PSU. | B |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 285 | Line position adjustment (MUSIC) error | Line position adjustment fails three consecutive times. | - Pattern sampling error due to insufficient image density of patterns used for the adjustment <br> - Inconsistency in the sampling line position adjustment pattern due to dust on the pattern, damage to the OPC drum, damage or toner dropped on the transfer belt, or a dirty or defective ID sensor |  | 1. Turn the main switch off and on. <br> 2. Check and fix the problem that causes low image density. . <br> 3. Clean or replace the transfer belt and/or the ID sensor. <br> 4. Replace the PCU or clean the development unit that causes toner to drop on the transfer belt. | B |
| SC 370 | TD sensor [K]: Adjustment error | During the developer initialization, the output value of the TD sensor is without the adjustment range ( $3.0 \pm 0.1 \mathrm{~V}$ ). | - Poor connection (TD sensor outputs is less than 0.5 V .) <br> - Defective TD sensor |  | 1. Turn the main switch off and on. <br> 2. Reset the related color development unit. <br> 3. Replace the related color development unit. | B |
| SC 371 | TD sensor [Y]: Adjustment error |  |  |  |  |  |
| SC 372 | TD sensor [C]: Adjustment error |  |  |  |  |  |
| SC 373 | TD sensor [M] : Adjustment error |  |  |  |  |  |
| SC 374 | Vt error [K] | During the image development, Vt value is less than 0.5 V . | - Poor connection (TD sensor outputs is less than 0.5 V .) <br> - Defective TD sensor |  | 1. Turn the main switch off and on. <br> 2. Reset the related color development unit. <br> 3. Replace the related color development unit. | B |
| SC 375 | Vt error [Y] |  |  |  |  |  |
| SC 376 | Vt error [C] |  |  |  |  |  |
| SC 377 | Vt error [M] |  |  |  |  |  |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 380 | Black development motor error | When the motor speed is within the target level, the motor sends a lock signal (High to Low at CN214-5) to the BCU. <br> SC380 is detected under the following conditions: <br> - The Lock signal stays High 2 seconds after the motor turns on. <br> - The Lock signal stays Low 2 seconds after the motor turns off. <br> - The Lock signal stays High for more than 2 seconds while the motor is on. | - Defective motor <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Replace the motor. <br> 3. Replace the BCU. | B |
| SC 381 | Color development motor error |  |  |  |  |  |
| SC 385 | ID sensor VSG adjustment error | Vsg is the out of adjustment range during a process control self-check. <br> Adjustment range: $4.0 \pm 0.5 \mathrm{~V}$ | - Defective ID sensor <br> - Dirty ID sensor <br> - ID sensor disconnected <br> - Dirty drum (cleaning incomplete) |  | 1. Turn the main switch off and on. <br> 2. Clean the ID sensor and adjacent parts. <br> 3. Check the drum cleaning condition. <br> 4. Check the ID sensor connector. <br> 5. Replace the ID sensor. | B |



| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { SC 391- } \\ & 01 \end{aligned}$ | Charge AC: output error 391-01: K 391-02: Y 391-03: M 391-04: C | The high voltage supply board sends the feedback signal (CN228-2 to 5; MCYK). The BCU monitors these feedback signals every 8 ms . If the average of the sampled data is not within the control target 30 consecutive times, this SC code is generated. | - Power pack disconnected <br> - Charge receptacle or terminal <br> - Defective PCU bias input terminal <br> - Incorrect power pack B/C output <br> - Damaged cable <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the connector. <br> 3. Check the PCU charge voltage input (the spring/conducting shaft) or replace the PCU. <br> 4. Replace the power pack B/C. <br> 5. Replace the cable. <br> 6. Replace the BCU. | B |
| $\begin{aligned} & \text { SC 460- } \\ & 001 \end{aligned}$ | Thermistor 1 error (open circuit) | When the temperature detected by thermistor 1, which is at the left (fusing unit) side of the laser optics unit, is less than $-30^{\circ} \mathrm{C}$ for 10 seconds consecutively, the BCU determines that the circuit is opened and displays this SC code. | - Thermistor 1 defective <br> - Cable connection error <br> - BCU defect |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Replace the thermistor. <br> 4. Replace the BCU. | B |
| $\begin{aligned} & \text { SC 460- } \\ & 002 \end{aligned}$ | Thermistor 1 error (short circuit) | When the temperature detected by the thermistor 1 , which is at the left (fusing unit) side of the laser optics unit, is higher than $70^{\circ} \mathrm{C}$ for 10 seconds consecutively, the BCU determines that the circuit is shorted and displays this SC code | - Thermistor 1 defective <br> - Cable connection error <br> - BCU defect |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Replace the thermistor. <br> 4. Replace the BCU. | B |

## SC TABLE

| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { SC 461- } \\ & 001 \end{aligned}$ | Thermistor 2 error (open circuit) | When the temperature detected by the thermistor 2, which is at the right (paper feed section) side of the laser optics unit, is less than $-30^{\circ} \mathrm{C}$ for 10 seconds consecutively, the BCU determines that the circuit is opened and displays this SC code. | - Thermistor 2 defective <br> - Cable connection error <br> - BCU defect |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Replace the thermistor. <br> 4. Replace the BCU. | B |
| $\begin{aligned} & \hline \text { SC 461- } \\ & 002 \end{aligned}$ | Thermistor 2 error (short circuit) | When the temperature detected by the thermistor 2, which is at the right (paper feed section) side of the laser optics unit, is higher than $70^{\circ} \mathrm{C}$ for 10 seconds consecutively, the BCU determines that the circuit is shorted and displays this SC code | - Thermistor 2 defective <br> - Cable connection error <br> - BCU defect |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Replace the thermistor. <br> 4. Replace the BCU. | B |
| SC 471 | Transfer belt H.P. error | The transfer belt HP sensor signal does not change from Low to High (home position) or vice versa 1 second after the transfer belt contact motor turns on. | - Transfer belt unit not set properly <br> - Defective transfer belt H.P. sensor and/or transfer belt set sensor <br> - Defective transfer belt contact motor <br> - Transfer belt unit problem |  | 1. Turn the main switch off and on. <br> 2. Reset the transfer belt unit. <br> 3. Clean or replace the transfer belt H.P. sensor and/or transfer belt set sensor. <br> 4. Replace the transfer belt contact motor. <br> 5. Check the contact and release mechanism of the transfer belt unit. | B |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 490 | Transfer bias / paper attraction roller bias leak error | The high voltage supply board (T/PA/CL) monitors the circuit and detects current leaks. If this happens, the high voltage supply board sends a SC signal (High to Low at CN213-8) to the BCU. <br> The BCU monitors this signal every 2 ms and generates this SC code when the error condition occurs 250 consecutive times. | - Defective high voltage supply board (T/PA/CL) <br> - Damaged transfer belt <br> - Transfer unit <br> - Damaged high voltage supply cables <br> - Damaged cables between the BCU and high voltage supply board <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the transfer unit and replace the belt and/or the transfer unit if any damage is found. <br> 3. Replace the high voltage supply board (T/PA/CL). <br> 4. Check and/or replace the high voltage supply cables. <br> 5. Check and/or replace the dc cables between the BCT and high voltage supply board. <br> 6. Replace the BCU. | B |
| SC 501 | $\begin{aligned} & \text { Paper Tray } 1 \\ & \text { error } \\ & \hline \end{aligned}$ | When the tray lift motor is turned on, if the upper limit is not detected within 10 seconds, the machine asks the user to reset the tray. If this condition occurs three consecutive times, the SC is generated. | - Defective paper lift sensor <br> - Defective tray lift motor <br> - Defective bottom plate lift mechanism |  | 1. Turn the main switch off and on. <br> 2. Check if the bottom plate smoothly moves up and down manually. <br> 3. Check and/or replace the paper lift sensor. <br> 4. Check and/or replace the tray lift motor. | B |
| SC 502 | $\begin{aligned} & \text { Paper Tray } 2 \\ & \text { error } \end{aligned}$ |  |  |  |  |  |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { SC 503- } \\ & 01 \end{aligned}$ | Tray 3 error (Paper Feed Unit or LCT) | For the paper feed unit: When the tray lift motor is turned on, if the upper limit is not detected within 18 seconds, the machine asks the user to reset the tray. If this condition occurs three consecutive times, the SC is generated. <br> For the LCT: <br> This SC is generated under the following conditions: <br> - If the upper or lower limit is not detected within 15 seconds when the tray lift motor is turned on to lift up or lower the tray <br> - If the paper stack is not transported within a specific number of pulses after the tray motor and stack transport clutch turn on to transport the paper stack <br> - If the end fence home position sensor stays ON for a specific number of pulses after the tray motor and stack transport clutch turn on to transport the paper stack. | For the paper feed unit: <br> - Defective tray lift motor or connector disconnection <br> - Defective lift sensor or connector disconnection <br> For the LCT: <br> - Defective stack transport clutch or connector disconnection <br> - Defective tray motor or connector disconnection <br> - Defective end fence home position sensor or connector disconnection <br> - Defective upper limit sensor or connector disconnection <br> - Defective tray lift motor or connector disconnection |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Check and/or replace the defective component. | B |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { SC 503- } \\ & 02 \end{aligned}$ | Tray 3 error (Paper Feed Unit or LCT) | - If the following condition occurs 3 consecutive times, this SC is generated. <br> For the paper feed unit: When the main switch is turned or when the tray is set and if the upper limit is already detected, the lift motor turns on to lower the bottom plate until the lift sensor goes off. If the motor turns on for 7 seconds or more, the machine asks the user to reset the tray. <br> For the LCT: When the main switch is turned on or when the LCT is set, if the end fence is not in the home position (home position sensor ON), the tray lift motor stops. | For the paper feed unit: <br> - Defective tray lift motor or connector disconnection <br> - Defective lift sensor or connector disconnection <br> For the LCT: <br> - Defective stack transport clutch or connector disconnection <br> - Defective tray motor or connector disconnection <br> - Defective end fence home position sensor or connector disconnection |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Check and/or replace the defective component. | B |
| $\begin{aligned} & \text { SC 504- } \\ & 01 \end{aligned}$ | Tray 4 error (3 Tray Paper Feed Unit) | When the tray lift motor is turned on, if the upper limit is not detected within 18 seconds, the machine asks the user to reset the tray. If this condition occurs three consecutive times, the SC is generated. | - Defective tray lift motor or connector disconnection <br> - Defective lift sensor or connector disconnection |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Check and/or replace the defective component. | B |

## SC TABLE

| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{array}{\|l\|} \hline \text { SC 504- } \\ 02 \end{array}$ | Tray 4 error (3 Tray Paper Feed Unit) | When the main switch is turned or when the tray is set and if the upper limit is already detected, the lift motor turns on to lower the bottom plate until the lift sensor goes off. If the motor turns on for 7 seconds or more, the machine asks the user to reset the tray. If this condition occurs 3 consecutive times, this SC is generated. | - Defective tray lift motor or connector disconnection <br> - Defective lift sensor or connector disconnection |  | 1. Turn the main switch off and on. <br> 2. Check the cable connections. <br> 3. Check and/or replace the defective component. | B |
| SC 530 | Fusing fan motor error | The BCU does not receive the lock signal (CN210-B5) 5 seconds after turning on the fusing fan. | - Defective fusing fan motor or connector disconnection <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the connector and/or replace the fusing fan motor. <br> 3. Replace the BCU. | B |
| SC 541 | Heating roller thermistor error | The temperature measured by the heating roller thermistor does not reach 7 ${ }^{\circ} \mathrm{C}$ for ten seconds. | - Loose connection of the heating roller thermistor <br> - Defective heating roller thermistor <br> - Defective BCU |  | 1. Check if the heating roller thermistor is firmly connected. <br> 2. Replace the fusing unit. <br> 3. Replace the BCU. | A |
| SC 542 | Heating roller warm-up error | After the main switch is turned on or the cover is closed, the heating roller temperature does not reach the ready temperature within 60 seconds during fusing unit warm-up. | - Heating roller fusing lamp broken <br> - Defective heating roller thermistor <br> - Defective BCU |  | 1. Check if the heating roller thermistor is firmly connected. <br> 2. Replace the fusing unit. <br> 3. Replace the BCU. | A |
| SC 543 | Heating roller fusing lamp overheat | The detected fusing temperature stays at $200^{\circ} \mathrm{C}$ or more for five seconds. | - Defective PSU <br> - Defective BCU |  | 1. Replace the PSU. <br> 2. Replace the BCU. | A |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 544 | Heating roller fusing lamp low temperature error | During stand-by mode or a print job, the detected heating roller temperature stays at $50^{\circ} \mathrm{C}$ or less for five seconds. | - Loose connection between the fusing unit and the main frame <br> - Defective heating roller thermistor <br> - Defective PSU <br> - Defective BCU |  | 1. Check the connection between the fusing unit and main frame. <br> 2. Replace the fusing unit. <br> 3. Replace the PSU. <br> 4. Replace the BCU. | A |
| SC 545 | Heating roller fusing lamp consecutive full power | When the fusing unit is not running in the Ready condition, the heating roller fusing lamp keeps on with full power for 30 consecutive seconds. | - Heating roller thermistor out of position |  | 1. Replace the fusing unit. | A |
| SC 546 | Heating roller fusing lamp temperature fluctuation | The heating roller temperature changes by $\pm 20^{\circ} \mathrm{C}$ or more in one second. This occurs three times in one minute or two consecutive times. | - Loose connection of the thermistor <br> - Loose connection between the fusing unit and main frame |  | 1. Check if the fusing unit is properly set and connected to the main frame. <br> 2. Check if the heating roller thermistor connector is firmly connected. <br> 3. Replace the fusing unit. | A |
| SC 551 | Pressure roller thermistor error | The measured pressure roller temperature does not reach $7^{\circ} \mathrm{C}$ for 30 seconds. | - Loose connection of pressure roller thermistor <br> - Defective pressure roller thermistor <br> - Defective BCU |  | 1. Check that the pressure roller thermistor is firmly connected. <br> 2. Replace the fusing unit. <br> 3. Replace the BCU. | A |
| SC 552 | Pressure roller warm-up error | After the main switch is turned on or the door is closed, the pressure roller temperature does not reach the ready temperature within 150 seconds during fusing unit warm-up. | - Pressure roller fusing lamp broken <br> - Defective pressure roller thermistor <br> - Defective BCU |  | 1. Check if the pressure roller thermistor is firmly connected. <br> 2. Replace the fusing unit. <br> 3. Replace the BCU. | A |

SC TABLE

| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 553 | Pressure roller fusing lamp overheat | The detected pressure roller temperature stays at $200^{\circ} \mathrm{C}$ or more for five seconds. | - Defective PSU <br> - Defective BCU |  | 1. Replace the fusing unit. <br> 2. Replace the PSU. <br> 3. Replace the BCU. | A |
| SC 554 | Pressure roller fusing lamp low temperature error | During stand-by mode or printing, the detected pressure roller temperature stays at $50^{\circ} \mathrm{C}$ or less for five seconds. | - Loose connection between the fusing unit and the machine <br> - Defective pressure roller thermistor <br> - Defective PSU <br> - Defective BCU |  | 1. Check the connection between the fusing unit and main frame. <br> 2. Replace the fusing unit. <br> 3. Replace the PSU. <br> 4. Replace the BCU. | A |
| SC 555 | Pressure roller fusing lamp consecutive full power | When the fusing unit is not running in the Ready condition, the pressure roller fusing lamp keeps ON with full power for 100 consecutive seconds. | - Pressure roller thermistor out of position |  | 1. Replace the fusing unit. | A |
| SC 556 | Pressure roller fusing lamp temperature fluctuation | The pressure roller temperature changes by $\pm 20^{\circ} \mathrm{C}$ or more in one second. This occurs three times in one minute or two consecutive times. | - Loose connection of the pressure roller thermistor <br> - Loose connection between the fusing unit and main frame |  | 1. Check if the fusing unit is properly set and connected to the main frame. <br> 2. Check if the pressure roller thermistor connector is firmly connected. <br> 3. Replace the fusing unit. | A |
| SC 560 | Zero cross error | When the main switch is turned on, the machine checks how many zerocross signals are generated during 500 ms . If the number of zero-cross signal generated is either more than 66 or less than 45 and when this condition is detected 10 consecutive times, this code is displayed. | - Electrical noise in the supply from the power cord |  | 1. Replace the PSU. | A |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { SC } 620 \\ \text { (CF) } \end{gathered}$ | ARDF communication error | - After the ARDF is detected, the break signal occurs or communication timeout occurs. | - Incorrect installation of ARDF <br> - ARDF defective <br> - IPU board defective <br> - External noise |  | 1. Turn the main switch off and on. <br> 2. Check the cable connection of the ARDF. <br> 3. Shut out the external noise. <br> 4. Replace the ARDF. <br> 5. Replace the IPU board. | B |
| SC 621 | Finisher/mailbox communication error | While the BCU communicates with an optional unit, an SC code is displayed if one of following conditions occurs. <br> 1. The BCU receives a signal which is generated by the peripherals only just after the main switch is turned on. <br> 2. When the BCU does not receive an OK signal from a peripheral 100ms after sending a command to it. The BCU resends the command. The BCU does not receive an OK signal after sending the command 3 times. | - Cable problems <br> - BCU problems <br> - PSU problems in the machine <br> - Main board problems in the peripherals |  | 1. Turn the main switch off and on. <br> 2. Check if the cables of peripherals are properly connected. <br> 3. Replace the PSU if no power is supplied to peripherals. <br> 4. Replace the BCU or main board of peripherals. | B |
| SC 622 | Bank communication error |  |  |  |  |  |
| SC 623 | Duplex unit communication error |  | - Cable problems <br> - BCU problems <br> - PSU problems in the machine <br> - Duplex control board problem |  | 1. Turn the main switch off and on. <br> 2. Check if the cable of the duplex inverter unit is properly connected. <br> 3. Replace the PSU if no power is supplied to the peripherals. <br> 4. Replace the duplex control board in the inverter unit. | B |
| SC 640 | BCU - Controller communication error (check sum error) | The check sum of the interface between the BCU and controller is not the same. | - Defective controller <br> - Defective PCU |  | 1. Turn the main switch off and on. <br> 2. Replace the controller. <br> 3. Replace the BCU. | B |
| SC 641 | BCU - Controller communication error (no response) | The controller does not receive any response from the BCU three consecutive times when sending a signal every 100 ms . | - Loose connection <br> - Defective controller <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the BCU and controller. <br> 3. Replace the controller. <br> 4. Replace the BCU. | B |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { SC } 642 \\ \text { (CF) } \end{gathered}$ | Communication timeout error between controller and operation panel | - The operation panel does not respond to the frame sent from the controller. | - Controller defective <br> - Operation panel defective <br> - External noise <br> - Harness between controller and operation panel disconnected |  | 1. Turn the main switch off an on. <br> 2. Check the cable connection between the controller and the operation panel. <br> 3. Shut out the external noise. <br> 4. Replace the controller. <br> 5. Replace the operation panel. | B |
| SC 660 | BCU NVRAM read/write diagnostics error | A read/write diagnostics error is detected when the main SW is turned ON. <br> Note: This only occurs with the 8 kB NVRAM. | - Defective 8 kB NVRAM (BCU) |  | 1. Turn the main switch OFF/ON. <br> 2. Replace the NVRAM. |  |
| SC 670 | No response from BCU at power on | When the main power is turned on or the machine starts warming up from energy-saving mode, the controller does not receive a command signal from the BCU. | - Loose connection <br> - Defective controller <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the BCU and controller. <br> 3. Replace the controller. <br> 4. Replace the BCU. | B |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { SC } 672 \\ \text { (CF) } \end{gathered}$ | Controller-tooperation panel communication error at startup | - After the machine is powered on, the communication between the controller and the operation panel is not established, or communication with controller is interrupted after a normal startup. <br> - After startup reset of the operation panel, the attention code or the attention acknowledge code is not sent from the controller. <br> - After the controller issues a command to check the communication line with the controller at 30 second intervals, the controller fails to respond twice. | - Controller stalled <br> - Controller board installed incorrectly <br> - Controller board defective <br> - Operation panel connector loose or defective |  | 1. Turn the main switch off and on. <br> 2. Check the condition of the controller board. <br> 3. Check the condition of the operation panel. <br> 4. Replace the controller board. <br> 5. Replace the operation panel. | B |
| SC 680 | BCU/ MUSIC communication error | After the engine CPU sends a message, the Music CPU does not respond within five seconds three consecutive times. | - Toner cartridge memory chip loose connection <br> - Memory chip problem <br> - Memory chip cable wiring problem |  | 1. Turn the main switch off and on. <br> 2. Check if the toner cartridge is installed correctly. <br> 3. Replace the toner cartridge. <br> 4. Check if the harnesses are not damaged. <br> 5. Replace the BCU. | B |

## SC TABLE

| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { SC } 685 \\ \text { (CF) } \end{gathered}$ | SBU-IPU communication error | - During data transfer, a checksum error occurs. <br> - During any operation except initialization, the SBU sends a hardwarereset acknowledgement to the IPU. | - Scanner unit cable connector loose <br> - SBU board defective <br> - IPU board defective <br> - External noise |  | 1. Turn the main switch off and on. <br> 2. Shut out the external noise. <br> 3. Check the cable connection of the scanner unit. <br> 4. Replace the SBU board. <br> 5. Replace the IPU board. | B |
| $\begin{gathered} \text { SC } 686 \\ \text { (CF) } \end{gathered}$ | BCU-IPU communication error | - After the machine is powered on or recovering from the power save mode, timeout occurs during BCU communication. <br> - The break signal is received after the communication is normally established with the BCU. <br> - Timeout occurs while the communication with the $B C U$ is retried after a communication error. | - Board connector between BCU and controller loose <br> - Board connector between controller and bridge board loose <br> - Board connector between bridge board and IPU loose <br> - BCU board defective <br> - IPU board defective <br> - Controller board defective <br> - Bridge board defective |  | 1. Turn the main switch off and on. <br> 2. Check the cable connection between the board connector and BCU. <br> 3. Check the cable connection between controller and bridge board. <br> 4. Check the cable connection between bridge board and IPU. <br> 5. Replace the BCU board. <br> 6. Replace the IPU board. <br> 7. Replace the controller board. <br> 8. Replace the bridge board. | B |
| SC 687 | Memory address command error | The BCU does not receive a memory address command from the controller 60 seconds after paper is in the position for registration. | - Loose connection <br> - Defective controller <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check if the controller is firmly connected to the BCU. <br> 3. Replace the controller. <br> 4. Replace the BCU. | B |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { SC } 691 \\ \text { (CF) } \end{gathered}$ | Scanner startup error | - After the machine is powered on or recovering from the power save mode, the scanner ready signal is not verified. | - Board connector between controller and bridge board loose <br> - Board connector between bridge board and IPU loose <br> - IPU board defective <br> - Controller board defective <br> - Bridge board defective |  | 1. Turn the main switch off and on. <br> 2. Check the cable connection between controller and bridge board. <br> 3. Check the cable connection between bridge board and IPU. <br> 4. Replace the IPU board. <br> 5. Replace the controller board. <br> 6. Replace the bridge board. | B |
| $\begin{gathered} \text { SC } 700 \\ \text { (CF) } \end{gathered}$ | ARDF original pick-up malfunction | - After the pick-up motor is turned on, the original stopper HP sensor is not activated. | - Original stopper HP sensor defective <br> - Pick-up motor defective (not rotating) <br> - Timing belt out of position <br> - ARDF main board defective | SC 701 | 1. Turn the main switch off and on. <br> 2. Replace the HP sensor. <br> 3. Turn the main switch off and on. <br> 4. Replace the pick-up motor. <br> 5. Replace the control board. | B |
| $\begin{gathered} \text { SC } 701 \\ \text { (CF) } \end{gathered}$ | ARDF original pick-up/paper lift mechanism malfunction | - The original pick-up HP sensor is not activated after the pick-up motor is turned on. | - Original pick-up HP sensor defective <br> - Pick-up motor defective <br> - ARDF main board defective | SC 700 | 1. Turn the main switch off and on. <br> 2. Replace the pick-up motor. <br> 3. Replace the control board. <br> 4. Replace the HP sensor. | B |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 722 | Finisher jogger motor error | - The jogger fences of the finisher donot return to home position within a specific time. <br> - The finisher jogger motor does not leave home position within a given time. | - Defective jogger H.P. sensor <br> - Loose connection <br> - Defective jogger motor |  | 1. Turn the main switch off and on. <br> 2. Check the connection of jogger H.P. sensor and jogger motor connectors <br> 3. Replace the jogger H.P. sensor. <br> 4. Replace the jogger motor. | B |
| SC 724 | Finisher staple hammer motor error | Stapling does not finish within 150 ms after the staple hammer motor turns on. | - Staple jam <br> - Loose connection <br> - Overload caused by stapling too many pages <br> - Defective staple hammer motor |  | 1. Turn the main switch off and on. <br> 2. Check if the staple hammer motor connector is properly connected. <br> 3. Check if the staple jam occurs. <br> 4. Replace the staple hammer motor. | B |
| SC 725 | Finisher stack feed-out motor error | The stack feed-out belt H.P. sensor does not activate within a specified time after the stack feed-out motor turns on. | - Defective stack feedout H.P. sensor <br> - Loose connection <br> - Stack feed-out motor overload <br> - Defective stack feedout motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the stack feed-out H.P. sensor and motor are properly connected. <br> 3. Replace the stack feed-out H.P. sensor. <br> 4. Replace the stack feed-out motor. | B |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \text { Related } \\ \text { SCs } \\ \hline \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 726 | Finisher shift tray 1 lift motor error | - The upper stack height 1 sensor is activated consecutively (detecting paper) for 15 seconds after the shift tray starts moving up. <br> - The upper stack height sensor 1 is deactivated consecutively (not detecting paper) for 15 seconds after the shift tray starts moving down. <br> - When the upper tray moves from lower paper exit to the upper paper exit, the upper stack height 1 sensor is activated. | - Loose connection <br> - Defective upper stack height 1 sensor <br> - Defective shift tray 1 lift motor <br> - Motor overload |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the upper stack height 1 sensor. <br> 4. Replace the shift tray 1 lift motor. | B |
| SC 727 | Finisher stapler rotation motor error | The stapler cannot return to its home position within a specified time after the stapler rotation motor starts rotating. | - Loose connection <br> - Defective stapler rotation motor <br> - Motor overload |  | 1. Turn the main switch off and on. <br> 2. Check if the stapler rotation motor connector is properly connected. <br> 3. Replace the stapler rotation motor. | B |
| SC 729 | Finisher punch motor error | The punch home position is not detected within 250 ms after the punch clutch turns on. | - Loose connection <br> - Defective punch H.P. sensor <br> - Defective punch clutch <br> - Defective punch hole motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of sensor, clutch and/or motor are properly connected. <br> 3. Replace the punch H.P. sensor. <br> 4. Replace the punch clutch. <br> 5. Replace the punch hole motor. | B |
| SC 730 | Finisher stapler motor error | The stapler home position is not detected within a specified time after the staple motor turns on. | - Loose connection <br> - Defective stapler H.P. sensor <br> - Defective stapler motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the stapler H.P. sensor. <br> 4. Replace the stapler motor. | B |

SC TABLE

| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 731 | Finisher exit guide plate motor error | The exit guide plate open sensor is not activated within a specified time after the exit guide plate motor turns on. | - Loose connection <br> - Defective exit guide plate open sensor <br> - Defective exit guide plate motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the exit guide plate open sensor. <br> 4. Replace the exit guide plate motor. | B |
| SC 732 | Finisher tray 1 shift motor error | Tray 1 home position is not detected within a specified time after the tray 1 shift motor turns on. | - Loose connection <br> - Defective tray shift 1 sensor <br> - Defective tray 1 shift motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the tray shift 1 sensor. <br> 4. Replace the tray 1 shift motor. | B |
| SC 733 | Finisher tray 2 lift motor error | - The lower stack height 1 sensor is activated consecutively (detecting paper) for 15 seconds after the shift tray starts moving up. <br> - The lower stack height sensor 1 is deactivated consecutively (not detecting paper) for 15 seconds after the shift tray starts moving down. | - Loose connection <br> - Defective lower stack height 1 sensor <br> - Defective tray 2 lift motor <br> - Motor overload |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the lower stack height 1 sensor. <br> 4. Replace the tray 2 lift motor. | B |
| SC 734 | Finisher tray 2 shift motor error | Tray 2 home position is not detected within a specified time after the tray 2 shift motor turns on. | - Loose connection <br> - Defective tray shift 2 sensor <br> - Defective tray 2 shift motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the tray shift 2 sensor. <br> 4. Replace the tray 2 shift motor. | B |


| $\Longrightarrow$ | $\begin{aligned} & \hline \hline \text { SC } 800 \\ & \text { (CF) } \end{aligned}$ | Startup without video output end error (K) | Video transfer to the engine is started, but the engine does not issue a video transmission end command within the specified time. | - Defective BCU | 1. Turn the main switch off and on. <br> 2. Check the cable connection. <br> 3. Replace the BCU. | B |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\Longrightarrow$ | $\begin{aligned} & \text { SC } 801 \\ & \text { (CF) } \end{aligned}$ | Startup without video output end error (Y) | Video transfer to the engine is started, but the engine does not issue a video transmission end command within the specified time. | - Defective BCU | 1. Turn the main switch off and on. <br> 2. Check the cable connection. <br> 3. Replace the BCU. | B |
| $\Longrightarrow$ | $\begin{aligned} & \text { SC } 802 \\ & \text { (CF) } \end{aligned}$ | Startup without video output end error (M) | Video transfer to the engine is started, but the engine does not issue a video transmission end command within the specified time. | - Defective BCU | 1. Turn the main switch off and on. <br> 2. Check the cable connection. <br> 3. Replace the BCU. | B |
| $\Longrightarrow$ | $\begin{aligned} & \hline \text { SC } 803 \\ & \text { (CF) } \end{aligned}$ | Startup without video output end error (C) | Video transfer to the engine is started, but the engine does not issue a video transmission end command within the specified time. | - Defective BCU | 1. Turn the main switch off and on. <br> 2. Check the cable connection. <br> 3. Replace the BCU. | B |
|  | $\begin{gathered} \text { SC } 804 \\ \text { (CF) } \end{gathered}$ | Video input incomplete (K) | - The scanner is requested to transfer video data, but does not issue the video transmission end command within the defined time. | - Board connector between controller and bridge board loose <br> - Board connector between bridge board and IPU loose <br> - IPU board defective <br> - Controller board defective <br> - Bridge board defective | 1. Turn the main switch off and on. <br> 2. Check the cable connection between controller and bridge board. <br> 3. Check the cable connection between bridge board and IPU. <br> 4. Replace the IPU board. <br> 5. Replace the controller board. <br> 6. Replace the bridge board. | B |
|  | $\begin{gathered} \text { SC } 805 \\ (C F) \\ \hline \end{gathered}$ | Video input incomplete (Y) |  |  |  |  |
|  | $\begin{gathered} \text { SC } 806 \\ \text { (CF) } \end{gathered}$ | Video input incomplete (M) |  |  |  |  |
|  | $\begin{gathered} \text { SC } 807 \\ (C F) \end{gathered}$ | Video input incomplete (C) |  |  |  |  |
|  | $\begin{gathered} \text { SC } 808 \\ \text { (CF) } \\ \hline \end{gathered}$ | Video input incomplete (R) |  |  |  |  |
|  | $\begin{gathered} \text { SC } 809 \\ \text { (CF) } \\ \hline \end{gathered}$ | Video input incomplete (G) |  |  |  |  |
|  | $\begin{gathered} \text { SC } 810 \\ \text { (CF) } \\ \hline \end{gathered}$ | Video input incomplete (B) |  |  |  |  |


|  |  | $\bullet$ | $\bullet$ | 7. |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SC 818 | Watch-dog error | While the system program is running, other processes do not operate at all. | - Defective controller <br> - Software error | 1. Turn the main switch off and on. <br> 2. Replace the controller. <br> 3. See NOTE 1 at the end of the SC table. | B |
| SC 819 | Fatal error |  |  |  |  |
| [696E] | Process error | System completely down | - Defective RAM DIMM <br> - Defective ROM DIMM <br> - Defective controller <br> - Software error | 1. Turn the main switch off and on. | B |
| [766D] | Memory error | Unexpected system memory size |  | 2. Check and/or replace the RAM DIMM. <br> 3. Check and/or replace the ROM DIMM. <br> 4. Replace the controller. <br> 5. See NOTE at the end of the SC table. |  |
| SC820 | Self-diagnostics error: CPU [XXXX]: Detailed error code |  |  |  |  |
| $\begin{aligned} & {[0001]} \\ & \text { to } \\ & {[06 F F]} \end{aligned}$ | CPU error | During the self-diagnostic, the controller CPU detects an error. There are 47 types of error code (0001 to 4005) depending on the cause of the error. The CPU detects an error and displays the specific error code with the program address where the error occurs). | - System firmware problem <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Reinstall the controller system firmware. <br> 3. Replace the controller. <br> When the problem cannot be fixed with the above procedure, the following information displayed on the screen needs to be fed back to a technical support center. <br> - SC code <br> - Detailed error code <br> - Program address | B |
| $\begin{aligned} & {[0702]} \\ & {[0709]} \\ & {[070 \mathrm{~A}]} \end{aligned}$ | CPU/Memory Error |  | - System firmware problem <br> - Defective RAM-DIMM <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Reinstall the controller system software. <br> 3. Replace the RAM-DIMM. <br> 4. Replace the controller. | B |


| $\begin{aligned} & \hline \hline[0801] \\ & \text { to } \\ & {[4005]} \end{aligned}$ | CPU error | Same as [0001] |  |  | B |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { SC 821 } \\ & \text { [OD05] } \end{aligned}$ | Self-diagnosis error: ASIC | The CPU checks if the ASIC timer works properly compared with the CPU timer. If the ASIC timer does not function in the specified range, this SC code is displayed. | - System firmware problem <br> - Defective RAM-DIMM <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Reinstall the controller system firmware. <br> 3. Replace the RAM-DIMM. <br> 4. Replace the controller board. | B |
| SC822 | Self-diagnostic error: HDD (Hard Disk Drive) [XXXX]: Detailed error code |  |  |  |  |
| [3003] | Timeout error | When the main switch is turned on or starting the self-diagnostic, the HDD stays busy for the specified time or more. | - Loose connection <br> - Defective HDD <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Check that the HDD is properly connected to the controller. <br> 3. Replace the HDD. <br> 4. Replace the controller. | B |
| [3004] | Command error |  |  |  |  |
| SC 823 | Self-diagnostic error: NIB [XXXX]: Detailed error code |  |  |  |  |
| [6101] | MAC address check sum error | The result of the MAC address check sum does not match the check sum stored in ROM. | - Defective controller | 1. Turn the main switch off and on. <br> 2. Replace the controller. | B |
| [6104] | PHY IC error | The PHY IC on the controller cannot be properly recognized. |  |  |  |
| [6105] | PHY IC loopback error | An error occurred during the loop-back test for the PHY IC on the controller. |  |  |  |
| $\begin{aligned} & \text { SC 824 } \\ & {[1401]} \end{aligned}$ | Self-diagnosis error: Standard NVRAM | The controller cannot recognize the standard NVRAM installed or detects that the NVRAM is defective. | - Loose connection <br> - Defective standard NVRAM <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Check the standard NVRAM is firmly inserted into the socket. <br> 3. Replace the NVRAM. <br> 4. Replace the controller. | B |




| SC 851 | IEEE1394 interface error | The 1394 interface is unusable. | - Defective IEEE1394 <br> - Defective controller. | 1. Turn the main switch off and on. <br> 2. Replace the IEEE1394 interface board. <br> 3. Replace the controller. | B |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SC 860 | HDD: <br> Initialization error | The controller detects that the hard disk fails. | - HDD not initialized <br> - Defective HDD | 1. Turn the main switch off and on. <br> 2. Reformat the HDD. <br> 3. Replace the HDD. | B |
| SC 861 | HDD: Reboot error | The HDD does not become ready within 30 seconds after the power is supplied to the HDD. | - Loose connection <br> - Defective cables <br> - Defective HDD <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Check the connection between the HDD and controller. <br> 3. Check and replace the cables. <br> 4. Replace the HDD. <br> 5. Replace the controller. | B |
| SC 863 | HDD: Read error | The data stored in the HDD cannot be read correctly. | - Defective HDD <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Replace the HDD. <br> 3. Replace the controller. | B |
| SC 864 | HDD: CRC error | While reading data from the HDD or storing data in the HDD, data transmission fails. | - Defective HDD | 1. Turn the main switch off and on. <br> 2. Replace the HDD. | B |
| SC 865 | HDD: Access error | An error is detected while operating the HDD. | - Defective HDD | 1. Turn the main switch off and on. <br> 2. Replace the HDD. | B |
| SC 900 | Electric counter error | Abnormal data is stored in the counters. | - Defective NVRAM <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Check the connection between the NVRAM and controller. <br> 3. Replace the NVRAM. <br> 4. Replace the controller. | B |
| SC 990 | Software performance error | The software makes an unexpected operation. | - Defective software <br> - Defective controller <br> - Software error | 1. Turn the main switch off and on. <br> 2. Reinstall the controller and/or engine main firmware. <br> 3. See NOTE 1 at the end of the SC table. | B |


| SC 991 | $\begin{array}{\|l} \hline \hline \text { Software } \\ \text { Performance } \\ \text { Error - Logged } \end{array}$ | The software performs an unexpected operation. <br> Note: Unlike SC990, the software/machine continue to function without requiring any action. | - Incorrect program argument or other parameter <br> - Insufficient working memory |  | This SC is not displayed on the LCD (logged only). | B |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { SC } 997 \\ \text { (CF) } \end{gathered}$ | Application function selection error | - The application selected by the operation panel key does not start or ends abnormally. | - Software (including the software configuration) defective <br> - An option required by the application (RAM, DIMM, board) is not installed | SC 998 | 1. Check the devices necessary for the application program. If necessary devices have not been installed, install them. <br> 2. Check that application programs are correctly configured. <br> 3. Take necessary countermeasures specific to the application program. If the logs can be displayed on the operation panel, see the logs. | B |
| SC 998 | Application start error | No applications start within 60 seconds after the power is turned on. | - Loose connection of RAM-DIMM, ROMDIMM <br> - Defective controller <br> - Software problem |  | 1. Turn the main switch off and on. <br> 2. Check if the RAM-DIMM and ROMDIMM are properly connected. <br> 3. Reinstall the controller system firmware. <br> 4. Replace the controller. | B |


| $\begin{gathered} \hline \hline \text { SC } 999 \\ \text { (CF) } \end{gathered}$ | Program download error | - The download (program, print data, language data) from the IC card does not execute normally. | - BCU Board installed incorrectly <br> - Engine (BCU) board defective <br> - IC card defective <br> - Incorrect IC card used (machine type/model, card ver.) <br> - NVRAM defective <br> - Incorrect destination code <br> - Defective DIMM <br> - Loss of power during downloading NOTE 1: This error is not logged because the error occurs in the download mode (different from normal operation mode). NOTE 2: If the machine loses power while downloading, or if the download does not normally end for some other reason, this could damage the controller board or the target PCB of the downloading and prevent subsequent downloading. If this problem occurs, the damaged PCB must be replaced. | 1. Turn the main switch off and on. <br> 2. If you can download necessary programs, do it by using an appropriate card. <br> 3. Check if the type and version of firmware is correct. If correct, turn off the main switch and reinsert the IC card, then retry the update. See Caution. <br> 4. Check if the correct destination code is set (SP5-808-1). If it is not, please contact Technical Support. A Regional Rep must reprogram the destination code. <br> 5. Check the connection of connectors and PCBs. <br> 6. Replace the IC card. <br> 7. Replace the DIMM <br> 8. Replace the BCU board. <br> Caution: Whenever updating the firmware, the front cover should be opened before turning on the main switch. | B |
| :---: | :---: | :---: | :---: | :---: | :---: |

NOTE 1: If a problem always occurs in a specific condition (for example. printer driver setting, image file), the problem may be caused by a software error. In this case, the following data and information needs to be sent back to your product specialist.

- Symptom / Possible Causes / Action taken
- Summary sheet (SP mode '1 Service', [Print Summary])
- SMC All (SP5-990-1)
- Logging (SP5-990-4)
- Printer driver settings used when the problem occurs
- All data displayed on the screen (SC code, error code, and program address where the problem is logged.)
- Image file which causes the problem, if possible


### 4.5 TROUBLESHOOTING GUIDE

### 4.5.1 IMAGE QUALITY

The table below shows the troubleshooting procedure for the following image problems.

- Smeared image for 4C thin lines or White lines in solid image areas
- Dirty background
- Fireflies
- Crow marks
- Image density change
- Toner blasting

$\Rightarrow$| Subject | Symptom | Cause |  |
| :--- | :--- | :--- | :--- |
| Smeared image for 4C <br> thin lines or white lines <br> in solid image areas | 4C thin lines become <br> smeared in the paper feed <br> direction or white lines <br> appear in solid image areas. | Spurs are located just before the fusing <br> section to prevent paper from touching <br> the fusing unit. When paper touches the <br> spurs and the spurs do not rotate, the <br> spurs scratch the mage. | Clean the edges of the spurs and change the <br> position of the spurs as shown below. <br> If 4C thin lines become smeared: |


| Subject | Symptom | Cause | Action |
| :---: | :---: | :---: | :---: |
| Dirty background | Dirty background may continuously appear on the left side (relative to paper feed) under very low temperature and humidity conditions. | When the developer has deteriorated or when prints are made in a very low humidity condition, dirty background may appear continuously. | Perform forced toner refresh mode (SP3-921-1 or 2). <br> The machine automatically does this in the following sequence. (It takes about 20 minutes to complete this mode.) <br> 1. Consumes toner in the development unit without toner supply until toner end is detected. <br> 2. Starts toner recovery mode. <br> 3. Starts process control self-check. <br> NOTE: It takes about 20 minutes to complete this mode, to prevent carrier flowing out. |
|  | Dirty background may intermittently appear with originals that have a high image area ratio after making multiple prints of originals with a low image area ratio. | While making prints with a low image area ratio, the toner-carrier attraction tends to increase. Then, when a large amount of toner is supplied under this condition, the supplied toner cannot be properly charged, causing toner to flow out from the development unit. | Change the settings of the following SP modes: <br> SP3-906-1 Job End Process Control Self-check 200 (Default) to 100 <br> SP3-920-3 OPC Refresh - Prints <br> 200 (Default) to 100 |
| Fireflies | Fireflies may appear with originals that have a high image area ratio after making multiple prints of originals with a low image area ratio. | While making prints with a low image area ratio, developer is agitated with less toner supplied. This may cause some toner to coagulate and harden. Then, when switching over to originals with a high image area ratio, this toner may cause fireflies. | 0 (Default: Disable) to 1 (Enable) <br> During the above mode, toner refresh will automatically be done after job end process control self-check, and will consume the coagulated or overcharged toner. <br> SP3-125-3 Auto TD Adjust <br> Default 0 (Disable) to 1 (Initial process control) <br> Making prints with a low image area ratio causes the toner-carrier attraction to increase, resulting in low image density. Activating the Auto TD Adjustment corrects toner density within the target range; however, it takes up to 6 minutes to complete the self-check and Auto TD Adjustment. |


| Subject | Symptom | Cause | Action |
| :--- | :--- | :--- | :--- | :--- |
| Crow marks | $\begin{array}{l}\text { When making duplex prints in } \\ \text { low temperature and humidity } \\ \text { conditions, crow marks may } \\ \text { appear on black images, } \\ \text { especially in halftone areas } \\ \text { on the 2 } 2^{\text {nd }} \text { side. }\end{array}$ | $\begin{array}{l}\text { A charge is applied to the paper at each } \\ \text { color station in order to attract each } \\ \text { toner onto the paper. Therefore, the } \\ \text { initial toner colors will receive multiple } \\ \text { charging as they pass each station, } \\ \text { which increases the attractive force } \\ \text { between the toner and paper. Since } \\ \text { black is the last toner to be applied, the } \\ \text { attractive force between it and the paper } \\ \text { is lowest. Black toner moves on the } \\ \text { paper during transport to the fusing } \\ \text { section, due to discharge from the toner } \\ \text { to the surrounding guide plates. }\end{array}$ | $\begin{array}{l}\text { Using SP2-301 (Transfer Current), increase the } \\ \text { paper transfer current for black in the mode in } \\ \text { which the problem occurs. }\end{array}$ |
| NOTE: White dotted lines may appear on outputs |  |  |  |
| if the transfer current is increased too |  |  |  |
| much. Therefore, after adjusting the |  |  |  |
| transfer current, it is necessary to check |  |  |  |
| the results by making a solid or halftone |  |  |  |
| image in duplex mode. |  |  |  |$\}$


| Subject | Symptom | Cause | Action |
| :---: | :---: | :---: | :---: |
| Image density change (2) | Image density is too low or high. | If the machine has never been turned off and Energy Saver 2 (Auto Off mode) is disabled, the machine has never performed the initial process control selfcheck, causing the image density to become low or high. | Change the settings of the following SP modes: <br> SP3-906-3 Non-use Time 1 <br> 0 (Default) to 500 <br> SP3-906-4 Non-use Time 2 <br> 30 (Default) to 480 <br> - If Energy Saver 1 is activated (Default: Off), the non-use time process control self-check will not function. Therefore, make sure that Energy Saver 1 is Off (SP5-101-3 or UP mode). <br> - With the above setting, the self-check automatically starts after 500 prints and after no prints have been made for 480 minutes ( 8 hours). Based on the average daily printing volume of 500 prints, self-check would be performed first thing every morning. These settings are suitable for machines, which are used during the day and then kept On in Ready status throughout the night. Therefore, this SP mode should be set based on the particular way the customer uses the printer. |
| Toner blasting | Toner may blast, causing smeared text characters and/or lines in 2C or process black mode (depending on the PDL setting or type of paper used.) | An excessive amount of toner is used for development. | Change the toner limit setting in SP mode. <br> - If toner blasted images appear for text or lines in 2C, decrease the setting for Text from 190\% to 150-170\%. <br> - If toner blasted images for text and lines recognized as pure image data (i.e. not processed as text/line data), decrease the setting for Photo from 260\% to 170-190\%. <br> NOTE: If the toner limit is lowered too much, it may cause the density of shadow areas to be not smooth. |

### 4.5.2 COLOR SHIFT

The following briefly explain the factors causing color shifts and what to do on the machine to correct it:

- Temperature change causes the optical components in the laser optics housing unit to contract, causing the main scan magnification to change. To correct the line position, the machine automatically does the line position adjustment when the temperature changes by $5^{\circ} \mathrm{C}$ since the last position adjustment.
If the line position adjustment functions properly, no color shift occurs. If the line position adjustment fails (result: SP5-993-7), color lines may shift anywhere on the outputs.
- The process speed at each stage (registration roller, transfer belt, and fusing belt/roller) affects the paper transport speed. If the paper transport speed changes during image transfer of a color, the color line being transferred shifts with respect to the color line already transferred to the paper. The registration roller speed (adjusted by color development motor speed) and fusing belt/roller speed (adjusted by black development motor speed) are adjusted by the manufacturer.
Paper speed may slightly change due to the type of paper used or after replacing the parts related to the drive sections of the registration section, transport unit, and fusing unit. (After replacing the fusing unit, the speed adjustment should be done in the User Program mode.) Also, the position where color shift occurs depends on which section starts moving at the incorrect speed.
- Paper skew directly affects the color shift between the front and rear sides. There are several factors. One of them is the position of the side fences.

As explained on the previous page, there are several types of color shift problem. The following table shows the symptoms, factors, action required, and the page to see for details.

|  | Symptom | Factors | Action Required | Refer to \# |
| :---: | :---: | :---: | :---: | :---: |
| 1 | Color shift on entire image in main-scan and/or sub-scan directions | - Line position adjustment does not function properly. <br> - Transfer belt unit has just been replaced. | - Check the result of the line position adjustment (SP5-993-7) and solve the problem if an error was detected. <br> - Check which color lines are shifted from black line and adjust the SP modes for registration and magnification. | Page 4-4 <br> Main-scan <br> Page 4-42/43 <br> Sub-scan <br> Page 40/41 <br> Transfer Unit <br> Page 4-46 |
| 2 | Color shifts only at the leading edge area (sometimes causing shock jitter, magenta or cyan lines) | Registration roller speed is not appropriate. | Adjust the color development motor speed (SP1-004-4, 5, and SP1-005-3) depending on the process speed. | Page 4-40 |
| 3 | Color shifts only at the trailing edge area | Fusing belt/roller speed is not appropriate. | Adjust the black development motor speed (SP1-004-1, 2, and 7, or "Fuser Adjust" in the User Program mode) depending on the process speed. | Page 4-40 |
| 4 | Color shifts between the front and rear sides | Paper skew on transfer belt <br> - Side fences are not properly set. <br> - Pressure between the paper attraction roller and transfer belt is not even at the front and rear sides. | Reposition the side fences. Reposition the paper attraction roller unit. | Page 4-43 |

## Adjustment Standard: Max. $200 \mu m$

As a machine capability, maximum amount of color shift is $200 \mu \mathrm{~m}$. Adjusting the SP modes (motor speed, registration, and magnification) can improve the color shifts level; however, there is a limit.

## Preparation

When color shift is reported, the following procedure should be done before adjusting the machine and/or SP modes.

1. Print out the SMC sheets (SP5-990-2).
2. Do the forced line position adjustment (SP5-993-2 or 'Auto Adjust' in the User Program mode). NOTE: Make sure that the result (SP5-993-7) is "0101". If not, solve the problem by referring to pages 4-2 and 4-3.
3. Print a 1 -dot grid pattern using $\mathrm{A} 3 / 11^{\prime \prime} \times 17^{\prime \prime}$ paper. Refer to the following table for the detailed SP mode settings.

| Mode | SP5-997 (Test Pattern) Setting |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | Tray <br> selection | Pattern | Color mode | Resolution | Paper size <br> (By-pass) |
| Normal, color, 600 dpi | 2 | 05 | Full Color | $600 \times 600$ | - |
| Normal, color, 1200 dpi | 2 | 05 | Full Color | $1200 \times 1200$ | - |
| Thick paper | 0 | 05 | Full Color | $1200 \times 1200$ | A3/11 $\times 17$ |

NOTE: When making prints on thick paper from the by-pass tray, the type of paper should be selected in the User Program mode. Any adjustment needs to be done by using the type of paper which the customer normally uses.
4. Check the tendency of color shift in the grid pattern printed in step 3 . Sometimes, a magnification scope must be used to measure the amount of color shift between colors.
5. Take the required action explained in each section depending on the type of color shift.
6. Do the 'Auto Adjust' in the User Program mode after the adjustment is done in step 5, and check the result.
7. Repeat steps 3 to 6 until the color shift is acceptable.

| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Sub-scan | Leading edge | Color shift, especially 100 mm from the leading edge. <br> pattern 1 on page 4-44 for the symptom) | Registration roller speed is not suitable for the paper used. | Normal Paper <br> 1200 dpi <br> Normal Paper <br> 600 dpi <br> Thick Paper <br> 1200 dpi <br> (by-pass feed) | SP1-004-4 <br> SP1-004-5 <br> SP1-005-3 | Check the magenta line position against the black line. If the registration roller is too fast or slow, the magenta line appears above or below the black line. <br> Above: Speed is too fast: Decrease speed <br> Below: Speed is too slow: Increase Speed <br> When adjusting the speed, change the setting in 0.1 steps, and check the result by printing the grid pattern. Then, repeat this until the shift between magenta and black is minimized. <br> NOTE: If the registration roller is too fast, magenta jitter may appear at 67 mm and/or cyan jitter at 165 mm from the trailing edge. This is caused by the mechanical shock when the trailing edge of the paper passes the registration rollers. |
|  | Trailing edge | Color shift, especially 100 mm from the trailing edge. <br> pattern 2 on page 4-44 for the symptom) | Fusing roller speed is not suitable for the paper used. | Normal Paper <br> 1200 dpi <br> Normal Paper <br> 600 dpi | SP1-004-1 | Check the magenta line position against the black line. If the fusing roller is too fast or slow, the magenta line appears above or below the black line. <br> Above: Speed is too fast: Decrease speed <br> Below: Speed is too slow: Increase Speed <br> When adjusting the speed, change the setting in 0.1 steps, and check the result by printing the grid pattern. Then, repeat this step until the shift between magenta and black is minimized. <br> NOTE: Fusing roller speed can be adjusted with ''Custom Adjust' in Fuser Adjust in the User Program Mode, instead of with SP mode. |
|  |  |  |  | Thick Paper 1200 dpi (by-pass feed) | SP1-004-7 |  |


| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Sub-scan | Entire image | Color shift on the entire image, and the amount of shift from leading to trailing edge is almost the same. | SP mode setting is not suitable for the paper used. | Normal Paper 600 dpi | $\begin{aligned} & \text { SP5-993- } \\ & 016 \text { (Y) } \\ & \text { SP5-993- } \\ & 017 \text { (M) } \\ & \text { SP5-993- } \\ & 018 \text { (C) } \end{aligned}$ | Measure the gap between the black line and other colors (YMC) using a magnification scope. <br> Convert the measured value from [ $\mu \mathrm{m}$ ] to [dots] with the following formula. Then, add or subtract the calculated dot value in the SP mode. <br> Correction [dots] = Measured value [ $\mu \mathrm{m}$ ] / 21.2 or 42.4 |
|  |  |  |  | Normal Paper 1200 dpi | $\begin{aligned} & \text { SP5-993- } \\ & 019 \text { (Y) } \\ & \text { SP5-993- } \\ & 020 \text { (M) } \\ & \text { SP5-993- } \\ & 021 \text { (C) } \end{aligned}$ | 1200 dpi mode: 1 dot $=21.2 \mu \mathrm{~m}$ <br> If color (YMC) has shifted up in relation to black, add the above value to the current value. <br> If color (YMC) has shifted down in relation to black, subtract the above value from the current value. <br> Examples <br> - If the magenta line has shifted up in relation to black by $40 \mu \mathrm{~m}$ in 600 dpi mode, add 1 to the current setting of SP5-993-17. <br> Correction [dots] = +(40/42.4) = Approx. +1 <br> - If the magenta line has shifted down in relation to black by $70 \mu \mathrm{~m}$ in 600 dpi mode, subtract 2 from the current setting of SP5-993-17. <br> Correction [dots] = -(70/42.4) = Approx. -2 |


| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Main-scan | Entire image | Color shifts on the entire image, and the amount of shift differs at front, center, and rear. <br> pattern 3 on page 4-45 for the symptom) | Main-scan magnification is not correctly adjusted. | - | $\begin{aligned} & \text { SP5-993- } \\ & 013 \text { (Y) } \\ & \text { SP5-993- } \\ & 014 \text { (M) } \\ & \text { SP5-993- } \\ & 015 \text { (C) } \end{aligned}$ | Measure the gap between the black line and other colors (YMC) using a magnification scope. <br> Convert the measured value [mm] to [\%] with the following formula. Then, add or subtract the calculated value in the SP mode <br> Correction [\%] = Measured value [mm] / $287 \times 10000$ <br> If the color line is enlarged in relation to black, add the correction value to the current setting. <br> If the color line is reduced in relation to black, subtract the correction value from the current setting. <br> NOTE: Line position adjustment (SP5-993-2 or 'Auto Adjust' in User Program mode) should be done to check the result after changing the main-scan magnification data. This is because the changes will affect the line position adjustment. <br> Examples <br> - If the magenta line is enlarged by 0.1 mm in relation to the black line, add "4" to the current setting of SP5-993-14. <br> Correction [\%] $=(0.1 / 287) \times 10000=$ Approx. +4 <br> - If the magenta line is reduced by 0.05 mm in relation to the black line, subtract " 2 " from the current setting of SP5-993-14. <br> Correction [\%] $=-(0.05 / 287) \times 10000=$ Approx. -2 |


| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Main-scan | Entire image | Color shifts on the entire image and amount of shifts is almost the same at front, center, and rear sides. <br> pattern 4 on page 4-45 for the symptom) | Main-scan registration is not correctly adjusted. | - | $\begin{aligned} & \text { SP5-993- } \\ & 010 \text { (Y) } \\ & \text { SP5-993- } \\ & 011 \text { (M) } \\ & \text { SP5-993- } \\ & 012 \text { (C) } \end{aligned}$ | Measure the gap between the black line and other colors (YMC) using a magnification scope. <br> Convert the measured value [ $\mu \mathrm{m}$ ] to [dots] with the following formula. Then, add or subtract the calculated dot value in the SP mode. <br> Correction [dots] = Measured value [ $\mu \mathrm{m}$ ] / 21.2 <br> If color (YMC) has shifted to the left in relation to black, add the above value to the current setting. <br> If color (YMC) has shifted to the right in relation to black, subtract the above value from the current setting. <br> Examples <br> - If the magenta line has shifted to the left by $40 \mu \mathrm{~m}$, add 4 to the current setting of SP5-993-011 Correction [dots] = +(40/21.2) = Approx. +2 <br> - If the magenta line has shifted to the right by $70 \mu \mathrm{~m}$, subtract 3 from the current setting of SP5-993-011. Correction [dots] = -(70/21.2) = Approx. -3 |
|  | Front or rear | The amount of color shift at the front and rear sides becomes gradually bigger toward the trailing edge. | - Side fence position <br> - Transfer belt position | - | - | - Check if the side fences of the paper trays are properly positioned. If there is clearance between the paper and the side fences, this causes paper to skew during paper transport. <br> - Check if the transfer belt is in correct position, if the tension springs are properly set, or if the paper attraction roller is properly installed.. <br> (-3.7.4 Transfer Belt in the service manual for the printer mainframe) |

## 5. SERVICE TABLES

### 5.1 SERVICE PROGRAM MODE - CF CONFIGURATION

```
\CAUTION
Before accessing the service menu, do the following:
Confirm that there is no print data in the printer buffer (the Data In LED
must not be lit or blinking).
If there is data in the buffer, wait until all data has been printed.
```


### 5.1.1 ENABLING AND DISABLING SERVICE PROGRAM MODE



Exit 5. Press Exit twice to return to the copy window.

### 5.1.2 TYPES OF SP MODES

Copy SP
Printer SP
Scanner SP
Fax SP

SP modes related to the engine functions
SP modes related to the controller functions
SP modes related to the scanner functions
SP modes related to the fax functions

After accessing the SP mode, select one of the Service Program modes (Copy, Printer, Scanner, or Fax) from the touch panel as shown in the diagram below. This section explains the functions of the Printer/Copy/Scanner SP modes. Please refer to the Fax service manual for the Fax SP modes.


## SERVICE PROGRAM MODE - CF CONFIGURATION

## SP Mode Button Summary

Here is a short summary of the touch-panel buttons.

(1) Opens all SP groups and sublevels.
(2) Closes all open groups and sublevels and restores the initial SP mode display.
(3) Opens the copy window (copy mode) so you can make test copies. To return to the SP mode screen, press SP Mode (highlighted) in the copy window.
(4) Enter the SP code directly with the number keys if you know the SP number and then press $\#$. (The required SP Mode number will be highlighted when pressing $\#$. If not, just press the required SP Mode number.)
(5) Press twice to leave the SP mode and return to the copy window to resume normal operation.
(6) Press any Class 1 number to open a list of Class 2 SP modes.
(7) Press to scroll the display to the previous or next group.
(8) Press to scroll to the previous or next display in segments the size of the screen display (page).
(9) Press to scroll the display to the previous or next line, line by line.
(0) Press to move the highlight on the left to the previous or next selection in the list.

## Switching Between SP Mode and Copy Mode for Test Printing

1) In the SP mode, select the test print and then press Copy Window.
2) Use the copy window (copier mode), to select the appropriate settings (paper size, etc.) for the test print.
3) Press Start (*) to execute the test print.
4) Press SP Mode (highlighted) to return to the SP mode screen and repeat from step 1.

## Selecting the Program Number

Program numbers have two or three levels.

1. Before you begin, refer to the Service Tables to find the SP that you want to adjust. (-5.3, 5.4, or 5.5)
2. Press the Group number on the left side SP Mode window that contains the SP that you want to adjust.
3. Use the scrolling buttons in the center of the SP mode window to display the SP number that you want to open, and then press that number to expand the list.
4. Use the center touch-panel buttons to scroll to the number and title of the item that you want to set and press. The small entry box on the right is activated and displays the default or the current setting below.


NOTE: Refer to the Service Tables for the range of allowed settings. (5.3, 5.4 , or 5.5 )
5. To enter a setting:

- Press $\circledast^{\circledast}$ to toggle between plus and minus and then use the keypad to enter the appropriate number. The number you enter writes over the previous setting.
- Press $\#$ to enter the setting. (If you enter a number that is out of range, the key press is ignored.)
- When you are prompted to complete the selection, press Yes.

6. If you need to perform a test print, press Copy Window to open the copy window and select the settings for the test print. Press Start (*), and then press SP Mode (highlighted) in the copy window to return to the SP mode display.
7. When you are finished, press Exit twice to return to the copy window.

## Exiting Service Mode

Press the "Exit" key on the touch-panel.
NOTE: To make the following settings effective, you must turn the main switch off and on after exiting service mode.

| SP Modes Related to the Engine | SP Modes Related to the Controller |
| :--- | :--- |
| SP2-208-009 | SP5-009-001 |
| SP2-213-001 | SP5-302-002 |
| SP2-224-001 to 004 | SP5-801-003 to 013 |
| SP5-930-001 to 005 | SP5-832-001 to 004 |
| SP5-994-001 and 002 | SP5-961-001 |
| SP7-905-007 and 009 |  |
| SP5-998-001 |  |

NOTE: If the settings of SP modes 5-993-013 to 015 are changed, these changes will affect the next line position adjustment.

### 5.2 SERVICE MODE

### 5.2.1 REMARKS

## Display on the Touch Panel Screen

Since the maximum number of characters which can be displayed on the touch panel screen is limited ( 20 characters), the description of SP modes displayed on the screen needs to be abbreviated. The following are the major abbreviations used for the SP modes for which the full description is over 20 characters.

## Paper Type

N : Normal paper
TH: Thick paper
Color Mode [Color]
[K]: Black in B\&W mode
[Y], [M], or [C]: Yellow, Magenta, or Cyan in Full Color mode
[YMC]: Only for Yellow, Magenta, and Cyan
[FC]: Full Color mode
[FC, K], [FC, Y], [FC, M], or [FC, C]: Black, Yellow, Magenta, or Cyan in full color mode
Paper Feed Station
P: Paper tray
B: By-pass table

## Fusing Section

H: Hot roller
$P$ : Pressure roller
Print Mode
S: Simplex
D: Duplex
Process Speed
62.5, 125, 185

As shown in the following table, the process speed (mm/s) depends on the print mode (B\&W or Color), resolution, and/or type of paper selected. Some SP mode settings depend on the process speed.

| Mode | Resolution <br> (dpi) | Line speed <br> $(\mathbf{m m} / \mathbf{s})$ | Print speed <br> $(\mathbf{p p m})$ |
| :---: | :---: | :---: | :---: |
| B/W | $600 \times 600$ <br> $1,200 \times 600$ | 185 | 38 |
|  | $1,200 \times 1,200$ | 125 | 28 |
| Color | $600 \times 600$ <br> $1,200 \times 600$ | 125 | 28 |
|  | $1,200 \times 1,200$ | 62.5 | 14 |
|  | $600 \times 600$ <br> $1,200 \times 600$ <br> $1,200 \times 1,200$ | 62.5 | 10 |

## Others

The following symbols are used in the SP mode tables.
FA: Factory setting
(Data may be adjusted from the default setting at the factory. Refer to the factory setting sheets enclosed, which is located underneath the jammed paper removal decal.)

DFU: Design / Factory Use only
Do not touch the SP mode in the field.
A sharp (\#) to the right hand side of the mode number column means that the main switch must be turned off and on to effect the setting change.

An asterisk (*) to the right hand side of the mode number column means that this mode is stored in the EEPROM (Engine) or NVRAM (Printer Controller). If you do a RAM clear, this SP mode will be reset to the default value. 'BCU', 'CTL', 'SBU', and 'NV' indicate which NVRAM contains the data.

- BCU: NVRAM on the BCU board
- CTL: NVRAM on the controller board
- SBU: NVRAM on the SBU board (this NVRAM cannot be removed in the field)
- NV: NVRAM on the NVRAM expansion board (user account enhancement kit)
The settings of each SP mode are explained in the right-hand column of the SP table in the following manner.
[ Adjustable range / Default setting / Step ] Alphanumeric
NOTE: If "Alphanumeric" is written to the right of the bracket as shown above, the setting of the SP mode is displayed on the screen using alphanumeric characters instead of only numbers. However, the settings in the bracket in the SP mode table are explained by using only the numbers.


### 5.3 PRINTER SP MODE

### 5.3.1 SP MODES

| 1 | Mode No. (Class 1 and 2) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 001 | [Bit Switch] |  |  |  |
|  | 1 | Bit Switch 1 Setting | $\stackrel{*}{\text { CTL }}$ | Adjusts bit switch settings. DFU <br> NOTE: Currently the bit switches are not being used. All data has to be set to " 0 ". |
|  | 2 | Bit Switch 2 Setting |  |  |
|  | 3 | Bit Switch 3 Setting |  |  |
|  | 4 | Bit Switch 4 Setting |  |  |
| 003 | [Clear Setting] |  |  |  |
|  | 1 | Initialize Printer System |  | Initializes settings in the "System" menu of the user mode. |
|  | 2 | Clear CSS Counter |  | DFU |
| 004 | [Print Summary] |  |  |  |
|  | 1 | Print Summary |  | Prints the service summary sheet (a summary of all the controller settings). |
| 005 | [Display Version] |  |  |  |
|  | 1 | Display Version |  | Displays the version of the controller firmware. |
| 101 | [Data Recall] |  |  |  |
|  | 1 | Factory | $\stackrel{*}{\text { CTL }}$ | Recalls a set of gamma settings. This can be either a) the factory setting, b) the previous setting, c) the current setting, or d) the ACC factory setting. |
|  | 2 | Previous |  |  |
|  | 3 | Current |  |  |
|  | 4 | ACC |  |  |
| 102 | [Resolution Setting] |  |  |  |
|  | 1 | *1200x1200 Photo |  | Selects the printing mode (resolution) for the printer gamma adjustment. When selecting a print mode, an asterisk $\left(^{*}\right)$ is displayed in the front of the mode. |
|  | 2 | $600 \times 600$ Text |  |  |
|  | 3 | $1200 \times 600$ Text |  |  |
|  | 4 | $600 \times 600$ Photo |  |  |
|  | 5 | $1200 \times 600$ Photo |  |  |
|  | 6 | 1200x1200 Text |  |  |
| 103 | [Test Page] |  |  |  |
|  | 1 | Color Gray Scale |  | Prints the test page to check the color balance before and after the gamma adjustment. |
|  | 2 | Color Pattern |  |  |
| 104 | [Gamma Adjustment] |  |  |  |
|  | 1 | Black: Highlight | $\stackrel{*}{C T L}$ | Adjusts the printer gamma for the mode selected in the "Mode Selection" menu. <br> [ 0 to $30 / \underline{15} / 1 /$ step ] |
|  | 2 | Black: Shadow |  |  |
|  | 3 | Black: Middle |  |  |
|  | 4 | Black: IDmax |  |  |
|  | 21 | Cyan: Highlight |  |  |
|  | 22 | Cyan: Shadow |  |  |
|  | 23 | Cyan: Middle |  |  |
|  | 24 | Cyan: IDmax |  |  |
|  | 41 | Magenta: Highlight |  |  |
|  | 42 | Magenta: Shadow |  |  |
|  | 43 | Magenta: Middle |  |  |
|  | 44 | Magenta: IDmax |  |  |
|  | 61 | Yellow: Highlight |  |  |
|  | 62 | Yellow: Shadow |  |  |
|  | 63 | Yellow: Middle |  |  |
|  | 64 | Yellow: IDmax |  |  |


| 1 | Mode No. (Class 1 and 2) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 105 | [Data Save] |  |  |  |
|  | 1 | Data Save |  | Stores the print gamma adjusted with the "Gamma Adj." menu item as the current setting. Before the machine stores the new 'current setting', it moves the data currently stored as the 'current setting' to the 'previous setting' memory storage location. |
| 106 | [Toner Limit] |  |  |  |
|  | 1 | Toner Limit: Photo | CTL | Adjusts the maximum toner amount for image development. <br> [ 100 to $400 / \underline{260 / 1 \% / s t e p]}$ |
|  | 2 | Toner Limit: Text |  | [ 100 to $400 / 190 / 1 \% /$ step ] |

### 5.3.2 BIT SWITCH PROGRAMMING

NOTE: Currently, the bit switches are not being used.

1. Press the numeral key (0 to 7) corresponding to the bit number you wish to change.
Pressing the numeral key changes the setting to either " 0 " or " 1 ".
NOTE: The left digit on the display is bit 7 and the right digit is bit 0 .
2. Press [Enter] to save changes and exit.

### 5.4 COPY SP MODE

### 5.4.1 SP MODES

## SP1-XXX (Feed)

| 1 | Mode No. (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 001 | [Lead Edge Reg.] Leading Edge Registration (Paper Type, [Color ], Process Speed) |  |  |  |
|  | 1 | Normal [K] 62.5 | BCU | Adjusts the leading edge registration by changing the registration clutch operation timing for each mode. [ -10.0 to $10.0 / \underline{0.0} / 0.1 \mathrm{~mm} / \mathrm{step}]$ FA |
|  | 2 | Normal [K] 125 |  |  |
|  | 3 | Normal [K] 185 |  |  |
|  | 4 | Normal [FC] 62.5 |  |  |
|  | 5 | Normal [FC] 125 |  |  |
|  | 6 | Thick [K] |  |  |
|  | 7 | Thick [FC] |  |  |
|  | 8 | OHP [K] |  |  |
|  | 9 | OHP [FC] |  |  |
| 002 | [Side to Side Reg.] Side-to-Side Registration |  |  |  |
|  | 1 | By-pass Table | BCU | Adjusts the side-to-side registration by changing the laser main scan start position for each mode. [ -10.0 to $10.0 / \underline{0.0 / 0.1 ~ m m / s t e p] ~ F A ~}$ |
|  | 2 | Paper Tray 1 |  |  |
|  | 3 | Paper Tray 2 |  |  |
|  | 4 | Paper Tray 3 |  | [ -10.0 to $10.0 / \underline{0.0} / 0.1 \mathrm{~mm} / \mathrm{step}$ ] |
|  | 5 | Paper Tray 4 |  |  |
|  | 6 | Duplex |  |  |
| 003 | [Paper Buckle] Paper Buckle <br> (Paper Tray or By-pass, Paper Type, Process Speed), Paper Type: N: Normal, TH: Thick |  |  |  |
|  | 1 | Paper Tray 62.5 | BCU | Adjusts the amount of paper buckle at the registration roller by changing the paper feed timing. <br>  |
|  | 2 | Paper Tray 125 |  |  |
|  | 3 | Paper Tray 185 |  |  |
|  | 4 | By-pass N 62.5 |  |  |
|  | 5 | By-pass N 125 |  |  |
|  | 6 | By-pass N 185 |  |  |
|  | 7 | By-pass TH |  |  |
|  | 8 | By-pass OHP |  |  |
| 004 | [Dev. Motor Speed] Development Drive Motor Speed 1 ([Color], Process Speed, Paper Type) |  |  |  |
|  | 1 | [K] 62.5 Normal | $B C U$ | Adjusts the development drive motor speed for correcting color shifts at the leading edge or trailing edge area. <br> Black Motor [K]: <br> Adjusts fusing roller speed for the trailing edge area. <br> Color Motor [YMC]: <br> Adjusts registration roller speed for the leading edge area. <br> [ 96.0 to $104.0 / \underline{100.0 / 0.1 \% / \text { step }]}$ <br> NOTE: <br> - SP1-004-002 and 005 is for color mode. Fine adjustment for B\&W mode can be done with SP1-005-001 and 002. <br> - SP1-004-004 is for normal paper. Fine adjustment for thick paper can be done with SP1-005-003. |
|  | 2 | [K] 125 |  |  |
|  | 3 | [K] 185 |  |  |
|  | 4 | [YMC] 62.5 |  |  |
|  | 5 | [YMC] 125 |  |  |
|  | 6 | [YMC] 185 |  |  |
|  | 7 | [K] 62.5 Thick |  |  |
|  |  |  |  |  |


| 1 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 005 | [Dev. Motor Speed2] Development Drive Motor Speed 2 ([Color], Process Speed) |  |  |  |
|  | 1 | [K] | BCU | Adjusts the black development drive motor speed for the B\&W $125 \mathrm{~mm} / \mathrm{s}$ process speed. The value stored in this SP mode is different from SP1-004002 ( the note for SP 1-004). <br> At the $125 \mathrm{~mm} / \mathrm{s}$ process speed, the transfer unit position for B\&W is different than for color mode. The transfer unit position affects the paper transport quality, causing the paper to flip up at the fusing section if the same speed as color mode is used for $\mathrm{B} \& \mathrm{~W}$ mode. To minimize the occurrence of paper flipping up, which causes smeared images in the trailing area, this SP mode can change the motor speed in B\&W mode. <br> [ -0.2 to $1.0 / \underline{2} / 0.1 \% /$ step ] |
|  | 2 | [YMC] |  | Adjusts the color development drive motor speed for the B\&W $125 \mathrm{~mm} / \mathrm{s}$ process speed. The value stored in this SP mode is different from SP1-004005 (the note for SP 1-004). <br> At the $125 \mathrm{~mm} / \mathrm{s}$ process speed, the transfer unit position for B\&W is different than for color mode. The transfer unit position affects the paper transport speed slightly. This SP mode can adjust the motor speed for $\mathrm{B} \& \mathrm{~W}$ mode. [ -1.0 to $1.0 / \underline{0} / 0.1 \% /$ step ] FA |
|  | 3 | [YMC] Thick |  | Adjust the color development drive motor speed for thick paper in by-pass mode. The value stored in this SP mode is different from SP1-004-004 the note for SP 1-004). <br> Normal and thick paper are different types of paper, and this sometime causes color shift due to paper slippage. This SP mode can change the motor speed for thick paper. <br> [ -0.3 to $0.3 / \underline{0} / 0.1 \% /$ step ] |
| 006 | [Dev. Motor Speed3] Development Drive Motor Speed 3 ([Color], Process Speed, Paper Type) |  |  |  |
|  | 1 | [K] 62.5 Special | BCU | Adjusts the development motor speed for special paper. <br> [ -4.0 to 4.0 / 0 / 0.1 \%/step ] |
|  | 2 | [K] 125 Special |  |  |
|  | 3 | [YMC] 62.5 Special |  |  |
|  | 4 | [YMC] 125 Special |  |  |
| 007 | [Dev. Motor Speed4] Development Drive Motor Speed 4 <br> ([Color], Process Speed, Paper Type), Paper Type -> SP: Special |  |  |  |
|  | 1 | [YMC] Post Card | BCU | Adjusts the development motor speed for post cards. <br> [ -4.0 to $4.0 / 0 / 0.1 \% /$ step ] |
| 104 | [Fusing Control] |  |  |  |
|  | 1 | Control Method | BCU | Selects the fusing control method. <br> [ 0 or $1 / 0 /-$ - Alphanumeric <br> 0: ON/OFF Control <br> 1: Phase Control <br> NOTE: This mode can be used only for N . <br> America models. |


| 1 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 104 | 25 | Process Speed | BCU | Selects the power-on default target fusing operation temperature. <br> The target operating fusing temperature depends on the process speed. When the machine is switched on, it starts warming up for the process speed specified in this SP mode. <br> [0 to 4 / $\underline{4}$ / 1/step] Alphanumeric <br> 0: CL (Cōlor) $62.5 \mathrm{~mm} / \mathrm{s}$ (temperature specified by SP 1-105-8 and 19) <br> 1: CL (Color) $125 \mathrm{~mm} / \mathrm{s}$ (temperature specified by SP 1-105-9 and 20) <br> 2: OHP / Thick (temperature specified by SP 1-105-13 and 28) <br> 3: B\&W $125 \mathrm{~mm} / \mathrm{s}$ (temperature specified by SP 1-105-4 and 15) <br> 4: B\&W $185 \mathrm{~mm} / \mathrm{s}$ (temperature specified by SP 1-105-5 and 16) |
| 105 | [Fusing Temperature] <br> (Heating or Pressure roller: Paper Type, [Color], Simplex/Duplex, Process Speed) <br> Paper Type -> N: Normal, OHP. TH: Thick, SP: Special <br> Some settings of fusing temperature depend on the destination (US or Europe/Asia). US: Setting for US, EU: Setting for Europe/Asia |  |  |  |
|  | 1 | H: Ready | BCU | Sets the heating roller temperature for the printing ready condition. <br> After the main switch has been turned on, the machine enters the print ready condition when the heating roller temperature reaches the temperature specified in this SP mode. When the machine is in the recovery mode from the energy saver or auto off mode, the machine becomes ready when both heating and pressure roller temperatures reach the specified temperature. <br> Ready temperature $=$ (Target temperature specified in SP1-104-25 or 105-3 to 28) Temperature specified in this SP mode. [ 10 to $100 / 10 / 1^{\circ} \mathrm{C} /$ step ] |
|  | 2 | P: Ready |  | Sets the pressure roller temperature for the printing ready condition. <br> Ready temperature = (Target temperature specified in SP1-104-25 or 105-3 to 28) Temperature specified in this SP mode NA: [ 10 to $100 / \underline{\left.10 / 1^{\circ} \mathrm{C} / \text { step }\right]}$ <br> EU: [ 10 to $100 / \underline{\left.\underline{20} / 1^{\circ} \mathrm{C} / \text { step }\right]}$ |
|  | The following SPs set the target operating temperatures of the heating and pressure rollers in various modes. (The default settings are different for N. America and Eur./Asia) |  |  |  |
|  | 4 | H:N [K] S 125 | BCU | [ 100 to $190 / 1 \underline{75} / 5^{\circ} \mathrm{C} /$ step] |
|  | 5 | H:N [K] S 185 |  | [ 100 to 190 / NA: $185 \mathrm{EU}: 180 / 5^{\circ} \mathrm{C} /$ step] |
|  | 6 | H:N [K] D 125 |  | [ 100 to $190 / \underline{165} / 5^{\circ} \mathrm{C} /$ step] |
|  | 7 | H:N [K] D 185 |  | [ 100 to $190 / 175 / 5^{\circ} \mathrm{C} /$ step] |
|  | 8 | H:N[FC] S 62.5 |  | [ 100 to $190 / 150 / 5^{\circ} \mathrm{C} /$ step] |
|  | 9 | H:N[FC] S 125 |  | [ 100 to 190 / NA: 175 EU: $180 / 5^{\circ} \mathrm{C} /$ step] |
|  | 10 | H:N[FC] D 62.5 |  | [ 100 to $190 / 145 / 5^{\circ} \mathrm{C} /$ step] |


| 1 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 105 | 11 | H:N[FC] D 125 | BCU | [ 100 to 190 / NA: $\left.165 \mathrm{EU}: 170 / 5^{\circ} \mathrm{C} / \mathrm{step}\right]$ |
|  | 13 | H:OHP [FC] |  | [ 100 to $190 / 180 / 5^{\circ} \mathrm{C} /$ step] |
|  | 15 | P:N [K] S 125 |  | [ 0 to 190 / NA: $145 \mathrm{EU}: 155 / 5^{\circ} \mathrm{C} /$ step] |
|  | 16 | P:N [K] S 185 |  | [ 0 to $190 / \mathrm{NA}: 155 \mathrm{EU}: 160 / 5^{\circ} \mathrm{C} / \mathrm{step}$ ] |
|  | 17 | P:N [K] D 125 |  | [ 0 to $190 / \mathrm{NA}: 135 \mathrm{EU}: 145 / 5^{\circ} \mathrm{C} / \mathrm{step}$ ] |
|  | 18 | P:N [K] D 185 |  | [ 0 to $190 / \mathrm{NA}: 145 \mathrm{EU}: 155 / 5^{\circ} \mathrm{C} /$ step] |
|  | 19 | P:N[FC] S 62.5 |  | [ 0 to $190 / \mathrm{NA}: 125 \mathrm{EU}: 130 / 5^{\circ} \mathrm{C} / \mathrm{step}$ ] |
|  | 20 | P:N[FC] S 125 |  | [ 0 to $190 / \mathrm{NA}: 145 \mathrm{EU}: 160 / 5^{\circ} \mathrm{C} / \mathrm{step}$ ] |
|  | 21 | P:N[FC] D 62.5 |  | [ 0 to 190/NA: $120 \mathrm{EU}: 125 / 5^{\circ} \mathrm{C} / \mathrm{step}$ ] |
|  | 22 | P:N[FC] D 125 |  | [ 0 to 190 / NA: $135 \mathrm{EU}: 150 / 5^{\circ} \mathrm{C} /$ step] |
|  | 24 | P:OHP |  | [ 0 to $190 / 160 / 5^{\circ} \mathrm{C} /$ step] |
|  | 26 | H:TH |  | [ 0 to $190 / 175 / 5^{\circ} \mathrm{C} /$ step] |
|  | 28 | P:TH |  | [ 0 to $190 / 155 / 5^{\circ} \mathrm{C} /$ step] |
|  | 29 | H:Envelop |  | [ 0 to $190 / 175 / 5^{\circ} \mathrm{C} /$ step] |
|  | 30 | P:Envelop |  | [ 0 to $\left.190 / 155 / 5^{\circ} \mathrm{C} / \mathrm{step}\right]$ |
|  | 31 | H: Slow Down |  | Sets the heating roller temperature for the printing start condition when changing the process speed. Fusing temperature must be decreased when the machine changes to a process speed that is slower than the current process speed (for example, when the speed changes from 185 $\mathrm{mm} / \mathrm{s}$ to $62.5 \mathrm{~mm} / \mathrm{s})$. The machine idles while reducing the fusing temperature. When the fusing temperature becomes lower than the ready temperature, the machine starts printing. Ready Temperature $=$ Target temperature + Temperature specified in this SP mode. [ 1 to $20 / \underline{5} / 1^{\circ} \mathrm{C} /$ step] |
|  | 32 | P: Slow Down |  | Sets the pressure roller temperature for the printing start condition when changing the process speed. <br> [ 1 to $20 / 10 / 1^{\circ} \mathrm{C} /$ step] |
|  | 33 | H:SP 62.5 |  | [ -20 to $30 / \underline{0} / 1^{\circ} \mathrm{C} / \mathrm{step}$ ] |
|  | 34 | H:SP 125 |  | [-20 to $\left.30 / \underline{0} / 1^{\circ} \mathrm{C} / \mathrm{step}\right]$ |
|  | 35 | H:SP 185 |  | [-20 to $\left.30 / \underline{0} / 1^{\circ} \mathrm{C} / \mathrm{step}\right]$ |
|  | 36 | P:SP 62.5 |  | [-20 to $30 / \underline{0} / 1^{\circ} \mathrm{C} /$ step] |
|  | 37 | P:SP 125 |  | [-20 to $\left.30 / \underline{0} / 1^{\circ} \mathrm{C} / \mathrm{step}\right]$ |
|  | 38 | P:SP 185 |  | [ -20 to $30 / \underline{0} / 1^{\circ} \mathrm{C} / \mathrm{step}$ ] |
| 106 | [Temperature Display] Fusing Temperature Display (Heating or Pressure) |  |  |  |
|  | 1 | Heat Roller |  | Displays the current temperature of the heating |
|  | 2 | Pressure Roller |  | and pressure rollers. |
| 902 | [Paper Size] Tray Paper Size |  |  |  |
|  | 1 | Tray 1 A4/LT | BCU | Specifies the paper size for tray 1. [ 0 or $1 / \underline{0} /-$ ] Alphanumeric 0 : A4 sideways, 1 : LT sideways Tray 1 can only use these two sizes. US: 1 FA |


| 1 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 902 | 2 | Tray 2 B4/LG | $\stackrel{*}{B C U}$ | Specifies the paper size for tray 2. [ 0 or $1 / \underline{0 /-]}$ Alphanumeric 0: B4 lengthwise, 1: LG lengthwise This specifies which size is detected for a sensor output of 1101 (see section 6 for details). US: 1 FA |
|  | 3 | Tray 2 A4/LT |  | Specifies the paper size for tray 2. [ 0 or $1 / \underline{0} /-$ ] Alphanumeric 0: A4 lengthwise, 1: LT lengthwise This specifies which size is detected for a sensor output of 0110 (see section 6 for details). US: 1 FA |
|  | 4 | Tray 2 B5/LT |  | Specifies the paper size for tray 2. <br> [ 0 or $1 / 0 /-$ - Alphanumeric <br> 0 : LT, 1: B 5 lengthwise <br> This specifies which size is detected for a sensor output of 1011 (see section 6 for details). |
| 910 | [Fusing Idling Time] |  |  |  |
|  | 1 | Fusing Idling Time | BCU | Specifies the timer for deciding whether to do fusing idling when receiving a print command. <br> When receiving a new job within the time specified in this SP mode after the last job is completed, fusing idling is not done because the fusing section was already warmed up during the last job. <br> [ 0 to 180 / 1 / 1 minute/step ] DFU |
| 912 | [Machine Temp. Cor.] Machine Temperature Correction Th: Threshold, Heating or Pressure roller |  |  |  |
|  | Corrects the fusing temperature depending on the temperature inside the machine. If the temperature inside the machine is too high or low, this may cause hot or cold offset image at the fusing section. To avoid the offset image, the fusing temperature is corrected depending on the temperature inside machine, which is monitored by the thermistor located on the right side of the laser optics housing unit. <br> If the temperature inside the machine is detected as high or low (based on the settings of SP1-912-001 or 002), the fusing temperature is decreased or increased by the temperature specified in SP1-912-003 to 006. |  |  |  |
|  | 1 | Th:High Temp | ${ }^{*}{ }^{*}$ | Sets the threshold for entering the high temperature condition. <br> [ 0 to $50 / 30 / 1^{\circ} \mathrm{C} /$ step] |
|  | 2 | Th:Low Temp |  | Sets the threshold for entering the low temperature condition. <br> [ 0 to $50 / 17 / 1^{\circ} \mathrm{C} /$ step] |
|  | 3 | H:High Temp |  | Sets the fusing temperature decrease for the high temperature condition. <br> [ 0 to $15 / 0 / 1^{\circ} \mathrm{C} /$ step $]$ |
|  | 4 | P:High Temp |  | [ 0 to $15 / \underline{0} / 1^{\circ} \mathrm{C} /$ step] |
|  | 5 | H:Low Temp |  | Sets the fusing temperature increase for the low temperature condition. <br> [ 0 to $15 / 5 / 1^{\circ} \mathrm{C} /$ step] |
|  | 6 | P:Low Temp |  | [ 0 to $15 / \underline{5} / 1^{\circ} \mathrm{C} /$ step] |


| 1 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 913 | [Temperature Cor. 1] Fusing Temperature Correction (Correction Timing) |  |  |  |
|  | 1 | Sheet Setting | BCU | Specifies the number of sheets to determine whether or not to apply the fusing temperature correction. <br> During a multi print job, the fusing temperature tends to slightly overshoot around the 10th sheet and then stabilize. Temperature overshooting may cause the glossiness to increase. <br> To minimize the overshooting, both fusing and pressure roller temperatures are decreased by the amount specified in SP1-914 at the number of sheets specified in this SP mode, until the end of the job. <br> [ 1 to $60 / 10 / 1$ sheet/step] |
| 914 | [Temperature Cor. 2] Fusing Temperature Correction (Temperature Setting) |  |  |  |
|  | 1 | Heating | BCU | Specifies the temperature to be subtracted from the targeted temperatures specified in SP1-105-3 to-24. <br> [ 0 to $30 / \underline{10 / 5^{\circ} \mathrm{C} / \text { step ] }}$ |
|  | 2 | Pressure |  |  |
| 915 | [Stand-by Time] |  |  |  |
|  | 1 | Job Receiving | $B C U$ | Specifies the time to shift the machine into the stand-by mode when not receiving a print start command after receiving a print preparation command. <br> [ 0 to 180 / 60 / 10 seconds/step ] <br> 0 : The machine does not shift to the stand-by mode. |
|  | 2 | Job End |  | Specifies the time to shift the machine into the stand-by mode after the last job is completed. [ 0 to 180 / $60 / 10$ seconds/step ] 0 : The machine does not shift to the stand-by mode. |
| 916 | [Idling Mode] |  |  |  |
|  | 1 | Mode Set | BCU | Enables or disables fusing unit idling. Idling is done for the time specified in SP1-916-2 after the machine enters the ready condition. <br> [ 0 or $1 / / \underline{0} /-$ ] DFU <br> 0 OFF <br> 1: ON |
|  | 2 | Idling Time |  | Specifies the time for the fusing unit idling. [10 to 120 / 30 / 10 seconds/step ] DFU |
|  | 3 | Pre-Job Mode |  | Enables or disables fusing unit idling for 4 seconds before starting a print job. <br> [ 0 or $1 / / \underline{0} /-$ - DFU <br> 0: OFF <br> 1: ON |



SP2-XXX (Drum)

| 2 | Mode No. (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 001 | [Charge Bias] Charge Roller Bias (DC or AC component: [Color], Process Speed) U: Upper, L: Lower |  |  |  |
|  | 1 | DC:[K] 62.5 | $B C U$ | Adjusts the DC component of the charge roller bias in the various print modes. <br> Charge bias (DC component) is automatically adjusted during process control; therefore, adjusting these settings does not effect while process control mode (SP3-125 Default: ON) is activated. When deactivating process control mode with SP3-125, the values in these SP modes are used for printing. <br> [ 300 to 1000 / 700 / 10 volts/step ] DFU |
|  | 2 | DC:[K] 125 |  |  |
|  | 3 | DC:[K] 185 |  |  |
|  | 4 | DC:[Y] 62.5 |  |  |
|  | 5 | DC:[Y] 125 |  |  |
|  | 6 | DC:[M] 62.5 |  |  |
|  | 7 | DC:[M] 125 |  |  |
|  | 8 | DC:[C] 62.5 |  |  |
|  | 9 | DC:[C] 125 |  |  |
|  | 10 | AC U Limit [K] |  | Sets the upper limit of the AC component adjustable range for black. <br> During machine initialization and process control self-check, the AC component of the charge roller bias is automatically adjusted within the range specified by SP2-001-010 and 011. <br> [0 to 255 / 103 / 1/step ] DFU |
|  | 11 | AC L Limit [K] |  | Sets the lower limit of the AC component adjustable range for black. <br> [0 to 255 / 97 / 1/step ] DFU |
|  | 12 | AC:[K] 62.5 |  | - Displays the AC component of the charge roller bias adjusted during machine initialization or process control self-check. <br> - Sets AC bias in the various print modes for test purposes. <br> If the optimum AC bias cannot be selected because of the upper and lower limits (SP2-00110 and 11 for K, SP 2-001-21 and 22 for YMC), this may cause white spots on images and black spots on background. (In particular, spots may appear if the room temperature is very low.) Check the printouts after changing the AC bias with these SP modes (SP2-001-12 to 20) and exiting SP mode. If increasing or decreasing the AC bias for relevant color solves the spot problem, shift the AC upper and lower limits (SP2-001-10 and 11 for K, SP 2-001-21 and 22 for YMC) by the value increased or decreased during the test. <br> NOTE: The AC upper and lower limits have been optimized by the manufacturer; therefore, these settings should not be adjusted in the field. <br> [0 to 255 / 71/1/step] DFU |
|  | 13 | AC:[K] 125 |  | [0 to 255 / 71 / 1/step ] DFU |
|  | 14 | AC:[K] 185 |  | [0 to 255 / 148 / 1/step ] DFU |
|  | 15 | AC:[Y] 62.5 |  | [0 to 255 / 71 / 1/step ] DFU |
|  | 16 | AC:[Y] 125 |  | [0 to 255 / 71 / 1/step ] DFU |
|  | 17 | AC:[M] 62.5 |  | [0 to 255 / $\overline{\overline{11}} / 1 /$ step ] DFU |
|  | 18 | AC:[M] 125 |  | [0 to 255 / 71 / 1/step] DFU |
|  | 19 | AC:[C] 62.5 |  | [0 to 255 / $\underline{\text { 11 / 1/step] DFU }}$ |
|  | 20 | AC:[C] 125 |  | [0 to 255 / 71 / 1/step] DFU |


| 2 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 001 | 21 | AC U Limit[FC] | BCU | Sets the upper limit of the AC component adjustable range for color. During machine initialization and process control self-check, the AC component of the charge roller bias is automatically adjusted within the range specified in the SP2-001-021 and 022. [ 0 to 255 / 90 / 1/step ] DFU |
|  | 22 | AC L Limit[FC] |  | Sets the lower limit of the AC component adjustable range for color. [0 to 255 / 84 / 1/step] DFU |
| 103 | [LD Control] LD Power Control ([Color Mode, Color], Process Speed, K or Color mode) P: Power, M: Magnification |  |  |  |
|  | Adjusts the laser power by changing the current applied to LD. <br> Laser power is automatically adjusted during process control; therefore, adjusting these data has no effect while Process Control (SP3-125-002 Default : ON) is activated. <br> After selecting "0: Fixed) in SP3-125-002, the values in these SP modes are used for printing. <br> The following is the procedure to check whether or not LD power control functions properly. <br> 1. Set SP3-125-002 to "0: Fixed". <br> 2. Set the LD power to " 400 " and make a test print. <br> 3. Set the LD power to " 900 " and make a test print. <br> 4. Check the image density of the test prints made with LD power " 400 " and " 900 ". <br> 5. If there is no difference between the test prints, check the LD unit. <br> NOTE: Do not set the LD power to " 300 " or lower. This may cause SC220. |  |  |  |
|  | , | P:[K] 62.5 C | ${ }^{*}$ BCU | [ 0 to 1023/672/1/step] DFU |
|  | 2 | P:[K] 125 C |  | [ 0 to 1023 / 640 / 1/step] DFU |
|  | 4 | P: [Y] 62.5 C |  | [0 to 1023/672/1/step] DFU |
|  | 5 | P:[Y] 125 C |  | [ 0 to 1023/640 / 1/step] DFU |
|  | 7 | P:[M] 62.5 C |  | [ 0 to 1023 / 672 / 1/step] DFU |
|  | 8 | P:[M] 125 C |  | [ 0 to 1023/640 / 1/step] DFU |
|  | 10 | P:[C] 62.5 C |  | [ 0 to 1023/672/1/step] DFU |
|  | 11 | P:[C] 125 C |  | [0 to 1023/640/1/step] DFU |
|  | 13 | P:[K] 62.5 K |  | [ 0 to 1023/672/1/step] DFU |
|  | 14 | P:[K] 125 K |  | [ 0 to 1023 / $672 / 1 /$ step] DFU |
|  | 15 | P: $[\mathrm{K}] 185 \mathrm{~K}$ |  | [ 0 to 1023 / 601 / 1/step] DFU |
|  | 26 | P:[0 1] 125 K |  | [ 0 to 1023 / $672 / 1 /$ step] DFU |
|  | 27 | P:[0 1] 185 K |  | [ 0 to 1023/601/1/step] DFU |
|  | Main Scan Magnification ([Color], Laser Exposure Frequency) |  |  |  |
|  | 55 | $\mathrm{M}:[\mathrm{K}] 64.3 \mathrm{MHz}$ | $* *$ Displays the result of the latest line position <br> adjustment. Changing this affects the main scan <br> magnification; however, this will be automatically <br> corrected at the next line position adjustment. If a <br> fine adjustment is required, it can be done with  <br> SP5-993-013 to 015 (this affects the way that the  <br> adjustment is done, and will be effective from the  <br> next line position adjustment).  <br> [0 to 280 / $140 / 1$ dot/step $] 1$ dot $=20 \mu$ DFU  <br> NOTE: If the line position adjustment does not  <br> work properly, the line position can be  <br> adjusted manually with this SP mode as a  <br> temporary measure. In this case, the line  <br> position adjustment needs to be disabled  <br> with SP5-993-001.  |  |
|  | 56 | $\mathrm{M}:[\mathrm{Y}] 64.3 \mathrm{MHz}$ |  |  |
|  | 57 | $\mathrm{M}:[\mathrm{M}] 64.3 \mathrm{MHz}$ |  |  |
|  | 58 | $\mathrm{M}:[\mathrm{C}] 64.3 \mathrm{MHz}$ |  |  |
|  | 59 | $\mathrm{M}:[\mathrm{K}] 47.6 \mathrm{MHz}$ |  |  |


| 2 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 103 | LD Power Control for CF ([Color Mode, Color] |  |  |  |
|  | 101 | CF:[K,K] 1 | $B C U$ | [ 0 to 1023 / 604 / 1/step ] DFU |
|  | 102 | CF:[K, K] 2 |  | [ 0 to 1023 / 604 / 1/step] DFU |
|  | 103 | CF[FC,K] |  | [ 0 to 1023 / 720 / 1/step ] DFU |
|  | 104 | CF:[FC:Y] |  | [ 0 to 1023 / 720 / 1/step] DFU |
|  | 105 | CF:[FC,M] |  | [ 0 to 1023 / 720 / 1/step] DFU |
|  | 106 | CF:[FC,C] |  | [ 0 to 1023 / 720 / 1/step] DFU |
|  | 107 | CF:[K] OHP/TH |  | [ 0 to 1023 / 590 / 1/step] DFU |
|  | 108 | CF:[Y] OHP/TH |  | [ 0 to 1023 / 590 / 1/step] DFU |
|  | 109 | CF:[M] OHP/TH |  | [ 0 to 1023 / 590 / 1/step ] DFU |
|  | 110 | CF:[C] OHP/TH |  | [ 0 to 1023 / 590/1/step] DFU |
| 109 | [LD Beam Pitch] LD Beam Pitch |  |  |  |
|  | Sets the beam pitch for black in 1200 dpi or 600 dpi mode. <br> NOTE: After replacing the laser optics housing unit, the data printed on the decal attached to the new unit must be input with this SP mode. |  |  |  |
|  | 2 | Pitch 1200 | $\mathrm{BCU}$ | [ 0 to $255 / 50 / 50$ pulse/step] FA |
|  | 3 | Pitch 600 |  | [ 0 to 255 / $42 / 50$ pulse/step] FA |
|  | 5 | Display 1200 |  | [ 0 to 255/-/1 pulse/step ] |
|  | 6 | Display 600 |  | [ 0 to 255/-/1 pulse/step] |
| 112 | [Polygon OFF Timing 1] Polygon Mirror Motor OFF Timing 1 |  |  |  |
|  | 1 | Warming-up | $\mathrm{BCU}$ | The polygon mirror motor turns off if the machine receives no print start command for the time specified in this SP mode after receiving the print preparation command. <br> [ 0 to 60 / $10 / 1$ second/step ] <br> 0 : Not turned off except for Energy Saver mode |
|  | 2 | Job End |  | The polygon mirror motor turns off if the machine receives no print job for the time specified in this SP mode after the previous job was completed. <br> [ 0 to 60 / $1 / 1$ second/step ] <br> 0: Not turned off except for Energy Saver mode |
| 113 | [Polygon OFF Timing 2] Polygon Mirror Motor OFF 2 |  |  |  |
|  | 1 | Polygon OFF Timing 2 |  | The polygon mirror motor does not turn on until the printer enters the ready condition even after receiving the print start command. <br> [ 0 or $1 / 1 / 1 /$ step ] <br> 0: Enable, 1: Disable <br> NOTE: When a user complains about high frequency noise, enabling this mode can minimize the noise. |
| 201 | [Development Bias] ([Color], Process Speed) |  |  |  |
|  | 1 | [K] 62.5 | $B C U$ | Adjusts the development bias. <br> Development bias is automatically adjusted during process control; therefore, adjusting these settings has no effect while Process Control (SP3-125 <br> Default: ON) is activated. <br> After deactivating Process Control with SP3-125, the values in these SP modes are used for printing. <br> [ 200 to 800 / $500 / 10$ V/step ] DFU |
|  | 2 | [K] 125 |  |  |
|  | 3 | [K] 185 |  |  |
|  | 4 | [Y] 62.5 |  |  |
|  | 5 | [Y] 125 |  |  |
|  | 6 | [M] 62.5 |  |  |
|  | 7 | [M] 125 |  |  |
|  | 8 | [C] 62.5 |  |  |
|  | 9 | [C] 125 |  |  |


| 2 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 207 | [Forced Toner Supply] ([Color]) |  |  |  |
|  | 1 | [K] | $\mathrm{BCU}$ | Forces toner to be supplied to the development unit for the number of times specified by this SP mode. <br> 1 time: The toner supply clutch turns on for 0.7 s and off for 1.3 s . <br> [ 0 to $3 / 2 / 1 /$ step ] |
|  | 2 | [Y] |  |  |
|  | 3 | [M] |  |  |
|  | 4 | [C] |  |  |
| 208 | [Toner Supply Mode] ([Color]) |  |  |  |
|  | 1 | [K] | $B C U$ | Selects the toner supply method. [ 0 to $2 / 1 / 1 /$ step ] Alphanumeric <br> 0 : Fixed supply (with the supply rates stored with SP2-208-5 to 8) <br> 1: Fuzzy control supply <br> 2: Proportional control supply (using the Vref values stored with SP2-224-5 to 8) |
|  | 2 | [Y] |  |  |
|  | 3 | [M] |  |  |
|  | 4 | [C] |  |  |
|  | 5 | Fixed Rate [K] |  | Sets the toner supply rate used when the toner supply method (SP2-208-1 to 4) is set to '0' (fixed supply mode). <br> [ 0 to $100 / \underline{5} / 1 \% /$ step ] |
|  | 6 | Fixed Rate [Y] |  |  |
|  | 7 | Fixed Rate [M] |  |  |
|  | 8 | Fixed Rate [C] |  |  |
|  | 9 | Upper Limit | $\begin{gathered} \mathrm{BCU} \\ \# \end{gathered}$ | Specifies the maximum possible toner supply, expressed as a percentage of the maximum amount of toner that can possibly be supplied for a sheet of paper. <br> If too much toner is supplied to the development unit especially for black or in the low humidity condition, this may cause dirty background due to insufficient agitation. This SP mode limits the maximum possible toner supply for black and only in the low humidity condition for color. [ 20 to 70 / 42 / 1 \%/step ] DFU NOTE: The main switch must be turned off and on to effect the setting change. |
|  | 10 | LowCoverage[K] | BCU | Adjusts the toner supply amount (fixed rate) when making multiple prints of pages with low image ratio (coverage). <br> When printing with a low image ratio, toner concentration is controlled only with Vt outputs since pixel count is not done for low image ratios. This may cause the attraction force between toner and carrier to increase, resulting in low image density on outputs. To prevent this, the machine counts the number of pixels and supplies a fixed amount of toner if the accumulated number of pixels becomes greater than the specified level. [ 0 to $100 / 9 / 1 \% /$ step ] DFU |
|  | 11 | LowCoverage[Y] |  | [ 0 to $100 / \underline{9} / 1 \% /$ step] DFU |
|  | 12 | LowCoverage[M] |  | [ 0 to $100 / \underline{5} / 1 \% /$ step] DFU |
|  | 13 | LowCoverage[C] |  | [ 0 to $100 / \underline{\underline{9}} / 1 \% /$ step] DFU |
| 210 | [Toner Supply Counter] ([Color]) |  |  |  |
|  | 5 | [K] | $B C U$ | Displays the total time that the toner supply clutch has been on. <br> This data is stored in the memory chip on each toner cartridge. <br> [ 0 to 5000/-/ 1 second/step ] |
|  | 6 | [Y] |  |  |
|  | 7 | [M] |  |  |
|  | 8 | [C] |  |  |


| 2 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 212 | [Toner Near/End] Toner Near End / End Detection Threshold ([Color]) |  |  |  |
|  | 1 | Start [K] | BCU | When the amount of toner amount left in the cartridge becomes less than this value, the machine starts monitoring the Vt values for toner near end detection. <br> [ 0 to $1000 / 600 / 10 \mathrm{~g} /$ step ] |
|  | 2 | Start [YMC] |  | [ 0 to $1000 / 300 / 10 \mathrm{~g} /$ step] |
|  | 5 | Near [K] |  | Specifies the threshold for toner near-end detection. <br> The machine detects toner near-end when the following happens 10 times consecutively. $\underline{\text { Vt }>V \text { ref }+ \text { Threshold }}$ <br> [ 0 to $5.0 / 0.4 / 0.1 \mathrm{~V} /$ step ] |
|  | 6 | Near [YMC] |  |  |
|  | 7 | End [K] |  | Specifies the threshold for toner end detection. The machine detects toner end when the following happens 10 times consecutively. Then, the machine stops printing, even during a print job. Vt > Vref + Threshold <br> [ 0 to $5.0 / \underline{0.8} / 0.1 \mathrm{~V} /$ step ] |
|  | 8 | End [YMC] |  |  |
|  | 9 | Pixel [K] |  | Specifies the number of sheets with full image coverage that can be printed after toner near-end has been detected. <br> When near-end is detected, the pixels in the images are counted. The machine detects toner end when the following happens, and the machine stops printing even during a print job. <br> Pixel count $=5 \mathrm{~A} 4 / \mathrm{LT}$ sheets with full image coverage <br> [ 0 to 255 / $\underline{5} / 1$ sheet/step ] <br> NOTE: The setting of SP2-212-11 has priority for deciding when to stop printing. |
|  | 10 | Pixel [YMC] |  |  |
|  | 11 | Min. Print |  | Specifies the minimum number of sheets that can be printed after toner near-end has been detected. However, when the following happens 10 consecutive times, the machine stops printing even during a print job or if this guaranteed minimum has not been met. <br> Vt $>$ Current Vref value +1.2 V or $\mathrm{Vt}>4.8 \mathrm{~V}$ [ 0 to $50 / 10 / 1$ sheet/step] |
| 213 | [Toner End ON/OFF] Toner End Detection ON/OFF |  |  |  |
|  | 1 | Toner END ON/OFF | $\underset{\#}{\mathrm{BCU}}$ | Enables or disables toner near-end and end detection (if disabled, the toner supply clutch on time is still counted). <br> [ 0 or $1 / 1 /$ - ] Alphanumeric, DFU 0: Disabled, 1 Enabled <br> NOTE: The main switch must be turned off and on to effect the setting change. |


| 2 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 223 | [TD Vent Control] TD Sensor Vent Control |  |  |  |
|  | 1 | Initialization | BCU | Enables or disables the Vcnt Auto Adjustment when detecting a new development unit. When the machine detects a new development unit, developer initialization automatically starts. During the developer initialization, Vcnt is automatically adjusted so that Vt is within $3.0 \pm$ 0.1 V . <br> [ 0 or 1 / 1 / - ] Alphanumeric, DFU <br> 0 : Disabled <br> 1: Enabled |
|  | 2 | Humidity |  | Enables or disables the Humidity Auto Correction. This corrects the Vcnt value for the current humidity. This correction is applied to both the Vcnt values automatically adjusted during developer initialization and manually adjusted with SP2-224-1 to 4. <br> If this correction does not work well under certain environmental conditions or due to a defective humidity sensor, deactivate the Humidity Auto Correction and adjust the Vcnt value in SP2-224-1 to 4 (by trial and error). <br> [ 0 or $1 / 1$ / - ] Alphanumeric <br> 0: Disabled <br> 1: Enabled |
|  | 3 | Toner Fill Up |  | Activates or deactivates the Toner Fill Up mode, which fills up the toner supply tube with toner during developer initialization. <br> This function is required only at machine installation. Although the default is " 0 ", the factory setting is " 1 ". After toner fill-up occurs during machine installation, the setting is changed to " 0 " automatically. <br> [ 0 or $1 / \underline{0} /-$ ] Alphanumeric, DFU <br> 0: Deactivate <br> 1: Activate |
| 224 | [Vant / Vref] Vent / Vref ([Color]) |  |  |  |
|  | Adjusts the Vent value manually. <br> The value in this SP mode is effective until after the next process control self-check. To always use this value for some reason, select proportional control supply mode with SP2-208-1 to 4. |  |  |  |
|  | 1 | Vcnt [K] | $\underset{\#}{*}{ }_{\#}^{*}$ | [ 0 to $220 / 100 / 0.1 \mathrm{~V} / \mathrm{step}$ ] <br> NOTE: The main switch must be turned off and on to effect the setting change. |
|  | 2 | V cnt [Y] |  |  |
|  | 3 | Vont [M] |  |  |
|  | 4 | Vcnt [C] |  |  |
|  | Adjusts the Vref value manually. <br> The value in this SP mode is effective until the next process control self-check. To always use this value for some reason, select proportional control supply mode with SP2-208-1 to 4. |  |  |  |
|  | 5 | Vref [K] |  | [ 0 to 50 / $\underline{8} / 0.1 \mathrm{~V} /$ step ] |
|  | 6 | Vref [Y] |  |  |
|  | 8 | Vref [M] |  |  |


| 2 | Mode No. (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 301 | [Transfer Current] Transfer Current ([Color Mode, Color], Paper Tray or By-pass, Simplex or Duplex, Process Speed) Paper Type -> TH: Thick Paper, SP: Special Paper |  |  |  |
|  | Adjusts the transfer current for each color and each print mode. <br> NOTE: If the transfer current is increased too much, image offset may occur especially in halftone areas. |  |  |  |
|  | 1 | [K]P S 125 | BCU | [ 0 to $50 / 16 / 1 \mu \mathrm{~A} /$ step ] |
|  | 2 | [K]P S 185 |  | [ 0 to $50 / \underline{\underline{2}} / 1 \mu \mathrm{~A} /$ step ] |
|  | 3 | [K]P D 125 |  | [ 0 to $50 / 16 / 1 \mu \mathrm{~A} /$ step ] |
|  | 4 | [K]P D 185 |  | [ 0 to $50 / 24 / 1 \mu \mathrm{~A} /$ step ] |
|  | 5 | [K]B S 62.5 |  | [ 0 to $50 / \underline{\underline{8} / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 6 | [K]B S 125 |  | [ 0 to $50 / 16 / 1 \mu \mathrm{~A} /$ step ] |
|  | 7 | [K]B S 185 |  | [ 0 to $50 / 24 / 1 \mu \mathrm{~A} /$ step ] |
|  | 8 | [FC,K]P S 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 9 | [FC,K]P S 125 |  | [ 0 to $50 / 13 / 1 \mu \mathrm{~A} /$ step ] |
|  | 10 | [FC, Y] P S 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 11 | [FC, Y] P S 125 |  | [ 0 to $50 / 11 / 1 \mu \mathrm{~A} /$ step ] |
|  | 12 | [FC,M]P S 62.5 |  | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step ] |
|  | 13 | [FC,M]P S 125 |  | [ 0 to $50 / 10 / 1 \mu \mathrm{~A} /$ step ] |
|  | 14 | [FC,C]P S 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 15 | [FC,C]P S 125 |  | [ 0 to $50 / 11 / 1 \mu \mathrm{~A} /$ step] |
|  | 16 | [FC,K]P D 62.5 |  | [ 0 to $50 / \underline{8} / 1 \mu \mathrm{~A} /$ step ] |
|  | 17 | [FC,K]P D 125 |  | [ 0 to $50 / 16 / 1 \mu \mathrm{~A} /$ step ] |
|  | 18 | [FC, Y]P D 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 19 | [FC,Y]P D 125 |  | [ 0 to $50 / 11 / 1 \mu \mathrm{~A} /$ step ] |
|  | 20 | [FC,M]P D 62.5 |  | [ 0 to $50 / \underline{\underline{5} / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 21 | [FC,M]P D 125 |  | [ 0 to $50 / \underline{9} / 1 \mu \mathrm{~A} /$ step ] |
|  | 22 | [FC,C]P D 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 23 | [FC,C]P D 125 |  | [ 0 to $50 / 10 / 1 \mu \mathrm{~A} /$ step] |
|  | 24 | [FC,K]B S 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 25 | [FC,K]B S 125 |  | [ 0 to $50 / 12 / 1 \mu \mathrm{~A} /$ step ] |
|  | 26 | [FC,Y]B S 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 27 | [FC,Y]B S 125 |  | [ 0 to $50 / 11 / 1 \mu \mathrm{~A} /$ step ] |
|  | 28 | [FC,M]B S 62.5 |  | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step ] |
|  | 29 | [FC,M]B S 125 |  | [ 0 to $50 / 10 / 1 \mu \mathrm{~A} /$ step ] |
|  | 30 | [FC,C]B S 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 31 | [FC,C]B S 125 |  | [ 0 to $50 / 11 / 1 \mu \mathrm{~A} /$ step ] |
|  | 32 | [K]OHP 62.5 |  | [ 0 to $50 / \underline{\underline{6} / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 33 | [FC,K]OHP 62.5 |  | [ 0 to $50 / 15 / 1 \mu \mathrm{~A} /$ step ] |
|  | 34 | [FC,Y]OHP 62.5 |  | [ 0 to $50 / 12 / 1 \mu \mathrm{~A} /$ step ] |
|  | 35 | [FC,M]OHP 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 36 | [FC,C]OHP 62.5 |  | [ 0 to $50 / \underline{9} / 1 \mu \mathrm{~A} /$ step ] |
|  | 37 | [K]TH D 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 38 | [FC,K]TH D 62.5 |  | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step ] |
|  | 39 | [FC,Y]TH D 62.5 |  | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step ] |
|  | 40 | [FC,M]TH D 62.5 |  | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step ] |
|  | 41 | [FC,C]TH D 62.5 |  | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step ] |
|  | 42 | [K]SP S 62.5 |  | [ 0 to $50 / \underline{9} / 1 \mu \mathrm{~A} /$ step ] |
|  | 43 | [K]SP S 125 |  | [ 0 to $50 / 18 / 1 \mu \mathrm{~A} /$ step ] |
|  | 44 | [K]SP S 185 |  | [ 0 to $50 / \underline{\underline{27} / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 45 | [FC,K]SP S 62.5 |  | [ 0 to $50 / \underline{8} / 1 \mu \mathrm{~A} /$ step] |


| 2 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 301 | 46 | [FC,Y]SP S 62.5 | $\mathrm{BCU}$ | [ 0 to $50 / 7 / 1 \mu \mathrm{~A} /$ step ] |
|  | 47 | [FC,M]SP S 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 48 | [FC,C]SP S 62.5 |  | [ 0 to $50 / \underline{\text { I } / 1 ~} \mu \mathrm{~A} /$ step ] |
|  | 49 | [FC,K]SP S 125 |  | [ 0 to $50 / 15 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 50 | [FC,Y]SP S 125 |  | [ 0 to $50 / \underline{14 / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 51 | [FC,M]SP S 125 |  | [ 0 to $50 / 12 / 1 \mu \mathrm{~A} /$ step ] |
|  | 52 | [FC,C]SP S 125 |  | [ 0 to $50 / 13 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 57 | [K]TH S 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 58 | [FC,K]TH S 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step] |
|  | 59 | [FC,Y]TH S 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 60 | [FC,M]TH S 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step ] |
|  | 61 | [FC,C]TH S 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step] |
|  | 62 | [K]SP D 62.5 |  | [ 0 to $50 / \underline{9 / 1 \mu \mathrm{~A} / \text { step ] }}$ |
|  | 63 | [K]SP D 125 |  | [ 0 to $50 / 18 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 64 | [K]SP D 185 |  |  |
|  | 65 | [FC,K]SP D 62.5 |  | [ 0 to $50 / 10 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 66 | [FC, Y]SP D 62.5 |  | [ 0 to $50 / \underline{7 / 1} \mu \mathrm{~A} /$ step ] |
|  | 67 | [FC,M]SP D 62.5 |  | [ 0 to $50 / \underline{6} / 1 \mu \mathrm{~A} /$ step] |
|  | 68 | [FC,C]SP D 62.5 |  | [ 0 to $50 / \underline{7} / 1 \mu \mathrm{~A} /$ step] |
|  | 69 | [FC,K]SP D 125 |  | [ 0 to $50 / \underline{18} / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 70 | [FC, Y]SP D 125 |  | [ 0 to $50 / 13 / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 71 | [FC,M]SP D 125 |  | [ 0 to $50 / \underline{11 / 1 \mu \mathrm{~A} / \mathrm{step} \text { ] }}$ |
|  | 72 | [FC,C]SP D 125 |  | [ 0 to 50/12/1 $\mu \mathrm{A} / \mathrm{step}$ ] |
| 309 | [Current Paper Size] Transfer Current - Paper Size Correction Paper Type -> N: Normal, TH: Thick, OHP |  |  |  |
|  | Corrects the transfer current for paper size. <br> When small paper is used for printing, the transfer current flows to the drum at the non image areas where the transfer belt touches the OPC drum. This may cause an abnormal image due to insufficient current at the image areas. <br> To increase the current by 1.5 times, set the SP mode to " 15 ". <br> NOTE: Increase only when an abnormal image (insufficient image transfer) occurs on a small paper size. However, increasing the current too much may cause image offset. |  |  |  |
|  | 5 | N LT SEF | $\stackrel{*}{B C U}$ | [ 10 to 40 / 16 / 0.1/step] |
|  | 6 | N A5 SEF |  | [ 10 to $40 / \underline{\text { 22 }} / 0.1 /$ step] |
|  | 7 | TH LT SEF |  | [ 10 to $40 / \underline{12} / 0.1 /$ step] |
|  | 8 | TH A5 SEF |  | [ 10 to $40 / \underline{30} / 0.1 /$ step] |
|  | 9 | OHP LT SEF |  | [ 10 to $40 / \underline{\text { 22 }} / 0.1 /$ step] |
|  | 10 | OHP A5 SEF |  | [ 10 to 40 / 40 / 0.1/step] |


| 2 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 801 | [PA Roller Current] Paper Attraction Roller Current ([Color], Simplex or Duplex, Process Speed): Current Adjustment (Paper or By-pass): Paper Size Correction |  |  |  |
|  | Adjusts the paper attraction roller current for color printing. <br> If paper misfeeds occur at the transfer unit in color mode, check and/or adjust the paper attraction roller current. <br> NOTE: The magenta development section is close to the paper attraction roller. <br> Decreasing the current may not cause paper misfeed. <br> If the current is increased too much, the following image problems may occur depending <br> on the humidity. <br> High humidity: <br> Insufficient image transfer in magenta due to current flow to the magenta OPC drum <br> Low humidity: <br> Offset image in magenta halftone areas due to paper charged positive too much When adjusting the current with this SP mode, the value should be lower than transfer current. |  |  |  |
|  | 6 | [FC] S 62.5 | $\mathrm{BCU}$ | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step] |
|  | 7 | [FC] S 125 |  | [ 0 to $50 / \underline{10} / 1 \mu \mathrm{~A} / \mathrm{step}$ ] |
|  | 8 | [FC] D 62.5 |  | [ 0 to $50 / \underline{2} / 1 \mu \mathrm{~A} /$ step ] |
|  | 9 | [FC] D 125 |  | [ 0 to $50 / \underline{5} / 1 \mu \mathrm{~A} /$ step ] |
|  | 14 | [K] B TH S |  | [ 10 to $30 / \underline{5} / 0.1 /$ step] |
|  | 15 | [FC] B TH S |  | [ 10 to $30 / \underline{0} / 0.1 /$ step] |
|  | 16 | [K] B OHP |  | [ 10 to $30 / 10 / 0.1 /$ step] |
|  | 17 | [FC] B OHP |  | [ 10 to $30 / 16 / 0.1 / \mathrm{step}$ ] |
|  | 18 | [K] B TH D |  | [ 10 to $30 / \underline{5} / 0.1 /$ step] |
|  | 19 | [FC]B TH D |  | [ 10 to $30 / \underline{0} / 0.1 /$ step] |
|  | 20 | [K] SP S |  | [ 10 to $30 / \underline{5} / 0.1 /$ step] |
|  | 21 | [K] SP D |  | [ 10 to $30 / 5 / 0.1 /$ step] |
|  | 22 | [FC] SP S 62.5 |  | [ 10 to $30 / \underline{5} / 0.1 /$ step] |
|  | 23 | [FC] SP S 125 |  | [ 10 to $30 / 10 / 0.1 / \mathrm{step}$ ] |
|  | 24 | [FC] SP D 62.5 |  | [ 10 to $30 / \underline{\underline{2} / 0.1 / \mathrm{step} \text { ] }}$ |
|  | 25 | [FC] SP D 125 |  | [ 10 to $30 / \underline{5} / 0.1 /$ step] |
| 802 | [PA Current Paper Size] Paper Attraction Roller Current - Paper Size Correction Paper Type -> N: Normal, TH: Thick, OHP |  |  |  |
|  | Adjusts the correction, depending on the paper size. <br> When small-width paper is used for printing, the paper attraction roller current flows to the non-image areas of OPC drum where the transfer belt touches the drum. This may cause paper misfeed due to insufficient current. <br> To increase the current by 1.5 times, set the SP mode to " 15 ". <br> NOTE: Adjust only when a paper misfeed occurs with a small paper size. Increasing the current too much may cause image offset in magenta halftone areas. |  |  |  |
|  | 1 | N LT SEF | ${ }_{\text {BCU }}$ | set in magenta halftone areas. $[10 \text { to } 40 / 15 / 0.1 / \text { step }]$ |
|  | 2 | N A5 SEF |  | [ 10 to $40 / \underline{\underline{20}} / 0.1 / \mathrm{step}$ ] |
|  | 3 | TH LT SEF |  | [ 10 to $40 / 15 / 0.1 /$ step] |
|  | 4 | TH A5 SEF |  | [ 10 to $40 / \underline{20} / 0.1 /$ step] |
|  | 5 | OHP LT SEF |  | [ 10 to $40 / \underline{\underline{2}} / 0.1 /$ step] |
|  | 6 | OHP A5 SEF |  |  |


| 2 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 908 | [Mirror Motor] Mirror Positioning Motor ([Color]) |  |  |  |
|  | Displays the result of the latest line position adjustment. Changing this affects the mirror position, which corrects the optically skewed image; however, this will be automatically corrected at the next line position adjustment. <br> NOTE: If the line position adjustment does not work properly, the line position can be adjusted manually with this SP mode as a temporary measure. In this case, the line position adjustment needs to be disabled with SP5-993-001. |  |  |  |
|  | 2 | [C] |  | [ [-128 to 127 / $/$ / 1 pulse/step] DFU |
|  | 3 | [M] | BCU |  |
|  | 4 | [Y] |  |  |
| 909 | [Main-scan Reg.] Main-scan Registration ([Color]) |  |  |  |
|  | Displays the result of the latest line position adjustment. Changing this affects the main scan registration; however, this will be automatically corrected at the next line position adjustment. If a fine adjustment is required, it can be done with SP5-993-010 to 012 (this affects the way that the adjustment is done, and will be effective from the next line position adjustment. <br> NOTE: If the line position adjustment does not work properly, the line position can be adjusted manually with this SP mode as a temporary measure. In this case, the line position adjustment needs to be disabled with SP5-993-001. $1 \mathrm{dot}=20 \mu$ |  |  |  |
|  | 1 | [Y] | $B C U$ | [ -255 to 255 / $\mathbf{~ / ~} 1$ dot/step ] DFU |
|  | 2 | [M] |  |  |
|  | 3 | [C] |  |  |
|  | 4 | [K] |  |  |
| 916 | [Sub-scan Reg.] Sub-scan Registration ([Color Mode, Color], Resolution) |  |  |  |
|  | Displays the result of the latest line position adjustment. Changing this affects the sub scan registration; however, this will be automatically corrected at the next line position adjustment. If a fine adjustment is required, it can be done with SP5-993-016 to 021 (this affects the way that the adjustment is done, and will be effective from the next line position adjustment. <br> NOTE: If the line position adjustment does not work properly, the line position can be adjusted manually with this SP mode as a temporary measure. In this case, the line position adjustment needs to be disabled with SP5-993-001. <br> $600 \mathrm{dpi}: 1 \mathrm{dot}=40 \mu, 1200 \mathrm{dpi}: 1$ dot $=20 \mu$ |  |  |  |
|  | 1 | [K] 1200 | BCU | [ 0 to 20000 / 7510 / 1 dot] DFU |
|  | 2 | [FC,K] 1200 |  | [ 0 to $20000 / 15038 / 1$ dot ] DFU |
|  | 3 | [FC, Y] 1200 |  | [ 0 to 20000/10402 / 1 dot] DFU |
|  | 4 | [FC,M] 1200 |  | [ 0 to 20000/1136/1 dot ] DFU |
|  | 5 | [FC,C] 1200 |  | [ 0 to 20000 / 5762 / 1 dot ] DFU |
|  | 6 | [K] 600 |  | [ 0 to 20000 / $3755 / 1$ dot ] DFU |
|  | 7 | [FC,K] 600 |  | [ 0 to $20000 / 7519 / 1 \mathrm{dot}$ ] DFU |
|  | 8 | [FC, Y] 600 |  | [ 0 to 20000 / 5201/1 dot ] DFU |
|  | 9 | [FC,M] 600 |  | [ 0 to 20000 / $5 \underline{68} / 1$ dot ] DFU |
|  | 10 | [FC,C] 600 |  | [ 0 to 20000 / 2881/1 dot] DFU |
| 919 | [Main Scan Lgth Det] Main-scan Length Detection |  |  |  |
|  | 1 | MScan Lgth Det | $B C U$ | Enables or disables the main-scan length detection. <br> [ 0 or 1/1/-] Alphanumeric <br> 0: Disable <br> 1: Enable |


| 2 |  | Mode No. <br> (Class 1, 2, and 3) |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 994 | [Main Scan Reg Cor] Main-scan Registration Correction ([Color]) |  |  |  |
|  | Specifies the correction to the main-scan length. <br> Main-scan length differs for each machine due to variations in parts used in the laser optics housing unit. Fine adjustment of main-scan length is done at the factory on each unit. <br> This SP mode is DFU except for when replacing the laser optics housing unit. When replacing the unit, the data printed on the label attached to the new unit must be input with this SP mode. <br> NOTE: When fine adjustment is required, the adjustment should be done with SP5-993- $\begin{aligned} & 010 \text { to } 012 . \\ & 1 \text { dot }=20 \mu \end{aligned}$ |  |  |  |
|  | 1 | [Y] | $\mathrm{BCU}$ | [ -128 to 127 / 0 / 1 dot/step ] FA DFU |
|  | 2 | [M] |  | [ -128 to 127/1/1 dot/step] FA DFU |
|  | 3 | [C] |  | [ -128 to 127/1/1 dot/step] FA DFU |
|  | 4 | [K] |  | [ -128 to 127 / $\underline{0} / 1$ dot/step] FA DFU |
| 995 | [Motor Reset] Mirror Positioning Motor Reset |  |  |  |
|  | 1 | Motor Reset |  | Rotates the mirror position motors (CMY) by 250 pulses clockwise; then by 125 pulses counterclockwise. This moves the mirrors back to the initial position. Then, the settings of SP2-908002 to 004 are reset to 0 . <br> When the line position adjustment fails, it is one of possible causes when the mirror position motor locks. Performing this SP mode can move the mirrors back to the original position if it locks. Then, do the forced line position adjustment (SP5-993-002). |

SP3-XXX (Process)

| 3 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 005 | [TD Initial] TD Sensor Initialization ([Color]) |  |  |  |
|  | 1 | [K] |  | Initializes the developer. DFU |
|  | 2 | [Y] |  |  |
|  | 3 | [M] |  | Press the Enter key to execute the initialization after the machine asks "Execute?". |
|  | 4 | [C] |  |  |
|  | 5 | [All Color] |  |  |
|  | 6 | Result |  | Displays the developer initialization result. <br> [ 1 to 9 / - / - ] <br> 1: Success <br> 2 to 9: Failure <br> All colors are displayed. Values is displayed in the order K Y C M. <br> e.g., 112 1: Initialization of Cyan failed but the others succeeded <br> See the troubleshooting section for details. |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| 006 | [Vent Initial] Vent Initial Setting Display ([Color]) |  |  |  |
|  | 1 | [K] |  | Displays the initial Vcnt value. [ 0 to 240 / 100 / 0.1/step ] |
|  | 2 | [Y] |  |  |
|  | 3 | [M] |  |  |
|  | 4 | [C] |  |  |
| 007 | [Vent Current] Vent Current Value Display ([Color]) |  |  |  |
|  | 1 | [K] |  | Displays the current Vcnt value. [ 0 to 240 / - / 0.1/step ] |
|  | 2 | [Y] |  |  |
|  | 3 | [M] |  |  |
|  | 4 | [C] |  |  |
| 008 | [Humidity] |  |  |  |
|  | 1 | Humidity |  | Displays the humidity measured by the humidity/temperature sensor. |
| 107 | [Vsg Display] Vsg Display (Front or Rear) |  |  |  |
|  | 1 | Vsg Front | BCU | Displays the Vsg value of the front ID sensor. |
|  |  |  |  | Vsg is normally $4.0 \pm 0.5 \mathrm{~V}$. <br> If Vsg is out of the adjustment range and this is detected 3 times consecutively, it leads to SC385. |
|  | 2 | LED Current Front |  | Displays the ID sensor LED current adjusted during Vsg adjustment. [ 0 to 1023/-/1] |
|  | 3 | Vsg Rear |  | Displays the Vsg value of the rear ID sensor. |
|  |  |  |  | Vsg is normally $4.0 \pm 0.5 \mathrm{~V}$. <br> If Vsg is out of the adjustment range and this is detected 3 times consecutively, it leads to SC385. |
|  | 4 | LED Current Rear |  | Displays the ID sensor LED current adjusted during Vsg adjustment. <br> [ 0 to 1023/-/1] |



| 3 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 125 | 4 | ACC | $\mathrm{BCU}$ | Enables or disables the process control self-check before printing the ACC pattern. <br> [ 0 to 2 / $\underline{\text { / }}$ / 1/step ] Alphanumeric <br> 0: Disable <br> 1: Process Control <br> 2: Auto TD Adj. (\& Process Control Self-check) <br> NOTE: <br> If color balance changes during multi-copy runs after ACC is performed, select 1 or 2. Setting 2 can precisely adjust the image density; however, it takes about 6 minutes. Select 1 or 2 depending on the customer's requirement. |
| 126 | [Forced Self-check] Forced Self-check |  |  |  |
|  | 1 | Forced Self-check |  | Performs a forced process control self-check. Performs a forced auto toner density adjustment. Do not use unless advised by senior technical staff. |
|  | 2 | Forced TD Adj. |  |  |
| 902 | [Pointer Display] Pointer Table Display ([Color]) |  |  |  |
|  | 1 | Printer [K] | $\mathrm{BCU}$ | Displays the number in the pointer table that was selected during the latest process control selfcheck. <br> [ 1 to 30 / - / 1/step ] |
|  | 2 | Printer [Y] |  |  |
|  | 3 | Printer [M] |  |  |
|  | 4 | Printer [C] |  |  |
|  | 5 | CF [K] |  |  |
|  | 6 | CF [Y] |  |  |
|  | 7 | CF [M] |  |  |
|  | 8 | CF [C] |  |  |
| 903 | [M/A Target] M/A Target ([Color]) |  |  |  |
|  | Adjusts the M/A (Mass per Area, $\mathrm{mg} / \mathrm{cm}^{2}$ ) value used during the process control selfcheck. <br> Adjusting this changes the development bias. This causes the solid ID to increase or decrease. If developer capability causes an ID problem, toner density needs to be adjusted with SP3-120-1 to 4, depending on the color. |  |  |  |
|  | 1 | Printer [K] | $\mathrm{BCU}$ | [ 0 to $1.50 / \underline{0.50} / 0.05 \mathrm{mg} / \mathrm{cm}^{2} / \mathrm{step}$ ] DFU |
|  | 2 | Printer [Y] |  |  |
|  | 3 | Printer [M] |  |  |
|  | 4 | Printer [C] |  |  |
|  | 5 | CF [K] |  | [ 0 to $1.50 / 0.60 / 0.01 \mathrm{mg} / \mathrm{cm}^{2} / \mathrm{step}$ ] DFU |
|  | 6 | CF [Y] |  |  |
|  | 7 | CF [M] |  |  |
|  | 8 | CF [C] |  |  |
| 904 | [M/A for LD] M/A Target for LD Correction ([Color]) |  |  |  |
|  | Adjusts the M/A value used during the LD correction mode. This value is effective when SP3-125-2 "LD Control Selection" is set to "2". <br> Adjusting this data effects the image reproduction especially in highlight areas. |  |  |  |
|  | 1 | Printer [K] | BCU | [ 0 to $1.00 / 0.10 / 0.01 \mathrm{mg} / \mathrm{cm} 2 / \mathrm{step}$ ] DFU |
|  | 2 | Printer [Y] |  | [ 0 to $1.00 / \underline{0.12} / 0.01 \mathrm{mg} / \mathrm{cm} 2 /$ step] DFU |
|  | 3 | Printer [M] |  |  |
|  | 4 | Printer [C] |  |  |
|  | 5 | CF [K] |  | [ 0 to $1.00 / 0.13 / 0.01 \mathrm{mg} / \mathrm{cm} 2 / \mathrm{step}$ ] DFU |
|  | 6 | CF [Y] |  | [ 0 to $1.00 / 0.14 / 0.01 \mathrm{mg} / \mathrm{cm} 2 / \mathrm{step}$ ] DFU |
|  | 7 | CF [M] |  |  |
|  | 8 | CF [C] |  |  |




| 3 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 920 | 4 | Mode Set | BCU | Enables/disables refresh mode. <br> [ 0 to 2 / $\underline{2}$ / 1/step ] Alphanumeric <br> 0 : Disabled <br> 1: Mode 1 (Done at power on and toner end recovery) <br> 2: Mode 2 (Done at power on, toner end recovery, and after the specified number of prints.) <br> NOTE: Refresh mode is done during the toner end recovery self-check after a new toner cartridge is installed. |
|  | 5 | Forced |  | Executes a forced refresh mode. Use this mode when the image is smeared. It takes about 1 minute. <br> Also use after replacing the components of the transfer unit (see section 3). |
|  | 6 | Auto Toner Refresh |  | Performs a toner refresh during the OPC refresh mode by changing the development bias from 50 V to 400 V . <br> [ 0 or 1/0/-] <br> 0: Disabled <br> 1: Enabled <br> Enable this SP mode when dirty background and/or firefly spots appear intermittently on prints with a low image area ratio. <br> While making prints with a low image area ratio, developer is agitated with less toner supplied. This may cause the toner-carrier attraction force to increase or toner to coagulate. <br> This sometimes causes firefly spots or dirty background when a large amount of toner is supplied. <br> NOTE: When enabling this SP mode, the following SP modes should be changed. <br> SP3-906-001 Job End Process Control Self-check $\begin{aligned} & 200 \text { (Default) } \rightarrow 100 \\ & \text { SP3-920-003 OPC Refresh Mode / Prints } \end{aligned}$ $200 \text { (Default) -> } 100$ |
| 921 | [Forced Toner Ref] Forced Toner Refresh |  |  |  |
|  | Perform forced toner refresh mode. <br> When the developer has deteriorated or when prints are made in a very low humidity condition, dirty background may appear continuously. <br> When this kind of dirty background appears, check whether or not the development gamma is within the target (SP3-120 and 121). If the development gamma is not within the target, do this SP mode. <br> The machine automatically does the toner refresh mode in the following sequence. <br> 1. Consumes toner in the development unit without toner supply until toner end is detected <br> 2. Starts toner recovery mode. <br> 3. Starts process control self-check. |  |  |  |

NOTE: If toner is drastically consumed for a short time, this may cause carrier to flow out. To prevent this, toner is consumed over a long period of time. (It takes about 20 minutes to complete this toner refresh mode).

| 1 | $[K]$ |  |  |
| :--- | :--- | :--- | :--- |
| 2 | All Color |  |  |



SP4-XXX (Scanner)

| 4 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 008 | [SubScanMagnification] Sub-scan Magnification Adjustment |  |  |  |
|  | 1 | SubScanMagnification | SBU | Adjusts the sub-scan magnification by changing the scanner motor speed. <br> [ -1.0 to $1.0 / \underline{0} / 0.1 \% /$ step ] FA |
| 010 | [Leading Edge Reg.] Leading Edge Registration Adjustment |  |  |  |
|  | 1 | Leading Edge Reg. | SBU | Adjusts the leading edge registration by changing the scanning start timing in the sub-scan direction. [ -3.0 to $3.0 / \underline{0} / 0.1 \mathrm{~mm} / \mathrm{step}$ ] FA |
| 011 | [Side-to-Side Reg.] Side-to-Side registration Adjustment |  |  |  |
|  | 1 | Side-to-Side Reg. | SBU | Adjusts the side-to-side registration by changing the scanning start timing in the main scan direction. <br> [ -6.0 to $6.0 / 0 / 0.1 \mathrm{~mm} /$ step $]$ FA |
| 012 | [Blank Margin] Blank Margin Adjustment |  |  |  |
|  | 1 | Leading Edge | NV | Sets the blank margin at each side for erasing the original shadow caused by the gap between the original and the scale. [ 0 to $3.0 / \underline{0} / 0.1 \mathrm{~mm} /$ step ] FA |
|  | 2 | Trailing Edge |  |  |
|  | 3 | Left |  |  |
|  | 4 | Right |  |  |
| 013 | [Scanner Free Run] |  |  |  |
|  | 1 | Lamp: OFF |  | Performs the scanner free run with the exposure lamp on or off in the following mode. <br> Full color mode / Full Size / A3 or DLT |
|  | 2 | Lamp: ON |  |  |
| 017 | [Scan Operation] |  |  |  |
|  | 1 | Shading ON |  | Makes one scan with generating an F-Gate signal and shading on or off in the following mode. <br> Full color mode / Full Size / A3 or DLT <br> Uses this SP mode to check if the F-Gate signal is properly generated ( F -Gate tells the engine to start printing data). |
|  | 2 | Shading OFF |  |  |
|  |  |  |  |  |
| 205 | [Black ADS Level] |  |  |  |
|  | 1 | Black ADS Level | SBU | Specifies the level for deleting the background density in ADS mode. <br> [ 0 to 128 / 70 / 1/step ] |
| 301 | [APS Operation Check] |  |  |  |
|  | 1 | APS Operation Check |  | Displays a code that represents the original size detected by the original sensors. (See Input Check Table.) |
| 303 | [APS A5size Check] |  |  |  |
|  | 1 | APS A5size Check | SBU | Specifies the result of the detection when the outputs from the original sensors are all OFF. [ 0 or $1 / \underline{0} /-$ ] <br> 0 : No original <br> 1: A5 Lengthwise |


| 4 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 417 | [IPU Test Pattern] |  |  |  |
|  | 1 | IPU Test Pattern |  | Selects the IPU test pattern. [ 0 to $16 / \underline{0} / 1 /$ step ] <br> 0 : Scanned image <br> 1: Grid pattern <br> 2: Slant grid pattern <br> 3: Gradation main scan1 <br> 4: Gradation sub scan1 <br> 5: Gradation RBGYMCK <br> 6: UCR pattern <br> 7: Color patch 16 (1) <br> 8: Color patch 16 (2) <br> 9: Color patch 64 <br> 10: Grid pattern YMCK <br> 11: Color patch YMCK <br> 12: Gray pattern (1) <br> 13: Gray pattern (2) <br> 14: Gradation main scan2 <br> 15: Scanned + Grid pattern <br> 16: Scanned + Gray scale |
| 440 | [Saturation Adj.] Saturation Adjustment |  |  |  |
|  | 1 | Saturation Adj. | $\begin{gathered} * \\ \text { NV } \end{gathered}$ | Adjusts the level of saturation for copying. [ 0 to $5 / 3 / 1 /$ step ] <br> 0 : High <br> 1: Lowest <br> 2: Lower <br> 3: Default <br> 4: Higher <br> 5: Highest |
| 628 | [R Gain Display] Gain Adjustment Red |  |  |  |
|  | 1 | R EVEN |  | Displays the gain value of the amplifiers on the scanner SBU for Red. |
| 629 | [G Gain Display] Gain Adjustment Green |  |  |  |
|  | 1 | G EVEN |  | Displays the gain value of the amplifiers on the scanner SBU for Green. |
| 630 | [B Gain Display] Gain Adjustment Blue |  |  |  |
|  | 1 | $\frac{\mathrm{B} \text { EVEN }}{}$ |  | Displays the gain value of the amplifiers on the scanner SBU for Blue. |
| 685 | [Reference Adj.: R] Reference Adjustment Red |  |  |  |
|  | 1 | Reference Adj.: R | SBU | Sets the reference voltage for the A/D converters on the scanner IPU for Red. [ 0 to 255 / 136 / 1/step ] DFU |
| 686 | [Reference Adj.: G] Reference Adjustment Green |  |  |  |
|  | 1 | Reference Adj.: G | SBU | Sets the reference voltage for the A/D converters on the scanner IPU for Green. [ 0 to 255 / 136 / 1/step ] DFU |
| 687 | [Reference Adj.: B] Reference Adjustment Blue |  |  |  |
|  | 1 | Reference Adj.: B |  | Sets the reference voltage for the A/D converters on the scanner IPU for Blue. [ 0 to 255 / 136 / 1/step ] DFU |


| 4 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 688 | [DF: Density Adj.] DF Density Adjustment |  |  |  |
|  | 1 | DF: Density Adj. | SBU | Adjusts the white shading parameter when scanning an image with the ARDF. [ 83 to 100 / $86 / 1 \% /$ step ] Adjusts the density level if the ID of outputs made in the DF and Platen mode is different. |
| 800 | [DF: Density Correction] |  |  |  |
|  | 1 | R | SBU | Sets a coefficient to adjust the image density level when scanning an image with the ARDF. <br> [ -20 to $20 / \underline{0} / 1 /$ step ] DFU |
|  | 2 | G |  |  |
|  | 3 | B |  |  |
| 904 | [Scanner IPU Test] |  |  |  |
|  | 1 | Test1:Register Access |  | Performs a write and read check of the ASICs on the scanner IPU board and displays the result. $\begin{aligned} & \text { 00: OK } \\ & 11,12,13,14,15: \mathrm{NG} \end{aligned}$ |
|  | 2 | Test2: Image Path |  | Performs an image path check on the scanner IPU board and displays the result. $\begin{aligned} & 00: \mathrm{OK} \\ & 21,22,23,24: \mathrm{NG} \end{aligned}$ |
| 905 | [Dither Selection] |  |  |  |
|  | 1 | Dither Selection | NV | Changes the parameters for error diffusion. [ 0 to 255 / 0 / 1/step ] DFU |
| 907 | [VPU Test Pattern] |  |  |  |
|  | 1 | Test Pattern: R |  | Selects the test pattern generated by the scanner SBU board. <br> [ 0 to 4 / 0 / 1 /step ] <br> 0 : Default (Scanned Image) <br> 1: Cyan pattern <br> 2: White pattern <br> 3: Cyan Pattern 16 steps <br> 4: Line pattern |
|  | 2 | Test Pattern: G |  | Selects the test pattern generated by the scanner SBU board. <br> [ 0 to 4 / $\underline{0} / 1$ /step ] <br> 0 : Default (Scanned Image) <br> 1: Magenta pattern <br> 2: White pattern <br> 3: Magenta Pattern 16 steps <br> 4: Line pattern |
|  | 3 | Test Pattern: B |  | Selects the test pattern generated by the scanner IPU board. <br> [ 0 to 4 / $\underline{0}$ / 1 /step ] <br> 0 : Default (Scanned Image) <br> 1: Yellow pattern <br> 2: White pattern <br> 3: Yellow Pattern 16 steps <br> 4: Line pattern |
| 909 | [Gamma [K] Photo (Mono) ] Printer Gamma Adjustment for Black/Photo mode |  |  |  |
|  | 1 | Offset: Highlight | NV | Adjusts the offset data of the printer gamma for black in B\&W and Photo mode. <br> [ 0 to 30 / 15 / 1 /step ] <br> See 'Replacement and Adjustment - Gamma Correction - Copy Mode' for how to use. |
|  | 2 | Offset: Middle |  |  |
|  | 3 | Offset: Shadow |  |  |
|  | 4 | Offset: IDmax |  |  |


| 4 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 909 | 5 | Option: Highlight | NV | Adjusts the option data of the printer gamma for black in the B\&W and Photo mode. <br> [ 0 to 255 / $\underline{0} / 1$ /step ] DFU |
|  | 6 | Option: Middle |  |  |
|  | 7 | Option: Shadow |  |  |
|  | 8 | Option: IDmax |  |  |
| 910 | [Gamma [K] Letter ] Printer Gamma Adjustment for Black/Letter mode |  |  |  |
|  | 1 | Offset: Highlight | NV | Adjusts the offset data of the printer gamma for black in Letter mode. <br> [ 0 to $30 / \underline{15} / 1 /$ step ] <br> See 'Replacement and Adjustment - Gamma Correction - Copy Mode' for how to use. <br> Adjusts the option data of the printer gamma for black in Letter mode. <br> [ 0 to 255 / $\underline{0}$ / 1 /step ] DFU |
|  | 2 | Offset: Middle |  |  |
|  | 3 | Offset: Shadow |  |  |
|  | 4 | Offset: IDmax |  |  |
|  | 5 | Option: Highlight |  |  |
|  | 6 | Option: Middle |  |  |
|  | 7 | Option: Shadow |  |  |
|  | 8 | Option: IDmax |  |  |
| 911 | [Gamma [C] Letter ] Printer Gamma Adjustment for Cyan/Letter mode |  |  |  |
|  | 1 | Offset: Highlight | * | Adjusts the offset data of the printer gamma for cyan in Letter mode. <br> [ 0 to $30 / \underline{15} / 1 /$ step ] <br> See 'Replacement and Adjustment - Gamma Correction - Copy Mode' for how to use. Adjusts the option data of the printer gamma for cyan in Letter mode. <br> [ 0 to 255 / 0 / 1 /step] DFU |
|  | 2 | Offset: Middle |  |  |
|  | 3 | Offset: Shadow |  |  |
|  | 4 | Offset: IDmax |  |  |
|  | 5 | Option: Highlight |  |  |
|  | 6 | Option: Middle |  |  |
|  | 7 | Option: Shadow |  |  |
|  | 8 | Option: IDmax |  |  |
| 912 | [Gamma [M] Letter ] Printer Gamma Adjustment for Magenta/Letter mode |  |  |  |
|  | 1 | Offset: Highlight | $\stackrel{*}{*}$ | Adjusts the offset data of the printer gamma for magenta in Letter mode. $\text { [ } 0 \text { to } 30 / \underline{15} / 1 / \text { step ] }$ <br> See 'Replacement and Adjustment - Gamma Correction - Copy Mode' for how to use. |
|  | 2 | Offset: Middle |  |  |
|  | 3 | Offset: Shadow |  |  |
|  | 4 | Offset: IDmax |  |  |
|  | 5 | Option: Highlight |  | Adjusts the option data of the printer gamma for magenta in Letter mode. <br> [ 0 to 255 / $\underline{0} / 1$ /step ] DFU |
|  | 6 | Option: Middle |  |  |
|  | 7 | Option: Shadow |  |  |
|  | 8 | Option: IDmax |  |  |
| 913 | [Gamma [Y] Letter ] Printer Gamma Adjustment for Yellow/Letter mode |  |  |  |
|  | 1 | Offset: Highlight | $\stackrel{*}{N}$ | Adjusts the offset data of the printer gamma for yellow in Letter mode. <br> [ 0 to $30 / \underline{15} / 1 /$ step ] <br> See 'Replacement and Adjustment - Gamma Correction - Copy Mode' for how to use. |
|  | 2 | Offset: Middle |  |  |
|  | 3 | Offset: Shadow |  |  |
|  | 4 | Offset: IDmax |  |  |
|  | 5 | Option: Highlight |  | Adjusts the option data of the printer gamma for yellow in Letter mode. <br> [ 0 to 255 / $\underline{0}$ / 1 /step ] DFU |
|  | 6 | Option: Middle |  |  |
|  | 7 | Option: Shadow |  |  |
|  | 8 | Option: IDmax |  |  |
| 914 | [Gamma [K] Letter (Mono)] Printer Gamma Adjustment for Black/Letter mode |  |  |  |
|  | 1 | Offset: Highlight | * | Adjusts the offset data of the printer gamma for black in B\&W and Letter mode. <br> [ 0 to 30 / $\underline{15}$ / 1 /step ] <br> See 'Replacement and Adjustment - Gamma Correction - Copy Mode' for how to use. |
|  | 2 | Offset: Middle |  |  |
|  | 3 | Offset: Shadow |  |  |
|  | , | Offset: IDmax |  |  |
|  | 5 | Option: Highlight |  | Adjusts the option data of the printer gamma for black in B\&W and Letter mode. <br> [ 0 to 255 / 0 / 1 /step ] DFU |
|  | 6 | Option: Middle |  |  |
|  | 7 | Option: Shadow |  |  |
|  | 8 | Option: IDmax |  |  |


| 4 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 915 | [Gamma [K] Photo ] Printer Gamma Adjustment for Black/Photo mode |  |  |  |
|  | 1 | Offset: Highlight | $\stackrel{*}{\text { NV }}$ | Adjusts the offset data of the printer gamma for black in Photo mode. <br> [ 0 to 30 / $\underline{15}$ / $1 /$ step ] <br> See 'Replacement and Adjustment - Gamma Correction - Copy Mode' for how to use. |
|  | 2 | Offset: Middle |  |  |
|  | 3 | Offset: Shadow |  |  |
|  | 4 | Offset: IDmax |  |  |
|  | 5 | Option: Highlight |  | Adjusts the option data of the printer gamma for black in Photo mode. [ 0 to 255 / $\underline{0}$ / 1 /step ] DFU |
|  | 6 | Option: Middle |  |  |
|  | 7 | Option: Shadow |  |  |
|  | 8 | Option: IDmax |  |  |
| 916 | [Gamma [C] Photo ] Printer Gamma Adjustment for Cyan/Photo mode |  |  |  |
|  | 1 | Offset: Highlight | NV | Adjusts the offset data of the printer gamma for cyan in Photo mode. <br> [ 0 to $30 / \underline{15} / 1 /$ step ] <br> See 'Replacement and Adjustment - Gamma Correction - Copy Mode' for how to use. |
|  | 2 | Offset: Middle |  |  |
|  | 3 | Offset: Shadow |  |  |
|  | 4 | Offset: IDmax |  |  |
| 916 | 5 | Option: Highlight |  | Adjusts the option data of the printer gamma for cyan in Photo mode. <br> [ 0 to 255 / $\underline{0}$ / 1 /step ] DFU |
|  | 6 | Option: Middle |  |  |
|  | 7 | Option: Shadow |  |  |
|  | 8 | Option: IDmax |  |  |
| 917 | [Gamma [M] Photo ] Printer Gamma Adjustment for Magenta/Photo mode |  |  |  |
|  | 1 | Offset: Highlight | NV | Adjusts the offset data of the printer gamma for magenta in Photo mode. <br> [ 0 to $30 / \underline{15} / 1 /$ step ] <br> See 'Replacement and Adjustment - Gamma <br> Correction - Copy Mode' for how to use. <br> Adjusts the option data of the printer gamma for magenta in Photo mode. <br> [ 0 to 255 / $\underline{0} / 1$ /step ] DFU |
|  | 2 | Offset: Middle |  |  |
|  | 3 | Offset: Shadow |  |  |
|  | 4 | Offset: IDmax |  |  |
|  | 5 | Option: Highlight |  |  |
|  | 7 | Option: Middle |  |  |
|  | 7 | Option: Shadow |  |  |
|  | 8 | Option: IDmax |  |  |
| 918 | [Gamma [Y] Photo ] Printer Gamma Adjustment for Yellow/Photo mode |  |  |  |
|  | 1 | Offset: Highlight | NV | Adjusts the offset data of the printer gamma for yellow in Photo mode. <br> [ 0 to $30 / \underline{15} / 1$ /step ] <br> See 'Replacement and Adjustment - Gamma Correction - Copy Mode' for how to use. |
|  | 2 | Offset: Middle |  |  |
|  | 3 | Offset: Shadow |  |  |
|  | 4 | Offset: IDmax |  |  |
|  | 5 | Option: Highlight |  | Adjusts the option data of the printer gamma for yellow in Photo mode. <br> [ 0 to 255 / $\underline{0}$ / 1 /step ] DFU |
|  | 6 | Option: Middle |  |  |
|  | 7 | Option: Shadow |  |  |
|  | 8 | Option: IDmax |  |  |
| 932 | [Dot Position Cor.] Main Scan Dot Position Correction |  |  |  |
|  | 1 | R: Left | * | Corrects the left or right side alignment of the red or blue filter on the CCD. <br> [ 0 to 9 / 5 / 1 /step ] <br> For details on this adjustment, see Replacement and Adjustment - Image Adjustment - Scanner |
|  | 2 | R: Right |  |  |
|  | 3 | B: Left |  |  |
|  | 4 | B: Right |  |  |

SP5-XXX (Mode)


| 5 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 046 | [ROM Update Display] |  |  |  |
|  | 1 | ROM Update | CTL | Enables or disables the ROM Update utility. When enabled, this utility will be displayed in the user program mode. <br> [ 0 or 1/1/-] <br> 0 : Enable, 1: Disable |
| 104 | [Double Count] |  |  |  |
|  | 1 | Double Count | CTL | Specifies whether the counter is double clicked for A3/DLT size prints. $\text { [ } 0 \text { or } 1 / \underline{0} /-]$ $0: N O, 1: Y E S$ |
| 132 | [Application Priority] |  |  |  |
|  | 1 | Application Priority | CTL | Selects which application has the first priority when jobs from different applications arrive simultaneously. <br> [2 or 3/2/-] <br> 2: Job Queue <br> 3: Copy application |
| 302 | [Set Time] |  |  |  |
|  | 2 | Set Time | $\begin{gathered} * \\ \# \\ \text { \# } \\ \text { CTL } \end{gathered}$ | Adjusts the RTC (real time clock) time setting for the local time zone. <br> [-1440 to $1440 / 60 / 1 \mathrm{~min} . / \mathrm{step}$ ] <br> Examples: For Japan (+9 GMT), enter 540 (9 hours x 60 min .) <br> NA :-300 (New York) <br> EU :+ 60 (Paris) <br> CH:+480 (Peking) <br> TW :+480 (Taipei) <br> AS :+480 (Hong Kong) |
| 404 | [User Code Co. Clear] User Code Counter Clear |  |  |  |
|  | 1 | User Code Co. Clear |  | Clears the user code counters. |
| 409 | [Password] |  |  |  |
|  | 1 | Password Set | CTL | Sets the password for the key operator. |
|  | 2 | Access Area |  | Specifies the parts of user program mode that can be accessed with the password. <br> [ 0 to 2 / $0 / 1$ /step ] <br> 0: None <br> 1: Part of system settings <br> 2: All features and system settings |
| 610 | [ACC Factory Setting] |  |  |  |
|  | 4 | Recall |  | Recalls the factory settings. |
|  | 5 | Overwrite |  | Overwrites the current values onto the factory settings. |
|  | 6 | Previous Setting |  | Recalls the previous settings. |
| 611 | [Toner Ratio in 2C] Toner Ratio Setting in 2C mode |  |  |  |
|  | 1 | B-C |  | Adjusts the color balance of a single color (blue, green, or red) by changing the proportion of color toner ( $\mathrm{C}, \mathrm{M}$, and/or Y ). <br> [ 0 to $100 / \underline{90} / 1 \% /$ step ] |
|  | 2 | B-M |  | [ 0 to $100 / 80 / 1 \% /$ step ] |
|  | 3 | G-C |  | [ 0 to $100 / \underline{\text { g0 / }} 1$ \%/step ] |
|  | 4 | G-Y |  | [ 0 to $100 / 80 / 1 \% /$ step] |
| 611 | 5 | R-M | NV | [ 0 to $100 / \underline{100} / 1 \% /$ step ] |
|  | 6 | R-Y |  | [ 0 to $100 / \underline{80} / 1 \% /$ step ] |
| G570 |  |  |  | -40 SM |


| 5 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 801 | [Memory Clear 1] |  |  |  |
|  | 1 | All module | \# | Resets all the controller and engine settings to their defaults and the counters to 0 . DFU |
|  | 2 | ENG All |  | Clears all the engine settings and counters. DFU |
|  | 3 | SCS / SRM |  | Initializes the system settings. |
|  | 5 | MCS |  | Not used. |
|  | 6 | Copy Memory Clr? |  | Initializes the copy application settings. |
|  | 7 | Fax |  | Initializes the fax application settings. |
|  | 8 | Printer application |  | Initializes the printer application settings. |
|  | 9 | Scanner application |  | Initializes the scanner application settings. |
|  | 10 | Network application |  | Deletes the network file application management files and thumbnails, and initializes the job login ID. |
|  | 11 | NCS |  | Initializes the system defaults and interface settings (IP addresses also), SmartNetMonitor for Admin, WebStatusMonitor settings, and the TELNET settings. |
|  | 12 | IPU |  | Clears the IPU settings |
|  | 13 | R-FAX |  | Initializes the job login ID, SmartNetMonitor for Admin, job history, and local storage file numbers. |
| 802 | [Engine Free Run] |  |  |  |
|  | 1 | Engine Free Run |  | Performs a free run on the printer engine. NOTE: <br> - The machine starts free run in the same condition as the sequence of A4/LT printing from the 1st tray. Therefore, paper should be loaded in the 1st tray, but paper is not fed. <br> - The main switch has to be turned off and on after using the free run mode for a test. |
| 803 | [Input Check] |  |  | See section 5-4-2. |
| 804 | [Output Check] |  |  | See section 5-4-3. |
| 808 | [Destination] Destination Code Display |  |  |  |
|  | 1 | Destination | *BCU | Displays the destination code. |
| 809 | [SC Detection ON/OFF] |  |  |  |
|  | 1 | SC ON/OFF | *BCU | Enable or disables the service call detection (SC codes will be ignored if disabling this SP mode). <br> [ 0 or $1 / \underline{0} /-$ ] Alphanumeric <br> 0 : Enable <br> 1: Disable |
| 810 | [SC Reset] |  |  |  |
|  | 1 | SC Reset | *BCU | Resets a type A service call condition. NOTE: Turn the main switch off and on after resetting the SC code. |
| 811 | [Machine Serial No.] Machine Serial Number Display |  |  |  |
|  | 2 | Serial Number Display | *BCU | Displays the machine serial number. |
| 812 | [FAX TEL No.] |  |  |  |
|  | 1 | Telephone | CTL | Sets the telephone number for a service representative. This number is printed on the Counter List, which can be printed with the user's "Counter" menu. <br> This can be up to 20 characters (both numbers and alphabetic characters can be input). |


| 5 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 812 | 2 | Facsimile | CTL | Sets the fax number for a service representative. This number is printed on the Counter List, which can be printed with the user's "Counter". This can be up to 20 characters (both numbers and alphabetic characters can be input). |
| 828 | [Network Setting] |  |  |  |
|  |  |  | CTL | Displays the version of NCS. |
|  | 11 | Mac Address |  | Displays the Mac Address. |
|  | 12 | Device Name |  | Displays the device name. |
|  | 13 | Comment |  | Displays the comment. |
|  | 14 | Operation Mode |  | Displays the operation mode. |
|  | 15 | Printer Server Name |  | Displays the print server name. |
|  | 16 | File Server Name |  | Displays the file server name. |
|  | 17 | NDS Context1:NW |  | Displays the NDS context. |
|  | 18 | NDS Context2:NW |  |  |
|  | 19 | Work Group Name |  | Displays the workgroup name. |
|  | 20 | Network Path Name:NB |  | Displays the network path name. |
|  | 25 | Software Switch |  | Sets the reference for the network software. [ 00000000 to FFFFFFFFh / $00000000 \mathrm{~h} / 1$ hex unit/step ] |
|  | 26 | OperationMode:TCP/IP |  | Sets the TCP/IP operation mode for the network. [ 00000000 to FFFFFFFFh / 00000000h / 1 hex unit/step ] |
|  | 27 | SyslogServer Address |  | Sets the syslog server address for the network. [ 00000000 to FFFFFFFFh / 7F000001h / 1 hex unit/step ] |
|  | 28 | Timer Server Address |  | Sets the timer server address for the network. [ 00000000 to FFFFFFFFh / 00000000h / 1 hex unit/step ] |
|  | 29 | DNS Server Address |  | Sets the DNS server address for the network. [ 00000000 to FFFFFFFFh / 00000000h / 1 hex unit/step ] |
|  | 30 | Directprint Port No |  | Sets the directprint port number for the network. [ 1024 to $65535 / 9100 / 1 /$ step ] |
|  | 31 | IPP Timeout |  | Sets the IPP timeout for the network. [ 30 to $65535 / 900 / 1 /$ step ] |
|  | 32 | IPX Address: NW |  | Sets the IPX Address. |
|  | 33 | Remote Printer No:NW |  | Sets the remote printer number for the network. [ 0 to 254 / $0 / 1 /$ step ] |
|  | 34 | Software Switch: NW |  | Sets the software switch for the network. [ 0000 to FFFFh / 0003h / 1 hex unit/step ] |
|  | 35 | Trans.Protocol PS NW |  | Sets the print server transport protocol for the network. <br> 0001h: TCP \& IPX <br> 0100h: TCP\& IPX (Priority: IPX) <br> 0102h: TCP Only (Priority: TCP) <br> 0001h: IPX Only |
|  | 36 | AppleTalk Module |  | Sets the AppleTalk module for the network. 2: EtherTalk Phase2 |
|  | 37 | Net No: AT |  | Sets the NetNo of the AppleTalk network. |
|  | 38 | Object Name: AT |  | Sets the object name of the AppleTalk Network. |


| 5 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 828 | 39 | Apple Talk Type | $\stackrel{*}{\text { CTL }}$ | Sets the AppleTalk type for the network. |
|  | 40 | Working Zone: AT |  | Sets the AppleTalk working zone for the network. |
|  | 47 | Job Analysis Timeout |  | Sets the Centronics job analysis timeout for the network. <br> [ 0 to $4200 / 3 / 1 \mathrm{sec} /$ step ] |
|  | 48 | Job Timeout |  | Sets the Centronics job timeout for the network. [ 0 to $4200 / \underline{0} / 1 \mathrm{sec} /$ step ] |
|  | 49 | Noise Cancel |  | Sets the noise cancel level for the network. [ 4 to 7 / $4 / 1$ clock/step] |
|  | 50 | 1284 Compatibility |  | Switches Centronics IEEE1284 compatibility on/off for the network. <br> [ 0 or $1 / 1 /-$ ] <br> 0: Disabled, 1: Enabled <br> Selecting "0" disables bi-directional data transmission. |
|  | 51 | Data Transfer |  | Sets the Centronics transfer speed for the network. <br> [ 0 or 1/1/-] <br> 0: Slow, 1: Fast <br> If you select " 0 " there will be a $120 \mu$ s delay from the STP signal to the data transfer. (With 1: Fast there is no delay.) |
|  | 52 | ECP |  | Switches the ECP setting for Centronics off/on. [ 0 or 1/1/-] <br> 0: Disabled, 1: Enabled With "1" selected, SP5-828-050 must be enabled for 1284 mode compatibility. |
|  | 53 | Transmission Speed |  | Selects the Ethernet transmission speed. <br> [ 0 to 3 / $\underline{0} / 1$ /step] <br> 0 : Auto <br> 1: 10Base-T <br> 2: 100Base-TX <br> 3: Auto |
| 831 | [IItitial Setting Clear] |  |  |  |
|  | 1 | Initial Setting Clear |  | Clears the system settings, except for the timer and user code settings. |
| 832 | [HDD Init.] HDD Initialization |  |  |  |
|  | 1 | All | \# | Initializes the hard disk (the entire disk, or by partitions). Use this SP mode only when there is a hard disk error. |
|  | 2 | IMF |  |  |
|  | 3 | NFA |  |  |
|  | 4 | Job Log |  |  |
|  | 5 | Printer Fonts |  |  |
|  | - | Debug |  | DFU |
| 833 | [JobLog ON/OFF] |  |  |  |
|  | 7 | JobLog ON/OFF | CTL | Saves the result of the jobs in the job log. If this mode is enabled, the result is written on the HDD. If no HDD is installed, this feature is disabled even if this SP is set to 'enabled'. <br> [ 0 or 1 / $\underline{0} /$-] <br> 0: Disabled <br> 1: Enabled |



| 5 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 930 | 3 | Menu | $\begin{gathered} * \\ \# \\ B C U \end{gathered}$ | Selects the method for displaying the alert when the life of the parts in a maintenance kit has almost ended. <br> [ 0 or 1/1/-] Alphanumeric <br> 0 Click 2 <br> 1: Click 1 <br> The following table shows the machine condition when the near end or end condition of each maintenance unit is detected. <br> In this table, '-' means 'normal operation' |  |  |  |  |  |  |
|  |  |  |  | Setting: 1 (Click 1) |  |  |  | Setting: 0 (Click 2) |  |  |
|  |  |  |  |  | Near | End | Printing |  |  |  |
|  |  |  |  | A |  | Alert |  |  |  |  |
|  |  |  |  | B |  | Alert |  |  |  |  |
|  |  |  |  | C | Aler | Alert | Stop | Alert | Alert | Stop |
|  |  |  |  | D |  | Alert |  |  |  |  |
|  |  |  |  | E | Aler | Alert | Stop | Alert | Alert | Stop |
|  |  |  |  |  |  | Alert |  |  |  |  |
|  |  |  |  | G | Aler | Alert | Stop | Alert | Alert | Stop |
|  |  |  |  | H |  | Note |  |  |  |  |
|  |  |  |  | A: Color PCU <br> B: Color Development Unit <br> C: Fusing Unit <br> D: Black Development Unit <br> E: Waste Toner Bottle <br> F: Black PCU <br> G: Oil Supply Unit <br> H: Paper Feed Rollers <br> NOTE: SP5-930-004 allows the alert for the paper feed roller to be displayed. |  |  |  |  |  |  |
|  | 4 | Paper Feed |  | Determines whether to display the alert when the life of the paper feed rollers is nearly ended. [ 0 or $1 / \underline{0} /-$ ] Alphanumeric 0 : No Alert <br> 1: Alert |  |  |  |  |  |  |
|  | 5 | Paper Transfer Unit |  | ```Determines whether to display the alert when the life of the transfer unit is nearly ended. [ 0 or \(1 / \underline{0} /-\) ] Alphanumeric 0: No Alert 1: Alert``` |  |  |  |  |  |  |
| 961 | [Finisher Stack] Finisher Maximum Stack |  |  |  |  |  |  |  |  |  |
|  | 1 | Finisher Stack | $\begin{gathered} * \\ \# \\ B C U \end{gathered}$ | Enables or disables maximum stack mode for the lower shift tray only in staple mode. <br> If this is enabled, the upper tray can be used for stacking 500 sheets but it stays at the upper exit (will not be used for stapling mode), and the lower tray is used for stacking up to 2,000 sheets. <br> If this is disabled, the upper tray can be used for stacking 500 sheets and the lower tray for 1,500 sheets. <br> [ 0 or 1/1/-] <br> 0: OFF <br> 1: ON <br> NOTE: The main switch must be turned off and on to effect the setting change. |  |  |  |  |  |  |


| 5 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 970 | Debug Serial Output |  |  |  |
|  | 1 | Debug Serial Output |  | DFU |
| 971 | [Touch Panel Correction] Touch Panel Correction Log |  |  |  |
|  | 1 | Touch Panel Calibration | CTL | Displays whether the touch panel has been calibrated after clearing all memory. <br> [ 0 or 1/0/-] <br> 0: Not calibrated <br> 1: Calibrated |
| 974 | [Cherry Server Setting] |  |  |  |
|  | 1 | Cherry Server Setting | CTL | ```Specifies which version of ScanRouter, "Lite" or "Full", is installed. [ 0 or 1/0/-] 0: Lite 1: Full``` |
| 989 | [Loop Back Test] |  |  |  |
|  | 1 | Duplex |  | Executes a communication test with peripherals by using a special tool (connector) which is unique for each peripheral. <br> The machine checks if the communication with the peripherals is OK or NG; then displays the result. DFU |
|  | 3 | Finisher |  |  |
|  | 4 | Paper Supply Unit |  |  |
| 990 | [SMC Print] |  |  |  |
|  | 1 | All (Data List) |  | Prints out the SMC sheets. |
|  | 2 | SP (Mode Data List) |  |  |
|  | 3 | User Program |  |  |
|  | 4 | Logging Data |  |  |
|  | 5 | Diagnosis Report |  |  |
|  | 6 | Non-Default |  |  |
|  | 7 | NIB Summary |  |  |
|  | 8 | Net File Log |  |  |
|  | 21 | Copier User Program |  |  |
|  | 22 | Scanner SP |  |  |
|  | 23 | Scanner User Program |  |  |
| 991 | [Jam OFF/ON] |  |  |  |
|  | Jam ON/OFF |  |  |  |
|  | 1 | Jam ON/OFF |  | Enables or disables jam detection. <br> [ 0 or 1 / $\underline{0} /$ - ] Alphanumeric <br> 0: Enable <br> 1: Disable |


| 5 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 993 | [Line Position Adj.] |  |  |  |
|  | Line Positioning Adjustment ([Color]) <br> M: Main-scan, S: Sub-scan, Reg.: Registration, Mag.: Magnification <br> For example: M Reg = Main scan registration |  |  |  |
|  | 1 | Mode Selection | $\stackrel{*}{*}$ | Specifies when the automatic line position adjustment is done. <br> [ 0 to 2 / 1 / 1/step ] Alphanumeric <br> 0 : Never done <br> 1: Process Control (Done at a) all process control self checks except after toner end recovery and developer initialization, b) new PCU detected, and c) the temperature has changed by $5^{\circ} \mathrm{C}$ since the last adjustment) <br> 2: Except Procon (As for setting '1', except it is not done during self-checks. However, it is done at the initial process control self check. <br> The size of the $5^{\circ} \mathrm{C}$ difference can be changed with SP5-993-3 |
|  | 2 | Execute |  | Use to make a line position adjustment. |
|  | 3 | Temperature |  | Specifies the temperature for starting the line positioning adjustment. <br> [ 3 to $15 / \underline{5} / 11^{\circ} \mathrm{C}$ ] <br> The line position adjustment automatically starts when the temperature differs by the amount specified in this SP mode from the temperature when the last adjustment was done. <br> There are two thermistors on the laser opticshousing unit. The thermistor close to the fusing unit monitors the temperature for this adjustment. |
|  | 4 | Interrupt |  | Enables or disables the line position adjustment during a print job when the temperature differs by the amount specified in SP5-993-003 from the temperature at the last adjustment. <br> [ 0 or 1/1/-] Alphanumeric <br> 0: Disabled <br> 1: Enabled |
|  | 5 | Stand-by |  | Enables or disables the line position adjustment during stand-by mode when the temperature differs by the amount specified in SP5-993-003 from the temperature at the last adjustment. [ 0 or $1 / \underline{0} /-$ ] Alphanumeric <br> 0 : Disabled <br> 1: Enabled |
|  | 6 | Job Start |  | Enables or disables the line position adjustment just before starting a color print job when the temperature differs by the amount specified in SP5-993-003 from the temperature when the machine woke up from energy saver mode. <br> [ 0 or 1/1/-] <br> 0 : Disabled <br> 1: Enabled |


| 5 |  | $\begin{array}{r} \text { Mode } \\ \text { (Class 1, 2, } \end{array}$ |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 993 | 7 | Result | BCU | Displays the result of the latest line position adjustment in 4 digits. <br> First 2 digits: Error detected on the front ID sensor Last 2 digits: Error detected on the rear ID sensor Refer to the Troubleshooting section for more details about the two-digit codes. |
|  | 8 | Exe. Counter |  | Displays how many times the line position adjustment has been executed. <br> Counts up by +1 normally. <br> After a forced adjustment and a PCU <br> replacement, it counts up +3 <br> Also includes adjustments done at the factory. |
|  | 9 | Error Counter |  | Displays how many times errors have been detected during the line position adjustment. |
|  | The way that the auto line position adjustment is done can be adjusted using the following SP modes (SP5-993-010 to 021). These are coefficients used for the adjustment. Normally, do not change except if the automatic adjustment gives poor results immediately after installing a new optics housing unit. Change the value then do a forced line position adjustment (SP 5-993-2) to check the effects of the changes. <br> Example: If magenta is always shifted one dot to the left, reduce 5-993-11 by 1 . |  |  |  |
|  | 10 | M Reg. [Y] | BCU | A fine adjustment to the main-scan registration. [ -128 to $127 / \underline{0} / 1$ dot/step ] FA 1 dot $=20 \mu$ |
|  | 11 | M Reg. [M] |  |  |
|  | 12 | M Reg. [C] |  |  |
|  | 13 | M Mag. [Y] |  | A fine adjustment to the main-scan magnification. [ - 100 to $100 / \underline{0} / 0.01 \% /$ step ] FA <br> NOTE: The setting changes in this SP mode will be affect the next line position adjustment. |
|  | 14 | M Mag. [M] |  |  |
|  | 15 | M Mag. [C] |  |  |
|  | 16 | S Reg. 600[Y] |  | A fine adjustment to the sub-scan registration for each color (color registration). <br> [ - 128 to 127 / $\underline{0} / 1$ dot/step ] FA <br> 600dpi: 1 dot $=40 \mu$ <br> 1200 dpi: 1 dot $=20 \mu$ |
|  | 17 | S Reg. 600[M] |  |  |
|  | 18 | S Reg. 600[C] |  |  |
|  | 19 | S Reg. 1200[Y] |  |  |
|  | 20 | S Reg. 1200[M] |  |  |
|  | 21 | S Reg. 1200[C] |  |  |
|  | 22 | Interrupt 1 |  | Specifies the number of sheets to be printed before a line position adjustment is done during a print job. <br> [ 10 to 250 / 100 / 10 sheets/step ] <br> SP 5-993-4 must be set to 'enabled'. <br> When the temperature difference meets the conditions specified in SP5-993-3, the machine starts counting the number of prints in the job. The machine interrupts the print job and does the line position adjustment if the number of prints exceeds the number specified in this SP mode. If the counted number of prints does not exceed the number specified, the machine resets the counter, then continues to monitor the temperature and does the line position adjustment next time. |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |


| 5 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 993 | 23 | Interrupt 2 | $\begin{gathered} * \\ \mathrm{BCU} \end{gathered}$ | Performs the line position adjustment when the number of prints reaches the number specified in this SP mode regardless of the temperature change. <br> [ 0 to 350 / $200 / 50$ prints/step ] <br> 0 : Disable |
|  | 24 | Mscan Lgth Det |  | Performs the main scan length detection when the polygon motor has operated consecutively for the time specified in this SP mode. <br> [ 100 to $990 / 200 / 50 \mathrm{~s} /$ step ] |
| 994 | [Unit Detection ON/OFF] Maintenance Unit Detection ON/OFF |  |  |  |
|  | 1 | Dev. Unit/PCU | $\begin{gathered} * \\ \# \\ B C U \end{gathered}$ | Enables or disables PCU and development unit detection. <br> [ 0 or 1 / $\underline{0}$ /-] Alphanumeric <br> 0 : Enable <br> 1: Disable <br> NOTE: If this mode is disabled, new unit detection also does not function. Use this mode as a temporary measure, only when the microswitches are defective. |
|  | 2 | Oil Supply Unit | $\begin{gathered} * \\ \# \\ B C U \end{gathered}$ | This is for the oil supply unit only, and not the fusing unit <br> [ 0 or 1 / $\underline{0} /$ - ] Alphanumeric <br> 0 : Enable <br> 1: Disable <br> NOTE: Use this mode as a temporary measure, only when the unit detection mechanism is defective. |
| 997 | [Test Pattern] |  |  |  |
|  | 1 | Tray Selection |  | Selects the tray for making a test print. <br> [ 0 to 4 / 1 / 1 /step] <br> 0 : By-pass Table <br> 1: Tray 1 <br> 2: Tray 2 <br> 3: Tray 3 <br> 4: Tray 4 <br> NOTE: The machine makes a test pattern on the paper size loaded in the selected paper tray. |


| 5 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 997 | 2 | Pattern |  | Selects a test pattern. [ 0 to 23 / 0 / 1/step ] <br> 0: None <br> 1: 1-dot sub-scan line <br> 2: 2-dot sub-scan line <br> 3: 1-dot main-scan line <br> 4: 2-dot main-scan line <br> 5: 1-dot grid pattern (fine) <br> 6: 2-dot grid pattern (fine) <br> 7. 1-dot grid pattern (rough) <br> 8. 2-dot grid pattern (rough) <br> 9. 1-dot slant grid pattern <br> 10. 2-dot slant grid pattern <br> 11. 1-dot pattern <br> 12. 2-dot pattern <br> 13. 4-dot pattern <br> 14. 1-dot trimming pattern <br> 15. 2-dot trimming pattern <br> 16. Cross stitch: sub-scan <br> 17. Cross stitch: main-scan <br> 18. Belt pattern <br> 19. Belt pattern (vertical) <br> 20. Checkered Flag <br> 21. Grey scale (vertical) <br> 22. Grey scale (Horizontal) <br> 23. Solid |
|  | 3 | Single Color |  | Selects the color for making a test pattern.  <br> [0 to $6 / \underline{6} / 1 /$ step] Alphanumeric  <br> 0: Red 1: Green <br> 2: Blue 3: Yellow <br> 4: Magenta 5: Cyan <br> 6: Black  |
|  | 4 | Color Mode |  | Selects the color mode for making a test print. <br> [0 or 1 / $\underline{0} / 1 /$ step] Alphanumeric <br> 0: Full Color <br> 1: Single Color |
|  | 5 | Resolution |  | Selects the resolution for making a test print. <br> [0 to 2 / 1 / 1/step] Alphanumeric <br> 0: 600x600 <br> 1: $1200 \times 600$ <br> 2: $1200 \times 1200$ |
|  | 6 | By-pass Paper size |  | Selects the paper size for making a test pattern from the by-pass table. <br> [0 to 3 / $\underline{0} / 1 /$ step ] Alphanumeric <br> 0: A4 LEF 1: LT LEF <br> 2: A3 <br> 3: DLT |
|  | 7 | Print |  | Prints the test pattern with the settings specified with SP5-997-001 to 006. <br> NOTE: When exiting the SP mode, the test print mode is automatically canceled. |
| 998 | [Memory Clear 2] |  |  |  |
|  | 1 | ENG Setting | \# | Clears the engine settings except for counters. |
|  | 2 | ENG Counter |  | Clears all counters. |

SP6-XXX (Peripherals)



SP7-XXX (Data Log)

| 7 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 002 | [Original Counters] |  |  |  |
|  | 1 | Total Counter | CTL | Displays the total original count (number of originals fed) for the selected mode. |
|  | 2 | Copies |  |  |
|  | 3 | Fax |  |  |
|  | 4 | Document Box |  |  |
|  | 5 | Scanner |  |  |
|  | 6 | Others |  |  |
| 003 | [M/C Counter] Meter Charge Counter (Print, Development) |  |  |  |
|  | 1 | Total | CTL | Displays the values of the counters. [ -9999 to 9999999 / $\underline{\text { / 1/step ] }}$ |
|  | 2 | Copy: B\&W |  |  |
|  | 3 | Copy: Single Color |  |  |
|  | 4 | Copy: Full Color |  |  |
|  | 5 | FAX: B\&W |  |  |
|  | 7 | Print: B\&W |  |  |
|  | 8 | Print: Full Color |  |  |
|  | 10 | Development: CMY |  |  |
|  | 11 | Development: K |  |  |
|  | 12 | Copy: Single Color |  |  |
|  | 13 | Copy: Twin Color |  |  |
|  | 14 | Print: B\&W :Contact |  |  |
|  | 15 | DocBox: B\&W :Contact |  |  |
|  | 20 | Total: Full Color |  |  |
|  | 21 | Total: B\&W, Single |  |  |
|  | 22 | Total: Single |  |  |
|  | 23 | Total: B\&W |  |  |
|  | 24 | Copy: Full Color |  |  |
|  | 25 | Print: Full Color |  |  |
|  | 26 | Copy: Color |  |  |
|  | 27 | Copy: B/W |  |  |
|  | 28 | Print: Color |  |  |
|  | 29 | Print: B/W |  |  |
|  | 30 | Total: Color |  |  |
| 007 | [Other Counter] |  |  |  |
|  | 1 | Duplex | *TL | Displays counter values. [ 0 to 9999999 / / 1 sheet/step ] |
|  | 2 | A3/DLT/Over420 |  |  |
|  | 3 | Staple |  |  |
| 101 | [Paper Size Counter] Paper Size Counter |  |  |  |
|  | 4 | A3 | CTL | Displays the counter values for each paper size. [ 0 to 9999999 / $\mathbf{0} / 1$ sheet/step ] |
|  | 5 | A4 |  |  |
|  | 6 | A5 |  |  |
|  | 13 | B4 |  |  |
|  | 14 | B5 |  |  |
|  | 32 | DLT |  |  |
|  | 36 | LG |  |  |
|  | 38 | LT |  |  |
|  | 44 | HLT |  |  |
|  | 128 | Others |  |  |


| 7 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 201 | [Total Scan Counter] |  |  |  |
|  | 1 | Total Scan Counter | CTL | Displays the total number of scans. [ 0 to 9999999 / $0 / 1 \mathrm{scan} / \mathrm{step}$ ] |
| 202 | [D Unit Op Ctr] Development Unit Operation Counter |  |  |  |
|  | 1 | Print: B\&W | CTL | Displays the number of prints made with black development unit operation only. [ 0 to 9999999 / $0 / 1$ print/step ] |
|  | 2 | Print: Color |  | Displays the number of prints made with color development unit operation. [ 0 to 9999999 / 0 / 1 print/step ] |
|  | 3 | Development: B\&W |  | Displays the number of developments made with black development unit operation only. [ 0 to 9999999 / $\underline{0} / 1$ development/step ] |
|  | 4 | Development: Color |  | Displays the number of developments made with color development unit operation. <br> [ 0 to 9999999 / $\underline{0} / 1$ development/step ] |
| 204 | [Paper Tray Counter] |  |  |  |
|  | 1 | Tray 1 | CTL | Displays the number of sheets fed from each paper feed station. [ 0 to 9999999 / 0 / 1 sheet/step ] <br> NOTE: The LCT is counted as the 3rd feed station. |
|  | 2 | Tray 2 |  |  |
|  | 3 | Tray 3/LCT |  |  |
|  | 4 | Tray 4 |  |  |
|  | 5 | By-pass |  |  |
|  | 6 | Duplex |  |  |
| 205 | [ADF Total Counter] |  |  |  |
|  | 1 | ADF Total Counter | $\stackrel{*}{\text { CTL }}$ | Displays the total number of originals fed by the ARDF. |
| 206 | [Staple Counter] |  |  |  |
|  | 1 | Staple Counter | CTL | Displays the total number of staples fired. |
| 209 | [Punch Counter] |  |  |  |
|  | 1 | Punch | CTL | Displays the number of times hole punching has been done. |
| 301 | [Copy Co.: Mag.] Copy Counter: Magnification |  |  |  |
|  | 1 | Reduce 25\% <-->49\% | $\stackrel{\star}{*}$ | Displays the number of copies made with each magnification ratio. |
|  | 2 | Reduce 50\% <-->99\% |  |  |
|  | 3 | Full Size |  |  |
|  | 4 | Enlarge 101\%<-->200\% |  |  |
|  | 5 | Enlarge 201\%<-->400\% |  |  |
|  | 6 | Direct Mag. |  |  |
|  | 7 | Direct Size Mag. |  |  |
|  | 8 | Auto reduce/Enlarge |  |  |
| 304 | [Copy Co.: Copy Mode] Copy Counter: Copy Mode |  |  |  |
|  | 1 | Text | NV | Displays the total number of copies made in the copy mode by each operation mode. |
|  | 2 | T/P (Glossy Photo) |  |  |
|  | 3 | T/P (Printed Photo) |  |  |
|  | 4 | T/P (Copied Photo) |  |  |
|  | 5 | Photo (Glossy Photo) |  |  |
|  | 6 | Photo (Printed Photo) |  |  |
|  | 7 | Photo (Copied Photo) |  |  |
|  | 8 | Generation Copy |  |  |
|  | 9 | Pale |  |  |
|  | 10 | Map |  |  |
|  | 11 | Punch |  |  |
|  | 12 | Repeat |  |  |


| 7 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 304 | 13 | Sort | NV | Displays the total number of copies made in the copy mode by each operation mode. |
|  | 14 | Staple |  |  |
|  | 15 | Series |  |  |
|  | 16 | Erase |  |  |
|  | 17 | Duplex |  |  |
|  | 18 | ADF |  |  |
|  | 19 | Double Copy |  |  |
|  | 20 | Duplex Original |  |  |
|  | 21 | Interrupt Copy |  |  |
|  | 22 | Combined 1 Side |  |  |
|  | 23 | Combined 2 Side |  |  |
|  | 26 | Batch |  |  |
|  | 27 | SADF |  |  |
|  | 28 | Mixed Sizes |  |  |
|  | 30 | Cover Page |  |  |
|  | 31 | Chapter Page |  |  |
|  | 32 | Color Balance Adjust |  |  |
|  | 33 | Adjust Color |  |  |
|  | 34 | Copy Quality |  |  |
|  | 35 | Erase Color |  |  |
| 305 | [Copy Co.: Set No.] Copy Counter: Set No. |  |  |  |
|  | 1 | 1 to 1 | NV | Displays the total number of multiple copy jobs made in copy mode. |
|  | 2 | 1 to 2 <-> 5 |  |  |
|  | 3 | 1 to $6<->10$ |  |  |
|  | 4 | 1 to $11<->20$ |  |  |
|  | 5 | 1 to $21<->50$ |  |  |
|  | 6 | 1 to $51<->100$ |  |  |
|  | 7 | 1 to $101<->300$ |  |  |
|  | 8 | 1 to 301 <-> Over |  |  |
| 306 | [Copy Co.: Job Mode] Copy Counter: Job Mode |  |  |  |
|  | 1 | Sort | NV | Displays the total number of jobs based on the function selected in copy mode. |
|  | 2 | Staple |  |  |
|  | 3 | Punch |  |  |
|  | 4 | Reverse Copy |  |  |
|  | 5 | Check Copy |  |  |
| 320 | [DS Co.: Total Scan] DS Co. : Document Server Counter |  |  |  |
|  | 1 | DS Co.: Total Scan | NV | Displays the original count stored on the document server. |
| 321 | [DS Co.: Scan Size] DS Co. : Document Server Counter |  |  |  |
|  | 4 | A3 | NV | Displays the number of originals by paper size scanned into the document server. |
|  | 5 | A4 |  |  |
|  | 6 | A5 |  |  |
|  | 13 | B4 |  |  |
|  | 14 | B5 |  |  |
|  | 32 | DLT |  |  |
|  | 36 | LG |  |  |
|  | 38 | LT |  |  |
|  | 44 | HLT |  |  |
|  | 128 | Others |  |  |
| 323 | [DS Co.: Copy Size] DS Co. : Document Server Counter |  |  |  |
|  | 5 | A4 (Sideways) | NV | Displays the number of copies made from the document server and classed by paper size. |
|  | 6 | A5 (Sideways) |  |  |
|  | 14 | B5 (Sideways) |  |  |
|  | 38 | LT (Sideways) |  |  |


| 7 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 323 | 44 | HLT (Sideways) | NV | Displays the number of copies made from the document server and classed by paper size. |
|  | 128 | Others |  |  |
|  | 132 | A3 (Lengthwise) |  |  |
|  | 133 | A4 (Lengthwise) |  |  |
|  | 134 | A5 (Lengthwise) |  |  |
|  | 141 | B4 (Lengthwise) |  |  |
|  | 142 | B5 (Lengthwise) |  |  |
|  | 160 | DLT (Lengthwise) |  |  |
|  | 164 | LG (Lengthwise) |  |  |
|  | 166 | LT (Lengthwise) |  |  |
|  | 172 | HLT (Lengthwise) |  |  |
| 324 | [DS Co.: Job Mode] DS Co. : Document Server Counter |  |  |  |
|  | 1 | Duplex | NV | Displays the number of jobs made from the document server and classed by job counter. |
|  | 2 | Sort |  |  |
|  | 3 | Staple |  |  |
|  | 4 | Punch |  |  |
|  | 5 | Check Copy |  |  |
|  | 6 | Print 1st Page |  |  |
| 325 | [DS Co.: Page No.] DS Co. : Document Server Counter |  |  |  |
|  | 1 | 1-page | NV | Displays the number of copy jobs made from the document server and classed by the size of the job. |
|  | 2 | 2-page |  |  |
|  | 3 | $3<->5$ pages |  |  |
|  | 4 | $6<->10$ pages |  |  |
|  | 5 | Over 11 pages |  |  |
| 326 | [DS Co.: File No.] DS Co. : Document Server Counter |  |  |  |
|  | 1 | 1 file | NV | Displays the number of copy jobs made from the document server and classed by number of files. |
|  | 2 | 2 <-> 5 files |  |  |
|  | 3 | $6<->10$ files |  |  |
|  | 4 | Over 11 files |  |  |
| 327 | [DS Co.: Set No.] DS Co. : Document Server Counter |  |  |  |
|  | 1 | 1 to 1 | NV | Displays the number of copy jobs made from the document server and classed by the set sizes. |
|  | 2 | 1 to 2 <-> 5 |  |  |
|  | 3 | 1 to $6<->10$ |  |  |
|  | 4 | 1 to $11<->20$ |  |  |
|  | 5 | 1 to $21<->50$ |  |  |
|  | 6 | 1 to $51<->100$ |  |  |
|  | 7 | 1 to $101<->300$ |  |  |
|  | 8 | 1 to 301 <-> Over |  |  |
| 328 | [DS Co.: Copy Mode] DS Co. : Document Server Counter |  |  |  |
|  | 6 | Punch | NV | Displays the number of copies made from the document server, and classed by the copy mode selected. |
|  | 8 | Sort |  |  |
|  | 9 | Staple |  |  |
|  | 12 | Duplex |  |  |
|  | 25 | Cover page |  |  |
|  | 26 | Slip Sheet |  |  |
| 401 | [SC Counter] |  |  |  |
|  | 1 | SC Counter | CTL | Displays the number of SC codes detected. [ 0 to 9999 / $\mathbf{0} / 1 /$ step ] |


| 7 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 403 | [Latest10Sclog] |  |  |  |
|  | 1 | Latest | CTL | Logs the SC codes detected. <br> The 10 most recently detected SC Codes are not displayed on the screen, but can be seen on the SMC (logging) outputs. |
|  | 2 | Latest -1 |  |  |
|  | 3 | Latest -2 |  |  |
|  | 4 | Latest - 3 |  |  |
|  | 5 | Latest -4 |  |  |
|  | 6 | Latest -5 |  |  |
|  | 7 | Latest -6 |  |  |
|  | 8 | Latest -7 |  |  |
|  | 9 | Latest -8 |  |  |
|  | 10 | Latest -9 |  |  |
| 502 | [Paper Jam Counter] |  |  |  |
|  | 1 | Total Jam | CTL | Displays the total number of jams detected. [ 0 to 9999 / $0 / 1$ sheet/step ] |
| 503 | [Original Jam Counter] |  |  |  |
|  | 1 | Original Jam counter | CTL | Displays the total number of original jams. [ 0 to 9999 / $\underline{0} / 1$ original/step] |
| 504 | [Paper Jam Location] <br> D: Duplex, MB: Mail Box, F; Finisher, E: External, I: Internal ON: On check, OFF: Off Check |  |  |  |
|  | 3 | Tray 1:ON | CTL | Displays the number of jams according to the location where jams were detected. <br> NOTE: The LCT is counted as the 3rd feed station. |
|  | 4 | Tray 2:ON |  |  |
|  | 5 | Tray 3/LCT:ON |  |  |
|  | 6 | Tray 4:ON |  |  |
|  | 8 | Regist.:ON |  |  |
|  | 9 | E Tray:ON |  |  |
|  | 10 | 1 Tray:ON |  |  |
|  | 11 | D:ON |  |  |
|  | 12 | D Exit 1:ON |  |  |
|  | 13 | D Exit 2:ON |  |  |
|  | 14 | D Exit 3:ON |  |  |
|  | 15 | D Feed: ON |  |  |
|  | 20 | MB Upper:ON |  |  |
|  | 21 | MB Lower:ON |  |  |
|  | 51 | Tray 1:OFF |  |  |
|  | 52 | Tray 2:OFF |  |  |
|  | 53 | Tray 3:OFF |  |  |
|  | 54 | Tray 4:OFF |  |  |
|  | 61 | Regist: OFF |  |  |
|  | 63 | E Tray:OFF |  |  |
|  | 64 | I Tray:OFF |  |  |
|  | 65 | D:OFF |  |  |
|  | 66 | D Exit 1:OFF |  |  |
|  | 67 | D Exit 2:OFF |  |  |
|  | 68 | D Exit 3:OFF |  |  |
|  | 69 | D Feed:OFF |  |  |
|  | 100 | F Entrance |  |  |
|  | 101 | F Shift Tray 1 |  |  |
|  | 102 | F Shift Tray 2 |  |  |
|  | 103 | F Staple |  |  |
|  | 104 | F Exit |  |  |
|  | 105 | F Drive |  |  |
|  | 106 | F Tray Up/Down |  |  |
|  | 107 | F Jogger |  |  |


| 7 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 504 | 108 | F Staple | CTL | Displays the number of jams according to the location where jams were detected. |  |  |
|  | 109 | F Exit |  |  |  |  |
|  | 110 | F Punch |  |  |  |  |
|  | 111 | F Jam Clear |  |  |  |  |
| 505 | [Original Jam Detection] |  |  |  |  |  |
|  | 1 | At Power On |  |  | CTL | Displays the total number of original jams by location. |
|  | 3 | Skew Correction Sensor (On Check) |  |  |  |  |
|  | 4 | Interval Sensor (On Check) |  |  |  |  |
|  | 5 | Registration Sensor (On Check) |  |  |  |  |
|  | 6 | Relay Sensor (On Check) |  |  |  |  |
|  | 7 | Inverter Sensor (On Check) |  |  |  |  |
|  | 53 | Skew Correction Sensor (Off Check) |  |  |  |  |
|  | 54 | Interval Sensor (Off Check) |  |  |  |  |
|  | 55 | Registration Sensor (Off Check) |  |  |  |  |
|  | 56 | Relay Sensor (Off Check) |  |  |  |  |
|  | 57 | Inverter Sensor (Off Check) |  |  |  |  |
| 506 | [Jam Paper Size] |  |  |  |  |  |
|  | 4 | A3 | CTL | Displays the number of jams according to the paper size. <br> [ 0 to 9999 / 0 / 1 sheet/step ] |  |  |
|  | 5 | A4 |  |  |  |  |  |  |
|  | 13 | B4 |  |  |  |  |  |  |
|  | 14 | B5 |  |  |  |  |  |  |
|  | 32 | DLT |  |  |  |  |  |  |
|  | 36 | LG |  |  |  |  |  |  |
|  | 38 | LT |  |  |  |  |  |  |
|  | 44 | HLT |  |  |  |  |  |  |
|  | 128 | Others |  |  |  |  |  |  |
| 507 | [Jam History] |  |  |  |  |  |
|  | 1 | Latest | CTL | Displays the 10 most recently detected paper jams. |  |  |
|  | 2 | Latest-1 |  |  |  |  |  |  |
|  | 3 | Latest-2 |  |  |  |  |  |  |
|  | 4 | Latest-3 |  |  |  |  |  |  |
|  | 5 | Latest-4 |  |  |  |  |  |  |
|  | 6 | Latest-5 |  |  |  |  |  |  |
|  | 7 | Latest-6 |  |  |  |  |  |  |
|  | 8 | Latest-7 |  |  |  |  |  |  |
|  | 9 | Latest-8 |  |  |  |  |  |  |
|  | 10 | Latest-9 |  |  |  |  |  |  |
| 508 | [Original Jam History] |  |  |  |  |  |
|  | 1 | Latest | CTL | Displays the 10 most recently detected original jams. |  |  |
|  | 2 | Latest-1 |  |  |  |  |  |  |
|  | 3 | Latest-2 |  |  |  |  |  |  |
|  | 4 | Latest-3 |  |  |  |  |  |  |
|  | 5 | Latest-4 |  |  |  |  |  |  |
|  | 6 | Latest-5 |  |  |  |  |  |  |
|  | 7 | Latest-6 |  |  |  |  |  |  |
|  | 8 | Latest-7 |  |  |  |  |  |  |
|  | 9 | Latest-8 |  |  |  |  |  |  |
|  | 10 | Latest-9 |  |  |  |  |  |  |
| 801 | [Firmware Version] |  |  |  |  |  |
|  | 255 | Firmware Version |  | Displ | s the | ersion of each firmware |


| 7 | Mode No.(Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 803 | [PM Counter] |  |  |  |
|  | (Sheets or Rotations, Unit, [Color]) <br> Dev.: Development Unit, PF: Paper Feed Rollers, Oil Supply: Oil Supply Unit, Fusing: <br> Fusing Unit, Transfer: Transfer Unit |  |  |  |
|  | 1 | S:PCU [K] | BCU | Displays the number of sheets printed for each current maintenance unit. <br> [ 0 to 9999999 / $\underline{0}$ / 1 sheet/step ] |
|  | 2 | $\mathrm{S}: \mathrm{PCU}[\mathrm{Y}]$ |  |  |
|  | 3 | $\mathrm{S}: \mathrm{PCU}$ [M] |  |  |
|  | 4 | S:PCU [C] |  | PM counters click up based on the number of A4 (LT) LEF size sheets printed. Therefore, the A3 (DLT) Double Count is activated. The Double Count cannot be deactivated. |
|  | 5 | S:Dev. [K] |  |  |
|  | 6 | S:Dev. [Y] |  |  |
|  | 7 | S:Dev. [M] |  |  |
|  | 8 | S:Dev. [C] |  | When a unit is replaced, the machine automatically detects that the new unit is installed. |
|  | 9 | S:Oil Supply |  |  |
|  | 10 | PF By-pass |  |  |
|  | 11 | PF Tray 1 |  | Then, the current PM counter value is |
|  | 12 | PF Tray 2 |  | automatically moved to the PM Counter - Previous (SP7-906-1 to 9) and is reset to " 0 ". |
|  | 13 | PF Tray 3/LCT |  |  |
|  | 14 | PF Tray 4 |  | The total number of sheets printed with the last unit replaced can be checked with SP7-906-1 to 9 . |
|  | 16 | S:Fusing |  | NOTE: The LCT is counted as the 3rd feed station. |
|  | Displays the number of revolutions of motors or clutches for each current maintenance unit. <br> [ 0 to 9999999 / $\underline{0}$ / 1 revolution/step ] <br> When a unit is replaced, the machine automatically detects that the new unit is installed. <br> Then, the current PM counter value is automatically moved to the PM Counter - Previous (SP7-906-10 to 20) and is reset to " 0 ". The total number of revolutions made with the last unit replaced can be checked with SP7-906-10 to 20. |  |  |  |
|  | 17 | R:PCU [K] | ${ }_{B C U}^{*}$ | -906-10 to 20. <br> Target Revolution: 550675 |
|  | 18 | R:PCU [Y] |  | Target Revolution: 591813 |
|  | 19 | $\mathrm{R}: \mathrm{PCU}$ [M] |  | Target Revolution: 591813 |
|  | 20 | $\mathrm{R}: \mathrm{PCU}[\mathrm{C}]$ |  | Target Revolution: 591813 |
|  | 21 | R:Dev. [K] |  | Target Revolution: 1076103 |
|  | 22 | R:Dev. [Y] |  | Target Revolution: 1173387 |
|  | 23 | R:Dev. [M] |  | Target Revolution: 1173387 |
|  | 24 | R:Dev. [C] |  | Target Revolution: 1173387 |
|  | 25 | R:Oil Supply |  | Target Revolution: 1861000 |
|  | 26 | R:Fusing |  | Target Revolution: 9303000 |
|  | 27 | R:Transfer |  | Target Revolution: 5163000 |
|  | 28 | S:Waste Toner |  | Displays the number of sheets printed until the waste toner bottle becomes full or toner runs out. [ 0 to 9999999 / - / 1 sheet/step ] |
|  | 29 | S:Toner [K] |  |  |
|  | 30 | S:Toner [ Y ] |  |  |
|  | 31 | S :Toner [M] |  |  |
|  | 32 | S:Toner [C] |  |  |
|  | 33 | TonerSupply[K] |  | Displays the total operating time for the toner attraction pump. <br> [ 0 to 9999999 /- / 1 s/step ] |
|  | 34 | TonerSupply[ Y ] |  |  |
|  | 35 | TonerSupply[M] |  |  |
|  | 36 | TonerSupply[C] |  |  |



| 7 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 833 | 11 | Toner [K] | $\mathrm{BCU}$ | Displays the total number of toner cartridges replaced. <br> [ 0 to 65535 / - / 1 cartridge/step ] |
|  | 12 | Toner [C] |  |  |
|  | 13 | Toner [M] |  |  |
|  | 14 | Toner [Y] |  |  |
| 837 | [Co. Clear: Copy: Copy Mode] Counter Clear: Copy: Copy Mode |  |  |  |
|  | 1 | Co. Clear: Copy Mode |  | Clears the copy counter classed by copy mode (SP7-304). |
| 838 | [Co. Clear: Copy: Set No.] Counter Clear: Copy: Set No. |  |  |  |
|  | 1 | Co. Clear: Set No. |  | Clears the copy counters classed by set number (SP7-305). |
| 839 | [Co. Clear: Copy: Job Mode] Counter Clear: Copy: Job Mode |  |  |  |
|  | 1 | Co. Clear: Job Mode |  | Clears the copy counters classed by job mode (SP7-306). |
| 840 | [Co. Clear: DS: Total Scan] Counter Clear: DS: Total Scan |  |  |  |
|  | 1 | Co. Clear: Total Scan |  | Clears the counter of total scans for the document server (SP7-320). |
| 841 | [Co. Clear: DS: Scan Size] Counter Clear: DS: Scan Size |  |  |  |
|  | 1 | Co. Clear: Scan Size |  | Clears the counters classed by the original size scanned for the document server (SP7-321). |
| 842 | [Co. Clear: DS: Copy Size] Counter Clear: DS: Copy Size |  |  |  |
|  | 1 | Co. Clear: Copy Size |  | Clears the counters classed by the size of copies made from the document server (SP7-323). |
| 843 | [Co. Clear: DS: Job Mode] Counter Clear: DS: Job Mode |  |  |  |
|  | 1 | Co. Clear: DS: Job Mode |  | Clears the counters classed by the job mode of copies made from the document server (SP7324). |
| 844 | [Co. Clear: DS: Page No.] Counter Clear: DS: Page No. |  |  |  |
|  | 1 | Co. Clear: DS: Page No. |  | Clears the counters classed by the job size of copies made from the document server (SP7325). |
| 845 | [Co. Clear: DS: File No.] Counter Clear: DS: File No. |  |  |  |
|  | 1 | Co. Clear: DS: File No. |  | Clears the counters classed by the file number of copies made from the document server (SP7326). |
| 846 | [Co. Clear: DS: Set No.] Counter Clear: DS: Set No. |  |  |  |
|  | 1 | Co. Clear: DS: Set No. |  | Clears the counters classed by the set number of copies made from the document server (SP7327). |
| 847 | [Co. Clear: DS: Copy Mode] Counter Clear: DS: Copy Mode |  |  |  |
|  | 1 | Co. Clear: DS: Copy Mode |  | Clears the counters classed by the mode of copies made from the document server (SP7328). |
| 848 | [Co. Clear: All] Counter Clear All |  |  |  |
|  | 1 | Co. Clear All |  | Clears all counters of copies made in copy mode and from the document server. $\begin{aligned} & \text { SP7-301, 304, } 305,306,320,321,323,324,325 \text {, } \\ & 326,327 \text {, and } 328 \end{aligned}$ |
| 901 | [Asset Info] |  |  |  |
|  | 1 | File Name |  | Records the location where a problem is detected in the program. The data stored in this SP is used for problem analysis. DFU |
|  | 2 | \# of Lines |  |  |
|  | 3 | Location |  |  |


| 7 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 904 | [Print: Printer Gamma] |  |  |  |
|  | 1 | Print: Printer Gamma |  | Prints all data lists. (same function as SP5-990001) DFU |
| 905 | [Alert Display] |  |  |  |
|  | 7 | Fusing: Alert | BCU | Specifies the timing for displaying the near-end condition. <br> With the default setting, near-end is detected and the alert lights on the panel 2.5 K prints before detecting the end condition. The unit life is 9303 K revolutions. <br> Increment: Delays the alert display timing. Decrement: Hastens the alert display timing. <br> 1.0K prints $=$ approximately 93 K revolutions <br> [ 0 to 20000 / $9070 / 1 \mathrm{~K}$ revolutions/step ] |
|  | 9 | Oil: Alert |  | Specifies the timing for displaying the near-end condition. <br> With the default setting, near-end is detected and the alert lights on the panel 2.5 K prints before detecting the end condition. The unit life is 1860 revolutions. <br> Increment: Delays the alert display timing. Decrement: Hastens the alert display timing. <br> 1.0 K prints $=93$ <br> [ 0 to 10000 / $1628 / 1 \mathrm{~K}$ revolutions/step ] |
| 906 | [PM Counter-Previous] |  |  |  |
|  | (Sheets or Rotations, Unit, [Color]), Dev.: Development Unit |  |  |  |
|  | 1 | S:PCU [K] | $B C U$ | Displays the number of sheets printed with the previous maintenance units. |
|  | 2 | $\mathrm{S}: \mathrm{PCU}[\mathrm{Y}]$ |  |  |
|  | 3 | S:PCU [M] |  |  |
|  | 4 | S:PCU [C] |  |  |
|  | 5 | S:Dev. [K] |  |  |
|  | 6 | S:Dev. [Y] |  |  |
|  | 7 | S:Dev. [M] |  |  |
|  | 8 | S:Dev. [C] |  |  |
|  | 9 | S:Oil Supply |  |  |
|  | 10 | S:Fusing |  |  |
|  | 11 | R:PCU [K] |  | Displays the number of revolutions for motors or clutches in the previous maintenance units. |
|  | 12 | R:PCU [Y] |  |  |
|  | 13 | R:PCU [M] |  |  |
|  | 14 | R:PCU [C] |  |  |
|  | 15 | R:Dev. [K] |  |  |
|  | 16 | R:Dev. [Y] |  |  |
|  | 17 | R:Dev. [M] |  |  |
|  | 18 | R:Dev. [C] |  |  |
|  | 19 | R:Oil Supply |  |  |
|  | 20 | R:Fusing |  |  |
|  | 21 | S:Waste Toner |  | Displays the number of sheets printed with the previous maintenance unit or toner cartridge. |
|  | 22 | S:Toner [K] |  |  |
|  | 23 | S:Toner [ Y$]$ |  |  |
|  | 24 | S:Toner [M] |  |  |
|  | 25 | S:Toner [C] |  |  |


| 7 | Mode No. <br> (Class 1, 2, and 3) |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: |
| 907 | [Check Sum] |  |  |
|  | 1 | Engine Main | ${ }^{*}$ |
|  | 2 | Engine MUSIC | Displays the check sum of the firmware. |

NOTE 1: Memory Clear (SP5-801 \& 7-808)
The following tables list the items that are cleared. The serial number information, meter charge setting (SP5-930), and meter charge counters (SP7-003) are not cleared.

| 5 | Mode No. (Class 1, 2, and 3) |  |  | SP Modes or User Setting to be cleared |
| :---: | :---: | :---: | :---: | :---: |
| 801 | [Memory Clear] |  |  |  |
|  | 1 | All module | \# | DFU |
|  | 2 | ENG All |  | DFU |
|  | 3 | SCS / SRM |  | SP5-009, 101, 104, 305, 812, 833, 961, and 970 SP7-101, 204, 209, 401, 502, 504, 506, and 507 |
|  | 5 | MCS |  | Not used. |
|  | 6 | Copy Memory Clr? |  | Initializes the copy application settings. |
|  | 7 | Fax |  | Initializes the fax application settings. |
|  | 8 | Printer aplication |  | The following service settings: <br> - Bit switches <br> - Gamma settings (User \& Service) <br> - Toner Limit <br> The following user settings: <br> - Tray Priority <br> - Menu Protect <br> - System Setting except for setting of Energy Saver <br> - I/F Setup (I/O Buffer and I/O Timeout) <br> - PCL Menu |
|  | 9 | Scanner aplication |  | Initializes the scanner application settings. |
|  | 10 | Network aplication |  | Deletes the network file application management files and thumbnails, and initializes the job login ID. |
|  | 11 | NCS |  | Initializes the system defaults and interface settings (IP addresses also), SmartNetMonitor for Admin, WebStatusMonitor settings, and the TELNET settings. |
|  | 12 | IPU |  | Clears the IPU settings |
|  | 13 | R-Fax |  | Initializes the job login ID, SmartNetMonitor for Admin, job history, and local storage file numbers. |
| 998 | 1 | ENG Setting | \# | All engine related SP modes except for the following: <br> - Serial number information <br> - SP modes related to meter charge <br> - Counters and logging data |
|  | 2 | ENG Counter |  | All counters and logging data related to engine |


| 7 | Mode No.(Class 1, 2, and 3) |  | SP Modes or User Setting to be cleared |
| :---: | :---: | :---: | :---: |
| 808 | [Counter Clear] |  |  |
|  | 1 | Counter Clear | SP7-101, 204, 209, 502, 504, 506, and 507 |

### 5.4.2 INPUT CHECK TABLE

## Main Frame Input Check: SP5-803

When entering the Input Check mode, 8 digits display the result for a section. Each digit corresponds to a different device as shown in the table.

| Bit No. | $\mathbf{7}$ | $\mathbf{6}$ | $\mathbf{5}$ | $\mathbf{4}$ | $\mathbf{3}$ | $\mathbf{2}$ | $\mathbf{1}$ | $\mathbf{0}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Result | 0 or 1 | 0 or 1 | 0 or 1 | 0 or 1 | 0 or 1 | 0 or 1 | 0 or 1 | 0 or 1 |



| $\begin{array}{\|\|c\|} \hline \text { SP5-803 } \\ \text {-XXX } \end{array}$ | Bit | Description | Reading |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | 0 | 1 |
| 5 | Paper Feed |  |  |  |
|  | 0 | Relay Sensor | Paper not detected | Paper detected |
|  | 1 | Vertical Transport Sensor | Paper not detected | Paper detected |
|  | 2 | Upper Relay Sensor (PFU) | Paper not detected | Paper detected |
|  | 3 | Lower Relay Sensor (PFU) | Paper not detected | Paper detected |
|  | 4 | Registration Sensor | Paper not detected | Paper detected |
|  | 5 | Duplex Inverter Sensor | Paper not detected | Paper detected |
|  | 6 | Duplex Feed Sensor | Paper not detected | Paper detected |
| 6 | Paper Exit |  |  |  |
|  | 0 | Fusing Exit Sensor | Paper not detected | Paper detected |
|  | 1 | Paper Exit Sensor | Paper not detected | Paper detected |
|  | 2 | Duplex Exit Sensor 1 | Paper not detected | Paper detected |
|  | 3 | Duplex Exit Sensor 2 | Paper not detected | Paper detected |
|  | 4 | Duplex Exit Sensor 3 | Paper not detected | Paper detected |
|  | 5 | Exit Upper Limit Sensor | Not full | Full |
| 7 | Fusing Unit |  |  |  |
|  | 0 | Fusing Unit (Set) | Not set | Set |
|  | 1 | Fusing Unit (New) | 0 to 1: New unit installed |  |
|  | 2 | Oil Supply Unit (Set) | Set | Not set |
|  | 3 | Oil Supply Unit (New) | 1 to 0 : New unit installed |  |
|  | 4 | European Version | US | Europe |
| 8 | Motor Lock |  |  |  |
|  | 0 | Development Drive Motor - CMY | Not locked | Locked |
|  | 1 | Development Drive Motor - K | Not locked | Locked |
|  | 2 | - | - | - |
|  | 3 | - | - | - |
|  | 4 | - | - | - |
|  | 5 | Fusing Fan Motor | Locked (normal speed) | Low speed or not working |
|  | 6 | - | - | - |
|  | 7 | - | - | - |
| 9 | Dev. Unit/ PCU |  |  |  |
|  | 0 | Development Unit - K | Not set | Set |
|  | 1 | Development Unit - C | Not set | Set |
|  | 2 | Development Unit - M | Not set | Set |
|  | 3 | Development Unit - Y | Not set | Set |
|  | 4 | PCU - K | Not set | Set |
|  | 5 | PCU - C | Not set | Set |
|  | 6 | PCU - M | Not set | Set |
|  | 7 | PCU - Y | Not set | Set |
| 13 | Others |  |  |  |
|  | 0 | LD H.P. Sensor | Not H.P. | H.P. |
|  | 1 | Transfer Belt Set Sensor | Not contact | Contact |
|  | 2 | Transfer Belt H.P. Sensor | Not. H.P. | H.P. |
|  | 3 | Used Toner Sensor | Not full | Full |
|  | 4 | Used Toner Bottle Set Sensor | Not set | Set |
|  | 5 | - | - | - |
|  | 6 | PSU Thermistor | Not high | High |
|  |  |  |  |  |


| $\begin{array}{\|c} \hline \text { SP5-803 } \\ \text {-XXX } \end{array}$ | Bit | Description | Reading |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | 0 | 1 |
| 15 | Mail Box 1 |  |  |  |
|  | 0 | Tray 1 Paper Overflow Sensor | Not full | Full |
|  | 1 | Tray 1 Paper Sensor | Paper not detected | Paper detected |
|  | 2 | Tray 2 Paper Overflow Sensor | Not full | Full |
|  | 3 | Tray 2 Paper Sensor | Paper not detected | Paper detected |
|  | 4 | Tray 3 Paper Overflow Sensor | Not full | Full |
|  | 5 | Tray 3 Paper Sensor | Paper not detected | Paper detected |
|  | 6 | Tray 4 Paper Overflow Sensor | Not full | Full |
|  | 7 | Tray 4 Paper Sensor | Paper not detected | Paper detected |
| 16 | Mail Box 2 |  |  |  |
|  | 0 | Vertical Transport Sensor 1 | Paper not detected | Paper detected |
|  | 1 | Vertical Transport Sensor 2 | Paper not detected | Paper detected |
|  | 2 | Door Safety Switch | Opened | Closed |

## ARDF Input Check: SP6-007

| $\begin{array}{\|c\|} \hline \text { SP6-007 } \\ \text {-XXX } \end{array}$ | Bit | Description | Reading |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | 0 | 1 |
| 1-1 | 7 | Original width sensor 4 | Paper not detected | Paper detected |
|  | 6 | Original width sensor 3 | Paper not detected | Paper detected |
|  | 5 | Original width sensor 2 | Paper not detected | Paper detected |
|  | 4 | Original width sensor 1 | Paper not detected | Paper detected |
|  | 3 | Skew correction sensor | Paper not detected | Paper detected |
|  | 2 | Original set sensor | Paper not detected | Paper detected |
|  | 1 | Original length sensor 1 | Paper not detected | Paper detected |
|  | 0 | Original length sensor 2 | Paper not detected | Paper detected |
| 2 | 7 | Original stopper HP sensor | Original stopper up | Original stopper down |
|  | 6 | Pick-up HP sensor | Cover closed | Cover opened |
|  | 5 | Top cover Sensor | Cover closed | Cover opened |
|  | 4 | Lift sensor | Pick-up roller up | Pick-up roller down |
|  | 3 | Inverter sensor | Paper not detected | Paper detected |
|  | 2 | Exit sensor | Paper not detected | Paper detected |
|  | 1 | Registration sensor | Paper not detected | Paper detected |
|  | 0 | Interval Sensor | Paper not detected | Paper detected |

Table 1: Paper Height Sensor
Low: Deactivated, High: Activated (actuator inside sensor)

| Remaining paper | Paper height sensor 1 | Paper height sensor 2 |
| :---: | :---: | :---: |
| Full | Low | Low |
| Nearly full | Low | High |
| Near end | High | High |
| Almost empty | High | Low |

Table 2: Paper Size Switch (Tray 2)
0: Not pushed, 1: pushed

| Models |  | Switch Location |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| North America | Europe/Asia | 1 | 2 | 3 | 4 |
| $11^{\prime \prime} \times 17^{\prime \prime}$ SEF | 11" x 17" SEF | 0 | 1 | 0 | 0 |
| A3 SEF | A3 SEF | 1 | 0 | 1 | 0 |
| 81/2" x 14" SEF *1 | B4 SEF *1 | 1 | 1 | 0 | 1 |
| 81/2" $\times 11$ " SEF *2 | A4 SEF *2 | 0 | 1 | 1 | 0 |
| 11" x 81/2" LEF *3 | 11" x 81/2" LEF *3 | 1 | 0 | 1 | 1 |
| A4 LEF | A4 LEF | 0 | 1 | 0 | 1 |
| B5 LEF | B5 LEF | 0 | 0 | 1 | 0 |
| A5 LEF | A5 LEF | 0 | 0 | 0 | 1 |

1: Pushed

## NOTES:

*1: The machine detects either 81/2" x 14" SEF or B4 SEF, depending on the setting of SP 1-902-2
*2: The machine detects either 81/2" x 11" SEF or A4 SEF, depending on the setting of SP 1-902-3
*3: The machine detects either 11" x 81/2" LEF or B5 SEF, depending on the setting of SP 1-902-4

Table 3: Paper Size (By-pass Table)

| Models |  | Bit No. |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| North America | Europe/Asia | $\mathbf{4}$ | $\mathbf{3}$ | $\mathbf{2}$ | $\mathbf{1}$ |
| $11 " \times 17 "$ SEF | $11 " \times 17 "$ SEF | 0 | 0 | 1 | 1 |
| A3 SEF | A3 SEF | 0 | 0 | 0 | 1 |
| - | B4 SEF | 0 | 0 | 1 | 0 |
| $81 / 2 " \times 11 "$ SEF | A4 SEF | 0 | 1 | 1 | 0 |
| $8 " \times 13 "$ SEF | F SEF | 0 | 1 | 0 | 0 |
| - | A5 SEF | 1 | 1 | 0 | 0 |
| $51 / 2 " \times 181 / 2 "$ SEF | B6 SEF | 1 | 0 | 0 | 0 |
| Post Card | Post Card | 0 | 0 | 0 | 0 |

Table 4: Original Size Detection

| Original Size |  | Length Sensor |  |  | Width Sensor |  | SP4-301 display |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A4/A3 version | LT/DLT version | L3 | L2 | L1 | W2 | W1 |  |
| A3 | $11^{\prime \prime} \times 17{ }^{\prime \prime}$ | O | 0 | 0 | 0 | 0 | 132 |
| B4 | $10^{\prime \prime} \times 14{ }^{\prime \prime}$ | 0 | 0 | 0 | X | 0 | 141 |
| F4 | 8.5 " x 14" (8" x 13") | O | 0 | 0 | X | X | 165 |
| A4-L | 8.5" $\times 11$ " | X | O | 0 | X | X | 133 |
| B5-L |  | X | X | O | X | X | 142 |
| A4-S | $11^{\prime \prime} \times 8.5$ " | X | X | X | 0 | 0 | 5 |
| B5-S |  | X | X | X | X | O | 14 |
| A5-L, A5-S | 5.5" x 8.5", 8.5" x 5.5" | X | X | X | X | X | 128 |

### 5.4.3 OUTPUT CHECK TABLE

CH: Charge
PF: Paper Feed
TS: Toner Supply
CW: Clockwise
CCW: Counterclockwise
MB: 4-bin Mailbox
DI: Duplex Inverter

| $\begin{gathered} \text { SP5- } \\ 804-X X X \end{gathered}$ |  | Description |
| :---: | :---: | :---: |
| 7 | Regist CL | Registration Clutch |
| 8 | By-pass CL | By-pass Feed Clutch |
| 9 | PF CL (1) | Tray 1 Paper Feed Clutch |
| 10 | Pick-up SOL | By-pass Pick-Up Solenoid |
| 11 | PF CL (2) | Tray 2 Paper Feed Clutch |
| 12 | Lift M UP (1) | Tray 1 Lift Motor / UP |
| 13 | Lift M DOWN(1) | Tray 1 Lift Motor / DOWN |
| 14 | Lift M UP(2) | Tray 2 Lift Motor / UP |
| 15 | Lift M DOWN(2) | Tray 2 Lift Motor / DOWN |
| 17 | PSU Fan H | PSU Cooling Fan Motor |
| 19 | Fusing Fan H | Fusing Fan Motor / High Speed |
| 20 | Fusing Fan L | Fusing Fan Motor / Low Speed |
| 21 | M Fan H | Laser Optics Housing Cooling Fan Motor / High Speed |
| 22 | M Fan L | Laser Optics Housing Cooling Fan Motor / Low Speed |
| 23 | Junction SOL | Exit Junction Gate Solenoid |
| 24 | Oil Supply SOL | Oil Supply Unit Solenoid |
| 28 | Fusing CL | Fusing Unit Clutch |
| 29 | K Dev CL | Development Unit Clutch - K |
| 30 | C Dev CL | Development Unit Clutch - C |
| 31 | M Dev CL | Development Unit Clutch - M |
| 32 | Y Dev CL | Development Unit Clutch - Y |
| 34 | Fusing Relay | Fusing Relay |
| 35 | Heat Lamp | Heating Roller Fusing Lamp |
| 36 | Pressure Lamp | Pressure Roller Fusing Lamp |
| 44 | CH DC [Y] 125 | Charge DC Bias for Yellow / $125 \mathrm{~mm} / \mathrm{s}$ |
| 45 | CH DC [M] 125 | Charge DC Bias for Magenta / $125 \mathrm{~mm} / \mathrm{s}$ |
| 46 | CH DC [C] 125 | Charge DC Bias for Cyan / $125 \mathrm{~mm} / \mathrm{s}$ |
| 47 | CH DC [K] 125 | Charge DC Bias for Black / $125 \mathrm{~mm} / \mathrm{s}$ |
| 48 | CH AC [FC]125 | Charge AC Bias for Color / $125 \mathrm{~mm} / \mathrm{s}$ |
| 49 | CH AC [K] 125 | Charge AC Bias for Black / $125 \mathrm{~mm} / \mathrm{s}$ |
| 50 | DevDC [Y] | Development DC Bias for Yellow |
| 51 | DevDC [M] | Development DC Bias for Magenta |
| 52 | DevDC [C] | Development DC Bias for Cyan |
| 53 | DevDC [K] | Development DC Bias for Black |
| 54 | DevAC [FC] | Development AC Bias for Color |
| 55 | DevAC [K] | Development AC Bias for Black |
| 56 | Transfer [Y] | Transfer Current for Yellow |
| 57 | Transfer [M] | Transfer Current for Magenta |
| 58 | Transfer [C] | Transfer Current for Cyan |


| $\begin{array}{\|c\|} \hline \text { SP5- } \\ 804-X X X \end{array}$ |  | Description |
| :---: | :---: | :---: |
| 59 | Transfer [K] | Transfer Current for Black |
| 60 | Cleaning Bias | Transfer Belt Cleaning Roller Bias |
| 61 | PA Roller Bias | Paper Attraction Roller Bias |
| 62 | TS CL [Y] | Toner Supply Clutch for Yellow |
| 63 | TS CL [M] | Toner Supply Clutch for Magenta |
| 64 | TS CL [C] | Toner Supply Clutch for Cyan |
| 65 | TS CL [K] | Toner Supply Clutch for Black |
| 67 | Air Supply [Y] | Air Pump Motor and Valve for Yellow |
| 68 | Air Supply [M] | Air Pump Motor and Valve for Magenta |
| 69 | Air Supply [C] | Air Pump Motor and Valve for Cyan |
| 70 | Air Supply [K] | Air Pump Motor and Valve for Black |
| 71 | ID Sensor LED | ID Sensor LED |
| 72 | Drum M L CW | Drum Drive Motors (K \& CMY) / Low Speed / Clockwise |
| 73 | Drum M M CW | Drum Drive Motors (K \& CMY) / Middle Speed / Clockwise |
| 74 | Drum M H CW | Drum Drive Motors (K \& CMY) / High Speed / Clockwise |
| 75 | PF M L CW | Paper Feed Motor / Low Speed / Clockwise |
| 76 | PF M M CW | Paper Feed Motor / Middle Speed / Clockwise |
| 77 | PF M HCW | Paper Feed Motor / High Speed / Clockwise |
| 78 | PF M Feed | Paper Feed Motor / Feed Speed / Clockwise |
| 79 | TD Vcnt | TD Sensor / Vcnt |
| 80 | CH AC[FC]62.5 | Charge AC Bias for Color - 62.5 |
| 81 | CH AC [K]62.5 | Charge AC Bias for Black - 62.5 |
| 82 | CH AC [FC]185 | Charge AC Bias for Color - 185 |
| 83 | CH AC [K]185 | Charge AC Bias for Black - 185 |
| 84 | Dev AC[FC]62.5 | Development AC Bias for Color - 62.5 |
| 85 | Dev AC[K]62.5 | Development AC Bias for Black - 62.5 |
| 86 | Dev AC[FC]185 | Development AC Bias for Color - 185 |
| 87 | Dev AC[K]185 | Development AC Bias for Black - 185 |
| 91 | PA Roller Bias | Paper Attraction Roller Bias |
| 92 | Memory Chip | Memory Chip / Power (5V) Supply |
| 97 | Belt M CW | Transfer Belt Contact Motor / Clockwise |
| 98 | Belt M CCW | Transfer Belt Contact Motor / Counterclockwise |
| 99 | Belt M Break | Transfer Belt Contact Motor / Break |
| 120 | PF CL PFU(1) | Paper Feed Clutch / Paper Feed Unit / Tray 3 |
| 121 | PF CL PFU(2) | Paper Feed Clutch / Paper Feed Unit / Tray 4 |
| 122 | Pick-upSOL LCT | Pick-up Solenoid / Large Capacity Tray |
| 125 | PFU M | Paper Feed Unit / Motor |
| 128 | Valve SOL [K] | Air Flow Valve solenoid for Black |
| 129 | Valve SOL [C] | Air Flow Valve solenoid for Cyan |
| 130 | Valve SOL [M] | Air Flow Valve solenoid for Magenta |
| 131 | Valve SOL [Y] | Air Flow Valve solenoid for Yellow |
| 132 | Toner Supply M | Toner Supply Motor |
| 135 | DevAC TRG[FC] | Development AC Trigger for Color |
| 136 | DevAC TRG[K] | Development AC Trigger for Black |
| 137 | DevPWM TRG[K] | Development PWM Trigger for Black |
| 138 | DevPWM TRG[C] | Development PWM Trigger for Cyan |


| $\begin{gathered} \text { SP5- } \\ 804-X X X \end{gathered}$ |  | Description |
| :---: | :---: | :---: |
| 139 | DevPWM TRG[M] | Development PWM Trigger for Magenta |
| 140 | DevPWM TRG[Y] | Development PWM Trigger for Yellow |
| 141 | CHdcPWM TRG[K] | Charge DC PWM Trigger for Black |
| 142 | CHdcPWM TRG[C] | Charge DC PWM Trigger for Cyan |
| 143 | CHdcPWM TRG[M] | Charge DC PWM Trigger for Magenta |
| 144 | CHdcPWM TRG[Y] | Charge DC PWM Trigger for Yellow |
| 145 | CHac1 TRG[FC] | Charge AC1 Trigger for Color |
| 146 | Chac2 TRG[FC] | Charge AC2 Trigger for Color |
| 147 | Chac3 TRG[FC] | Charge AC3 Trigger for Color |
| 148 | CHac1 TRG[K] | Charge AC1 Trigger for Black |
| 149 | Chac2 TRG[K] | Charge AC2 Trigger for Black |
| 150 | Chac3 TRG[K] | Charge AC3 Trigger for Black |
| 151 | MB M | 4-bin Mailbox Main Motor |
| 152 | MB SOL1 | 4-bin Mailbox Junction Gate Solenoid 1 |
| 153 | MB SOL2 | 4-bin Mailbox Junction Gate Solenoid 2 |
| 154 | MB SOL3 | 4-bin Mailbox Junction Gate Solenoid 3 |
| 155 | Gate SOL | 4-bin Mailbox Junction Gate Solenoid 4 |
| 160 | Duplex SOL | Duplex Junction Gate Solenoid |
| 161 | DI M1 62.5CCW | Duplex Inverter Motor 1/62.5 / Counterclockwise |
| 162 | DI M1 65CCW | Duplex Inverter Motor 1 / 65 / Counterclockwise |
| 163 | DI M1 125CCW | Duplex Inverter Motor 1 / 125 / Counterclockwise |
| 164 | DI M1 130CCW | Duplex Inverter Motor 1 / 130 / Counterclockwise |
| 165 | DI M1 185CCW | Duplex Inverter Motor 1 / 185 / Counterclockwise |
| 166 | DI M1 193CCW | Duplex Inverter Motor 1 / 193 / Counterclockwise |
| 168 | DI M1 370CCW | Duplex Inverter Motor 1 / 370 / Counterclockwise |
| 169 | DI M1 370CW | Duplex Inverter Motor 1 / 370 / Clockwise |
| 170 | DI M1 450CW | Duplex Inverter Motor 1 / 450 / Clockwise |
| 171 | DI M2 62.5CCW | Duplex Inverter Motor 2/62.5 / Counterclockwise |
| 172 | DI M2 65CCW | Duplex Inverter Motor 2 / 65 / Counterclockwise |
| 173 | DI M2 125CCW | Duplex Inverter Motor 2 / 125 / Counterclockwise |
| 174 | DI M2 130CCW | Duplex Inverter Motor 2 / 130 / Counterclockwise |
| 175 | DI M2 185CCW | Duplex Inverter Motor 2 / 185 / Counterclockwise |
| 176 | DI M2 193CCW | Duplex Inverter Motor 2 / 193 / Counterclockwise |
| 178 | DI M2 370CCW | Duplex Inverter Motor 2 / 370 / Counterclockwise |
| 179 | DI M2 370CW | Duplex Inverter Motor 2 / 370 / Clockwise |
| 180 | DI M2 450CW | Duplex Inverter Motor 2 / 450 / Clockwise |
| 181 | DI M12 62.5CCW | Duplex Inverter Motor 1\&2 / 62.5 / Counterclockwise |
| 182 | DI M12 65CCW | Duplex Inverter Motor 1\&2 / 65 / Counterclockwise |
| 183 | DI M12 125CCW | Duplex Inverter Motor 1\&2 / 125 / Counterclockwise |
| 184 | DI M12 130CCW | Duplex Inverter Motor 1\&2 / 130 / Counterclockwise |
| 185 | DI M12 185CCW | Duplex Inverter Motor 1\&2 / 180 / Counterclockwise |
| 186 | DI M12 193CCW | Duplex Inverter Motor 1\&2 / 193 / Counterclockwise |
| 188 | DI M12 370CCW | Duplex Inverter Motor 1\&2 / 370 / Counterclockwise |
| 189 | DI M12 370CW | Duplex Inverter Motor 1\&2 / 370 / Clockwise |
| 190 | DI M12 450CW | Duplex Inverter Motor 1\&2 / 450 / Clockwise |
| 193 | PF M125CCW | Duplex Feed Motor / 125 / Counterclockwise |
| 197 | PF M230CCW | Duplex Feed Motor / 230 / Counterclockwise |


| $\begin{gathered} \text { SP5- } \\ 804-X X X \end{gathered}$ |  | Description |
| :---: | :---: | :---: |
| 198 | PF M370CCW | Duplex Feed Motor / 370 / Counterclockwise |
| 202 | DI M2 OFF | Duplex Inverter Motor 2 / OFF |
| 204 | K Dev M H | Development Motor - K / High Speed |
| 205 | K Dev M M | Development Motor - K / Middle Speed |
| 206 | K Dev M L | Development Motor - K / Low Speed |
| 207 | Color Dev M H | Development Motor - YMC / High Speed |
| 208 | Color Dev M M | Development Motor - YMC / Middle Speed |
| 209 | Color Dev M L | Development Motor - YMC / Low Speed |
| 210 | Polygon M 29 | Polygon Motor / 29.528 |
| 211 | Polygon M 21 | Polygon Motor / 21.850 |
| 212 | LD FC[K]62.5 | LD Power for Black in Color Mode / 62.5 |
| 213 | LD FC[K]125 | LD Power for Black in Color Mode / 125 |
| 214 | LD FC[Y]62.5 | LD Power for Yellow in Color Mode / 62.5 |
| 215 | LD FC[Y]125 | LD Power for Yellow in Color Mode / 125 |
| 216 | LD FC[M]62.5 | LD Power for Magenta in Color Mode / 62.5 |
| 217 | LD FC[M]125 | LD Power for Magenta in Color Mode / 125 |
| 218 | LD FC[C]62.5 | LD Power for Cyan in Color Mode / 62.5 |
| 219 | LD FC[C]125 | LD Power for Cyan in Color Mode / 125 |
| 220 | LD1 [K] 62.5 | LD1 Power for Black / 62.5 |
| 221 | LD1 [K] 125 | LD1 Power for Black / 125 |
| 222 | LD1 [K] 185 | LD1 Power for Black / 185 |
| 223 | LD2 [K] 62.5 | LD2 Power for Black / 62.5 |
| 224 | LD2 [K] 125 | LD2 Power for Black / 125 |
| 225 | LD2 [K] 185 | LD2 Power for Black / 185 |
| 226 | LD [K]62.5 | LD Power for Black / 62.5 |
| 227 | LD [K]125 | LD Power for Black / 125 |
| 228 | LD [K]185 | LD Power for Black / 185 |

### 5.4.4 TEST PATTERN (SP5-997)



### 5.5 SCANNER SP

### 5.5.1 SP MODES

## SP1-xxx (System and Others)

| 1 | Mode No. (Class 1, 2, and 3) |  |  | Function / [Setting] |
| :---: | :---: | :---: | :---: | :---: |
| 001 | [System] |  |  |  |
|  | , | Model Name | NV | Displays the model name. |
|  | 2 | Scanner Firmware Version |  | Displays the scanner firmware version. |
|  | 3 | Scanner Firmware Number |  | Displays the firmware's part number. |
|  | 4 | Detail Model Name |  | Displays the detail model name. |
| 002 | [Error Log Display] |  |  |  |
|  | 1 | Error Log Display | *NV | Displays the error log data. |
| 003 | [FTP Port Number] |  |  |  |
|  | 1 | FTP Port Number | NV | Changes the FTP port number. <br> After changing this value, do the following: <br> 1. Run the Registry Editor <br> 2. Access <br> /HKEY_LOCAL_MACHINE/SOFTWARE/ Ricoh/NetworkScanner <br> 3. Change the value of 'PortNo' to this SP mode's value <br> [ 0 to 65535 / $3670 / 1 /$ step ] |
| 004 | [Compression Type] |  |  |  |
|  | 1 | Compression Type | NV | Selects the compression type for binary picture processing. <br> [ 1 to 3 / $\underline{3} / 1 /$ step ] <br> 1: MH, 2: MR, 3: MMR |
| 005 | [Erase margin] |  |  |  |
|  | 1 | Erase Margin | NV | Creates an erase margin for all edges of the scanned image. <br> If the machine has scanned the edge of the original, create a margin. <br> [ 0 to $5 / \underline{0} / 1 \mathrm{~mm} / \mathrm{step}$ ] |
| 006 | [Auto Reset Timer] |  |  |  |
|  | 1 | Auto Reset Timer | *V | Adjusts the auto reset timer for the scanner function. <br> If this is " 0 ", the auto reset function is disabled. [ 0 to 99 / $60 / 1 \mathrm{sec} / \mathrm{step}$ ] |

SP2-XXX (Scanning-image quality)

| 2 | Mode Number (Class 1, 2, and 3) |  |  | Function / [Setting] |
| :---: | :---: | :---: | :---: | :---: |
| 002 | [Text mode settings] |  |  |  |
|  | 1 | MTF Filter Coefficient (Main scan) | $\begin{gathered} * \\ \text { NV } \end{gathered}$ | Selects the MTF filter coefficient in the main scan direction for Text mode. <br> Select a higher number for a stronger filter. If this is " 0 ", the MTF filter is not applied. <br> [ 0 to 15 / $\underline{\text { / }} 1 /$ step ] DFU |
|  | 2 | MTF Filter Coefficient (Sub scan) |  | As above, for sub scan [ 0 to 13 / $\underline{6} / 1 /$ step ] DFU |
|  | ${ }^{3}$ | Smoothing Filter |  | Selects the smoothing pattern for Text mode when using binary picture processing mode. A larger value could cause moiré to appear in the image. <br> [ 0 to 7 / $\underline{0} / 1 /$ step ] DFU |
|  | 4 | Scanner Gamma |  | Selects the scanner gamma type for Text mode when using binary picture processing mode. <br> [ 0 to 6 / 4 / 1/step ] DFU <br> 0: Standard <br> 1: Smooth <br> 2: Clearly <br> 3: Liner <br> 4: Text image for the delivery function <br> 5: Text/photo image for the delivery function <br> 6: Photo image for the delivery function |
|  | 5 | Notch No.7(Lighter): Brightness |  | Adjusts the image density for each image density level for Text mode when using binary picture processing mode. <br> [ 0 to 255 / 104 / 1/step ] DFU |
|  | 6 | Notch No.7(Lighter): Contrast |  | [ 0 to255 / 128/1/step ] DFU |
|  | 7 | Notch No.7(Lighter): <br> Threshold |  | [ 0 to 255/160/1/step] DFU |
|  | 8 | Notch No.6: Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 9 | Notch No.6: Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 10 | Notch No.6: Threshold |  | [ 0 to 255/145/1/step] DFU |
|  | 11 | Notch No.5: Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 12 | Notch No.5: Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 13 | Notch No.5: Threshold |  | [ 0 to 255/135/1/step] DFU |
|  | 14 | Notch No.4(Middle): Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 15 | Notch No. 4(Middle): Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 16 | Notch No. 4(Middle): Threshold |  | [ 0 to 255/128/1/step] DFU |
|  | 17 | Notch No.3: Brightness |  | [ 0 to 255/128/1/step] DFU |


| 2 | Mode Number (Class 1, 2, and 3) |  |  | Function / [Setting] |
| :---: | :---: | :---: | :---: | :---: |
| 002 | 18 | Notch No.3: Contrast | NV | Adjusts the image density for each image density level for Text mode when using binary picture processing mode. [ 0 to 255 / $128 / 1 /$ step ] DFU |
|  | 19 | Notch No.3: Threshold |  | [ 0 to 255 / 100 / 1/step ] DFU |
|  | 20 | Notch No.2: Brightness |  | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 21 | Notch No.2: Contrast |  | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 22 | Notch No.2: Threshold |  | [ 0 to 255 / 85 / 1/step ] DFU |
|  | 23 | Notch No.1(Darker): Brightness |  | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 24 | Notch No. 1(Darker): Contrast |  | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 25 | Notch No. 1(Darker): Threshold |  | [ 0 to 255 / $7 \underline{0}$ / 1/step ] DFU |
| 003 | [Text/Photo mode settings] |  |  |  |
|  | 1 | MTF Filter Coefficient (Main scan) | NV | Selects the MTF filter coefficient in the main scan direction for Text/Photo mode. <br> Select a higher number for a stronger filter. If this is " 0 ", the MTF filter is not applied. [ 0 to 15 / $\underline{4} / 1 /$ step ] DFU |
|  | 2 | MTF Filter Coefficient (Sub scan) |  | As above, for sub scan [ 0-13 / 4 / 1/step ] DFU |
|  | 3 | Smoothing Filter |  | Selects the smoothing pattern for Text/Photo mode when using binary picture processing mode. <br> A larger value could cause moiré to appear in the image. <br> [ 0 to 7 / $\underline{0}$ / 1/step ] DFU |
|  | 4 | Scanner Gamma |  | Selects the scanner gamma type for Text/Photo mode when using binary picture processing mode. <br> [ 0 to 6 / $\underline{5}$ / 1/step ] DFU |
|  | 5 | Notch No.7(Lighter): Brightness |  | Adjusts the image density for each image density level for Text mode when using binary picture processing mode. <br> [ 0 to 255 / $128 / 1 /$ step ] DFU |
|  | 6 | Notch No.7(Lighter): Contrast |  | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 7 | Notch No.7(Lighter): Threshold |  | [ 0 to 255 / 160 / 1/step ] DFU |
|  | 8 | Notch No.6: Brightness |  | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 9 | Notch No.6: Contrast |  | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 10 | Notch No.6: Threshold |  | [ 0 to 255 / 145 / 1/step ] DFU |
|  | 11 | Notch No.5: Brightness |  | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 12 | Notch No.5: Contrast |  | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 13 | Notch No.5: Threshold |  | [ 0 to 255 / 135 / 1/step ] DFU |
|  | 14 | Notch No.4(Middle): Brightness |  | [ 0 to 255 / 128 / 1/step ] DFU |


| 2 | Mode Number (Class 1, 2, and 3) |  |  | Function / [Setting] |
| :---: | :---: | :---: | :---: | :---: |
| 003 | 15 | Notch No. 4(Middle): Contrast | NV | [ 0 to 255/128/1/step] DFU |
|  | 16 | Notch No. 4(Middle): Threshold |  | [ 0 to 255/128/1/step] DFU |
|  | 17 | Notch No.3: Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 18 | Notch No.3: Contrast |  | Adjusts the image density for each image density level for Text mode when using binary picture processing mode. <br> [ 0 to 255 / 128 / 1/step ] DFU |
|  | 19 | Notch No.3: Threshold |  | [ 0 to 255/100/1/step] DFU |
| 003 | 20 | Notch No.2: Brightness |  | [ 0 to 255 / 128/1/step] DFU |
|  | 21 | Notch No.2: Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 22 | Notch No.2: Threshold |  | [ 0 to 255/85/1/step ] DFU |
|  | 23 | Notch No.1(Darker): Brightness |  | [ 0 to 255/128/1/step ] DFU |
|  | 24 | Notch No. 1(Darker): Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 25 | Notch No. 1(Darker): Threshold |  | [ 0 to -255 / 70 / 1/step ] DFU |
| 004 | [Photo mode settings] |  |  |  |
|  | 1 | MTF Filter Coefficient (Main scan) | NV | Selects the MTF filter coefficient in the main scan direction for Photo mode. <br> Select a higher number for a stronger filter. If this is " 0 ", the MTF filter is not applied. <br> [ 0 to 15 / $\underline{0} / 1 /$ step ] DFU |
|  | 2 | MTF Filter Coefficient (Sub scan) |  | As above, for sub scan [ 0 to 13 / $\underline{0} / 1 /$ step ] DFU |
|  | 3 | Smoothing Filter |  | Selects the smoothing pattern for Photo mode when using binary picture processing mode. A larger value could cause moiré to appear in the image. <br> [ 0 to 7 / $\underline{0} / 1 /$ step ] DFU |
|  | 4 | Scanner Gamma |  | Selects the scanner gamma type for Photo mode when using binary picture processing mode. <br> [ 0 to 6 / $\underline{6} / 1 /$ step ] DFU |
|  | 5 | Dither Matrix Filter |  | Selects the dither matrix type for Photo mode when using binary picture processing mode. [ 1 to $26 / 4 / 1$ step] DFU |
|  | 6 | Notch No.7(Lighter): Brightness |  | Adjusts the image density for each image density level for Text mode when using binary picture processing mode. <br> [ 0 to 255 / 128/1/step ] DFU |
|  | 7 | Notch No.7(Lighter): Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 8 | Notch No.7(Lighter): Threshold |  | [ 0 to $255 / \underline{160 / 1 / s t e p] ~ D F U ~}$ |
|  | 9 | Notch No. 6 Brightness |  | [ 0 to 255 / 128/1/step] DFU |
|  | 10 | Notch No.6: Contrast |  | [ 0 to 255/128/1/step] DFU |


| 2 | Mode Number (Class 1, 2, and 3) |  |  | Function / [Setting] |
| :---: | :---: | :---: | :---: | :---: |
| 004 | 11 | Notch No.6: Threshold | $\begin{gathered} * \\ \text { NV } \end{gathered}$ | [ 0 to 255/145/1/step] DFU |
|  | 12 | Notch No.5: Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 13 | Notch No.5: Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 14 | Notch No.5: Threshold |  | [ 0 to 255/135/1/step] DFU |
|  | 15 | Notch No.4(Middle): Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 16 | Notch No. 4(Middle): Contrast |  | [ 0 to 255 / 128 / 1/step] DFU |
|  | 17 | Notch No. 4(Middle): Threshold |  | [ 0 to 255 / 128/1/step] DFU |
|  | 18 | Notch No.3: Brightness |  | [ 0 to 255 / 128/1/step] DFU |
|  | 19 | Notch No.3: Contrast |  | Adjusts the image density for each image density level for Text mode when using binary picture processing mode. <br> [ 0 to 255 / 128/ 1/step ] DFU |
|  | 20 | Notch No.3: Threshold |  | [ 0 to 255/100/1/step] DFU |
|  | 21 | Notch No.2: Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 22 | Notch No.2: Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 23 | Notch No.2: Threshold |  | [ 0 to 255/85/1/step] DFU |
|  | 24 | Notch No.1(Darker): Brightness |  | [ 0 to 255 / 128/1/step] DFU |
|  | 25 | Notch No. 1(Darker): Contrast |  | [ 0 to 255 / 128/1/step] DFU |
|  | 26 | Notch No. 1(Darker): Threshold |  | [ 0 to 255 / $\underline{\text { O }}$ / 1/step ] DFU |
| 005 | [Gray - scale mode settings] |  |  |  |
|  | 1 | MTF Filter Coefficient (Main scan) | $\begin{gathered} * \\ \text { NV } \end{gathered}$ | Selects the MTF filter coefficient in the main scan direction when using grayscale processing mode. <br> Select a higher number for a stronger filter. If this is " 0 ", the MTF filter is not applied [ 0 to 15 / $\underline{0} / 1$ step ] DFU |
|  | 2 | MTF Filter Coefficient (Sub scan) |  | As above, for sub scan [ 0 to 13 / $\underline{0} / 1$ step ] DFU |
|  | 3 | Smoothing Filter |  | Selects the smoothing pattern when using grayscale processing mode. <br> A larger value could cause moiré to appear in the image. <br> [ 0 to $7 / \underline{0} / 1 /$ step ] DFU |
|  | 4 | Scanner Gamma |  | Selects the scanner gamma type when using grayscale processing mode. <br> [ 0 to $6 / \underline{3} / 1 /$ step ] DFU |
|  | 5 | Notch No.7(Lighter): Brightness |  | Adjusts the image density for each image density level for Text mode when using binary picture processing mode. <br> [ 0 to 255 / 128 / 1/step ] DFU |
|  | 6 | Notch No.7(Lighter): Contrast |  | [ 0 to 255/128/1/step] DFU |


| 2 | Mode Number (Class 1, 2, and 3) |  |  | Function / [Setting] |
| :---: | :---: | :---: | :---: | :---: |
| 005 | 7 | Notch No.7(Lighter): Threshold | $\begin{gathered} * \\ \mathrm{NV} \end{gathered}$ | [ 0 to 255 / 160 / 1/step] DFU |
|  | 8 | Notch No.6: Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 9 | Notch No.6: Contrast |  | [ 0 to $255 / 128 / 1 /$ step ] DFU |
|  | 10 | Notch No.6: Threshold |  | [ 0 to 255/145/1/step] DFU |
|  | 11 | Notch No.5: Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 12 | Notch No.5: Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 13 | Notch No.5: Threshold |  | [ 0 to 255/135/1/step] DFU |
|  | 14 | Notch No.4(Middle): Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 15 | Notch No. 4(Middle): Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 16 | Notch No. 4(Middle): Threshold |  | [ 0 to 255/128/1/step] DFU |
|  | 17 | Notch No.3: Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 18 | Notch No.3: Contrast |  | Adjusts the image density for each image density level for Text mode when using binary picture processing mode. <br> [ 0 to 255 / 128 / 1/step ] DFU |
|  | 19 | Notch No.3: Threshold |  | [ 0 to 255/100/1/step] DFU |
|  | 20 | Notch No.2: Brightness |  | [ 0 to 255 / 128/1/step] DFU |
|  | 21 | Notch No.2: Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 22 | Notch No.2: Threshold |  | [ 0 to $255 / 85 / 1 /$ step ] DFU |
|  | 23 | Notch No.1(Darker): Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 24 | Notch No. 1(Darker): Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 25 | Notch No. 1(Darker): Threshold |  | [ 0 to 255 / $\underline{\text { 70 / 1/step ] DFU }}$ |
| 006 | [Full Color settings] |  |  |  |
|  | 1 | MTF Filter Coefficient (Main scan) | $\begin{gathered} * \\ \text { NV } \end{gathered}$ | Selects the MTF filter coefficient in the main scan direction when using grayscale processing mode. <br> Select a higher number for a stronger filter. If this is " 0 ", the MTF filter is not applied [ 0 to 15 / 0 / $1 /$ step ] DFU |
|  | 2 | MTF Filter Coefficient (Sub scan) |  | As above, for sub scan [ 0 to 13 / $\underline{0} / 1 /$ step ] DFU |
|  | 3 | Smoothing Filter |  | Selects the smoothing pattern when using grayscale processing mode. <br> A larger value could cause moiré to appear in the image. <br> [ 0 to 7 / $\underline{0} / 1 /$ step ] DFU |
|  | 4 | R-Gamma Curve |  | Adjusts the scanner gamma for RGB. |
|  | 5 | G-Gamma Curve |  | [ 0 to $9 / \underline{7} / 1 /$ step ] DFU |
|  | 6 | B-Gamma Curve |  |  |


| 2 | Mode Number (Class 1, 2, and 3) |  |  | Function / [Setting] |
| :---: | :---: | :---: | :---: | :---: |
| 006 | 7 | Notch No.7(Lighter): R - Brightness | $\mathrm{NV}$ | Adjusts the image density for each image density level for Text mode when using binary picture processing mode. <br> [ 0 to 255 / 195/1/step] DFU |
|  | 8 | Notch No.7(Lighter): G <br> - Brightness |  | [ 0 to 255/ 194 / 1/step] DFU |
|  | 9 | Notch No.7(Lighter): B <br> - Brightness |  | [ 0 to 255 / 195 / 1/step] DFU |
|  | 10 | Notch No.7(Lighter): R <br> - Contrast |  | [ 0 to $255 / \underline{185} / 1 /$ step ] DFU |
|  | 11 | Notch No.7(Lighter): G - Contrast |  | [ 0 to $255 / \underline{184 / 1 / s t e p] ~ D F U ~}$ |
|  | 12 | Notch No.7(Lighter): B <br> - Contrast |  | [ 0 to $255 / \underline{185} / 1 /$ step ] DFU |
|  | 13 | Notch No.7(Lighter): R - Threshold |  | [ 0 to $255 / \underline{128 / 1 / s t e p] ~ D F U ~}$ |
|  | 14 | Notch No.7(Lighter): G - Threshold |  | [ 0 to $255 / \underline{128 / 1 / s t e p] ~ D F U ~}$ |
|  | 15 | Notch No.7(Lighter): B - Threshold |  | [ 0 to 255/128/1/step] DFU |
|  | 16 | Notch No.6: R Brightness |  | [ 0 to 255/177/1/step] DFU |
|  | 17 | Notch No.6: G Brightness |  | [ 0 to 255 / 174 / 1/step] DFU |
|  | 18 | Notch No.6: B Brightness |  | [ 0 to 255 / 177 / 1/step ] DFU |
|  | 19 | Notch No.6: R Contrast |  | [ 0 to $255 / \underline{168 / 1 / s t e p] ~ D F U ~}$ |
|  | 20 | Notch No. 6 G Contrast |  | [ 0 to 255 / 164 / 1/step ] DFU |
|  | 21 | Notch No.6: B Contrast |  | [ 0 to $255 / \underline{168} / 1 /$ step ] DFU |
|  | 22 | Notch No.6: R Threshold |  | [ 0 to $255 / \underline{128 / 1 / s t e p] ~ D F U ~}$ |
|  | 23 | Notch No.6: G Threshold |  | [ 0 to $255 / \underline{128 / 1 / s t e p] ~ D F U ~}$ |
|  | 24 | Notch No.6: B Threshold |  | [ 0 to $255 / \underline{128 / 1 / s t e p] ~ D F U ~}$ |
|  | 25 | Notch No.5: R Brightness |  | [ 0 to $255 / \underline{172} / 1 /$ step ] DFU |
|  | 26 | Notch No.5: G Brightness |  | [ 0 to $255 / \underline{165 / 1 / s t e p] ~ D F U ~}$ |
|  | 27 | Notch No.5: B Brightness |  | [ 0 to $255 / \underline{168} / 1 /$ step ] DFU |
|  | 28 | Notch No.5: R Contrast |  | [ 0 to 255/165/1/step ] DFU |
|  | 29 | Notch No. 5 G Contrast |  | [ 0 to $255 / \underline{161 / 1 / s t e p] ~ D F U ~}$ |
|  | 30 | Notch No.5: B Contrast |  | [ 0 to 255/164/1/step ] DFU |
|  | 31 | Notch No.5: R Threshold |  | [ 0 to 255 / 128 / 1/step ] DFU |


| 2 | Mode Number (Class 1, 2, and 3) |  |  | Function / [Setting] |
| :---: | :---: | :---: | :---: | :---: |
| 006 | 32 | Notch No.5: G Threshold | NV | [ 0 to 255 / 128 / 1/step] DFU |
|  | 33 | Notch No.5: B - <br> Threshold |  | [ 0 to 255/128/1/step] DFU |
|  | 34 | Notch No.4(Middle): R - Brightness |  | [ 0 to 255 / 128 / 1/step] DFU |
|  | 35 | Notch No. 4(Middle): G - Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 36 | Notch No. 4(Middle): B - Brightness |  | [ 0 to 255/128/1/step] DFU |
|  | 37 | Notch No. 4(Middle): R - Contrast |  | [ 0 to 255 / 128/1/step] DFU |
|  | 38 | Notch No. 4(Middle) G - Contrast |  | [ 0 to 255/128/1/step] DFU |
|  | 39 | Notch No. 4(Middle): B <br> - Contrast |  | [ 0 to 255 / 128/1/step] DFU |
|  | 40 | Notch No. 4(Middle): R - Threshold |  | [ 0 to 255/128/1/step] DFU |
|  | 41 | Notch No. 4(Middle): G - Threshold |  | [ 0 to 255 / 128/1/step] DFU |
|  | 42 | Notch No. 4(Middle): B - Threshold |  | [ 0 to 255 / 128/1/step] DFU |
|  | 43 | Notch No.3: R Brightness |  | [ 0 to 255 / 125/1/step] DFU |
|  | 44 | Notch No.3: G Brightness |  | [ 0 to 255 / 127/1/step] DFU |
|  | 45 | Notch No.3: B Brightness |  | [ 0 to 255 / 127/1/step] DFU |
|  | 46 | Notch No.3: R Contrast |  | [ 0 to 255 / 136 / 1/step] DFU |
|  | 47 | Notch No. 3 G Contrast |  | [ 0 to 255 / 134 / 1/step] DFU |
|  | 48 | Notch No.3: B Contrast |  | [ 0 to 255/134/1/step] DFU |
|  | 49 | Notch No.3: R Threshold |  | [ 0 to 255/128/1/step] DFU |
|  | 50 | Notch No.3: G Threshold |  | [ 0 to 255 / 128/1/step] DFU |
|  | 51 | Notch No.3: B Threshold |  | [ 0 to 255/128/1/step] DFU |
|  | 52 | Notch No.2: R Brightness |  | [ 0 to 255 / 124/1/step] DFU |
|  | 53 | Notch No.2: G Brightness |  | [ 0 to 255 / 126/1/step] DFU |
|  | 54 | Notch No.2: B Brightness |  | [ 0 to 255 / 126 / 1/step] DFU |
|  | 55 | Notch No.2: R Contrast |  | [ 0 to 255 / 140 / 1/step] DFU |
|  | 56 | Notch No. 2 G Contrast |  | [ 0 to 255 / 138 / 1/step] DFU |
|  | 57 | Notch No.2: B Contrast |  | [ 0 to 255 / 138/1/step] DFU |


| 2 | Mode Number (Class 1, 2, and 3) |  |  | Function / [Setting] |
| :---: | :---: | :---: | :---: | :---: |
| 006 | 58 | Notch No.2: R Threshold | NV | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 59 | Notch No.2: G Threshold |  | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 60 | Notch No.2: B Threshold |  | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 61 | Notch No.1(Darker): R - Brightness |  | [ 0 to 255 / 124 / 1/step ] DFU |
|  | 62 | Notch No. 1(Darker): <br> G - Brightness |  | [ 0 to 255 / 125 / 1/step ] DFU |
|  | 63 | Notch No. 1(Darker): B - Brightness |  | [ 0 to 255 / 126 / 1/step ] DFU |
|  | 64 | Notch No. 1(Darker): R - Contrast |  | [ 0 to 255 / 144 / 1/step ] DFU |
|  | 65 | Notch No. 1(Darker) G - Contrast |  | [ 0 to 255 / 144 / 1/step ] DFU |
|  | 66 | Notch No. 1(Darker): B <br> - Contrast |  | [ 0 to 255 / 142 / 1/step ] DFU |
|  | 67 | Notch No. 1(Darker): R - Threshold |  | [ 0 to 255 / 128 / 1/step ] DFU |
|  | 68 | Notch No. 1(Darker): G - Threshold |  | [ 0 to 255 / $\underline{128} / 1 /$ step ] DFU |
|  | 69 | Notch No. 1(Darker): B - Threshold |  | [ 0 to 255 / 128 / 1/step ] DFU |
| 007 | [Compression ratio of gray-scale] |  |  |  |
|  | 1 | Compression ratio (Normal image) | NV | Selects the compression ratio for grayscale processing mode (JPEG) for the three settings that can be selected at the operation panel. [ 5 to 95 / $50 / 1 /$ step ] |
|  | 2 | Compression ratio (High quality image) |  | [ 5 to 95 / 6 / 1 /step] |
|  | 3 | Compression ratio (Low-quality image) |  | [ 5 to 95 / 40 / $1 /$ step ] |

SP8-XXX (Delivery)

| 8 | Mode Number |  |  | Function and [Setting] |
| :---: | :---: | :---: | :---: | :---: |
| 001 | [Delivery] |  |  |  |
|  | 1 | Delivery Server IP Address | $\begin{gathered} * \\ \text { NV } \end{gathered}$ | Sets the IP address for the delivery server. [000.000.000.000] |
| 002 | [Delivery Retry] |  |  |  |
|  | 1 | Delivery Re-try (Interval) | NV | Sets the delivery re-try interval. [ 60-999 / $300 / 1 \mathrm{sec} /$ step ] |
|  | 2 | Delivery Re-try (Number of re-try) |  | Sets the number of delivery re-tries. If this is " 0 ", the machine will not re-try to send an image to the delivery server. [ 0-99 / 3 / 1 time/step ] |
| 003 | [Ecabinet IP Address] |  |  |  |
|  | 1 | ECabinet IP Address | NV | Sets the IP address for the eCabinet. [ 000.000.000.000] |
| G570 |  |  |  | 2 S |


| 8 | Mode Number |  |  | Function and [Setting] |
| :---: | :---: | :---: | :---: | :---: |
| 004 | [Display timer of N/W error] |  |  |  |
|  | 1 | Display timer of N/W error | $\begin{gathered} * \\ \text { NV } \end{gathered}$ | Selects the length of time that the network error message for the scanner utilities is displayed. <br> If this is " 0 ", the error message is displayed until the error is solved. <br> [ 0-999 / $300 / 1 \mathrm{sec} /$ step ] |


| SP9 | Mode Number | Function and [Setting] |
| :---: | :---: | :---: |
| 9001 | Not used |  |

### 5.6 REBOOT / SYSTEM SETTING RESET

### 5.6.1 SOFTWARE RESET

The software can be rebooted when the machine hangs up. To reboot the software, use the following procedure.

Turn the main power switch off and on.
-or-
Press and hold down $\because \circledast$ together for over 10 seconds. When the machine beeps once, release both buttons. After "Now loading. Please wait" is displayed for a few seconds, the copy window will open. The machine is ready for normal operation.

### 5.6.2 SYSTEM SETTINGS AND COPIER SETTING RESET

## System Setting Reset

The system settings in the UP mode can be reset to their defaults. Use the following procedure.

1. Press User Tools/Counter $\boxed{\Delta} /\left[\begin{array}{ll}{[2]} \\ \hline\end{array}\right.$
2. Hold down $\#$ and then press System Settings.

NOTE: You must press ${ }^{\#}$ first.

3. When the message prompts you to confirm that you want to reset the system settings, press Yes.
4. When the message tells you that the settings have been reset, press Exit.

## Copier Setting Reset

The copy settings in the UP mode can be reset to their defaults. Use the following procedure.

1. Press User Tools/Counter $\boxed{\Delta /[123}$.
2. Hold down $\#$ and then press Copier/Document Server Settings.

NOTE: You must press ${ }^{\#}$ first.

3. When the message prompts you to confirm that you want to reset the Copier Document Server settings, press Yes.
4. When the message tells you that the settings have been reset, press Exit.

### 5.7 FIRMWARE UPDATE PROCEDURE

### 5.7.1 TYPE OF FIRMWARE

There are 11 types of firmware as shown below.

| Type of firmware | Function | Location of firmware | Message displayed |
| :---: | :---: | :---: | :---: |
| * Engine - Main | Printer engine control | BCU Flash ROM | Engine (1) |
| * Engine - Music | Line position adjustment | BCU Flash ROM | Music (1) |
| - System <br> - Copier Application <br> - Netfile Application | 3 different firmware (system, Copier and Netfile applications) are combined. | DIMM 1 | Onboard Sys (1) |
| Printer Application | Feature application | DIMM 2 | Onboard Printer (1) |
| Scanner Application |  | DIMM 2 | Onboard Scn (1) |
| Fax Application |  | DIMM 2 | Opt DIMM Fax (1) |
| * NIB | Network Interface | Controller Flash ROM | Network Support (1) |
| Scanner IPU | Scanner control | IPU Flash ROM | Scanner IPU (1) |
| Operation Panel | Panel control | Operation Panel | Ope Panel. XX (1) |
| Fax FCU | Fax control | FCU | Jupi FCU (XXX)-1 (1) |
| Language (16 languages) | Language firmware Two languages can be selected from 16 languages. | Operation Panel | Download Language |

* The firmware with an asterisk mark is used in both the printer (G060) version and CF (G060+G570) version. Other firmware is unique for the CF version. (For example, if you insert the IC card containing controller firmware for the printer version, "Download Error SC999" is displayed.

Refer to "5.4.3 Firmware Upgrade" for the procedure.

### 5.7.2 ERROR RECOVERY

If an error occurs during the firmware update, "NG!" or "ERR" is displayed. In this case, turn the main switch off and retry the firmware update after reinserting the IC card using the procedure described in section 5.6.3.

### 5.7.3 FIRMWARE UPGRADE

## $\triangle$ CAUTION

1. Turn off the main switch whenever inserting or removing an IC card.
2. Open the front cover whenever updating the firmware.
3. Do not turn off the machine while downloading the firmware.
4. Make sure that the main switch is turned off.
5. Remove the IC card cover [A].
6. Fully insert the IC card $[B]$ containing the required firmware into the IC card slot on the controller.
7. Open the front cover.
8. Turn on the main switch. The message below is displayed. Press the button where the firmware
 description is displayed.

9. Pressing the UpDate button starts updating the firmware. To indicate the progress, bars change to asterisks one by one.

10. After the firmware update is completed, "Update done" or "Power Off On" is displayed. Turn off the main switch and remove the IC card.
11. If more firmware needs to be downloaded, make sure that the main switch is turned off and repeat steps 3 to 6.
```
PCcard -> ROM Page01
```

Update done.

Engine Card No.:1/1
9. When all firmware updates are completed, remove the IC card while the machine power is off and reinstall the IC card cover.
10. Turn the main switch on and confirm that the machine starts normally.

## NOTE: Operation Panel Firmware Update

While the firmware of the operation panel is updating, the operation panel cannot display anything (this is normal while firmware update is in process).
The following message is displayed for 10 seconds after pressing the Update button. Then the message disappears and firmware update starts.
You can check the firmware update processing and completion by watching the Start key.

## Condition of the Start key

- When the above message disappears, the Start key starts blinking red. This shows that the machine has started the firmware update, and it takes about 5 minutes.
- When the firmware update is completed, the Start key starts blinking green instead of red.


### 5.8 CONTROLLER SELF-DIAGNOSTICS

### 5.8.1 OVERVIEW

There are three types of self-diagnostics for the controller.

- Power-on self-diagnostics: The machine automatically starts the self-diagnostics just after the power has been turned on.
- Detailed self-diagnostics: The machine does the detailed self-diagnostics by using a loop-back connector (P/N G0219350)
- SC detection: The machine automatically detects SC conditions at power-on or during operation.
The following shows the workflow of the power-on and detailed self-diagnostics.



### 5.8.2 DETAILED SELF-DIAGNOSTICS

In addition to the self-diagnostic test initiated every time the main machine is powered on, you can set the machine in a more detailed diagnostic mode manually in order to test other components or conditions that are not tested during selfdiagnosis after power on. The following device is required in order to set the machine in the detailed self-diagnosis mode.

| No. | Name |
| :---: | :---: |
| G0219350 | Parallel Loopback Connector |

## Executing Detailed Self-Diagnosis

Follow this procedure to execute detailed self-diagnosis.

1. Switch off the machine, and connect the parallel loopback device to the Centronics I/F port.

2. Hold down $\#$, press and hold down $\circledast$, and then while pressing both keys at the same time, switch on the machine.

You will see "Now Loading" on the touch-panel, and then you will see the results of the test.
The machine automatically starts the self-diagnostics and prints the diagnostic report after completing the test.

- Refer to the diagnostics report for the detected errors. The errors detected during self-diagnostics can be checked with SP7-832-001 (Diag. Result).
- Refer to section 4.2 in the Printer Engine Service Manual for details about the error codes.


### 5.9 USER PROGRAM MODE

The user program (UP) mode is accessed by users and operators, and by sales and service staff. UP mode is used to input the copier's default settings. The system/copier settings can be reset at any time by the user. ( -5.6 )

### 5.9.1 HOW TO USE UP MODE

## UP Mode Initial Screen: User Tools/Counter Display

To enter the UP mode, press User Tools/Counter $\begin{aligned} & \Delta / \text { 国 }\end{aligned}$


## System Settings

In the User Tools/Counter display, press System Settings.
Press a tab to display the settings. If the Next button is lit in the lower right corner, press to display more options. Perform the settings, press Exit to return to the User Tools/Counter display, and then press exit to return to the copy window.

| 20 DEC 200111:23 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| -0, System Settings Exit |  |  |  |  |
| Select one of the following default settings. |  |  |  |  |
| General Features Tray Paper Settings | Timer Setting | Interface Settings | File Transter | Key Operator Tools |
| Panel Tone $O N$ Function Reset Timer $\quad 30$ second(s) |  |  |  |  |
| Warm Up Notice | ON | Output: Copier |  | Standard tray |
| Copy Count Display | Up | Output: Document Server |  | Standard tray |
| Function Priority | Copier | Output: Facsimile |  | Standard tray |
| $<\mathrm{F} / \mathrm{F} 4>$ Size Setting | $81 / 2 \times 13 \square$ | Output: Printer |  | Standard tray |

## Copier/Document Server Features

In the User/Tools Counter display, press Copy/Document Server Settings.


Press a tab to display the settings. If the Next button is lit in the lower right corner, press to display more options. Perform the settings, press Exit to return to the User Tools/Counter display, and then press Exit to return to the copy window.

## Printer, Facsimile, Scanner Settings

In the User/Tools Counter display, press Printer Settings, Facsimile, or Scanner Settings to open the appropriate screen and then press the tab to display more settings. The screen below shows the Printer Features screen.


## Counter

In the User/Tools Counter display, press Counter.


## Maintenance

In the User/Tools Counter display, press Maintenance.


### 5.10 DIP SWITCHES

## Controller Board

| DIP SW No. | OFF | ON |
| :---: | :--- | :--- |
| 1 | Boot-up from flash ROM | Boot-up from IC card |
| 2 to 4 | Factory Use Only: Keep these switches OFF. |  |

NOTE: If a download attempt failed, you must boot up the machine from the IC card. To do this, DIP SW 1 on the controller board needs to be ON.

## BCU Board

| DIP SW No. | OFF | ON |
| :---: | :--- | :--- |
| 4 | Fusing clutch is not <br> installed. | Fusing clutch is installed. |
| 1 to 3 | Factory Use Only: Keep these switches OFF. |  |

The fusing clutch has been added from December '01 production onward. The fusing clutch turns on to operate the fusing unit. It does not turn on during process control self-checks, line position adjustment, or image processing for print/copy jobs. This is to maximize the life of the fusing unit and oil supply unit.

Because of this modification, a DIP switch has been added to the BCU board, and the machine recognizes whether or not the fusing clutch is used according to the DIP switch setting.
NOTE: When replacing the BCU board, check if the old board has a DIP switch on it.
If there is no DIP switch on the old board, keep the DIP switch on the new board OFF.
If there is a DIP switch on the old board, the DIP switch setting on the new BCU board must be the same as on the old board. Otherwise, the problems in the following table may occur.
The default setting of the DIP switch on the service part is OFF.

| Fusing Clutch |  | Not installed |
| :--- | :--- | :--- |
| Installed |  |  |
| DIP Switch | Correct | OFF |
| Setting | Incorrect | ON |
| Expected problem if the <br> setting is wrong | The fusing unit is always driven <br> as it was. However, the <br> machine thinks that a fusing <br> clutch is isstalled. This causes <br> the PM counter of the fusing <br> unit and oil supply unit not to <br> count up when the machine <br> does not send the signal to turn <br> the clutch on (at the process <br> control self check, etc, as <br> mentioned above). | The fusing clutch does not <br> operate and the fusing unit <br> is not driven at all. This <br> causes a paper jam. |

## 6. DETAILED DESCRIPTIONS

### 6.1 SCANNING

### 6.1.1 OVERVIEW



1. Scanner HP sensor
2. ADF exposure glass
3. Exposure glass
4. 2nd scanner (2nd carriage)
5. Scanner lamp
6. 1st scanner (1st carriage)
7. Scanner motor
8. Sensor board unit (SBU)
9. Original length sensor
10. Original width sensor

The original on the exposure glass or ARDF exposure glass reflects the light emitted from the scanner lamp. The reflected light goes to the CCD on the sensor board by way of the 1st and 2nd scanners. The sensor board converts the CCD analog signals into digital signals.
When the original is manually placed on the exposure glass, the scanner motor pulls the 1st and 2nd scanners via mechanical linkage. The original is scanned from left to right as shown above.

When the original is fed from the optional ARDF, it is automatically transported onto the ARDF exposure glass, and to the original exit. The original does not stay on the glass, but keeps going to the exit. The 1st and 2nd scanners stay at their home positions during ARDF copying.

### 6.1.2 SCANNER DRIVE



The 1st and 2nd scanners [A] are driven by the scanner motor [B] through the scanner drive pulley, scanner drive shaft [C], and two scanner wires [D].

## - Book mode -

The SBU board controls the scanner drive motor. The 2nd scanner speed is half that of the 1st scanner.

In reduction or enlargement mode, the scanning speed depends on the magnification ratio. The returning speed is always the same, whether in full size or magnification mode. The image length change in the sub scan direction is done by changing the scanner motor speed, and in the main scan direction it is done by image processing on the IPU board.
Magnification in the sub-scan direction can be adjusted by changing the scanner motor speed using SP4-008.

## - ARDF mode -

The scanners are always kept at their home position (the scanner H.P sensor detects the 1st scanner) to scan the original. The ARDF motor feeds the original through the ARDF. In reduction/enlargement mode, the image length change in the sub-scan direction is done by changing the ARDF motor speed. Magnification in the main scan direction is done in the IPU board, as for book mode.

Magnification in the sub-scan direction can be adjusted by changing the ARDF motor speed using SP6-017

### 6.1.3 ORIGINAL SIZE DETECTION



- The original width sensors [A] detect the original width, and the original length sensors [B] detect the original length.
- The SBU controller on the SBU board checks each sensor status when the platen cover sensor is activated as it is closed. It detects the original size by the on/off signals received from each sensor.
- If a copy is made with the platen cover fully open, the SBU controller on the SBU determines the original size from the sensor outputs after the Start key is pressed.


| Original Size |  | Length Sensor |  |  | Width <br> Sensor |  | SP4-301 <br> display |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| Metric <br> version | Inch version | L3 | L2 | L1 | W2 | W1 |  |
| A3 | $11^{\prime \prime} \times 17^{\prime \prime}$ | O | O | O | O | O | 132 |
| B4 | $10 " \times 14^{\prime \prime}$ | O | O | O | X | O | 141 |
| F4 | $8.5 " \times 14 "\left(8^{\prime \prime} \times 13^{\prime \prime}\right)$ | O | O | O | X | X | 165 |
| A4-L | $8.5^{\prime \prime} \times 11^{\prime \prime}$ | X | O | O | X | X | 133 |
| B5-L |  | X | X | O | X | X | 142 |
| A4-S | $11^{\prime \prime} \times 8.5 "$ | X | X | X | O | O | 5 |
| B5-S |  | X | X | X | X | O | 14 |
| A5-L, A5-S | $5.5 " \times 8.5^{\prime \prime}, 8.5 " \times 5.5 "$ | X | X | X | X | X | 128 |

NOTE: L: Lengthwise, S: Sideways, O: Paper present, X: Paper not present

For other combinations, "Cannot detect original size." will be indicated on the operation panel display.
The above table shows the outputs of the sensors for each original size. This original size detection method eliminates the necessity for a pre-scan and increases the machine's productivity.
However, if the by-pass tray is used, note that the machine assumes that the copy paper is lengthwise (L). For example, if $11 \times 8.5$ sideways paper is placed on the by-pass tray, the machine assumes it is $11 \times 17$ paper and scans a full $11 \times 17$ area, disregarding the original size sensors.

Original size detection using the ARDF is described in the manual for the ARDF (G564)

### 6.1.4 OTHERS

## DC Power Supply

The scanner power supply unit (scanner PSU) supplies power to the scanner unit.

## Overcurrent Control

The scanner PSU has an overcurrent control function. The SBU cuts electricity when the current of a specific circuit exceeds its limit. When an overcurrent condition is detected, nothing is displayed on the operation panel because the power to the operation panel is cut.

The table below shows the controlled circuits and their recovery procedures.

| Circuit | Recovery |
| :--- | :--- |
| 5 V | If the problem is solved, the machine goes to standby after |
| 24 V | turning the main switch off and on. |

## Anti-Condensation Heater

An anti-condensation heater is available as an optional unit. The anti-condensation heater prevents condensation on the mirrors, which may occur when the scanner unit is, for example, moved from a cold room to a warm room. Such condensation can cause abnormal images.

- 1.5.6 "Anti-Condensation Heater" for installation


### 6.2 IMAGE PROCESSING

### 6.2.1 OVERVIEW



- The CCD (Charged Coupled Device) generates three analog video signals.
- The SBU (Sensor Board Unit) converts the three analog signals to 10-bit digital signals. It sends these signals to the IPU (Image Processing Unit).
- The IPU processes the image, then the image data is sent to the controller.


### 6.2.2 SBU BLOCK DIAGRAM



## Signal Processing

1. Signal Amplification

- Odd-pixel and even-pixel RGB analog signals from the CCD are amplified by operational amplifiers.

2. Signal Composition

- The amplified signals (even-pixel and odd-pixel for each RGB color) are combined by the MPX circuit after A/D conversion.


## A/D Conversion

- The analog signals (CCD output) are converted to 10-bit (1024 gradations) digital signals.


## White Level Correction:

- White reference plate scanned before the original.
- Data is updated before each scan.
- Corrects for variations in the white level across the page, including irregularities in the CCD and the optics across the main scan.


## Others

The SBU controller exchanges the $R$ and $B$ signals if the original is scanned by using ARDF.

## Black Level Correction

- Improves image reproduction for high-density areas.
- Reads the black video level at black elements on the CCD. These pixels are masked off, and should produce a pure black signal.
- This is subtracted from the value of each pixel.
- Calculated for each scan line.
- Corrects the image data for any changes in black level with time, as the machine scans down the page.


## Adjustments

The properties of the scanner unit, which are necessary for controlling the scanner VPU (video processing unit), are not stored in the memory of the printer mainframe. These properties are stored in the EEPROM on the SBU.
After replacing the SBU, adjust the following:

| SP4-008 | Scanner sub-scan magnification |
| :--- | :--- |
| SP4-010 | Scanner leading edge registration |
| SP4-011 | Scanner side-to-side registration |

## VPU Test Mode

To make sure the scanner VPU control is functioning, output the VPU test pattern with SP4-907. ("4. Troubleshooting" for details)

### 6.2.3 IPU BLOCK DIAGRAM



## Shading Correction

Auto shading compensates for the possible differences in the amount of light at the edge and center of a scanned image caused by the scanner lens, or variations among pixels of the CCD.

## Picture Element (Dot Position) Correction

Picture element correction does two things.

1. Completion of the scan line correction process.
2. Correction if the CCD is not perpendicular to the light.

- The green CCD line is taken as a standard.
- Both ends of the red and blue lines are adjusted to match.
- Use SP 4-932-1 to 4-932-4 to change the vertical line correction level ( "3. Replacement and Adjustment - Image Adjustments").


## Scan Line Correction

$R$, $G$, and $B C C D$ lines are spaced 4 lines apart (8 lines total) when full size magnification is used.

- Scan line correction synchronizes these signals by storing each line in memory.
- The difference between the $R, G$ and $B$ signals depends on the magnification ratio.
- If this calculation does not result in an integer, the corrected data is set to the closest integer, but further correction is needed (Picture Element Correction").


## Image Separation

The machine separates the original image into text and photo (dot screen) areas.

## Edge Separation

- Used to locate text and line diagrams
- Locates areas of strong contrast.
- Looks for continuity of black or colored pixels.
- Looks for continuity of white pixels around black or colored pixels.
- Only uses data from the green CCD.


## Dot Screen Separation

- If white pixels are not detected around non-white pixels, it is a dot screen area.


## Colored Text Separation

- Identifies whether the text area's pixels are black or color.
- Based on:

1) Differences among the RGB maximum signal levels.
2) Output levels of the RGB video signals.

## Scanner Gamma Correction (RGB Gamma Correction)



Fig. 1


Fig. 2

The RGB video signals from the CCD are sent to the IPU section. This signal is proportional to the intensity of light reflected from the original image (Fig. 1).
Scanner gamma correction inverts the video signals. The shading circuit converts the signal from 10-bit to 8 -bit.

- The IPU section converts the signal levels as shown in Fig. 2.
- This improves the accuracy of RGB to CMY color conversion (conversion is done later in the image process).
- The same table is used for $R, G$, and $B$ signals.


## Filtering

Appropriate software filters are applied to the RGB video signals.

- Varies depending on the results of auto text/photo separation (or on the selected original mode).
- RGB smoothing is applied to photo areas
- Edge emphasis applied to text areas.


## Background Density Control

- Removes low ID image signals (background) that are less than a certain threshold.
- The threshold depends on the color mode (single color or full color).

Users can select a different threshold for each mode.

## ADS (Auto Image Density Selection)

- Full color mode

1) Refers to the RGB data taken from the entire original.
2) Calculates a threshold for removing the background based on this data.

- Black and white mode

1) Determines the peak white level.
2) Peak level data is taken for each scan line.
3) Removes the peak white level from the image. This produces a white background.
4) Also uses the peak white level to determine the white reference value for A/D conversion.
5) Background density is adjusted before data is input to the $A / D$ converter.

## Color Conversion

Transparency for each color toner is not ideal. Color conversion compensates for the differences between the ideal and actual characteristics. A matrix converts the RGB video signals into CMYK video signals while the original is scanned once.

## Conversion Matrix

The following color conversion table is an example of the results from the matrix operation.

- Simple color copying.
- No special modes applied.
- To represent green, the yellow and cyan toners are used in a 1:1 ratio.


## Color Conversion Table

| Original Color |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Toner | K | $\mathbf{R}$ | $\mathbf{Y}$ | $\mathbf{G}$ | $\mathbf{C}$ | $\mathbf{B}$ | $\mathbf{M}$ | W |
| $\mathbf{Y}$ | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| M | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| C | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| K | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## User Program Mode

When the user selects one of the following special modes, the values in this table may fall between 0 and 1.

## Photo mode

- Glossy Photo
- Printed Photo
- Copied Photo


## Others

- Generation Mode
- Pale Mode
- Map Mode


## Two-color mode

- Separates black areas and colored areas.
- Converts black areas to a color selected by the user.
- All other areas are converted to a second color selected by the user.
( the operator's manual for details)


## Main Scan Magnification

While the machine changes the scanner speed to reduce or enlarge the original in the sub-scan direction, the ASIC2 chip on the IPU board handles reduction and enlargement in the main scan direction.

- Scanning and laser writing are done at a fixed pitch (CCD elements cannot be squeezed or expanded).
- Imaginary points are calculated, corresponding to a physical enlargement or reduction.
- Image density is then calculated for each of the imaginary points based on the image data for the nearest two true points.
- The calculated data then becomes the new (reduced or enlarged) image data.

NOTE: The actual calculations for main scan magnification use the polynomial convolution method. This mathematical process is beyond the scope of a service manual and will not be covered here.

## Printer Gamma Correction



Fig. 1


Fig. 2

Ideally, the gamma curves for Yellow, Magenta, Cyan, and Black should be identical, as shown in figure 1. However, slight variations in the electrical components can result in varying gamma curves, as shown in figure 2.

- Printer characteristics are much more variable than the scanner. Printer gamma needs recalibration and adjustment from time to time.
- The Auto Color Calibration (ACC) procedure compensates for any discrepancies in color reproduction.
- ACC makes new gamma curves for each color in each mode (text, photo, and black text).
- After ACC, the gamma curve for each color can be adjusted with service programs (SP4-909 to SP4-918).
- 4 different modes:

1) ID max.
2) Shadow (High ID)
3) Middle (Middle ID)
4) Highlight (Low ID)

- If the previous gamma curve was better, it can be recalled.
- Factory settings can be loaded using SP 5-610-4.

NOTE: If the factory settings have been overwritten, this will return the new values, not the actual settings made in the factory. This is deliberate, since some drift is expected. After a time, the original factory settings may no longer be suitable.

- Factory settings can be overwritten by the current gamma settings using SP5-610-5.


## ID Max.

This mode adjusts the total image density as shown in figure 3.


Fig. 3

## Shadow (High ID)

The High ID mode adjusts the image density between Level 6 and Level 9 of the color gradation scale on the C-4 test chart (figure 4).


Fig. 4

## Middle (Middle ID)

The Middle ID mode adjusts the image density between Level 3 and Level 7 of the color gradation scale on the C-4 test chart (figure 5).

## Highlight (Low ID)

The Low ID mode adjusts the image density between Level 2 and Level 5 of the color gradation scale on the C-4 test chart (figure $6)$.


Fig. 5


Fig. 6

## Auto Color Calibration Test Pattern

The test pattern has eight 17-step gradation scales for each color (CMYK), including background white, for Text and Photo modes.

ACC automatically calibrates the printer gamma curve. The user starts the ACC process.

1. The user prints an ACC Test Pattern.
2. The user places the test pattern on the exposure glass.
3. The copier makes 8 scans to read each color scale.
4. The copier corrects the printer gamma by comparing the ideal settings with the current image density.
5. The copier combines the corrected gamma curve with the Shadow, Middle, and Highlight values currently in memory.
6. The copier then calculates the ID max (amplitude of the gamma curve) based on data from the ACC scan.
7. The corrected printer gamma curves can be adjusted further using SP modes (SP4-909 to SP4-918).

## Error Diffusion

Error diffusion reduces the difference in contrast between light and dark areas of a halftone image. Each pixel is corrected using the difference between it and the surrounding pixels. The corrected pixels are then compared with an error diffusion matrix.

## IPU Board Test

You can check the IPU board with the SP mode menu, SP4-904-1 or 2.
(- "4. Troubleshooting" for details)

### 6.3 PRINTER ENGINE

### 6.3.1 DIFFERENCES IN THE PRINTER MAINFRAME

To improve reproduction in copy mode, the machine generates the print image with 2 bits per pixel.

If the CF expander is installed on the printer mainframe, different parameters are used for copy and print modes as shown in the table below.

| Function | Copy Mode | Printer Mode |
| :--- | :--- | :--- |
| Gradation for printing | 2 bits / pixel | 1 bit / pixel |
| LD control | SP2-103-101 to -110 | SP2-103-1 to -59 |
| Pointer table display | SP3-902-5 to -8 | SP3-902-1 to -4 |
| M/A target | SP3-903-5 to -8 | SP3-903-1 to -4 |
| M/A target for LD correction | SP3-904-5 to -8 | SP3-904-1 to -4 |

### 6.3.2 PAPER FEED LINE SPEED

This machine has three process line speeds (for feed from the registration roller to the fusing unit) depending on the mode.

| Mode | Resolution <br> (dpi) | Line speed <br> $(\mathbf{m m} / \mathbf{s})$ | Print speed <br> $(\mathbf{p p m})$ |
| :--- | :---: | :---: | :---: |
| B/W | 600 | 185 | 38 |
| Color | 600 | 125 | 28 |
| OHP/Thick | 600 | 62.5 | 10 |

### 6.4 SCANNER FUNCTIONS

### 6.4.1 IMAGE PROCESSING FOR SCANNER MODE

The image processing for scanner mode is done in the IPU chip on the BICU board. The IPU chip chooses the most suitable image processing methods (gamma tables, dither patterns, etc) depending on the settings made in the driver.
The image compression method for binary picture processing can be selected with scanner SP1-004 (either MR, MH, or MMR). For grayscale processing, JPEG is used.

Whether the user selects the image mode using the driver (TWAIN mode) or from the operation panel (Delivery mode), the IPU chip does the image processing using the appropriate image processing methods mentioned above.

## Image Data Path

## 1. Image Store/Image Delivery Mode



The user can select the following modes from the LCD.

1) Delivery only
2) Store only
3) Store and delivery

After image processing and image compression, all image data for the job are stored in the printer controller HDD using TIFF file format (binary picture processing) or JPEG file format (grayscale processing). The type of TIFF format used depends on the user's scanner settings.

When delivery mode is selected, the controller creates a file which contains the destination and page information, then the controller sends the file to a server.
2. Twain Mode


After image processing and image compression, the data (RAW or JPEG) is sent to the scanner Twain driver directory on the computer.

HARD DISK DRIVES

### 6.5 HARD DISK DRIVES

A 40GB hard disk is provided as an option for the copier feature expander. A 20GB hard disk is only used for printer functions. The hard disks are partitioned as listed in the table.

| Partition | 40GB HDD | 20GB HDD | Function | Comment |
| :--- | :---: | :---: | :--- | :--- |
| Image Local <br> Storage | $17,700 \mathrm{MB}$ | --- | Document server | Remains stored even <br> after cycling power <br> off/on. |
| File System 1 | 500 MB | 500 MB | Downloaded fonts, <br> forms. | Remains stored even <br> after cycling power <br> off/on. |
| File System 2 | $1,000 \mathrm{MB}$ | $1,000 \mathrm{MB}$ | Job spooling area | Erased after power off. |
| File System 3 | $2,000 \mathrm{MB}$ | $2,000 \mathrm{MB}$ | Work data area | Remains stored even <br> after cycling power <br> off/on. |
|  | $7,486 \mathrm{MB}$ | $7,486 \mathrm{MB}$ | Commonly used area <br> for applications | Erased after power off. |
|  | $7,200 \mathrm{MB}$ | --- | Copier application | Erased after power off. |
|  | $3,440 \mathrm{MB}$ | $3,440 \mathrm{MB}$ | Printer application | Erased after power off. |
| Job Log | $1,000 \mathrm{MB}$ | --- | Scanner application | Erased after power off. |
|  | 10 MB | Job log | Remains stored even <br> after cycling power <br> off/on. |  |

### 6.6 IMAGE DATA PATH



## Copier Application

SBU $\rightarrow$ IPU $\rightarrow$ Controller (HDD/Memory) $\rightarrow$ IPU $\rightarrow$ Controller (straight through) $\rightarrow$ BCU

## Printer Application

Controller $\rightarrow$ IPU (through) $\rightarrow$ Controller $\rightarrow$ BCU

## Scanner Application (1 bit/8 bits)

SBU $\rightarrow$ IPU $\rightarrow$ Controller (HDD/Memory)

## Fax Application (Transmission/Reception)

Transmission: SBU $\rightarrow$ IPU $\rightarrow$ FCU
Reception: FCU $\rightarrow$ IPU $\rightarrow$ Controller (straight through) $\rightarrow \mathrm{BCU}$

## SPECIFICATIONS

## 1. GENERAL SPECIFICATIONS (COPY MODE)

Configuration: Add-on scanner for printer mainframe
Number of scans: 1
Resolution: Scan: 600 dpi
Print: 600 dpi
Gradation: Scan: 8 bits/pixel
Print: 2 bits/pixel
Original type: Sheets, book, objects
Maximum original
A3/11" x 17" size:

Original reference position:
Copy speed: $\quad$ Normal: 28 cpm (color) or 38 cpm (black \& white)
OHP/thick: 10 cpm (color/black \& white)
ADF 1 to $1: 28 \mathrm{cpm}$ (color) or 38 cpm (black \& white)
First copy (normal mode):

Warm-up time:
Color: 10 seconds or less
Black \& white: 8 seconds or less

Continuous copy:
Zoom:
Up to 99 sheets
Arbitrary: From 25 to 400\% (1\% step)
Fixed:

| North America | Europe |  |  |
| :---: | :---: | :---: | :---: |
| $85 \%$ | $82 \%$ |  |  |
| $78 \%$ | $75 \%$ |  |  |
| $73 \%$ | $71 \%$ |  |  |
| $65 \%$ | $65 \%$ |  |  |
| $50 \%$ | $50 \%$ |  |  |
| $25 \%$ | $25 \%$ |  |  |
| $121 \%$ | $115 \%$ |  |  |
| $129 \%$ | $122 \%$ |  |  |
| $155 \%$ | $141 \%$ |  |  |
| $200 \%$ | $200 \%$ |  |  |
| $400 \%$ | $400 \%$ |  |  |
|  |  |  |  |

## SPECIFICATIONS

| Power source: | System: |
| :---: | :---: |
|  | 120 V, $60 \mathrm{~Hz}: 12$ A (for North America) 220-240 V, 50/60 Hz: 8 A (for Europe/Asia) |
|  | Scanner: |
|  | 120 V, $60 \mathrm{~Hz}: 2 \mathrm{~A}$ (for North America) 220-240 V, 50/60 Hz: 1.1 A (for Europe/Asia) |
| Maximum power | System: 1,440 W or less |
| consumption <br> (during copying): | Scanner: 240 W or less |
| ```Dimensions (W x D x H):``` | System: the next page |
|  | Scanner: $570 \times 757 \times 100 \mathrm{~mm}$ (without platen cover or ARDF) |
| Weight: | Scanner: 15 kg or less |
| Radio interference | VCCI Class B |
| Noise emission | Operating: 72 dB or less |
|  | Waiting: 45 dB or less |
|  | Standing by: 40 dB or less |

1) Printer mainframe with CF Expander, One-tray Paper Feed Unit, and Rack

2) Printer mainframe with CF Expander, One-tray Paper Feed Unit, Duplex unit, Finisher, and Rack

[F]
[D]: 150 mm
[E]: $1,100 \mathrm{~mm}$
[F]: $1,480 \mathrm{~mm}$

## SPECIFICATIONS

3) Printer mainframe with CF Expander, Large Capacity Tray (Two-tray Paper Feed Unit), Duplex unit, Finisher, and Rack

[G]: 150 mm
[H]: 1,200 mm

## 2. GENERAL SPECIFICATIONS (SCANNER MODE)

| Standard Scanner Resolution: | Main scan/Sub scan 600 dpi |
| :---: | :---: |
| Available scanning Resolution Range: | Twain Mode: |
|  | 100 ~ 1200 dpi |
|  | Delivery Mode: |
|  | 100/200/300/400/600 dpi |
| Grayscales: | 1 bit or 8 bits/pixel each for RGB |
| Scanning Throughput (ARDF mode): | Without 40GB HDD |
|  | B/W: 21 spm (A4/81/2" x 11" SEF, $200 \mathrm{dpi}, 1 \mathrm{bit}$ ) |
|  | Color: 11 spm (A4/81/2" x 11" SEF, 200 dpi, 8 bits) |
|  | With 40GB HDD |
|  | B/W: 30 spm (A4/81/2" x 11" SEF, $200 \mathrm{dpi}, 1 \mathrm{bit}$ ) |
|  | Color: 20 spm (A4/81/2" x 11" SEF, 200 dpi, |
|  | ) |
| Interface: | Ethernet (100 Base-TX/10 Base-T for TCP/IP) |
| Compression | MH, MR, MMR (Binary Picture Processing) |
| Method: | JPEG (Grayscale Processing) |

## 3. SUPPORTED PAPER SIZES

### 3.1 PLATEN/ARDF ORIGINAL SIZE DETECTION

| Size (width x length) [mm] | Platen |  | ARDF |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Inches | Metric | Inches | Metric |
| A3 (297 x 420) L | No | Yes | Yes | Yes |
| B4 (257 x 364) L | No | Yes | No | Yes |
| A4 (210 x 297) L | No | Yes | No | Yes** |
| A4 (297 x 210) S | No | Yes | Yes | Yes |
| B5 (182 x 257$)$ L | No | Yes | No | Yes |
| B5 (257 x 182) S | No | Yes | No | Yes |
| A5 $(148 \times 210) \mathrm{L}$ | No | No* | No | Yes |
| A5 (210 $\times 148) \mathrm{S}$ | No | No | No | Yes |
| B6 (128 x 182) L | No | No | No | Yes |
| B6 (182 x 128) S | No | No | No | Yes |
| 11" x 17" (DLT) | Yes | No | Yes** | Yes** |
| $11^{\prime \prime} \times 15{ }^{\text {c }}$ | No | No | Yes** | No |
| $10^{\prime \prime} \times 14{ }^{\prime \prime}$ | No | No | Yes | No |
| 8.5" $\times 14^{\prime \prime}$ (LG) | Yes | No | Yes** | No |
| 8.5 " $\times 13^{\prime \prime}$ (F4) | No | No | Yes** | Yes |
| $8.25{ }^{\prime \prime} \times 13^{\prime \prime}$ | No | No | No | No |
| 8" $\times 13^{\prime \prime}(\mathrm{F})$ | No | Yes | No | No |
| $8.5^{\prime \prime} \times 11^{\prime \prime}$ (LT) | Yes | No | Yes** | No |
| $11^{\prime \prime} \times 8.5^{\prime \prime}(\mathrm{LT})$ | Yes | No | Yes** | No |
| 8" $\times 10.5$ " | No | No | No | No |
| 8" $\times 10{ }^{\prime \prime}$ | No | No | Yes** | No |
| $5.5 " \times 8.5$ (HLT) | No* | No | Yes | No |
| 8.5" x 5.5" (HLT) | No | No | Yes | No |
| $8 \mathrm{~K}(267 \times 390)$ | No | No | No | Yes** |
| 16K L (195 x 267) | No | No | No | Yes** |
| 16K S (267 x 195) | No | No | No | Yes |
| $7.25^{\prime \prime} \times 10.5^{\prime \prime}$ <br> (Executive) | No | No | Yes | No |
| $10.5 \text { " } \times 7.25^{\prime \prime}$ (Executive) | No | No | Yes** | No |

*: When the message "Cannot detect original size" appears, use SP4-303 to detect original sizes as A5 lengthwise/HLT.
**: The machine can detect the paper size depending on the setting of SP6-016-1.

### 3.2 PAPER FEED

| Paper | Size (W x L) | Inches |  |  | Metric |  |  | By-pass Tray |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Tray 1 | $\begin{aligned} & \text { Tray } \\ & \text { 2/3/4 } \end{aligned}$ | LCT | Tray 1 | $\begin{aligned} & \text { Tray } \\ & 2 / 3 / 4 \end{aligned}$ | LCT |  |
| A3 W | 12 " 18 " | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| A3 SEF | $297 \times 420 \mathrm{~mm}$ | N | Y | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| A4 SEF | $210 \times 297 \mathrm{~mm}$ | N | $\mathrm{Y}^{\#} / \mathrm{Y}^{*}$ | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| A4 LEF | $297 \times 210 \mathrm{~mm}$ | $Y^{*}$ | Y | $Y^{*}$ | Y | Y | Y | $\mathrm{Y}^{\#}$ |
| A5 SEF | $148 \times 210 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| A5 LEF | $210 \times 148 \mathrm{~mm}$ | N | Y | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| A6 SEF | $105 \times 148 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| B4 SEF | $257 \times 364 \mathrm{~mm}$ | N | $Y^{\#} / Y^{*}$ | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| B5 SEF | $182 \times 257 \mathrm{~mm}$ | N | $Y^{\#} / Y^{*}$ | N | N | $Y^{\#} / Y^{*}$ | N | $\mathrm{Y}^{\#}$ |
| B5 LEF | $257 \times 182 \mathrm{~mm}$ | N | Y | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| B6 SEF | $128 \times 182 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| Ledger | $11^{\prime \prime} \times 17^{\prime \prime}$ | N | Y | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| Letter SEF | 8.5 " $\times 11^{\prime \prime}$ | N | Y | N | N | $Y^{\#} / Y^{*}$ | N | $\mathrm{Y}^{\#}$ |
| Letter LEF | $11^{\prime \prime} \times 8.5$ " | Y | Y | Y | $Y^{*}$ | Y | $Y^{*}$ | $\mathrm{Y}^{\#}$ |
| Legal SEF | 8.5 " x 14" | N | Y | N | N | $\mathrm{Y}^{\#} / \mathrm{Y}^{*}$ | N | $\mathrm{Y}^{\#}$ |
| Half Letter SEF | 5.5 " x 8.5" | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| Executive SEF | 7.25" x 10.5" | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| Executive LEF | 10.5 " x 7.25" | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| F SEF | $8{ }^{\prime \prime} \times 13^{\prime \prime}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| Foolscap SEF | 8.5 " $\times 13$ " | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| Folio SEF | 8.25 " $\times 13^{\prime \prime}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| 8K | $267 \times 390 \mathrm{~mm}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| 16K SEF | $195 \times 267 \mathrm{~mm}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| 16K LEF | $267 \times 195 \mathrm{~mm}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| Custom | Minimum: $90 \times 148 \mathrm{~mm}$ Maximum: $305 \times 458 \mathrm{~mm}$ | N | N | N | N | N | N | $Y^{\#}$ |
| Com10 Env. | $4.125^{\prime \prime} \times 9.5$ " | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| Monarch Env. | 3.875 " x 7.5" | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| C6 Env. | $114 \times 162 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| C5 Env. | $162 \times 229 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| DL Env. | $110 \times 220 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |

Remarks:

| Y | Supported: The sensor detects the paper size. |
| :---: | :--- |
| $\mathrm{Y}^{\#}$ | Supported: The user specifies the paper size. |
| $\mathrm{Y}^{*}$ | Supported: Depends on a technician adjustment |
| N | Not supported |

## SPECIFICATIONS

### 3.3 PAPER EXIT

| Paper | Size (W x L) | Internal Tray (Face Down) | External Tray (Face Up) | Finisher | Multi-bin Output Tray | Duplex |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A3 W | 12 " x 18" | N | Y | N | N | N |
| A3 SEF | $297 \times 420 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| A4 SEF | $210 \times 297 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| A4 LEF | $297 \times 210 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| A5 SEF | $148 \times 210 \mathrm{~mm}$ | Y | Y | N | N | N |
| A5 LEF | $210 \times 148 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| A6 SEF | $105 \times 148 \mathrm{~mm}$ | Y | Y | N | N | N |
| B4 SEF | $257 \times 364 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| B5 SEF | $182 \times 257 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| B5 LEF | $257 \times 182 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| B6 SEF | $128 \times 182 \mathrm{~mm}$ | Y | Y | N | N | N |
| Ledger SEF | $11^{\prime \prime} \times 17^{\prime \prime}$ | Y | Y | Y | Y | Y |
| Letter SEF | 8.5 " x 11" | Y | Y | Y | Y | Y |
| Letter LEF | 11" $\times 8.5$ " | Y | Y | Y | Y | Y |
| Legal SEF | 8.5 " $\times 14$ " | Y | Y | Y | Y | Y |
| Half Letter SEF | $5.5 " \mathrm{x} 8.5$ " | Y | Y | N | N | N |
| Executive SEF | 7.25" x 10.5" | Y | Y | Y | Y | Y |
| Executive LEF | 10.5 " x 7.25" | Y | Y | N | N | N |
| F SEF | 8" $\times 13$ " | Y | Y | Y | Y | Y |
| Foolscap SEF | 8.5 " x 13" | Y | Y | Y | Y | Y |
| Folio SEF | 8.25 " x 13" | Y | Y | Y | Y | Y |
| 8K | $267 \times 390 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| 16K SEF | $195 \times 267 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| 16K LEF | $267 \times 195 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| Custom | Minimum: $90 \times 148 \mathrm{~mm}$ Maximum: $305 \times 458 \mathrm{~mm}$ | Y | Y | N | N | N |
| Com10 Env. | $4.125^{\prime \prime} \times 9.5{ }^{\prime \prime}$ | N | Y | N | N | N |
| Monarch Env. | 3.875" x 7.5" | N | Y | N | N | N |
| C6 Env. | $114 \times 162 \mathrm{~mm}$ | N | Y | N | N | N |
| C5 Env. | $162 \times 229 \mathrm{~mm}$ | N | Y | N | N | N |
| DL Env. | $110 \times 220 \mathrm{~mm}$ | N | Y | N | N | N |

Remarks:

| Y | Supported |
| :---: | :--- |
| N | Not supported |

## 4. SOFTWARE ACCESSORIES

### 4.1 SCANNER

The scanner driver and utility software are provided on one CD-ROM.

## Scanner Drivers

- Network Twain Driver for Win95/98/ME/NT4.0/2000


## Scanner Utilities

- Scan Router V2 Lite (Cherry-Lite) for Win95/98/ME/NT4.0/2000
- Desk Top Binder V2 Lite (Plumeria-Lite) for Win95/98/ME/NT4.0/2000


## SPECIFICATIONS

## 5. MACHINE CONFIGURATION



| Item | Machine Code | No. | Remarks |
| :---: | :---: | :---: | :---: |
| Mainframe |  |  |  |
| Printer | G060 | A |  |
| Copier Feature Expander | G570 | B |  |
| Peripherals |  |  |  |
| Finisher | G565 | C | Requires the HDD or 128MB DIMM memory, duplex unit, and one of the three paper feed options. |
| Paper Feed Unit (500 x 1) | G567 | D | Install any one of these three units. |
| Paper Feed Unit (500 x 2) | G568 | D |  |
| LCT | G569 | D |  |
| Duplex Unit | G571 | E |  |
| Punch Unit | B377 |  | Requires the finisher |
| Rack | G317 | F | Requires the CF expander. |
| Platen Cover | G329 | G | Requires the CF expander. |
| ARDF | G564 | H | Requires the CF expander. |
| Multi-Bin Output Tray | G306 | I | Requires the CF expander. |


| Item | Machine <br> Code | No. | Remarks |
| :--- | :---: | :---: | :--- |
| Controller Options |  |  |  |
| 64MB DIMM Memory | G579 | J |  |
| 128MB DIMM Memory | G580 | J |  |
| 256MB DIMM Memory | G581 | J |  |
| NVRAM Memory | G311 | K |  |
| IEEE1394 I/F Board | G590 | L | At least 64 MB of DIMM is required |
| HDD Type 1 | G308 | M | Only for printer features |
| HDD Type 2 | G309 | M | For both printer and copier features |

NOTE: The punch unit and copier feature expander (including its options) must be installed by service representatives; the other units can be installed by users.

## 6. OPTIONAL EQUIPMENT

## Rack

Dimensions (W $\times \mathrm{D} \times \mathrm{H}$ ): $675 \mathrm{~mm} \times 758 \mathrm{~mm} \times 1110 \mathrm{~mm}\left(26.6^{\prime \prime} \times 29.8^{\prime \prime} \times 43.7^{\prime \prime}\right)$

Weight:
30 kg

## ARDF

Paper Size/Weight:

Table Capacity:
Original Standard Position:

Separation:
Original Transport:
Original Feed Order:
Supported Magnification Ratios:

| Copy | 50 to $200 \%$ |  |
| :---: | :---: | :---: |
| Fax | Color | 32.6 to $200 \%$ |
|  | Black \& white | 48.9 to $200 \%$ |

Power Source:
Power Consumption:
DC $24 \mathrm{~V}, 5 \mathrm{~V}$ from the scanner unit

Dimensions (W $\times \mathrm{D} \times \mathrm{H}$ ): $570 \mathrm{~mm} \times 518 \mathrm{~mm} \times 150 \mathrm{~mm}\left(22.4\right.$ " $\left.\times 20.4^{\prime \prime} \times 5.9^{\prime \prime}\right)$
Weight:
12 kg

## Multi-bin Output Tray

Number of Bins
Paper Size

Paper Weight
Stack Capacity ( $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$. )

2
Maximum: A3/11" x 17" (SEF)
Minimum: A5 (LEF)/81/2" x 11"
60 to $105 \mathrm{~g} / \mathrm{m}^{2}$ (16 to 28 lb .)
Tray 1: 100 sheets
Tray 2: 100 sheets (A4/smaller than 81/2" x 11") 250 sheets (B4/81/2" x 14")

Printing Speed:

|  | Resolution <br> Monochrome | Printing Speed |
| :---: | :---: | :---: |
| Color | $600 \times 600 \mathrm{dpi}$ <br> $1200 \times 600 \mathrm{dpi}$ <br> Copy mode | 26 ppm |$|$| $1200 \times 1200 \mathrm{dpi}$ |
| :---: |
|  |

## ARDF <br> G564

## 1. REPLACEMENT AND ADJUSTMENT

### 1.1 COVERS


[A]: Front cover (
[B]: Rear cover ( $\hat{\xi}^{(1)} \times 2$ )

[D]: Original tray (테 $\times 1$, ( 3 ) $\times 1$ )
[E]: Platen sheet (Velcro pads)
[F]: Original exit tray ( $\hat{\beta}^{2} \times 2$ ). Slide to the right and then pull out.

| $\triangle$ CAUTION |
| :--- |
| The hinge of the ARDF is spring-loaded and becomes much lighter with all |
| the covers removed. After removing all the covers, lay a heavy book on the |
| front right corner of the ARDF to prevent it from springing up |
| unexpectedly. |

### 1.2 ORIGINAL FEED UNIT

Open the top cover.
[A]: Original feed unit
Press it toward you on its shaft to release and lift out.

### 1.3 ORIGINAL PICK-UP ROLLER

Original feed unit (-1.2)
[A]: Pick-up roller ((3) $\times 1$ )

[A]

## 1．4 ORIGINAL FEED BELT



Original feed unit and original pick－up roller（1．2，1．3）
［A］：Shaft（级 $\times 1$ ）
NOTE：Before removing the shaft，note carefully the positioning of the spring ［B］．This must be reset during re－installation．
［C］：Feed belt cover（Timing belt，gear，shaft，springs x 2）
NOTE：Do not lose the springs．
［D］：Original feed belt

### 1.5 SKEW CORRECTION/INTERVAL/ REGISTRATION/ORIGINAL WIDTH SENSORS



Open the top cover.
[A]: Upper original guide ( $(\hat{\xi} \times 3)$.
[B]: Skew correction sensor (툐) x 1)
[C]: Interval sensor ( Ell $^{\boldsymbol{E}} \times 1$ )
[D]: Registration sensor (E』\#l $\times$ 1)

[F]: Original width sensors

## 1．6 ORIGINAL LENGTH SENSORS

Raise the original table．
［A］：Lower cover of original tray（
［B］：Original length sensor－1（㙊 C 1）
［C］：Original length sensor－2（ㅌㅔㅔ $\times 1$ ）


## 1．7 SEPARATION ROLLER

Original feed unit（－1．2）
［A］：Separation roller cover
［B］：Separation roller（（3）x 1）


### 1.8 INVERTER／ORIGINAL SET SENSORS

Rear cover．（－1．1）
［A］：Lower the original stopper by rotating the pick－up motor
Original feed unit（ -1.2 ）
［B］：Feed guide plate（ ${ }^{2} \times 4$ ，stepped screw）

NOTE：Raise the original tray before you re－install the paper feed guide．
Separation roller，torque limiter（3）$\times 1$ ） 1．7）

［D］：Inverter sensor（ $\hat{\xi}^{(1)} \times 1$ ）
［E］：Original set sensor（㙊x 1）


## 1．9 PICK－UP MOTOR／ORIGINAL STOPPER HP SENSOR／PICK－UP HP SENSOR

Rear cover（1．1）
［A］：Pick－up motor（玉気）$\times 1$ ，氞 $\times 2$ ，Timing belt）

［C］：Pick－up HP sensor
［D］：Original stopper HP sensor


### 1.10 TRANSPORT MOTOR AND INVERTER MOTOR



Rear cover (1.1)

[B]: Motor bracket ( $\hat{\xi}^{\boldsymbol{\xi}} \times 3$, 気 ${ }^{\| l} \times 2$, Timing belt $\times 2$ )
[C]: Transport motor (食 $\times 2$, Spring $\times 1$ )
[D]: Inverter motor (

### 1.11 FEED MOTOR, SKEW CORRECTION ROLLER CLUTCH



Rear cover (1.1)
[A]: Motor bracket ( $\hat{\xi}^{(1)} \times 5$, 気 $\mathrm{H} \times 1$ )
[B]: Feed motor ( $\hat{E}^{2} \times 2$ )
[C]: Clutch stopper ( $\hat{\xi}^{2} \times 1$ )
[D]: Skew correction roller clutch (

### 1.12 EXIT SENSOR

Open the ARDF.
[A]: Pull the platen sheet off halfway.
[B]: Open the exit guide plate.
[C]: Exit guide plate cover (
[D]: Exit sensor (

### 1.13 STAMP SOLENOID

Rear cover (1.1)
Open exit guide plate (1.12)
[A]: Exit guide plate cover (



### 1.14 CONTROLLER BOARD

## Rear cover (1.1)

[A]: Controller board (


## 2. TROUBLESHOOTING

### 2.1 TIMING CHARTS

### 2.1.1 A4(S)/LT(S) SINGLE-SIDED ORIGINAL MODE



### 2.1.2 A4(S)/LT(S) DOUBLE-SIDED ORIGINAL MODE



### 2.2 JAM DETECTION



1. Registration sensor
2. Interval sensor
3. Skew correction sensor
4. Inverter sensor
5. Exit sensor
6. Scanning position

| Jam Site | Cause |
| :--- | :--- |
| Original stopper HP <br> sensor (Jam 1) | Original stopper home position could not be detected within 1000 ms <br> after the pick-up motor switched on and started rotating counter- <br> clockwise. |
| Pick-up HP sensor <br> (Jam 2) | Pick-up roller home position could not be detected within 1000 ms <br> after the pick-up motor switched on and started rotating clockwise. |
| Skew correction <br> sensor jam (Jam 3) | The skew correction sensor does not turn on after the feed motor <br> has fed the original 185 mm. |
| Transport jam <br> (Jam 4) | The interval sensor does not turn on after the feed motor has fed the <br> original 141 mm. |
| Registration sensor <br> (Jam 5) | The registration sensor does not turn on after the interval sensor <br> turned on and the original has been fed 117 mm. |
| Exit jam (Jam 6) | The exit sensor does not turn on after the transport motor has fed <br> the original 124 mm. |
| Exit jam (Jam 7) | The exit sensor does not turn off after the exit sensor turned on and <br> the original has been fed 294 mm. |
| Inverter sensor jam <br> (Jam 8) | The inverter sensor does not turn on after the inverter motor has fed <br> the original 100 mm. |
| Interval sensor jam <br> (Jam 9) | The interval sensor does not turn on after the inverter motor has fed <br> the original 339 mm. |

## 3. SERVICE TABLES

### 3.1 DIP SWITCHES

| DPS101 |  |  |  |
| :---: | :---: | :---: | :--- | $\mathbf{l}$ Description

### 3.2 TEST POINTS

| No. | Label | Monitored Signal |
| :---: | :---: | :--- |
| TP100 | (GND) | Ground |
| TP101 | (Vcc) | +5V |
| TP103 | (TXD) | TXD to the copier |
| TP104 | (RXD) | RXD from the copier |

### 3.3 FUSES

| No. | Function |
| :---: | :--- |
| FU101 | Protects the 24 V line. |

## 4. DETAILED DESCRIPTIONS

### 4.1 MAIN COMPONENTS



1 Pick-up roller
2 Original tray
3 Original length sensor 1
4 Original length sensor 2
5 Reverse table
6 Inverter roller
7 Junction gate
8 Separation roller
9 Exit roller

10 Exit sensor
11 Idle roller 3
12 Idle roller 2
13 Transport roller
14 Registration sensor
15 Idle roller 1
16 Original width sensor
17 Skew correction roller
18 Feed belt

Pick-up Mechanism. Picks up the originals for scanning.
Feed/Separation Mechanism. Comprised of the feed belt and separation roller, feeds and separates the originals, and corrects skew.
Original Size Detection Sensors. Comprised of 4 width sensors and 2 length sensors, detect the sizes of the originals.
Original Transport Mechanism. Comprised of the transport roller, ADF exposure glass, and exit roller.
Original Reverse/Exit Mechanism. Exit/junction gate.

### 4.2 DRIVE LAYOUT



1 Feed motor
2 Feed belt
3 Pick-up roller
4 Pick-up motor
5 Transport motor

7 Inverter roller
8 Exit roller
9 Separation roller
10 Transport roller
11 Skew correction roller

6 Inverter motor

### 4.3 ORIGINAL SIZE DETECTION

### 4.3.1 BASIC MECHANISM



The original size is detected by four original width sensors [A] and two original length sensors, $[\mathrm{B}]$ and $[\mathrm{C}]$.
The machine determines the original width when the leading edge of the original activates the registration sensor.
The ARDF detects the original size by combining the readings of the four width sensors and two length sensors, as shown in the table on the next page.

| Size (Width x Length) | Width Sensor |  |  |  | Length Sensor |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | (1) | (2) | (3) | (4) | B5 | LG |
| A3 L*1 $297 \times 420 \mathrm{~mm}$ ) | ON | ON | ON | ON | ON | ON |
| B4 L ( $257 \times 364 \mathrm{~mm}$ ) | ON | ON | - | - | ON | ON |
| A4 L (210 x 297 mm ) | ON | - | - | - | ON | - |
| A4 S* ${ }^{\text {² }}$ (297 x 210 mm ) | ON | ON | ON | ON | - | - |
| B5 L (182 $\times 257 \mathrm{~mm}$ ) | - | - | - | - | ON | - |
| B5 S (257 x 182 mm ) | ON | ON | - | - | - | - |
| A5 L (148 $\times 210 \mathrm{~mm}$ ) | - | - | - | - | - | - |
| A5 S (210 $\times 148 \mathrm{~mm}$ ) | ON | - | - | - | - | - |
| B6 L (128 $\times 182 \mathrm{~mm}$ ) | - | - | - | - | - | - |
| B6 S (182 x 128 mm ) | - | - | - | - | - | - |
| DLT L (11" x 17") | ON | ON | ON | - | ON | ON |
| $11^{\prime \prime} \times 15{ }^{\prime \prime} \mathrm{L}$ | ON | ON | ON | - | ON | ON |
| $10^{\prime \prime} \times 14{ }^{\text {L L }}$ | ON | ON | - | - | ON | ON |
| LG L (81/2" $\times 14^{\prime \prime}$ ) | ON | - | - | - | ON | ON |
| F4 L (81/2" $\times 13^{\prime \prime}$ ) | ON | - | - | - | ON | ON |
| F L (8" x 13") | ON | - | - | - | ON | ON |
| LT L (8.5" x 11") | ON | - | - | - | ON | - |
| LT S (11" x 8.5") | ON | ON | ON | - | - | - |
| 71/4" $\times 101 / 2^{\prime \prime} \mathrm{L}$ | - | - | - | - | ON | - |
| 101/2" $\times 71 / 4$ " S | ON | ON | ON | - | - | - |
| 8" x 10" L | ON | - | - | - | ON | - |
| HLT L 51/2" x 81/2" | - | - | - | - | - | - |
| HLT S 81/2" x 51/2" | ON | - | - | - | - | - |
| $267 \times 390 \mathrm{~mm}$ | ON | ON | ON | - | ON | ON |
| $195 \times 267 \mathrm{~mm}$ | ON | - | - | - | ON | - |
| $267 \times 195 \mathrm{~mm}$ | ON | ON | ON | - | - | - |

### 4.3.2 MIXED ORIGINAL SIZE MODE

This section explains what happens when the user selects mixed original size mode.

Because this ADF is a sheet-through document feeder, the method for original document width detection is the same as when the originals are the same size, but the document length detection method is different. Therefore, the scanning speed is slightly slower.

## Document length detection

From when the registration sensor switches on until the interval sensor switches off, the CPU counts the transport motor pulses. The number of pulses determines the length of the original.

## Feed-in cycle

When the original size for the copy modes listed below cannot be determined, the image cannot be correctly scaled (reduced or enlarged) or processed until the document length has been accurately detected. The length must be determined before the image is scanned.

Auto Reduce/Enlarge
Centering
Erase Center/Border
Booklet
Image Repeat
An original follows this path during transport:

1. Document length detection $\rightarrow$ Scanning glass $\rightarrow$ Inverter table
2. Inverter table $\rightarrow$ Scanning glass $\rightarrow$ Inverter table (restores original order)
3. Inverter table $\rightarrow$ Scanning glass (image scanned) $\rightarrow$ Exit tray

## Normal feed-in

In a copy mode other than those listed above, when the rate of reduction/enlargement has been determined, the originals are scanned normally. In order to store the scanned images, a large area of memory (the detected document width $\times 432 \mathrm{~mm}$ ) is prepared. Next, only the portion of the image up to the detected document length is read from memory and printed.

### 4.4 ORIGINAL FEED-IN MECHANISM

### 4.4.1 PICK-UP AND SEPARATION



When the original is put on the original table, it contacts the original stopper [A] and pushes the actuator $[B]$ out of the original set sensor $[C]$.
When Start © $(3)$ is pressed, the pick-up motor [ D$]$ turns on and the original stopper cam $[E]$ rotates. The original stopper lowers and releases the original.
Next, the pick-up roller cam [F] lowers the pick-up roller, and then the feed motor [ $G$ (at this location but not shown in the drawing)] turns on to feed the top sheet of paper. After being fed from the pick-up roller, the top sheet is separated from the stack by the separation roller [H] and the feed belt [I].

## ORIGINAL FEED-IN MECHANISM

### 4.4.2 ORIGINAL SKEW CORRECTION

S


This mechanism is the same as the skew correction used by the registration roller in the main machine.

The feed motor and the skew correction clutch control the skew correction roller. Immediately after separation, the skew correction sensor [A] detects the leading edge of the original. The feed belt [B] moves the paper slightly until it presses against the skew correction roller [C] and buckles slightly to correct any skew.

### 4.4.3 REDUCING THE INTERVAL BETWEEN PAGES



After performing skew correction, the feed motor runs at a speed higher than its original speed in order for the next original to catch up to the one ahead of it. This reduces the gap between the leading edge of the next original with the trailing edge of the one ahead.

When the leading edge of the original activates the interval sensor [A], the feed motor slows to match the speed of paper transport.

### 4.5 ORIGINAL TRANSPORT AND EXIT

### 4.5.1 SINGLE-SIDED ORIGINALS



The transport motor drives the transport roller [A] and the exit roller [B]. When the leading edge of the original activates the interval sensor [C], the transport motor rotates the transport roller. The transport roller then feeds the original through scanning area. After scanning, the original is fed out by the exit roller to the exit tray.

### 4.5.2 DOUBLE-SIDED ORIGINALS

Shortly after the transport motor has been turned on, the inverter solenoid is activated and junction gate $[A]$ opens. The original is then scanned and transported towards the reverse table [B].


Shortly after the original exit sensor [C] detects the trailing edge of the original, the inverter solenoid turns off and the junction gate [D] closes.
Next, the inverter motor turns on and the inverter roller [E] starts rotating to feed the original from the reverse table.

Then the original is fed to the transport roller and the scanning area $[F]$ (where the reverse side is scanned).


After scanning the reverse side of the original, the original is then sent to the reverse table [G] a second time and turned over. This ensures that the double-sided original will be properly stacked in the correct order, front side down, in the original exit tray [H].


### 4.6 STAMP



NOTE: This function is only for fax mode.
The stamp [A] is located between the transport roller [B] and the exit roller [C].
When the original reaches the stamp, the transport motor stops and the stamp solenoid turns on if the page is sent successfully (immediate transmission) or stored successfully (memory transmission). After stamping, the ARDF feed motor re-starts to feed out the document.
NOTE: The position of the stamp can be adjusted with the Stamp Position Adjustment SP mode.

FAX UNIT
G307

## 1. INSTALLATION

### 1.1 FAX UNIT

### 1.1.1 CAUTIONS

NOTE: 1) Never install telephone wiring during a lightning storm.
2) Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3) Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4) Use caution when installing or modifying telephone lines.
5) Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
6) If there is a gas leak, do not use the telephone in the vicinity of the leak to report it.

## $\triangle$ CAUTION

1. Before installing the fax unit, switch off the main power and operation switches, and disconnect the power cord.
2. The fax unit contains a lithium battery. The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

### 1.1.2 FAX OPTION INSTALLATION



## ⒸAUTION <br> Before installing this option, do the following: <br> 1. Print out all data in the printer buffer. <br> 2. Turn off the main switch and disconnect the power cord and the network cable.

1. Remove the rear left cover plate $[A]\left(\hat{S}^{3} \times 2\right)$.
2. Turn on the DIP switch $[B]$ on the MBU board, then install the fax unit [C] (笋 $\times 2$ ).
NOTE: Make sure that the controller unit is installed when inserting the fax unit. If the controller unit is installed after the fax unit has been installed, this may cause poor connection between the fax unit and controller unit.
3. Remove the cover key tops [D] and install key tops $[E] /[F]$ and cover [G].
4. Attach the FCC decal (only for US/Canada) to the rear cover.

5. Attach the serial number decal $[A]$ to the rear cover.
6. Attach the super G 3 decal $[\mathrm{B}]$ as shown
7. If the ADF has been installed, insert the stamp cartridge [C] into the ADF as shown.
8. Connect the telephone line to the "LINE" jack at the rear of the machine.
9. Plug in the machine and turn on the main power switch.

NOTE: The machine must be connected to a properly-grounded socket outlet.
10. Be sure to set the clock. (Date and time)
11. Enter service mode and program the serial number into the fax unit (SP3-102000). The serial number can be found on the serial number label (attached to the machine in step 5).

### 1.1.3 INSTALLING THE HANDSET



NOTE: The optional handset is for the U.S. model only.

1. Remove the thumb screw $[A]$ on the left spacer.
2. Install the handset bracket $[B]$ on the left arm (2 screws, 1 thumb screw).
3. Install the handset holder [C] on the bracket (2 screws).
4. Place the handset [D] with the handset cord resting on the cord holder [E] on the bracket.
5. Connect the handset cord to the jack.

### 1.2 FAX UNIT OPTIONS

### 1.2.1 G3 INTERFACE UNIT INSTALLATION


[J]

## ⒸAUTION

Before installing this option, do the following:

1. Print out all data in the printer buffer.
2. Turn off the main switch and disconnect the power cord and the network.
3. Remove the jack window (LINE2) $[A]$ from the panel plate $[B]$.
4. Install the G3 board [C] and NCU board [D] (3 screws each).
5. Attach the harness clamp [E].
6. Connect the harness [F] to the connectors on G3 and NCU boards (harness clamp [E]).
7. Connect the flat cable [G] to the connector [H] on the FCU board.
8. Connect the I/F board [I] to the G3 board and connect the flat cable [G] to the I/F board.

NOTE: When installing the fax unit and G3 unit simultaneously, turn on the DIP switch [J] on the MBU board.

7. Remove the rear left cover plate [A] and install the fax unit [B] (2 screws each).

NOTE: Make sure that the controller unit is installed when inserting the fax unit. If the controller unit is installed after the fax unit has been installed, this may cause poor connection between the fax unit and controller unit.
8. Connect the cable to the LINE2 jack, then plug in the machine and turn the main switch on.
9. Attach the FCC/IC approval label to the machine near the ISDN jack (this step is only for US/Canada).
10. Enter the service mode and set bit 1 of communication switch 16 to " 1 ", then turn the main switch off and on.
11. Print the system parameter list and ensure that "SG3-V34" is listed as an option.
12. Set up and program the items required for PSTN-2 communications.

### 1.2.2 ISDN OPTION INSTALLATION



## ⒸAUTION <br> Before installing this option, do the following:

1. Print out all data in the printer buffer.
2. Turn off the main switch and disconnect the power cord and the network cable.
3. Remove the jack window (ISDN) $[A]$ from the panel $[B]$.
4. Install the G4 unit [C] (3 screws) and harness clamp.
5. Connect the flat cable [D] to the connector [E] on the FCU board.
6. Connect the I/F board [F] to the G4 unit and connect the flat cable [D] to the I/F board.
7. Attach the modular socket [G] to the bracket $[\mathrm{H}]$ and install the bracket (2 screws).
8. Connect the cable [I] to the G4 unit and route the cable (2 clamps [J]).

NOTE: When installing the fax unit and G4 unit simultaneously, turn on the DIP switch $[K]$ on the MBU board.

7. Remove the rear left cover $[A]$ and install the fax unit $[B]$ ( $\hat{\xi}^{2} \times 2$ each).

NOTE: Make sure that the controller unit is installed when inserting the fax unit.
If the controller unit is installed after the fax unit has been installed, this may cause poor connection between the fax unit and controller unit.
8. Connect the cable to the ISDN jack, then plug in the machine and turn the main switch on.
9. Attach the FCC/IC approval label to the machine near the ISDN jack (this step is only for US/Canada).
10. Enter service mode and set bit 2 of communication switch 16 to "1". After that, turn the main switch off and on.
11. Print the system parameter list and ensure that "G4" is listed as an option.
12. Set up and program the items required for ISDN communications. After setting up the ISDN parameters, be sure to turn the main switch off and on.

### 1.2.3 FAX FUNCTION UPGRADE UNIT INSTALLATION



## ⒸAUTION <br> Before installing this option, do the following:

1. Print out all data in the printer buffer.
2. Turn off the main switch and disconnect the power cord and the network cable.
3. Turn on the DIP switch $[A]$ on the fax function upgrade unit $[B]$.
4. Attach the stand $[C]$ to this unit.
5. Connect the fax function upgrade unit to CN621 and attach the stand to the board.
6. Turn the main switch off and on.
7. Enter service mode and set bit 7 of system switch 1E to "1"

NOTE: When installing the fax unit and fax function upgrade unit at the same time, turn on the DIP switch [D] on the MBU board.

### 1.2.4 EXPANSION MEMORY INSTALLATION



## $\triangle$ CAUTION

Before installing this option, do the following:

1. Print out all data in the printer buffer.
2. Turn off the main switch and disconnect the power cord and the network cable.
3. Slide the expansion memory $[A]$ into the CN602 slot and tilt it down until it is locked by the pin [B].

NOTE: When installing the fax unit and expansion memory at the same time, turn on the DIP switch [C] on the MBU board.

## 2. TROUBLESHOOTING

### 2.1 ERROR CODES

If an error code occurs, retry the communication. If the same problem occurs, try to fix the problem as suggested below. Note that some error codes appear only in the error code display and on the service report.

| Code | Meaning | Suggested Cause/Action |
| :---: | :---: | :---: |
| 0-00 | DIS/NSF not detected within 40 s of Start being pressed | - Check the line connection. <br> - Check the NCU - FCU connectors. <br> - The machine at the other end may be incompatible. <br> - Replace the NCU or FCU. <br> - Check for DIS/NSF with an oscilloscope. <br> - If the rx signal is weak, there may be a bad line. |
| 0-01 | DCN received unexpectedly | - The other party is out of paper or has a jammed printer. <br> - The other party pressed Stop during communication. |
| 0-03 | Incompatible modem at the other end | - The other terminal is incompatible. |
| 0-04 | CFR or FTT not received after modem training | - Check the line connection. <br> - Check the NCU - FCU connectors. <br> - Try changing the tx level and/or cable equalizer settings. <br> - Replace the FCU or NCU. <br> - The other terminal may be faulty; try sending to another machine. <br> - If the rx signal is weak or defective, there may be a bad line. <br> Cross reference <br> - Tx level - NCU Parameter 01 (PSTN) <br> - Cable equalizer - G3 Switch 07 (PSTN) <br> - Dedicated Tx parameters - Section 4 |
| 0-05 | Unsuccessful after modem training at 2400 bps | - Check the line connection. <br> - Check the NCU - FCU connectors. <br> - Try adjusting the tx level and/or cable equalizer. <br> - Replace the FCU or NCU. <br> - Check for line problems. <br> Cross reference <br> - See error code 0-04. |


| Code | Meaning | Suggested Cause/Action |
| :---: | :---: | :---: |
| 0-06 | The other terminal did not reply to DCS | - Check the line connection. <br> - Check the FCU - NCU connectors. <br> - Try adjusting the $t x$ level and/or cable equalizer settings. <br> - Replace the NCU or FCU. <br> - The other end may be defective or incompatible; try sending to another machine. <br> - Check for line problems. <br> Cross reference <br> - See error code 0-04. |
| 0-07 | No post-message response from the other end after a page was sent | - Check the line connection. <br> - Check the FCU - NCU connectors. <br> - Replace the NCU or FCU. <br> - The other end may have jammed or run out of paper. <br> - The other end user may have disconnected the call. <br> - Check for a bad line. <br> - The other end may be defective; try sending to another machine. |
| 0-08 | The other end sent RTN or PIN after receiving a page, because there were too many errors | - Check the line connection. <br> - Check the FCU - NCU connectors. <br> - Replace the NCU or FCU. <br> - The other end may have jammed, or run out of paper or memory space. <br> - Try adjusting the tx level and/or cable equalizer settings. <br> - The other end may have a defective modem/NCU/FCU; try sending to another machine. <br> - Check for line problems and noise. <br> Cross reference <br> - Tx level - NCU Parameter 01 (PSTN) <br> - Cable equalizer - G3 Switch 07 (PSTN) <br> - Dedicated Tx parameters - Section 4 |
| 0-14 | Non-standard post message response code received | - Check the FCU - NCU connectors. <br> - Incompatible or defective remote terminal; try sending to another machine. <br> - Noisy line: resend. <br> - Try adjusting the tx level and/or cable equalizer settings. <br> - Replace the NCU or FCU. <br> Cross reference <br> - See error code 0-08. |


| Code | Meaning | Suggested Cause/Action |
| :---: | :---: | :---: |
| 0-15 | The other terminal is not capable of specific functions. | The other terminal is not capable of accepting the following functions, or the other terminal's memory is full. <br> - Confidential rx <br> - Transfer function <br> - SEP/SUB/PWD/SID |
| 0-16 | CFR or FTT not detected after modem training in confidential or transfer mode | - Check the line connection. <br> - Check the FCU - NCU connectors. <br> - Replace the NCU or FCU. <br> - Try adjusting the tx level and/or cable equalizer settings. <br> - The other end may have disconnected, or it may be defective; try calling another machine. <br> - If the rx signal level is too low, there may be a line problem. <br> Cross reference <br> - See error code 0-08. |
| 0-17 | Communication was interrupted by pressing the Stop key. | If the Stop key was not pressed and this error keeps occurring, replace the operation panel. |
| 0-20 | Facsimile data not received within 6 s of retraining | - Check the line connection. <br> - Check the FCU - NCU connectors. <br> - Replace the NCU or FCU. <br> - Check for line problems. <br> - Try calling another fax machine. <br> - Try adjusting the reconstruction time for the first line and/or rx cable equalizer setting. <br> Cross reference <br> - Reconstruction time - G3 Switch 0A, bit 6 <br> - Rx cable equalizer - G3 Switch 07 (PSTN) |
| 0-21 | EOL signal (end-of-line) from the other end not received within 5 s of the previous EOL signal | - Check the connections between the FCU, NCU, \& line. <br> - Check for line noise or other line problems. <br> - Replace the NCU or FCU. <br> - The remote machine may be defective or may have disconnected. <br> Cross reference <br> - Maximum interval between EOLs and between ECM frames - G3 Bit Switch 0A, bit 4 |
| 0-22 | The signal from the other end was interrupted for more than the acceptable modem carrier drop time (default: 200 ms ) | - Check the line connection. <br> - Check the FCU - NCU connectors. <br> - Replace the NCU or FCU. <br> - Defective remote terminal. <br> - Check for line noise or other line problems. <br> - Try adjusting the acceptable modem carrier drop time. <br> Cross reference <br> - Acceptable modem carrier drop time - G3 Switch 0 A , bits 0 and 1 |


| Code | Meaning | Suggested Cause/Action |
| :---: | :---: | :---: |
| 0-23 | Too many errors during reception | - Check the line connection. <br> - Check the FCU - NCU connectors. <br> - Replace the NCU or FCU. <br> - Defective remote terminal. <br> - Check for line noise or other line problems. <br> - Try asking the other end to adjust their tx level. <br> - Try adjusting the rx cable equalizer setting and/or rx error criteria. <br> Cross reference <br> - Rx cable equalizer - G3 Switch 07 (PSTN) <br> - Rx error criteria - Communication Switch 02, bits 0 and 1 |
| 0-30 | The other terminal did not reply to NSS(A) in Al short protocol mode | - Check the line connection. <br> - Check the FCU - NCU connectors. <br> - Try adjusting the tx level and/or cable equalizer settings. <br> - The other terminal may not be compatible. <br> Cross reference <br> - Dedicated tx parameters - Section 4 |
| 0-32 | The other terminal sent a DCS, which contained functions that the receiving machine cannot handle. | - Check the protocol dump list. <br> - Ask the other party to contact the manufacturer. |
| 0-52 | Polarity changed during communication | - Check the line connection. Retry communication. |
| 0-70 | The communication mode specified in CM/JM was not available (V. 8 calling and called terminal) | - The other terminal did not have a compatible communication mode (e.g., the other terminal was a V. 34 data modem and not a fax modem.) <br> - A polling tx file was not ready at the other terminal when polling rx was initiated from the calling terminal. |
| 0-74 | The calling terminal fell back to T .30 mode, because it could not detect ANSam after sending Cl . | - The calling terminal could not detect ANSam due to noise, etc. <br> - ANSam was too short to detect. <br> - Check the line connection and condition. <br> - Try making a call to another V.8/V. 34 fax. |
| 0-75 | The called terminal fell back to T .30 mode, because it could not detect a CM in response to ANSam (ANSam timeout). | - The terminal could not detect ANSam. <br> - Check the line connection and condition. <br> - Try receiving a call from another V.8/V. 34 fax. |
| 0-76 | The calling terminal fell back to T .30 mode, because it could not detect a JM in response to a CM (CM timeout). | - The called terminal could not detect a CM due to noise, etc. <br> - Check the line connection and condition. <br> - Try making a call to another V.8/V. 34 fax. |


| Code | Meaning | Suggested Cause/Action |
| :---: | :---: | :---: |
| 0-77 | The called terminal fell back to T .30 mode, because it could not detect a CJ in response to JM (JM timeout). | - The calling terminal could not detect a JM due to noise, etc. <br> - A network that has narrow bandwidth cannot pass JM to the other end. <br> - Check the line connection and condition. <br> - Try receiving a call from another V.8/V. 34 fax. |
| 0-79 | The called terminal detected CI while waiting for a V. 21 signal. | Check for line noise or other line problems. If this error occurs, the called terminal falls back to T. 30 mode. |
| 0-80 | The line was disconnected due to a timeout in V. 34 phase 2 - line probing. | - The guard timer expired while starting these phases. Serious noise, narrow bandwidth, or low signal level can cause these errors. |
| 0-81 | The line was disconnected due to a timeout in V. 34 phase 3 - equalizer training. | If these errors happen at the transmitting terminal: <br> - Try making a call at a later time. <br> - Try using V. 17 or a slower modem using |
| 0-82 | The line was disconnected due to a timeout in the V. 34 phase 4 - control channel start-up. | dedicated tx parameters. <br> - Try increasing the tx level. <br> - Try adjusting the tx cable equalizer setting. |
| 0-83 | The line was disconnected due to a timeout in the V. 34 control channel restart sequence. | - Try adjusting the rx cable equalizer setting. <br> - Try increasing the tx level. <br> - Try using V. 17 or a slower modem if the same error is frequent when receiving from multiple senders. |
| 0-84 | The line was disconnected due to abnormal signaling in V. 34 phase 4 - control channel start-up. | - The signal did not stop within 10 s . <br> - Turn off the machine, then turn it back on. <br> - If the same error is frequent, replace the FCU. |
| 0-85 | The line was disconnected due to abnormal signaling in V. 34 control channel restart. | - The signal did not stop within 10 s . <br> - Turn off the machine, then turn it back on. <br> - If the same error is frequent, replace the FCU. |
| 0-86 | The line was disconnected because the other terminal requested a data rate using MPh that was not available in the currently selected symbol rate. | - The other terminal was incompatible. <br> - Ask the other party to contact the manufacturer. |
| 0-87 | The control channel started after an unsuccessful primary channel. | - The receiving terminal restarted the control channel because data reception in the primary channel was not successful. <br> - This does not result in an error communication. |
| 0-88 | The line was disconnected because PPR was transmitted/received 9 (default) times within the same ECM frame. | - Try using a lower data rate at the start. <br> - Try adjusting the cable equalizer setting. |
| 2-10 | The modem cannot enter tx mode | - Replace the FCU. |
| 2-11 | Only one V. 21 connection flag was received | - Replace the FCU. |


| Code | Meaning | Suggested Cause/Action |
| :---: | :---: | :---: |
| 2-12 | Modem clock irregularity | - Replace the FCU. |
| 2-13 | Modem initialization error | - Turn off the machine, then turn it back on. <br> - Update the modem ROM. <br> - Replace the FCU. |
| 2-20 | Abnormal coding/decoding (cpu not ready) | - Replace the FCU. |
| 2-23 | JBIG compression or reconstruction error | - Turn off the machine, then turn it back on. <br> - Replace the EXFUNC board if the error is frequent. |
| 2-24 | JBIG ASIC error | - Turn off the machine, then turn it back on. <br> - Replace the EXFUNC board if the error is frequent. |
| 2-25 | JBIG data reconstruction error (BIH error) | - JBIG data error <br> - Check the sender's JBIG function. |
| 2-26 | JBIG data reconstruction error (Float marker error) | - Update the MBU ROM. |
| 2-27 | JBIG data reconstruction error (End marker error) |  |
| 2-28 | JBIG data reconstruction error (Timeout) |  |
| 2-50 | The machine resets itself for a fatal FCU system error | - If this is frequent, update the ROM, or replace the FCU. |
| 2-51 | The machine resets itself because of a fatal communication error | - If this is frequent, update the ROM, or replace the FCU. |
| 3-00 | G4 interface board reset | - Replace the G4 interface board or FCU. |
| 3-10 | Disconnection during ISDN G3 communication | - Check the other terminal and the ISDN line. <br> - The other terminal may have dialed a wrong number. |
| 3-11 | Disconnection during ISDN G4 communication | - Check the other terminal and the ISDN line. |
| 3-20 | A CSA signal was received during ISDN G4 communication | - The operator at the other terminal may have interrupted the communication. |
| 3-21 | A CSA signal was sent during ISDN G4 communication, because the Stop key was pressed | - The local operator has interrupted the communication. |
| 3-30 | Mismatched specifications (rx capability) | - Check the receive capabilities requested from the other terminal. |
| 4-01 | Line current was cut | - Check the line connector. <br> - Check the connection between FCU and NCU. <br> - Check for line problems. <br> - Replace the FCU or the NCU. |
| 4-10 | Communication failed because of an ID Code mismatch (Closed Network) or Tel. No./CSI mismatch (Protection against Wrong Connections) | - Get the ID Codes the same and/or the CSIs programmed correctly, then resend. <br> - The machine at the other end may be defective. |


| Code | Meaning | Suggested Cause/Action |
| :---: | :---: | :---: |
| 5-00 | Data construction not possible | - Replace the FCU. |
| 5-01 | Data reconstruction not possible |  |
| 5-10 | DCR timer expired |  |
| 5-20 | Storage impossible because of a lack of memory | - Temporary memory shortage. <br> - Test the SAF memory. <br> - Replace the FCU or optional EXMEM board |
| 5-21 | Memory overflow |  |
| 5-22 | Mode table overflow after the second page of a scanned document | - Wait for the messages which are currently in the memory to be sent or delete some files from memory. |
| 5-23 | Print data error when printing a substitute rx or confidential rx message | - Test the SAF memory. <br> - Ask the other end to resend the message. <br> - Replace the FCU or optional EXMEM board. |
| 5-24 | Memory overflow after the second page of a scanned document | - Try using a lower resolution setting. <br> - Wait for the messages which are currently in the memory to be sent or delete some files from memory. |
| 5-25 | SAF file access error | - Replace the FCU or EXMEM board. |
| 6-00 | G3 ECM - T1 time out during reception of facsimile data | - Try adjusting the rx cable equalizer. <br> - Replace the FCU or NCU. |
| 6-01 | G3 ECM - no V. 21 signal was received |  |
| 6-02 | G3 ECM - EOR was received |  |
| 6-04 | G3 ECM - RTC not detected | - Check the line connection. <br> - Check connections from the NCU to the FCU. <br> - Check for a bad line or defective remote terminal. <br> - Replace the FCU or NCU. |
| 6-05 | G3 ECM - facsimile data frame not received within 18 s of CFR, but there was no line fail | - Check the line connection. <br> - Check connections from the NCU to the FCU. <br> - Check for a bad line or defective remote terminal. <br> - Replace the FCU or NCU. <br> - Try adjusting the rx cable equalizer <br> Cross reference <br> - Rx cable equalizer - G3 Switch 07 (PSTN) |
| 6-06 | G3 ECM - coding/decoding error | - Defective FCU. <br> - The other terminal may be defective. |
| 6-08 | G3 ECM - PIP/PIN received in reply to PPS.NULL | - The other end pressed Stop during communication. <br> - The other terminal may be defective. |
| 6-09 | G3 ECM - ERR received | - Check for a noisy line. <br> - Adjust the tx levels of the communicating machines. <br> - See code 6-05. |


| Code | Meaning | Suggested Cause/Action |
| :---: | :---: | :---: |
| 6-10 | G3 ECM - error frames still received at the other end after all communication attempts at 2400 bps | - Check for line noise. <br> - Adjust the tx level (use NCU parameter 01 or the dedicated tx parameter for that address). <br> - Check the line connection. <br> - Defective remote terminal. |
| 6-21 | V. 21 flag detected during high speed modem communication | - The other terminal may be defective or incompatible. |
| 6-22 | The machine resets the sequence because of an abnormal handshake in the V. 34 control channel | - Check for line noise. <br> - If the same error occurs frequently, replace the FCU. <br> - Defective remote terminal. |
| 6-99 | V. 21 signal not stopped within 6 s | - Replace the FCU. |
| 22-00 | Original length exceeded the maximum scan length | - Divide the original into more than one page. <br> - Check the resolution used for scanning. Lower the scan resolution if possible. <br> - Add optional page memory. |
| 22-01 | Memory overflow while receiving | - Wait for the files in the queue to be sent. <br> - Delete unnecessary files from memory. <br> - Transfer the substitute reception files to an another fax machine, if the machine's printer is busy or out of order. <br> - Add an optional SAF memory card or hard disk. |
| 22-02 | Tx or rx job stalled due to line disconnection at the other end | - The job started normally but did not finish normally; data may or may not have been received fully. <br> - Restart the machine. |
| 22-04 | The machine cannot store received data in the SAF | - Update the ROM <br> - Replace the FCU. |
| 23-00 | Data read timeout during construction | - Restart the machine. <br> - Replace the FCU |
| 25-00 | The machine software resets itself after a fatal transmission error occurred | - Update the ROM <br> - Replace the FCU. |
| F0-xx | V. 34 modem error | - Replace the FCU. |
| F6-8x | SG3-V34 modem error | - Update the SG3-V34 modem ROM. <br> - Replace the SG3-V34 board. <br> - Check for line noise or other line problems. <br> - Try communicating another V.8/V. 34 fax. |

### 2.2 ERROR CODES FOR THE ISDN OPTION

The tables on the following pages show the error codes for the ISDN option.
The meaning of the numbers in the Action column is as follows.

1. Check Layer 1 signaling with a protocol analyzer to determine the cause of the problem. This may require assistance from a G4 specialist.
2. Repeat the communication. If the problem does not repeat itself, the problem was a temporary one caused by the user connecting the machine to another interface. However, if the problem remains, there is a network problem.
3. There is a network problem.
4. If there is a network problem, do the following:

- Check the error bit rate of the network. If it is high, contact the network administrator and ask them to improve the line.
- Check the network speed (is it 56 or 64 kbps ), and make sure that the bit switch setting is correct. You may also use the dedicated transmission parameters if this problem only occurs when dialing certain numbers.
- Check that the user dialed the correct number.

5. There is a network problem, or a problem in the machine at the other end.
6. There is a problem in the machine at the other end; ask a technician to check it.
7. The machine at the other end is not a Group 4 fax terminal.
8. The machine is not compatible with the machine at the other end. A compatibility test is needed.

Error codes related to the errors detected by the FCU are listed in the service manual of the main body.

### 2.2.1 D-CHANNEL LAYER MANAGEMENT

| Code | Probable Cause | Action |
| :---: | :--- | :---: |
| $7-00$ | Link reset | 2 |
| $7-01$ | Link set-up failed because of time-out. | 2 |
| $7-02$ | Link release failed because of time-out. | 2 |
| $7-03$ | Link set-up parameter error | 2 |

### 2.2.2 D-CHANNEL, LAYER 1

| Code | Probable Cause | Action |
| :---: | :--- | :---: |
| $7-10$ | T3 timeout (layer 1 activation error) | 1 |
| $7-11$ | No connection on the S0 interface | 1 |
| $7-12$ | Deactivated | 1 |

### 2.2.3 D-CHANNEL LINK LAYER

| Code | Probable Cause | Action |
| :---: | :--- | :---: |
| $7-20$ | At the start of link set-up, the machine received an unsolicited S (F=1). | 2 |
| $7-21$ | At the start of link set-up, the machine received an unsolicited DM <br> $(F=1)$. | 2 |
| $7-22$ | At TEI release, the machine received an unsolicited UA (F=1). | 2 |
| $7-23$ | At the start of link set-up, the machine received an unsolicited DM <br> (Fo0). | 2 |
| $7-24$ | At TEI release, the machine received an unsolicited UA (F=0). | 2 |
| $7-25$ | SABME received at the start of network link set-up | No error |
| $7-26$ | N200 retransmission error for SABME | 2 |
| $7-27$ | N200 retransmission error for DISC | 2 |
| $7-28$ | N200 retransmission error for situation enquiry (RR) | 2 |
| $7-29$ | N(R) sequence number error | 3 |
| $7-30$ | N(S) sequence number error | 3 |
| $7-31$ | FRMR received | 3 |
| $7-32$ | Non-standard frame received | 3 |
| $7-33$ | Abnormal frame length | 3 |
| $7-34$ | N201 error; information field N in the I frame exceeded N201 | 3 |
| $7-35$ | T201 timeout; timeout while waiting for checking | 3 |
| $7-36$ | T202 timeout; timeout while waiting for ID assignment | 3 |

### 2.2.4 D-CHANNEL NETWORK LAYER

| Code | Probable Cause | Action |
| :---: | :--- | :---: |
| $7-40$ | Insufficient mandatory information elements | 3 |
| $7-41$ | Abnormal LI for a mandatory information element | 3 |
| $7-42$ | T301 timeout; timeout while waiting for R:CONN | 3 |
| $7-43$ | T303 timeout; timeout while waiting for R: CALL-PROC etc. | 3 |
| $7-44$ | T304 timeout; timeout while waiting for R: CALL-PROC etc. | 3 |
| $7-45$ | T305 timeout; timeout while waiting for R:REL | 3 |
| $7-46$ | T308 timeout; timeout while waiting for R:REL-COMP | 3 |
| $7-47$ | T310 timeout; timeout while waiting for R: ALERT etc. | 3 |
| $7-48$ | T313 timeout; timeout while waiting for R:CONN-ACK | 3 |
| $7-49$ | Internal error | 3 |
| $7-51$ | Release call reference during communication | 3 |

### 2.2.5 B-CHANNEL LINK LAYER

| Code | Probable Cause | Action |
| :---: | :--- | :---: |
| $7-60$ | T3 timeout; timeout while waiting for flag | 4 |
| $7-61$ | T3 timeout; timeout while waiting for SABM during an incoming call | 4 |
| $7-62$ | T1 timeout x N2; timeout while waiting for UA after sending SABM | 5 |
| $7-63$ | T1 timeout x N2; timeout while waiting for a response to a transmitted <br> S frame (P=1) | 5 |
| $7-64$ | T1 timeout x N2; timeout while waiting for SABM or DISC after sending <br> FRMR | 5 |
| $7-65$ | T1 timeout x N2; timeout while waiting for a response to DISC | 5 |
| $7-66$ | RNR x N2 (other end busy, RCB counter error) | 5 |
| $7-67$ | Invalid (Ad) frame received | 5 |
| $7-68$ | Invalid short frame received | 5 |
| $7-69$ | Link reset error | 5 |
| $7-70$ | FRMR received | 5 |
| $7-71$ | Non-standard (Cn) frame received | 5 |
| $7-72$ | An S or U frame having an information field was received | 5 |
| $7-73$ | A frame longer than the maximum N1 length was received | 5 |
| $7-74$ | An S or I frame having an N(R) error was received | 5 |
| $7-75$ | CRC error | 3 |

## ERROR CODES FOR THE ISDN OPTION

### 2.2.6 B-CHANNEL NETWORK LAYER

| Code | Probable Cause | Action |
| :---: | :--- | :---: |
| $7-80$ | A packet having an abnormal GFI was received | 6 |
| $7-81$ | A packet was received that had a logical channel number different <br> from the logical channel being used for the communication | 6 |
| $7-82$ | A packet containing a format error was received | 6 |
| $7-83$ | A packet containing an LI error was received | 7 |
| $7-84$ | A CN packet was received that had a PID different from 02 | 7 |
| $7-85$ | Unsupported packet type received | 7 |
| $7-86$ | Abnormal or unsupported facility received | 7 |
| $7-87$ | P(s) sequence number error | 6 |
| $7-88$ | P(r) sequence number error | 6 |
| $7-89$ | A reset using S:RQ or R:RI occurred | 6 |
| $7-90$ | A restart using S:RQ or R:SI occurred | 6 |
| $7-91$ | Call set-up error; in reply to S:CR, R:CI was received to indicate <br> rejection of the call | 6 |
| $7-92$ | T20 timeout; timeout while waiting for an SF packet | 6 |
| $7-93$ | T21 timeout; timeout while waiting for a CC packet | 6 |
| $7-94$ | T22 timeout; timeout while waiting for an RF packet | 6 |
| $7-95$ | T23 timeout; timeout while waiting for a CF packet | 6 |
| $7-96$ | T10 timeout; timeout while waiting for the first frame | 6 |

### 2.2.7 TRANSPORT LAYER

| Code | Probable Cause | Action |
| :---: | :--- | :---: |
| $8-00$ | Invalid block received | 8 |
| $8-01$ | TCC block received | 8 |
| $8-02$ | TBR block received | 8 |
| $8-05$ | TCR block; block format error | 8 |
| $8-06$ | TCR block; block size parameter LI error | 8 |
| $8-07$ | TCR block; extended addressing LI error | 8 |
| $8-08$ | TCR block; block size length error | 8 |
| $8-10$ | TCA block; block format error | 8 |
| $8-11$ | TCA block; Tx origin reference data in TCR disagreed with the address <br> reference data in TCA | 8 |
| $8-12$ | TCA block; octet 7 did not equal 0 | 8 |
| $8-13$ | TCA block; extended addressing LI error | 8 |
| $8-14$ | TCA block; block size exceeded that set by TCR | 8 |
| $8-15$ | TCA block; block size parameter LI error | 8 |
| $8-20$ | TDT block; block format error | 8 |
| $8-21$ | TDT block; octet 3 did not equal either 00 or 80(H) | 8 |
| $8-22$ | TDT block; the end indicator was "Continue" even though there was no <br> field data | 8 |
| $8-23$ | TDT block; an end block with no field data was received after an end <br> indicator of "End" | 8 |
| $8-26$ | Timeout during state 0.2 | 8 |
| $8-27$ | Timeout during state 1.1 | 8 |
| $8-28$ | Timeout during state 0.3 | 8 |

### 2.2.8 SESSION LAYER

| Code | Probable Cause | Action |
| :---: | :--- | :---: |
| $8-30$ | Invalid frame received | 8 |
| $8-31$ | RSSN received | 8 |
| $8-32$ | CSA received | 8 |
| $8-34$ | Calling terminal identification error in CSS | 8 |
| $8-35$ | Date and time error in CSS | 8 |
| $8-36$ | Window size error in CSS | 8 |
| $8-37$ | Service identification error in CSS | 8 |
| $8-38$ | Session user data error in CSS | 8 |
| $8-39$ | CSS rejected (new session rejected) | 8 |
| $8-40$ | Called terminal identification error in RSSP | 8 |
| $8-41$ | Date and time error in RSSP | 8 |
| $8-42$ | Date and time in RSSP was not the same as that in CSS | 8 |
| $8-43$ | Window size error in RSSP | 8 |
| $8-44$ | Service identification error in RSSP | 8 |
| $8-45$ | Session user data error in RSSP | 8 |
| $8-47$ | Message synchronization error inside the CCU | 8 |
| $8-48$ | Document task busy | 8 |
| $8-50$ | Ti timeout; non-communication surveillance timer (T.62) | 8 |
| $8-51$ | T2 timeout; timeout while waiting for a response (T.62) | 8 |
| $8-52$ | T3 timeout; CSA timer timeout (T.62) | 8 |
| $8-53$ | G4 board load timer timeout; calling side waited too long for a new <br> session | 8 |
| $8-54$ | G4 board load timer timeout; calling side waited too long for transport <br> probability | 8 |
| $8-55$ | G4 board load timer timeout; called side waited too long for S:RSSP | 8 |
| $8-56$ | G4 board load timer timeout; document transmission surveillance timer <br> timeout | 8 |
| $8-57$ | G4 board load timer timeout; timeout while waiting for a user abort <br> request after a provider fail | 8 |

### 2.2.9 DOCUMENT LAYER

| Code | Probable Cause | Action |
| :---: | :--- | :---: |
| $8-60$ | T. 62 coding format error (LI error) | 8 |
| $8-61$ | A mandatory PI was absent, or the LI for a mandatory PI was 0 | 8 |
| $8-62$ | Calling/called terminal identification LI was different from that specified <br> by F.184 (LI = 24) | 8 |
| $8-63$ | The LI for session user data exceeded the maximum value (512) | 8 |
| $8-64$ | The LI for CDUI was not 0 | 8 |
| $8-65$ | Checkpoint and document reference numbers LI error, or they were <br> not in T.61 (ASCII) coding | 8 |
| $8-66$ | The checkpoint reference number differed from the expected value | 8 |
| $8-70$ | RDGR received | 8 |
| $8-71$ | A non-standard PDU was received while in calling mode | 8 |
| $8-72$ | A non-standard PDU was received while in called mode | 8 |
| $8-73$ | Abnormal PDU received while in calling state ds1 | 8 |
| $8-74$ | 15 consecutive CDCL signals received | 8 |
| $8-75$ | Session window size control error (size not equal to 0) | 8 |
| $8-76$ | Internal error | 8 |

### 2.2.10 PRESENTATION LAYER

| Code | Probable Cause | Action |
| :---: | :--- | :---: |
| $8-80$ | X.209 coding error in session user data (LI error) | 8 |
| $8-81$ | PV error in session user data | 8 |
| $8-82$ | PI error in session user data | 8 |
| $8-83$ | The capabilities in the session user data of CDS/CDC were not the <br> same as those in RDCLP | 8 |
| $8-84$ | X.209 coding error in the DP (LI error) | 8 |
| $8-85$ | X.209 coding error in the SLD (document descriptor/page descriptor) <br> (LI error) | 8 |
| $8-86$ | SLD object type absent | 8 |
| $8-87$ | PI error in the SLD (document descriptor/page descriptor) | 8 |
| $8-88$ | The capabilities in the SLD (document descriptor/page descriptor) are <br> duplicated or are not the same as those in RDCLP | 8 |
| $8-89$ | No document descriptor at the start of the document | 8 |
| $8-90$ | No page descriptor at the start of the page | 8 |
| $8-91$ | Page descriptor PV error | 8 |
| $8-92$ | X.209 coding error in the TU (LI error) | 8 |
| $8-93$ | The TU was absent | 8 |
| $8-94$ | PV error in the TU | 8 |
| $8-95$ | TI error | 8 |
| $8-96$ | X.209 coding nest level >> 8, or an LI form error | 8 |
| $8-97$ | CDPB/CDE received while TU/TI not yet completed, or an unexpected <br> PDU was received while analyzing an SLD | 8 |

### 2.3 FAX SC CODES

### 2.3.1 OVERVIEW

When the FCU detects a Fax SC Code condition other than SC1201 and SC1207, it resets itself automatically (default setting). This initializes the FCU without erasing files in the SAF memory or resetting the switches.
NOTE: For details on Fax SC Codes 1201 and 1207, refer to the following sections.
If bit 7 of System Switch $1 F$ is changed to " 1 ", when the FCU detects a Fax SC Code condition, it displays the code on the display and stops working until the fax unit is initialized using one of the following methods:

- Hold down the " 7 " and " 9 " keys for more than 10 s .
- Turn off the main power switch and turn it back on.


### 2.3.2 SC1201

When the FCU detects an unrecoverable error in the SRAM, which requires a complete SRAM initialization, the fax unit displays this SC Code and stops. There is no way to recover from this error condition without a complete SRAM initialization (all the user and service programmed data will be erased).

The possible causes are:

- SRAM backup battery defect, or SW1 on the MBU is at the "OFF" position
- SRAM on the MBU has a physical defect
- Flash memory card connection was loose


### 2.3.3 SC1207

This is the same as SC1201 except the error location is the SRAM on the Fax Function Upgrade board.
The possible causes are:

- SRAM backup battery defect, or SW1 on the Fax Function Upgrade board is at the "OFF" position.
- SRAM on the Fax Function Upgrade board has a physical defect.
- The Fax Function Upgrade board connection was loose.

FAX SC CODES

### 2.3.4 FAX SC CODE TABLE

| SC Code | Description | Suggested Action | Sys Switch <br> 1F bit $7=0$ | Sys Switch <br> 1F bit $7=1$ |
| :---: | :---: | :---: | :---: | :---: |
| 1101 | FCU error | Initialize the fax unit. (See section 2.3.1.for the initialization procedure) | Automatic reset | SC Code display |
| 1201 | Unrecoverable FCU SRAM error | Refer to section 2.3.2. | $\begin{gathered} \text { "Service Call" } \\ \text { display } \end{gathered}$ |  |
| 1207 | Unrecoverable Fax Function Upgrade SRAM error | Refer to section 2.3.3. | "Service Call" display |  |
| 1299 | Software error | Initialize the fax unit. | Automatic reset |  |
| 1305 |  |  |  |  |
| 1310 |  |  |  |  |
| 1312 |  |  |  |  |
| 1401 |  |  |  |  |
| 1405 |  |  |  |  |

### 2.4 ISDN TEST FUNCTION

### 2.4.1 LEDS

There are four LEDs on the G4 board. These LEDs show the status of the machine.

\section*{| LED 1 | LED 2 | LED 3 | LED 4 |
| :--- | :--- | :--- | :--- |}

## Initial Settings

Initial check (if the flash ROM is updated)
Handshaking with the FCU ready

## Standby Mode

Ready to communicate
O=ON, --=OFF

| O | O | O | O |
| :--- | :--- | :--- | :--- |


| O | O | -- | -- |
| :--- | :--- | :--- | :--- |

## Communication

Layer 1 activated
Link setup
B channel 1 connected
B channel 2 connected
$\square$
$\square$

| -- | O | O | O |
| :--- | :--- | :--- | :--- |



| O | -- | O | O |
| :--- | :--- | :--- | :--- |

### 2.4.2 BACK-TO-BACK TEST

To make a back-to-back test, you need:

- Two machines, one with the CiG4 board (G4 board used in the FX4, FR4, Adam, NAD, Stinger, and Russian) and the other with the SiG4 board (G4 board used with the Schmidt 3, S4, J-CF, and Kaiser 1).
- Cross rosette

NOTE: You cannot make a back-to-back test using two SiG4 machines.

The procedure is as follows.

1. Switch off the machines
2. Connect two machines back-to-back using a cross rosette as follows.

3. Make the following bit switch adjustments:

- In the machine acting in NT mode (CiG4 board), set bits 0 and 1 of G4 parameter switch OD to 1.
- In the machine acting in TE mode (SiG4 board) set bit 0 of G4 parameter switch 0 D to 0 and bit 1 to 1 .

4. Reset the machines by switching them off, waiting a few seconds, then switching back on.
5. Place a document in one of the machines, dial a number, then press Start.
6. After you have finished the test, set bits 0 and 1 of G4 parameter switch 0D back to 0 , then reset the machine.
NOTE: The following cannot be tested using this procedure:

- ISDN G3 communication
- Point to Multi (Like a broadcasting test, from one point to many places.)


## 3. SERVICE TABLES

> $\triangle$ CAUTION
> Never turn off the main power switch when the power LED is lit or flashing. To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

NOTE: The main power LED lights or flashes while the platen cover or ARDF is open, while the main machine is communicating with a facsimile machine or the network server, or while the machine is accessing the hard disk or memory for reading or writing data.

### 3.1 SERVICE PROGRAM MODE

### 3.1.1 SERVICE PROGRAM MODE OPERATION

The service program (SP) mode is used to check electrical data, change modes, and adjust values.

## Entering and Exiting SP mode

人 1. Press the Clear Mode key.
2. Use the keypad to enter "107".
3. Hold down Clear/Stop for at least 3 seconds.

Fax SP 4. On the touch-panel, press Fax SP.
Exit 5. Press Exit twice to return to the copy window.

## SP Mode Button Summary

Here is a short summary of the touch-panel buttons.

(1) Opens all SP groups and sublevels.
(2) Closes all open groups and sublevels and restores the initial SP mode display.
(3) Not used for the Fax SP mode.
(4) Enter the SP mode directly with the number keys if you know the SP number and then press $\#$. (SP Mode must be highlighted before you can enter the number. Just press SP Mode if it is not highlighted.)
(5) Press twice to leave the SP mode return to the copy window to resume normal operation.
(6) Press any Group number to open a list of SP modes and titles for that group. For example, to open the SP mode list for SP1-nnn, press Group1. If an SP has sublevels, click the appropriate button to expand the list.
(7) Press to scroll the display to the previous or next group.
(8) Press to scroll to the previous or next display in segments the size of the screen display (page).
(9) Press to scroll the display to the previous or next line, line by line.
(10) Press to move to the highlight to the previous or next selection in the list on the left.

## Switching Between SP Mode and Copy Mode for Test Printing

1) In the SP mode, select the test print and then press Copy Window.
2) Use the copy window (copier mode), to select the appropriate settings (paper size, etc.) for the test print.
3) Press Start (©) to execute the test print.
4) Press SP Mode (highlighted) to return to the SP mode screen and repeat from step 1.

## Selecting the Program Number

Program numbers have two or three levels.

1. Before you begin, refer to the Service Tables to find the SP that you want to adjust. (-3.1.2)
2. Click the Group number on the left side SP Mode window that contains the SP that you want to adjust.
3. Use the scrolling buttons in the center of the SP mode window to display the SP number that you want to open, then press that number to expand the list.
4. Use the center touch-panel buttons to scroll to the number and title of the item that you want to set and press. The small entry box on the right is activated and displays the default or the current setting below.


Refer to the Service Tables for the range of allowed settings. (-3.1.2)

1. To enter a setting:

- Press $\odot^{*}$ to toggle between plus and minus, then use the keypad to enter the appropriate number. The number you enter writes over the previous setting.
- Press $\#$ to enter the setting. (If you enter a number that is out of range, the key press is ignored.)
- When you are prompted to complete the selection, press Yes.

2. When you are finished, press Exit twice to return to the copy window.

### 3.1.2 SERVICE PROGRAM MODE TABLES

SP1-XXX (Bit Switches) Section 3.2 Bit Switches

| 1 | Mode No. |  | Function |
| :---: | :---: | :---: | :---: |
| 101 | System Switch |  |  |
|  | 001-032 | 00-1F | Change the bit switches for system settings for the fax option <br> - Section 3.2 Bit Switches |
| 102 | Scanner Switch |  |  |
|  | 001-016 | 00-0F | Change the bit switches for scanner settings for the fax option <br> - Section 3.2 Bit Switches |
| 103 | Printer Switch |  |  |
|  | 001-016 | $00-0 \mathrm{~F}$ | Change the bit switches for printer settings for the fax option <br> - Section 3.2 Bit Switches |
| 104 | Communication Switch |  |  |
|  | 001-032 | 00-1F | Change the bit switches for communication settings for the fax option <br> - Section 3.2 Bit Switches |
| 105 | G3-1 Switch |  |  |
|  | 001-016 | 00-0F | Change the bit switches for the protocol settings of the standard G3 board Section 3.2 Bit Switches |
| 106 | G3-2 Switch |  |  |
|  | 001-016 | 00-0F | Change the bit switches for the protocol settings of the optional extra G3 board <br> - Section 3.2 Bit Switches |
| 108 | G4 Internal Switch |  |  |
|  | 001-032 | 00-1F | Change the bit switches for the optional ISDN <br> Section 3.2 Bit Switches |
| 109 | G4 Parameter Switch |  |  |
|  | 001-016 | 00-0F | Change the bit switches for the optional ISDN <br> - Section 3.2 Bit Switches |

## SP2-XXX (RAM Data)

| 2 | Mode No. |  | Function |
| :---: | :---: | :---: | :---: |
| 101 | RAM Read/Write |  |  |
|  | 001 |  | Change RAM data for the fax board directly. <br> - Section 3.5 Service RAM Addresses |
| 102 | Memory Dump |  |  |
|  | 001 | G3-1 Memory Dump | Print out RAM data for the fax board. Section 3.5 Service RAM Addresses |
|  | 002 | G3-2 Memory Dump | Print out RAM data for the optional extra G3 board. |
|  | 004 | G4 Memory Dump | Print out RAM data for the SiG4 board. |


| 2 | Mode No. |  | Function |
| :---: | :---: | :---: | :---: |
| 103 | G3-1 NCU Parameters |  |  |
|  | 001-023 | CC, 01-22 | NCU parameter settings for the standard G3 board. Section 3.3 NCU Parameters |
| 104 | G3-2 NCU Parameters |  |  |
|  | 001-023 | CC, 01-22 | NCU parameter settings for the optional G3 board. Section 3.3 NCU Parameters |

## SP3-XXX (Tel Line Settings)

| 3 | Mode No. |  | Function |
| :---: | :---: | :---: | :---: |
| 101 | Service Station |  |  |
|  | 001 | Fax Number | Enter the fax number of the service station. |
|  | 002 | Select Line | Select the line type. |
| 102 | Serial Number |  |  |
|  | 000 |  | Enter the fax unit's serial number. |
| 103 | PSTN-1 Port Settings |  |  |
|  | 001 | Select Line | Select the line type setting for the G3-1 line. If the machine is installed on a PABX line, select "PABX", "PABX(GND)" or "PABX(FLASH)". |
|  | 002 | PSTN Access Number | Enter the PSTN access number for the G3-1 line. |
|  | 003 | Memory Lock Disabled | If the customer does not want to receive transmissions using Memory Lock on this line, turn this SP on. |
|  | 004 | Transmission Disabled | If you turn this SP on, the machine does not send any fax messages on the G3-1 line. |
| 104 | PSTN-2 Port Settings |  |  |
|  | 001 | Select Line | Select the line setting for the G3-2 (optional extra G3) line. If the machine is installed on a PABX line, select "PABX", "PABX(GND)" or "PABX(FLASH)". |
|  | 002 | PSTN Access Number | Enter the PSTN access number for the G32 line. |
|  | 003 | Memory Lock Disabled | If the customer does not want to receive transmissions using Memory Lock on this line, change this SP to on. |
|  | 004 | Transmission Disabled | If you turn this SP on, the machine does not send any fax messages on the G3-2 line. |
| 106 | ISDN Port Settings |  |  |
|  | 001 | Select Line | Select the line setting for the ISDN line. If the machine is installed on a PABX line, select "PABX". |
|  | 002 | PSTN Access Number | Enter the PSTN access number for ISDN line. |
|  | 003 | Memory Lock Disabled | If the customer does not want to receive transmissions using Memory Lock on this line, change this SP to on |
|  | 004 | Transmission Disabled | If you turn this SP on, the machine does not send any fax messages on the ISDN line. |

SP4-XXX (ROM Versions)

| $\mathbf{4}$ | Mode No. |  | Function |
| :---: | :--- | :--- | :--- |
| 101 | 001 | FCU ROM Version | Displays the FCU ROM version. |
| 102 | 001 | Error Codes | Displays the latest 64 fax error codes. |
| 103 | 001 | G3-1 ROM Version | Displays the G3-1 modem version. |
| 104 | 001 | G3-2 ROM Version | Displays the G3-2 modem version. |
| 106 | 001 | G4 ROM Version | Displays the G4 (ISDN) ROM version. |
| 107 | 001 | Charge ROM Version | Not used. |

SP5-XXX (Initializing)

| 5 | Mode No. |  | Function |
| :---: | :---: | :---: | :---: |
| 101 | Initialize SRAM |  |  |
|  | 000 |  | Initializes the bit switches and user parameters, user data in the SRAM, files in the SAF memory, and clock. |
| 102 | Erase All Files |  |  |
|  | 000 |  | Erases all files stored in the SAF memory. |
| 103 | Reset Bit Switches |  |  |
|  | 000 |  | Resets the bit switches and user parameters. |
| 104 | Factory setting |  |  |
|  | 000 |  | Resets the bit switches and user parameters, user data in the SRAM and files in the SAF memory. |
| 105 | Delete All Speed Dials |  |  |
|  | 001 | Speed Dials Enabled | 200 speed dials and 1000 quick dials are available when the Fax Function Upgrade Unit is installed. |
|  | 002 | Speed Dials Disabled | 1200 quick dials (but no speed dials) are available when the Fax Function Upgrade Unit is installed. |

## SP6-XXX (Reports)

| $6 \mathbf{6}$ | Mode No. |  | Function |  |
| :---: | :---: | :--- | :--- | :---: |
| 101 | System Parameter List |  | Touch the "ON" button to print the system <br> parameter list. |  |
|  | 000 |  |  |  |
| 102 | Service Monitor Report |  | Touch the "ON" button to print the service <br> monitor report. |  |
|  | 000 |  | Prints the protocol dump list of all <br> communications for all G3 lines. |  |
| 103 | G3 Protocol Dump List | Prints the protocol dump list of all <br> communications for the G3-1 line. |  |  |
|  | 001 | G3 All <br> Communications |  |  |
|  | 002 | G3-1 (All <br> Communications) |  |  |


| 6 | Mode No. |  | Function |
| :---: | :---: | :---: | :---: |
| 103 | 003 | $\begin{aligned} & \hline \text { G3-1 (1 } \\ & \text { Communication) } \end{aligned}$ | Prints the protocol dump list of the last communication for the G3-1 line. |
|  | 004 | $\begin{aligned} & \text { G3-2 (All } \\ & \text { Communications) } \end{aligned}$ | Prints the protocol dump list of all communications for the G3-2 line. |
|  | 005 | $\begin{aligned} & \text { G3-2 (1 } \\ & \text { Communication) } \end{aligned}$ | Prints the protocol dump list of the last communication for the G3-2 line. |
| 104 | G4 Protocol Dump List |  |  |
|  | 001 | Dch + Bch 1 | Prints the protocol dump lists for the G4 line. |
|  | 002 | Dch |  |
|  | 003 | Bch 1 Link Layer |  |
|  | 004 | Dch Link Layer |  |
|  | 005 | Dch +Bch 2 |  |
|  | 006 | Bch 2 Link Layer |  |
| 105 | All Files print out |  |  |
|  | 000 |  | Prints out all the user files in the SAF memory, including confidential messages. <br> NOTE: Do not use this function, unless the customer is having trouble printing confidential messages or recovering files stored using the memory lock feature. |
| 106 | Journal Print out |  |  |
|  | 001 | All Journals | The machine prints all the communication records on the report. |
|  | 002 | Specified Date | The machine prints all communication records after the specified date. |
| 107 | Log List Print out |  |  |
|  | 001 | All log files | These log print out functions are for designer use only. |
|  | 002 | Printer |  |
|  | 003 | SC/TRAP Stored |  |
|  | 004 | Decompression |  |
|  | 005 | Scanner |  |
|  | 006 | JOB/SAF |  |
|  | 007 | Reconstruction |  |
|  | 008 | JBIG |  |
|  | 009 | FAX Driver |  |
|  | 010 | G3CCU |  |
|  | 011 | FAX Job |  |
|  | 012 | CCU |  |
|  | 013 | Scanner Condition |  |
| 107 | 011 | JBIG | These log print out functions are for designer use only. |
|  | 012 | Fax Driver |  |
|  | 013 | G3CCU |  |
|  | 014 | Fax Job |  |

## SP7-XXX (Test Modes)

These are test modes for PTT approval.

| 7 | Function |
| :---: | :--- |
| 101 | G3-1 Modem Tests |
| 102 | G3-1 DTMF Tests |
| 103 | Ringer Test |
| 104 | G3-1 V34 (S2400baud) |
| 105 | G3-1 V34 (S2800baud) |
| 106 | G3-1 V34 (S3000baud) |
| 107 | G3-1 V34 (S3200baud) |
| 108 | G3-1 V34 (S3429baud) |
| 109 | Recorded Message Test |
| 110 | G3-2 Modem Tests |
| 111 | G3-2 DTMF Tests |
| 112 | G3-2 V34 (S2400baud) |
| 113 | G3-2 V34 (S2800baud) |
| 114 | G3-2 V34 (S3000baud) |
| 115 | G3-2 V34 (S3200baud) |
| 116 | G3-2 V34 (S3429baud) |
| 124 | IG3-1 Modem Tests |
| 125 | IG3-1 DTMF Tests |
| 126 | IG3-1 V34 (S2400baud) |
| 127 | IG3-1 V34 (S2800baud) |
| 128 | IG3-1 V34 (S3000baud) |
| 129 | IG3-1 V34 (S3200baud) |
| 130 | IG3-1 V34 (S3429baud) |
| 131 | IG3-2 Modem Tests |
| 132 | IG3-2 DTMF Tests |
| 133 | IG3-2 V34 (S2400baud) |
| 134 | IG3-2 V34 (S2800baud) |
| 135 | IG3-2 V34 (S3000baud) |
| 136 | IG3-2 V34 (S3200baud) |
| 137 | IG3-2 V34 (S3429baud) |

### 3.2 BIT SWITCHES

## WARNING <br> Do not adjust a bit switch or use a setting that is described as "Not used", as this may cause the machine to malfunction or to operate in a manner that is not accepted by local regulations. Such bits are for use only in other areas, such as Japan.

NOTE: Default settings for bit switches are not listed in this manual. Refer to the System Parameter List printed by the machine.

### 3.2.1 SYSTEM SWITCHES

| System Switch 00 SP No. 1-101-001 |  |  |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Dedicated transmission parameter programming 0 : Disabled 1: Enabled | Set this bit to 1 before changing any dedicated transmission parameters. <br> Reset this bit to 0 after programming dedicated transmission parameters. |
| 1 | Confidential RX message print out without the password. <br> 0 : Disabled 1: Enabled | 1: Confidential RX messages can be printed out without the password. Use this bit if the customer forgot the password for the confidential messages. Reset this bit to 0 after printing confidential RX messages. |
| 2 | Technical data printout on the Journal <br> 0 : Disabled <br> 1: Enabled | 1: Instead of the personal name, the following data are listed on the Journal for each G3 communication. |
|  | e.g. $0000 \quad 32 \mathrm{~V} 34 \quad$ 288/264 $\quad$ L0100 0304 <br> (1) (2)(3) (4) (5) (6) (7) (8) <br> (1): EQM value (Line quality data). A larger number means more errors. <br> (2): Symbol rate (V. 34 only) <br> (3): Final modem type used <br> (4): Starting data rate (for example, 288 means 28.8 kbps ) <br> (5): Final data rate <br> (6): Rx revel (refer to the note after this table for how to read the $r x$ level) <br> (7): Total number of error lines that occurred during non-ECM reception. <br> (8): Total number of burst error lines that occurred during non-ECM reception. <br> Note: <br> EQM and $r x$ level are fixed at "FFFF" in tx mode. <br> The seventh and eighth numbers are fixed at " 00 " for transmission records and ECM reception records. |  |

## BIT SWITCHES

| System Switch 00 SP No. 1 |  | -001 COMMENTS |
| :---: | :---: | :---: |
| No | FUNCTION |  |
| 2 | Rx level calculation <br> Example: 000032 V34 288/2 <br> The four-digit hexadecimal value The high byte is given first, foll 16 to get the rx level. <br> In the above example, the dec So, the actual $r x$ level is 256/-1 | $\text { L } \underline{01} \underline{00} 0304$ <br> $(\mathrm{N})$ after " L " indicates the rx level. ed by the low byte. Divide the decimal value of N by - <br> alue of $N(=0100[H])$ is 256. $=-16 \mathrm{~dB}$ |
| 3-4 | Not used | Do not change the settings. |
| 5 | G3/G4 communication parameter display 0: Disabled <br> 1: Enabled | This is a fault-finding aid. The LCD shows the key parameters (see below). This is normally disabled because it cancels the CSI display for the user. Be sure to reset this bit to 0 after testing. |
| 6 | ```Protocol dump list output after each communication 0 : Off 1: On``` | This is only used for communication troubleshooting. It shows the content of the transmitted facsimile protocol signals. Always reset this bit to 0 after finishing testing. If system switch 09 bit 6 is at " 1 ", the list is only printed if there was an error during the communication. |
| 7 | Not used | Do not change the setting. |

G3 Communication Parameters

| Modem rate | 336: 33600 bps $168: 16800 \mathrm{bps}$ <br> 312: 31200 bps 144: 14400 bps <br> 288: 28800 bps $120: 12000 \mathrm{bps}$ <br> 264: 26400 bps $96: 9600 \mathrm{bps}$ <br> 240: 24000 bps $72: 7200 \mathrm{bps}$ <br> 216: 21600 bps $48: 4800 \mathrm{bps}$ <br> 192: 19200 bps $24: 2400 \mathrm{bps}$ |
| :---: | :---: |
| Resolution | S: Standard ( $8 \times 3.85$ dots $/ \mathrm{mm}$ ) <br> D: Detail ( $8 \times 7.7$ dots $/ \mathrm{mm}$ ) <br> F: Fine ( $8 \times 15.4$ dots $/ \mathrm{mm}$ ) <br> SF: Superfine ( $16 \times 15.4$ dots $/ \mathrm{mm}$ ) <br> 21: Standard ( $200 \times 100 \mathrm{dpi}$ ) <br> 22: Detail ( $200 \times 200 \mathrm{dpi}$ ) <br> 44: Superfine ( $400 \times 400 \mathrm{dpi}$ ) |
| Compression mode | MMR: MMR compression <br> MR: MR compression <br> MH: MH compression <br> JBO: JBIG compression (Optional mode) <br> JBB: JBIG compression (Basic mode) |
| Communication mode | ECM: With ECM NML: With no ECM |
| Width and reduction | A4: A4 (8.3"), no reduction B4: B4 (10.1"), no reduction A3: A3 (11.7"), no reduction |


| I/O rate | $0: 0 \mathrm{~ms} /$ line | $10: 10 \mathrm{~ms} / \mathrm{line}$ |
| :--- | :--- | :--- |
|  | $25: 2.5 \mathrm{~ms} / \mathrm{line}$ | $20: 20 \mathrm{~ms} / \mathrm{line}$ |
|  | 5:5 ms/line | $40: 40 \mathrm{~ms} / \mathrm{line}$ |
|  | Note: |  |
|  | "40" is displayed while receiving a fax message using Al short |  |
|  | protocol. |  |

G4 Communication Parameters

| Compression mode | MMR: MMR compression MR: MR compression <br> MH: MH compression |
| :---: | :---: |
| Resolution | 21: Standard ( $200 \times 100$ dpi) <br> 22: Detail ( $200 \times 200 \mathrm{dpi}$ ) <br> 44: Superfine ( $400 \times 400$ dpi) |
| Width and reduction | A4: A4 (8.3"), no reduction B4: B4 (10.1"), no reduction A3: A3 (11.7"), no reduction |
| Transfer | T: Transfer <br> - : Other |
| Confidential | C: Confidential <br> - : Other |
| Other parameters | The following information is shown in 6-bit format. Bit 1 is the first bit from the left, and bit 6 is at the right end. <br> Bit 1 -Smoothing 0: Off, 1: On (Smoothing is disabled in halftone mode.) <br> Bit 2-CIL printing 0: On, 1: Off <br> Bit 3 - Not used <br> Bit 4 - mm/inch conversion 0: Off, 1: On <br> Bit 5 - Engine type $0: \mathrm{mm}$, 1 : inches <br> Bit 6 - Document resolution unit 0 : mm, 1 : inches |

System Switch 01 - Not used (Do not change the factory settings.)

| System Switch 02 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-101-003 |
| $0 \mathbf{0 - 3}$ | Not used | Do not change the settings. |
| $\mathbf{4}$ | File retention time <br> 0: Depends on User Parameter <br> 24 [18(H)] <br> 1: No limit | 1: A file that had a communication error will not be <br> erased unless the communication is successful. |
| $\mathbf{5}$ | Not used | Do not change the settings. |



| System Switch 03 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-101-004 |
| $\mathbf{0}$ | Length of time that RDS is | $00-99$ hours (BCD). |
| to | temporarily switched on when |  |
| $\mathbf{7}$ | bits 6 and 7 of System Switch |  |
|  | 02 are set to "User selectable" | This setting is only valid if bits 6 and 7 of System <br> Switch 02 are set to "User selectable". <br> The default setting is 24 hours. |


| System Switch 04 |  |  |
| :--- | :--- | :--- |
| No | FUNCTION | COMMENTS |$|$| $\mathbf{0 - 2}$ | Not used 1-101-005 | Do not change the settings. |
| :--- | :--- | :--- |
| $\mathbf{3}$ | Printing dedicated tx <br> parameters on Quick/Speed <br> Dial Lists <br> 0: Disabled <br> 1: Enabled | 1: Each Quick/Speed dial number on the list is <br> printed with the dedicated tx parameters (10 <br> bytes each). <br> The first 10 bytes of data are the programmed <br> dedicated tx parameters; 34 bytes of data are <br> printed (the other 24 bytes have no use for service <br> technicians). |
| $\mathbf{4}$ | Not used | Do not change the setting. |


| System Switch 04 |  | SP No. 1-101-005 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 5 | Memory file transfer operation <br> 0: User level <br> 1: Service level | If the machine is unable to print fax messages due to a mechanical problem, change this bit to 0 to transfer all messages in the memory (including confidential rx messages) to an another terminal. Always reset this bit to 1 after transfer. However, this bit can be left at 0 , if the customer's keyoperators want to transfer the files themselves. This machine does not support the confidential rx. <br> Procedure <br> 1. Enter service mode and change this bit to 0 . <br> 2. Exit the service mode. <br> 3. Enter the key-operator mode, and select 'Keyoperator settings'. <br> 4. Choose ' 03 ' and specify a destination for the machine to transfer all the files to. <br> 5. Press 'Start'. <br> 6. After the machine transfers the memory files, enter the service mode and reset this bit to 1. Otherwise, anybody who knows how to enter the key-operator mode can transfer confidential messages. |
| 6 | G3 CSI/G4 Terminal ID programming level <br> 0 : User level <br> 1: Service level | 1: The CSI and Terminal ID can only be programmed by a technician (in the user tools). The Terminal ID can only be programmed if a Group 4 option is installed. <br> This machine does not have a Group 4 option. |
| 7 | Telephone line type programming mode <br> 0 : User level <br> 1: Service level | 1: Telephone line type selection (choosing tone dial or pulse dial) can only be programmed by a technician (in the user tools). |

System Switch 05 - Not used (Do not change the factory settings.)

| System Switch 06 |  |  |
| :---: | :--- | :--- |
| No | SUNCTION | COMMENTS |
| $\mathbf{0}$ | Margin setting for Create | 71 to 99 (BCD) \%. This setting determines the |
| to | Margin Transmission | reduction ratio when the user uses the Create |
| 7 |  | Margin Transmission feature. |
|  |  | Default setting:1001 0011 (93\%) |

System Switch 07 - Not used (Do not change the factory settings.)
System Switch 08 - Not used (Do not change the factory settings.)

| System Switch 09 |  |  |
| :--- | :--- | :--- |
| No | FUNCTION | COMMENTS |


| System Switch 0A |  | SP No. 1-101-011 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0-2 | Not used | Do not change the settings. |
| 3 | Continuous polling reception 0 : Disabled 1: Enabled | This feature allows a series of stations to be polled in a continuous cycle. This will continue until the polling reception file is erased. <br> The dialing interval is the same as memory transmission. |
| 4 | Dialing on the ten-key pad when the external telephone is off-hook <br> 0: Disabled 1: Enabled | 0: Prevents dialing from the ten-key pad while the external telephone is off-hook. Use this setting when the external telephone is not by the machine, or if a wireless telephone is connected as an external telephone. <br> 1: The user can dial on the machine's ten-key pad when the handset is off-hook. |
| 5 | On hook dial 0: Disabled 1: Enabled | 0: On hook dial is disabled. |
| 6 | Line used for G3 transmission 0: PSTN 1: ISDN | If an ISDN unit has been installed, this bit determines whether G3 transmissions go out over the PSTN or the ISDN. |
| 7 | Line used when the machine falls back to G3 from G4 if the other end is not a G4 machine 0: PSTN 1: ISDN | This bit switch has no effect if Communication Switch 07 bit 0 is set to 0 . |


| System Switch 0B - Not used (Do not change the factory settings.) |
| :--- |
| System Switch 0C - Not used (Do not change the factory settings.) |
| System Switch 0D - Not used (Do not change the factory settings.) |


| System Switch OE |  |  |
| :--- | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-101-015 |
| 0-2 | Not used | Do not change the settings. |


| System Switch 0F |  | SP No. 1-101-016 |
| :---: | :---: | :---: |
| No | FUNCTION |  |
| $\begin{gathered} 0 \\ \text { to } \\ 7 \end{gathered}$ | Country/area code for  <br> functional settings (Hex)  <br>   <br> 00: France 11: USA <br> 01: Germany 12: Asia <br> 02: UK 13: Japan <br> 03: Italy 14: Hong Kong <br> 04: Austria 15: South Africa <br> 05: Belgium 1: Australia <br> 06: Denmark 17: New Zealand  <br> 07: Finland 18: Singapore <br> 08: Ireland 19: Malaysia <br> 09: Norway 1A: China <br> OA: Sweden 1B: Taiwan <br> OB: Switz. 1C: Korea <br> 0C: Portugal 20: Turkey <br> OD: Holland 21: Greece <br> 0E: Spain 22: Hungary <br> 0F: 1 srael 23: Czech <br> 10: Canada 24: Poland | This country/area code determines the factory settings of bit switches and RAM addresses. However, it has no effect on the NCU parameter settings and communication parameter RAM addresses. <br> Cross reference <br> NCU country code: <br> SP No. 2-103-001 for G3-1 <br> SP No. 2-104-001 for G3-2 |


| System Switch $\mathbf{1 0}$ |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-101-017 |
| $\mathbf{0}$ | Threshold memory level for | Threshold $=\mathrm{N} \times 128 \mathrm{~KB}+256 \mathrm{~KB}$ |
| to | parallel memory transmission | N can be between $00-\mathrm{FF}(\mathrm{H})$ |
| $\mathbf{7}$ |  | Default setting: $02(\mathrm{H})=512 \mathrm{~KB}$ |


| System Switch 11 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-101-018 |
| $\mathbf{0}$ | TTI printing position <br> 0: Superimposed on the page <br> data <br> 1: Printed before the data <br> leading edge | Change this bit to 1 if the TTI overprints information <br> that the customer considers to be important (G3 <br> transmissions). |
| $\mathbf{1}$ | TSI (G3) or CILTID (G4) <br> printing position <br> 0: Superimposed on the page <br> data <br> 1: Printed before the data <br> leading edge | Change this bit to 1 if the TSI (G3) or CIL/TID (G4) <br> overprints information that the customer considers <br> to be important. <br> CIL: Command Information Line (Group 4) |
| $\mathbf{2}$ | Not used | TTI used for broadcasting <br> 0: The TTIs selected for each <br> Quick/Speed dial are used <br> 1: The same TTI is used for all <br> destinations | | 1: The TTI ITTI_1 or TTI_2) which is selected for all |
| :--- |
| destinations during broadcasting. |


| System Switch 11 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-101-018 |
| $\mathbf{4}$ | Type of TTI used for <br> transmission using the ten-key <br> pad <br> 0: TTI_1 <br> 1: TTI_2 | 1: The machine uses TTI_2 when the user dials the <br> destination using the ten-key pad. It is also used <br> for polling transmission and manual transmission <br> using the handset. |
| $5-6$ | Not used | Do not change the factory settings. |
| $\mathbf{7}$ | Use of parallel memory <br> transmission with G4 <br> transmission <br> 0: Disabled 1: Enabled | This determines whether parallel transmission can <br> be used with a G4 transmission or not. <br> Note that this bit is only effective if Parallel Memory <br> transmission is enabled (User Parameter 07 - bit 2). |


| System Switch 12 |  | SP No. 1-101-019 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 7 \end{gathered}$ | TTI/CIL printing position in the main scan direction | TTI/CIL: 08 to 92 (BCD) mm Input even numbers only. <br> This setting determines the print start position for the TTI and CIL from the left edge of the paper. If the TTI is moved too far to the right, it may overwrite the file number which is on the top right of the page. On an A4 page, if the CIL is moved over by more than 50 mm , it may overwrite the page number. |

System Switch 13 - Not used (do not change the settings)
System Switch 14 - Not used (do not change the settings)

| System Switch 15 |  | SP No. 1-101-022 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Not used | Do not change the settings. |
| 1 | Going into the Energy Saver mode automatically <br> 0 : Enabled <br> 1: Disabled | 1: The machine will restart from the Energy Saver mode quickly, because the +5 V power supply is active even in the Energy Saver mode. |
| 2-3 | Not used | Do not change the settings. |
| 4-5 | Interval for preventing the machine from entering Energy Saver mode if there is a pending transmission file. | If there is a file waiting for transmission, the machine does not go to Energy Saver mode during the selected period. <br> After transmitting the file, if there is no file waiting for transmission, the machine goes to the Energy Saver mode. |
| 6 | Print user codes on reports. 0 : Disabled 1: Enabled | 1: User codes are printed out on the Journal or other reports. |
| 7 | Not used | Do not change the settings. |


| System Switch 16 |  | SP No. 1-101-023 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Parallel Broadcasting <br> 0 : Disabled <br> 1: Enabled | 1: When the G4 or/and G3 unit is installed, the machine sends messages simultaneously using both available ports (PSTN/ISDN) during broadcasting. |
| 1 | Priority setting for the G3 line. <br> 0: PSTN-1 > PSTN-2 <br> 1: PSTN-2 > PSTN-1 | This function allows the user to select the default G3 line type. The optional SG3 unit is required to use the PSTN-2 setting. |
| 2 | Changing the l-G3 modem default. <br> 0: PSTN-1 <br> 1: PSTN-2 | This function allows the user to select the default IG3 modem. The optional SG3 unit and ISDN unit are required to use the PSTN-2 setting. |
| 3 | Line used for I-G3 transmissions 0 : Allowed to change 1: Fixed | 0: The machine will place priority on the line selected by the above bit 2 for I-G3 transmissions. <br> 1: The machine will always use the line selected by the above bit 2 for I-G3 transmissions. |
| 4-7 | Not used | Do not change the settings. |

System Switch 17 - Not used (do not change the settings)
System Switch 18 - Not used (do not change the settings)

| System Switch 19 |  | SP No. 1-101-026 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0-3 | Not used | Do not change the settings. |
| 4 | Number of jobs controlled for PC-FAX TX <br> 0: 64 Jobs <br> 1: No limitations (But conforms to device limitations) | Sets the number of jobs controlled for PC-FAX transactions. If " 1 " is selected (no limitations), control is relinquished to the device (standard 400, expandable to 800). |
| 5 | Not used | Do not change the settings. |
| 6 | Extended scanner page memory after memory option is installed <br> 0: Disabled <br> 1: Enabled | 0 : After installing the memory expansion option, the scanner page memory is extended to 4 MB from 2 MB. <br> 1: If this bit is set to 1 after installing the memory expansion option, the scanner page memory is extended to 12 MB. But the SAF memory decreases to 18 MB . |
| 7 | Special Original mode <br> 0: Disabled <br> 1: Enabled | 1: If the customer frequently wishes to transmit a form or letterhead which has a colored or printed background, change this bit to " 1 ". "Original 1" and "Original 2" can be selected in addition to the "Text", "Text/Photo" and "Photo" modes. |

```
System Switch 1A - Not used (do not change the settings)
System Switch 1B - Not used (do not change the settings)
System Switch 1C - Not used (do not change the settings)
```

| System Switch 1D |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS |
| $\mathbf{0}$ | RTI/CSI/CPS No. 1-101-030 <br> 0: Disabled <br> $1:$ Enabled | 1: RTI/CSI/CPS is displayed on the top line of the <br> LCD panel during communication. |
| 1-7 | Not used | Do not change the settings. |


| System Switch 1E |  | SP No. 1-101-031 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Communication after the Journal data storage area has become full <br> 0 : Impossible <br> 1: Possible | This setting is effective only when Automatic Journal printout is enabled but the machine cannot print the report (e.g., no paper). <br> $\mathbf{0}$ : If the buffer memory of the communication records for the Journal has become full, fax communications will become impossible, to prevent overwriting the communication records before the machine prints them out. <br> 1: If the buffer memory of the communication records for the Journal is full, fax communications are still possible. But the machine will overwrite the oldest communication records. <br> Cross Reference <br> Automatic Journal output - User switch 03 bit 7 <br> - Number of communication records for the Journal: <br> 200 records (standard) 1000 records (with the Function Upgrade unit installed) |
| 1 | Action when the SAF memory has become full during scanning <br> 0 : The current page is erased. <br> 1: The entire file is erased. | 0: If the SAF memory becomes full during scanning, the successfully scanned pages are transmitted. <br> 1: If the SAF memory becomes full during scanning, the file is erased and no pages are transmitted. <br> This bit switch is ignored for parallel memory transmission. |
| 2 | RTI/CSI display priority 0: RTI 1: CSI | This bit determines which identifier, RTI or CSI, is displayed on the LCD while the machine is communicating in G3 non-standard mode. |
| 3 | File No. printing 0 : Enabled <br> 1: Disabled | 1: File numbers are not printed on any reports. |


| System Switch 1E |  | SP No. 1-101-031 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 4 | Action when authorized reception is enabled but authorized RTIs/CSIs are not yet programmed <br> 0 : All fax reception is disabled 1: Faxes can be received if the sender has an RTI or CSI | If authorized reception is enabled but the user has stored no acceptable sender RTIs or CSIs, the machine will not be able to receive any fax messages. <br> If the customer wishes to receive messages from any sender that includes an RTI or CSI, and to block messages from senders that do not include an RTI or CSI, change this bit to " 1 ", then enable Authorized Reception. Otherwise, keep this bit at " 0 (default setting)". |
| 5 | Address display priority in the Al redial mode <br> 0: RTI/CSI <br> 1: Telephone number | 0: When the machine has both RTI/CSI and the telephone number information, the machine displays RTI/CSI. <br> 1: The machine always displays the telephone number. |
| 6 | Not used | Do not change the settings |
| 7 | RAM initialization after the optional Function Upgrade unit is installed or removed <br> 0: Enabled <br> 1: Disabled | When the machine detects that a Function Upgrade unit has been installed or removed, the machine shows the following message on the display for the customer. <br> "Adding/Removing FAX Feature Expander causes data loss. Turn Main Power Switch off and remove/replace it to avoid loss. To continue, press Yes." <br> If Yes is pressed, the machine initializes the RAM to the "with" or "without card" configuration. However, changing this bit to " 1 " disables this initialization, even if Yes is pressed. <br> Change this bit to 1 after installing the Function Upgrade unit. <br> 0 : When the above message is displayed, the machine initializes the RAM if Yes is pressed. The amount of data lost depends on whether the board is in or out. To avoid losing data, the user must switch off immediately and put the Function Upgrade unit back in. <br> 1: When the above message is displayed, the machine does not initialize the RAM even if Yes is pressed. However, the fax unit cannot be used until the user switches off, puts the Function Upgrade unit back in, then switches back on. No |


| System Switch 1F |  | SP No. 1-101-032 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Not used | Do not change the settings. |
| 1 | Report printout after an original jam during SAF storage or if the SAF memory fills up 0: Enabled <br> 1: Disabled | 0: When an original jams, or the SAF memory overflows during scanning, a report will be printed. <br> Change this bit to " 1 " if the customer does not want to have a report in these cases. <br> Memory tx - Memory storage report <br> Parallel memory tx - Transmission result report |
| 2 | Not used | Do not change the settings. |
| 3 | Received fax print start timing (G3 reception) <br> 0 : After receiving each page <br> 1: After receiving all pages | 0 : The machine prints each page immediately after the machine receives it. <br> 1: The machine prints the complete message after the machine receives all the pages in the memory. |
| 4 | Received fax print start timing (G4 reception) <br> 0 : After receiving each page <br> 1: After receiving all pages |  |
| 5-6 | Not used | Do not change the factory settings. |
| 7 | Action when a fax SC has occurred <br> 0 : Automatic reset <br> 1: Fax unit stops | $\mathbf{0}$ : When the fax unit detects a fax SC code other than SC1201 and SC1207, the fax unit automatically resets itself. <br> 1: When the fax unit detects any fax SC code, the fax unit stops. <br> Cross Reference <br> Fax SC codes - See "Troubleshooting" |

### 3.2.2 SCANNER SWITCHES

Scanner Switch 00 - Not used (do not change the settings)

| Scanner Switch 01 SP No. 1-102-002 |  |  |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0-7 | Scan density step value (Text mode) | When scan density is adjusted manually away from the Normal setting, the threshold value for binary picture processing changes for each step from the value specified by Scanner Switch 02, by the amount programmed here. <br> For example, with the default setting (14), the threshold value changes as follows. $\begin{array}{ll} +3(\text { Darkest }): & 83(=98-15) \\ +2: & 98(=113-15) \\ +1: & 113(=128-15) \\ 0(\text { Normal }): & 128(\text { Scanner Switch } 02 \text { setting }) \\ -1: & 143(=128+15) \\ -2: & 158(=143+15) \\ -3 \text { (Lightest) }: & 173(=158+15) \end{array}$ <br> For smaller steps, input a lower value. |


| Scanner Switch 02 |  |  |
| :--- | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-102-003 |
| $\mathbf{0 - 7}$ | Binary picture processing: | Chreshold for Text mode - |
| Thresting determines the threshold value for |  |  |
| Normal setting (center position) | This sery picture processing in Text mode (when the <br> binaran density setting is at the center). <br> sca <br> The value can be between 01 and FF. For a darker <br> threshold, input a lower value. <br> Default setting: $80(\mathrm{H})=128(\mathrm{D})$ |  |

Scanner Switch 03 - Not used (do not change the settings)

| Scanner Switch 04 |  | SP No. 1-102-005 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0-7 | Binary picture processing: Threshold for monotone background special original 1 mode - Normal setting (center position) | This setting determines the threshold value for binary picture processing in monotone background special original 1 mode (when the scan density setting is at the center). <br> The value can be between 01 and FF. For a darker threshold, input a lower value. <br> Default setting: $\mathrm{CO}(\mathrm{H})=192(\mathrm{D})$ |


| Scanner Switch 05 |  |  |
| :--- | :--- | :--- |
| No | FUNCTION | SP No. 1-102-006 |
| $\mathbf{0 - 7}$ | Binary picture processing: | COMMENTS |
| Threshold for colored |  |  |
| background special original 2 |  |  |
| mode - Normal setting (center |  |  |
| position) |  |  |$\quad$| This setting determines the threshold value for |
| :--- |
| binary picture processing in colored background |
| special original 2 2 mode (when the scan density |
| setting is at the center). |
| The value can be between 01 and FF. For a darker |
| threshold, innut a lower value. |
| Default setting: 3E (H) $=62$ (D) |


| Scanner Switch 06 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION |  |
| $\mathbf{0}$ | MTF filter level (Text mode) | COMMENTS 1-102-007 |
| to | The value can be between 0(Off) and F. For a weaker threshold, input a lower value. |  |
| $\mathbf{3}$ | Default setting: 2 |  |
|  | This setting is independent from the threshold specified by the copier SP modes. |  |
| $\mathbf{4}$ | MTF filter level (Text/Photo mode) |  |
| to | The value can be between 0(Off) and F. For a weaker threshold, input a lower value. |  |
| $\mathbf{7}$ | Default setting: 2 |  |
|  | This setting is independent from the threshold specified by the copier SP modes. |  |


| Scanner Switch 07 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | SP No. 1-102-008 |
| $\mathbf{0}$ | Smoothing filter level (Photo | The value can be between 0(Off) and 7. For a |
| to | mode) | weaker threshold, input a lower value. |
| $\mathbf{2}$ |  | Default setting: 2 |
|  |  | This setting is independent from the threshold |
|  |  | setting specified by the copier SP modes. |
| 3-7 | Not used | Do not change the settings. |

Scanner Switch 08 - Not used (do not change the settings)
Scanner Switch 09 - Not used (do not change the settings)

| Scanner Switch 0A |  |  |
| :--- | :--- | :--- |
| No | FUNCTION | COMMENTS |
| 0-3 | Not used 1-102-011 | Do not change the settings |
| 4-7 | MTF filter level (Color mode) <br> The value can be between 0(Off) and F. For a weaker threshold, input a lower value. <br> Default setting: 5 <br> This setting is independent from the threshold specified by the copier SP modes. |  |


| Scanner Switch OB |  |  |
| :--- | :--- | :--- |
| No | FUNCTION | SP No. 1-102-012 |
| $\mathbf{0 - 3}$ | Scan margin setting (right and left margin in book scan ADF mode) <br> The setting can be between 0 and $\mathrm{F}(\mathrm{H})$ (unit 0.5 mm ). <br> Default setting: 2 mm |  |
| 4-7 | Scan margin setting (top and bottom margin in book scan and ADF mode) <br> The setting can be between 0 and 7 <br> Default setting: 3 mm |  |


| Scanner Switch 0C |  | SP No. 1-102-013 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Action when an original jam has occurred while scanning the original into memory for memory tx <br> 0 : Continues scanning after recovery <br> 1: Stops scanning and erases all scanned pages for that job | This bit is only effective when parallel memory tx is disabled (user parameter 07 - bit 2). <br> If parallel memory tx is enabled, the machine always erases the scanned pages when an original jam occurs. The machine then asks the user to retry from the first page, even if the parallel memory $t x$ is not actually used. <br> 0 : The machine displays a message asking the user to put the jammed page back into the original stack, and continues scanning. The message is displayed for the time period specified by scanner switch 0E, bit 2. <br> 1: The machine erases all the scanned pages and asks the user to retry from the first page. |
| $\begin{gathered} 1 \\ \text { to } \\ 2 \end{gathered}$ | Setting when an original size cannot be recognized <br> Bit 21 Setting <br> 0 No original <br> 01 A5 D <br> 10 A5 $\square$ <br> 11 No original |  |
| 3-5 | Not used | Do not change the settings. |
| 6 | Scan width used for a document set in the ADF when the width is less than 230 mm . 0: A4 ( 210 mm ) <br> 1: LT ( 216 mm ) | This bit is set at " 1 " when the country code is set to the US. |
| 7 | Not used | Do not change the settings. |


| Scanner Switch OD |  | SP No. 1-102-014 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0-6 | Not used | Do not change the settings. |
| 7 | Scan width for A5 lengthwise or B5 lengthwise originals 0: 210 mm (8.5") <br> 1: Original width | 0: The machine scans the original as 210 mm (8.5") width. The transmitted image has a blank area on the right. <br> 1: The machine scans 148 mm (A5) or 182 mm (B5) and centers the scanned data on a 216 mm width transmitted image. |


| Scanner Switch 0E |  | SP No. 1-102-015 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Wait time for the next page when scanning a book original into memory $0: 60 \mathrm{~s}$ $1: 30 \mathrm{~s}$ | This bit determines how long the machine waits for the next page when scanning a book original for memory transmission. If this timer expires, the machine transmits all the pages scanned so far as one document. <br> Note: In immediate tx or parallel memory tx, the wait time for the next page is 10 s . |
| 1 | Scan resolution unit 0: mm <br> 1: inches | This bit determines which resolution unit will be used for scanning a fax message. <br> Default setting: mm |
| 2 | ADF jam alarm display time $0: 60 \mathrm{~s}$ <br> 1:30 s | The bit is only effective when bit 0 of scanner bit switch 0 C is " 0 ". <br> This bit determines how long the machine displays the ADF jam alarm after a jam occurred. |
| 3-7 | Not used | Do not change the settings. |


| Scanner Switch 0F |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-102-016 |
| $\mathbf{0}$ | Image rotation before <br> transmission (A4/LT sideways) <br> 0: Disabled <br> 1: Enabled | This bit determines whether the machine rotates the <br> scanned image by 90 degrees before transmission. <br> If this bit is set at 1, A4 (LT) sideways images (297 <br> mm width in the protocol) will be transmitted as A4 <br> (LT) lengthwise images (216 mm width in the <br> protocol). |
| $\mathbf{1}$ | Not used | Do not change the settings |
| $\mathbf{2}$ | Image rotation before <br> transmission (A5/HLT <br> lengthwise) <br> 0: Disabled <br> 1: Enabled | This bit determines whether the machine rotates the <br> scanned image by 90 degrees before transmission. <br> If this bit is set at "1", A5 (HLT) lengthwise images <br> will be transmitted as A4 (LT) width images (216 <br> mm width in the protocol). |
| 3-7 | Not used | Do not change the settings. |

### 3.2.3 PRINTER SWITCHES

| Printer Switch 00 |  | SP No. 1-103-001 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Page separation mark <br> 0: Disabled <br> 1: Enabled | 0: No marks are printed. <br> 1: If a received page has to be printed out on two sheets, an asterisk inside square brackets is printed at the bottom right hand corner of the first sheet, and a " 2 " inside a small box is printed at the top right hand corner of the second sheet. This helps the user to identify pages that have been split. |
| 1 | Repetition of data when the received page is longer than the printer paper <br> 0: Disabled <br> 1: Enabled | 0 : The next page continues from where the previous page left off. <br> 1: The final few mm of the previous page are repeated at the top of the next page. The amount of repeated data depends on printer switch 04, bits 5 and 6 . |
| 2 | Prints the date and time on received fax messages <br> 0 : Disabled <br> 1: Enabled | This switch is only effective when user parameter 02 - bit 2 (printing the received date and time on received fax messages) is enabled. <br> 1: The machine prints the received and printed date and time at the bottom of each received page. |
| 3-7 | Not used | Do not change the settings. |


| Printer Switch 01 |  | SP No. 1-103-002 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0-2 | Not used | Do not change the settings. |
| 3-4 | Maximum print width used in the setup protocol | These bits are only effective when bit 7 of printer switch 01 is " 1 ". |
| 5-6 | Not used | Do not change the settings. |
| 7 | Received message width restriction in the protocol signal to the sender <br> 0 : Disabled <br> 1: Enabled | $\mathbf{0}$ : The machine informs the transmitting machine of the print width depending on the paper size available from the paper feed stations. Refer to the table on the next page for how the machine chooses the paper width used in the setup protocol (NSF/DIS). <br> 1: The machine informs the transmitting machine of the fixed paper width which is specified by bits 3 and 4 above. |

Relationship between available paper sizes and printer width used in the setup protocol

| Available Paper Size | Printer width used in the Protocol (NSF/DIS) |
| :---: | :---: |
| A4 or $8.5^{\prime \prime} \times 11^{\prime \prime}$ | 297 mm width |
| B5 | 256 mm width |
| A5 or $8.5^{\prime \prime} \times 5.5^{\prime \prime}$ | 216 mm width |
| No paper available (Paper end) | 216 mm width |


| Printer Switch 02 |  | SP No. 1-103-003 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | 1st paper feed station usage for fax printing <br> 0 : Enabled <br> 1: Disabled | 0: The paper feed station can be used to print fax messages and reports. <br> 1: The specified paper feed station will not be used for printing fax messages and reports. <br> Note: Do not disable usage for a paper feed station which has been specified by User Parameter Switch 0F (15), or which is used for the Specified Cassette Selection feature. |
| 1 | 2nd paper feed station usage for fax printing <br> 0 : Enabled <br> 1: Disabled |  |
| 2 | 3rd paper feed station usage for fax printing <br> 0 : Enabled <br> 1: Disabled |  |
| 3 | 4th paper feed station usage for fax printing <br> 0 : Enabled <br> 1: Disabled |  |
| 4 | LCT usage for fax printing 0 : Enabled <br> 1: Disabled |  |
| 5-7 | Not used | Do not change the settings. |


| Printer Switch 03 |  | SP No. 1-103-004 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Length reduction of received data <br> 0 : Disabled <br> 1: Enabled | 0 : Incoming pages are printed without length reduction. <br> (Page separation threshold: Printer Switch 03, bits 4 to 7) <br> 1: Incoming page length is reduced when printing. (Maximum reducible length: Printer Switches 04, bits 0 to 4) |
| 1-3 | Not used | Do not change the settings |


| Printer Switch 03 |  |  | SP No. 1-103-0 |
| :---: | :---: | :---: | :---: |
| No | FUNCTION |  |  |
| $\begin{gathered} 4 \\ \text { to } \\ 7 \end{gathered}$ | Page separation threshold (with reduction disabled with switch 03-0 above) |  |  |
|  | If the incoming page is up to x mm longer than the length of copy paper, the excess portion will not be printed. If the incoming page is more than $\times \mathrm{mm}$ longer than the length of copy paper, the excess portion will be printed on the next page. The value of x is determined by these four bits. |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  | Hex value of bits 4 to $7 \times(\mathrm{mm}$ ) |  |  |
|  | $\begin{array}{lll}\text { and so on until } & & 1 \\ & F & 15\end{array}$ |  |  |
|  |  |  |  |
|  |  |  |  |
|  | Default setting: 6 mm |  |  |
|  | Cross reference |  |  |
|  | Length reduction On/O | Printer Switch 03, Bit 0 |  |


| Printer Switch 04 SP No. 1-103-005 |  |
| :---: | :---: |
| No | FUNCTION COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 4 \end{gathered}$ | Maximum reducible length when length reduction is enabled with switch 03-0 above. <Maximum reducible length> = <Paper length > + ( $\mathrm{N} \times 5 \mathrm{~mm}$ ) <br> " N " is the decimal value of the binary setting of bits 0 to 4 . ```Bit 43210 Setting 000000 mm 000015 mm \(\begin{array}{llllll}0 & 0 & 1 & 0 & 0 & 20 \mathrm{~mm} \text { (default setting) }\end{array}\) 1155 mm``` <br> For A5 sideways and B5 sideways paper <Maximum reducible length> = <Paper length> $+0.75 \times(\mathrm{N} \times 5 \mathrm{~mm})$ |
| $\begin{aligned} & \hline 5 \\ & 6 \end{aligned}$ | Length of the duplicated image on the next page, when page separation has taken place. $\binom{0}{0}=4 \mathrm{~mm}\binom{1}{0}=10 \mathrm{~mm}\binom{0}{1}=15 \mathrm{~mm}\binom{1}{1}=\text { Not used }$ |
| 7 | Not used. $\quad$ Do not change the setting. |

Printer Switch 05 - Not used (do not change the settings)

| Printer Switch 06 |  | SP No. 1-103-007 |
| :---: | :---: | :---: |
| No | FUNCTION |  |
| 0 | Printing while a paper cassette is pulled out, when the Just Size Printing feature is enabled. <br> 0 : Printing will not start <br> 1: Printing will start if another cassette has a suitable size of paper, based on the paper size selection priority tables. | Cross reference <br> Just size printing on/off - User switch 05, bit 5 |
| 1-7 | Not used. | Do not change the settings. |


| Printer Switch 07 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-103-008 |
| $\mathbf{0}$ | Reduction for Journal printing <br> 0: Off <br> 1: On | 1: The Journal is reduced to 91\% to ensure that <br> there is enough space in the left margin for punch <br> holes or staples. |
| 2-3 | Not used. | Do not change the settings. |
| $\mathbf{4}$ | List of destinations in the <br> Communication Failure Report <br> for broadcasting <br> 0: All destinations <br> 1: Only destinations where <br> communication failure occurred | 1: Only destinations where communication failure <br> occurred are printed on the Communication <br> Failure Report. |
| 5 5-7 | Not used. | Do not change the settings. |


| Printer Switch 08 - Not used (do not change the settings) |
| :--- |
| Printer Switch 09 - Not used (do not change the settings) |
| Printer Switch 0A - Not used (do not change the settings) |
| Printer Switch 0B - Not used (do not change the settings) |
| Printer Switch 0C - Not used (do not change the settings) |
| Printer Switch 0D - Not used (do not change the settings) |


| Printer Switch 0E |  | SP No. 1-103-015 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Paper size selection priority <br> 0 : Width <br> 1: Length | 0: A paper size that has the same width as the received data is selected first. <br> 1: A paper size which has enough length to print all the received lines without reduction is selected first. |
| 1 | Paper size selected for printing A4 width fax data $0: 8.5^{\prime \prime} \times 11^{\prime \prime} \text { size }$ <br> 1: A4 size | This switch determines which paper size is selected for printing A4 width fax data, when the machine has both A4 and $8.5 " \times 11^{\prime \prime}$ size paper. |


| Printer Switch 0E |  | SP No. 1-103-015 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 2 | Page separation <br> 0 : Enabled <br> 1: Disabled | 1: If all paper sizes in the machine require page separation to print a received fax message, the machine does not print the message (Substitute Reception is used). <br> After a larger size of paper is set in a cassette, the machine automatically prints the fax message. |
| $\begin{array}{\|c\|} \hline 3 \\ \text { to } \\ 4 \end{array}$ | Printing the sample image on   <br> reports   <br> Bit 4 Bit 3 Setting  <br> 0 0 The upper half <br> 0 1 only <br> $50 \%$ reduction <br>  <br> 1 <br> 1 in sub-scan only  <br> 1 1 Same size <br> Not used   | "Same size" means the sample image is printed at $100 \%$, even if page separation occurs. <br> User Parameter Switch 19 (13H) bit 4 must be set to " 0 " to enable this switch. <br> Refer to Detailed Section Descriptions for more on this feature. |
| 5-6 | Not used | Do not change the settings. |
| 7 | Equalizing the reduction ratio among separated pages (Page Separation) <br> 0: Enabled <br> 1: Disabled | 0: When page separation has taken place, all the pages are reduced with the same reduction ratio. <br> 1: Only the last page is reduced to fit the selected paper size when page separation has taken place. Other pages are printed without reduction. |


| Printer Switch 0F |  | SP No. 1-103-016 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 1 \end{gathered}$ | Smoothing feature    <br> Bit 1 Bit 0 Setting   <br> 0 0 Disabled  <br> 0 1 Disabled  <br> 1 0 Enabled  <br> 1 1 Not used  | $(0,0)(0,1):$ Disable smoothing if the machine receives halftone images from other manufacturers fax machines frequently. |
| 2 | Duplex printing <br> 0: Disabled <br> 1: Enabled | 1: The machine always prints received fax messages in duplex printing mode: |
| 3 | Binding direction for Duplex printing <br> 0 : Left binding <br> 1: Top binding |  |
| 4 | Printing fax messages in user code mode <br> 0 : Enabled <br> 1: Disabled | 1: The machine holds the received fax messages until the machine exits the restricted access mode (user code or key counter). If the machine enters the restricted access mode again while printing fax messages, the machine stops printing the machine exits the mode again. |
| 5-7 | Not used | Do not change the settings. |

### 3.2.4 COMMUNICATION SWITCHES

| Communication Switch 00 |  | SP No. 1-104-001 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 1 \end{gathered}$ | Compression modes available   <br> in receive mode   <br> Bit $\mathbf{1}$   <br> $\mathbf{0}$   <br> 0  $\mathbf{0}$ ModesMH only <br> 0 | These bits determine the compression capabilities to be declared in phase $B$ (handshaking) of the T. 30 protocol. |
| $\begin{gathered} \hline 2 \\ \text { to } \\ 3 \end{gathered}$ | Compression modes available   <br> in transmit   <br> Bode   <br> Bit $\mathbf{3}$ $\mathbf{2}$ Modes <br> 0 0 MH only <br> 0 1 MH/MR <br> 1 0 MH/MR/MMR <br> 1 1 MH/MR/MMR/ <br>    <br>    <br>    <br>    | These bits determine the compression capabilities to be used in the transmission and to be declared in phase B (handshaking) of the T. 30 protocol. |
| 4 | Not used | Do not change the settings. |
| 5 | JBIG compression method: Reception <br> 0 : Only basic supported <br> 1: Basic and optional both supported | Change the setting when communication problems occur using JBIG compression. |
| 6 | JBIG compression method: Transmission 0 : Basic mode priority <br> 1: Optional mode priority | Change the setting when communication problems occur using JBIG compression. |
| 7 | Closed network (reception) <br> 0: Disabled <br> 1: Enabled | 1: Reception will not go ahead if the ID code of the other terminal does not match the ID code of this terminal. This function is only available in NSF/NSS mode. |


| Communication Switch 01 |  | SP No. 1-104-002 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | $\begin{aligned} & \text { ECM } \\ & \text { 0: Off 1: On } \end{aligned}$ | If this bit is set to 0 , ECM is switched off for all communications. <br> In addition, V. 8 protocol and JBIG compression are switched off automatically. |
| 1 | Not used | Do not change the setting. |
| $\begin{gathered} 2 \\ \text { to } \\ 3 \end{gathered}$ | Wrong connection prevention method | $(0,1)$ - The machine will disconnect the line without sending a fax message, if the last 8 digits of the received CSI do not match the last 8 digits of the dialed telephone number. This does not work when manually dialed. <br> $(1,0)$ - The same as above, except that only the last 4 digits are compared. <br> $(1,1)$ - The machine will disconnect the line without sending a fax message, if the other end does not identify itself with an RTI or CSI. <br> $(0,0)$ - Nothing is checked; transmission will always go ahead. <br> Note: This function does not work when dialing is done from the external telephone. |
| 4-5 | Not used | Do not change the setting. |
| $\begin{gathered} 6 \\ \text { to } \\ 7 \end{gathered}$ |  | The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames). |


| Communication Switch 02 SP No. 1-104-003 |  |  |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Burst error threshold <br> 0: Low 1: High | If there are more consecutive error lines in the received page than the threshold, the machine will send a negative response. <br> The Low and High threshold values depend on the sub-scan resolution, and are as follows. |
| 1 | Acceptable total error line ratio 0: 5\% 1: 10\% | If the error line ratio for a page exceeds the acceptable ratio, RTN will be sent to the other end. |
| 2 | Treatment of pages received with errors during G3 reception <br> 0 : Deleted from memory without printing <br> 1: Printed | 0: Pages received with errors are not printed. |


| Communication Switch 02 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-104-003 |
| $\mathbf{3}$ | Hang-up decision when a <br> negative code (RTN or PIN) is <br> received during G3 immediate <br> transmission <br> 0: No hang-up, 1: Hang-up | 0: The next page will be sent even if RTN or PIN is <br> received. <br> 1: The machine will send DCN and hang up if it <br> receives RTN or PIN. <br> This bit is ignored for memory transmissions or if <br> ECM is being used. |
| $4-7$ | Not used | Do not change the settings. |


| Communication Switch 03 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | SP No. 1-104-004 |
| $\mathbf{0}$ | Maximum number of page | COMMENTS |
| to | retransmissions in a G3 | This setting is not used if ECM is switched on. |
| 7 | memory transmission | Default setting -03(H) |


| Communication Switch 04 - Not used (do not change the settings) |
| :--- |
| Communication Switch 05 - Not used (do not change the settings) |
| Communication Switch 06 - Not used (do not change the settings) |


| Communication Switch 07 |  | SP No. 1-104-008 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Fallback from G4 to G3 if the other terminal is not a G4 terminal <br> 0: Disabled <br> 1: Enabled | Also see system switch 0A bit 7 . Refer to G4 Internal Switches 17, 18, 1A, 1B, and 1C for the CPS code set (Cause Value set) that determines G4 to G3 fallback. |
| 1 | Not used | Do not change the setting. |
| 2 | Not used | Do not change the setting. |
| 3 | Fallback from G4 to G3 reflected in programmed Quick/Speed dials 0: Fallback enabled <br> 1: Always start with G4 | 0: If a communication falls back from G4 to G3, the machine will always start transmission with G3 from the next communication. <br> 1: The machine will always start to transmit with G4. |
| 4 | Fallback from G4 to G3 when G4 communication fails on the ISDN B-channel <br> 0: Fallback disabled <br> 1: Fallback enabled | 1: Enable this switch only when G4 communication errors occur because the exchanger connects G4 calls to the PSTN. <br> This problem occurs with some types of exchanger. |
| 5 | Not used | Do not change the setting. |
| 6 | Not used | Do not change the setting. |
| 7 | Not used | Do not change the setting. |

Communication Switch 08 - Not used (do not change the settings)
Communication Switch 09 - Not used (do not change the settings)

| Communication Switch 0A |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-104-011 |
| $\mathbf{0}$ | Point of resumption of memory <br> transmission upon redialing <br> 0: From the error page <br> 1: From page 1 | 0: The transmission begins from the page where <br> transmission failed the previous time. <br> 1:Transmission begins from the first page, using <br> normal memory transmission. <br> 1-6 Not used |
| $\mathbf{7}$ | Emergency calls using 999 <br> 0: Enabled 1: Disabled | Do not change the settings. <br> If this bit is at 1, the machine will not allow you to <br> dial 999 at the auto-dialer. This is a PTT <br> requirement in the Hong Kong. |


| Communication Switch OB |  | SP No. 1-104-012 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Use of Economy Transmission during a Transfer operation to end receivers <br> 0 : Disabled 1: Enabled | These bits determine whether the machine uses the Economy Transmission feature when it is carrying out a Transfer operation as a Transfer Station. |
| 1 | Use of Economy Transmission during a Transfer operation to the Next Transfer Stations 0: Disabled 1: Enabled |  |
| 2 | Use of Label Insertion for the End Receivers in a Transfer operation <br> 0 : Disabled 1: Enabled | This bit determines whether the machine uses the Label Insertion feature when it is carrying out a Transfer operation as a Transfer Station. |
| 3 | Conditions required for Transfer Result Report transmission <br> 0: Always transmitted <br> 1: Only transmitted if there was an error | 0: When acting as a Transfer Station, the machine will always send a Transfer Result Report back to the Requesting Station after completing the Transfer Request, even if there were no problems. <br> 1: The machine will only send back a Transfer Result Report if there were errors during communication, meaning one or more of the End Receivers could not be contacted. |
| 4 | Printout of the message when acting as a Transfer Station <br> 0 : Disabled 1: Enabled | When the machine is acting as a Transfer Station, this bit determines whether the machine prints the fax message coming in from the Requesting Terminal. |
| 5 | Action when there is no fax number in the programmed Quick/Speed dials which meets the requesting terminal's own fax number <br> 0 : Transfer is disabled <br> 1: Transfer is enabled | After the machine receives a transfer request, the machine compares the last $N$ digits of the requesting terminal's own fax number with all the Quick/Speed dials programmed in the machine. ( N is the number programmed in communication switch OC.) <br> 0 : If there is no matching number programmed in the machine, the machine rejects the transfer request. <br> 1: Even if there is no matching number programmed in the machine, the machine accepts the transfer request. The result report will be printed at the transfer terminal, but will not be sent back to the requesting terminal. |
| 6-7 | Not used | Do not change the settings. |


| Communication Switch 0C |  | SP No. 1-104-013 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 4 \end{gathered}$ | Number of digits compared to find the requester's fax number from the programmed Quick/Speed Dials when acting as a Transfer Station | 00-1F (0 to 31 digits) <br> After the machine receives a transfer request, the machine compares the own telephone number sent from the Requesting Terminal with all Quick/Speed Dials programmed in the machine, starting from Quick Dial 01 to the end of the Speed Dials. <br> This number determines how many digits from the end of the telephone numbers the machine compares. <br> If it is set to 00, the machine will send the report to the first Quick/Speed Dial that the machine compared. If Quick Dial 01 is programmed, the machine will send the report to Quick 01. If Quick Dial 01 through 04 are not programmed and Quick Dial 05 is programmed, the machine will send the report to Quick 05. <br> Default setting - 05(H) $=5$ digits |
| 5-7 | Not used | Do not change the settings. |


| Communication Switch 0D |  | SP No. 1-104-014 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 7 \end{gathered}$ | The available memory threshold, below which ringing detection (and therefore reception into memory) is disabled | $00 \text { to FF (Hex), unit }=4 \text { kbytes }$ <br> (e.g., 06(H) $=24$ kbytes) <br> One page is about 24 kbytes. <br> The machine refers to this setting before each fax reception. If the amount of remaining memory is below this threshold, the machine cannot receive any fax messages. <br> If this setting is kept at 0 , the machine will detect ringing signals and go into receive mode even if there is no memory available. This will result in communication failure. |


| Communication Switch 0E |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-104-015 |
| $\mathbf{0}$ | Minimum interval between | 06 to $\mathrm{FF}(\mathrm{Hex})$, unit $=2 \mathrm{~s}$ |
| to | automatic dialing attempts | $($ e.g., $06(\mathrm{H})=12 \mathrm{~s})$ |
| $\mathbf{7}$ |  | This value is the minimum time that the machine |
|  | waits before it dials the next destination. |  |

Communication Switch 0F - Not used (do not change the settings.)

| Communication Switch 10 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-104-017 |
| $\mathbf{0}$ | Memory transmission: | 01-FE (Hex) times |
| to | Maximum number of dialing |  |
| 7 | attempts to the same |  |
|  | destination |  |

Communication Switch 11 - Not used (do not change the settings.)

| Communication Switch 12 |  |  |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS No. 1-104-019 |
| $\mathbf{0}$ | Memory transmission: Interval | 01-FF (Hex) minutes |
| to | between dialing attempts to the |  |
| 7 | same destination |  |

Communication Switch 13 - Not used (do not change the settings.)

| Communication Switch 14 |  | SP No. 1-104-021 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Inch-to-mm conversion during transmission <br> 0: Disabled 1: Enabled | 0: In immediate transmission, data scanned in inch format are transmitted without conversion. In memory transmission, data stored in the SAF memory in mm format are transmitted without conversion. <br> Note: When storing the scanned data into SAF memory, the fax unit always converts the data into mm format. <br> 1: The machine converts the scanned data or stored data in the SAF memory to the format which was specified in the set-up protocol (DIS/NSF) before transmission. |
| 1-5 | Not used | Do not change the factory settings. |
| $\begin{aligned} & 6 \\ & \text { to } \\ & 7 \end{aligned}$ | Available unit of resolution in which fax messages are received | For the best performance, do not change the factory settings. |
|  | Bit 7 Bit 6 Unit <br> 0 0 mm <br> 0 1 inch <br> 1 0 mm and inch <br>   (default) <br> 1 1 Not used | The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames). |

[^0]| Communication Switch 16 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-104-023 |
| $\mathbf{0}$ | Standard G3 unit <br> 0: Disabled <br> 1: Enabled | Set this bit to 0 if the user wants to use only the <br> ISDN line (option G4 unit), even for G3 <br> communications. However, for ISDN on hook <br> dialing, bit 7 of user parameter 30 must be set to 1. <br> Note: If the optional G4 unit is not installed, but this <br> bit is changed to 'disabled', no document can be <br> transmitted. |
| $\mathbf{1}$ | Optional G3 unit (G3-2) <br> 0: Not installed <br> 1: Installed | Change this bit to 1 when installing the first optional <br> G3 unit. |
| $\mathbf{2}$ | Optional ISDN unit <br> 0: Not installed <br> 1: Installed | Change this bit to 1 when installing the optional <br> ISDN unit. |
| 3-5 | Not used | Use of the I-G3 line <br> 0: Tx or rx <br> 1: Tx only | | Change not change the settings. |
| :--- |
| $\mathbf{7}$ |
| G4 Dual communication to 1 when the customer requires. <br> 0: Enabled <br> 1: Disabled |


| Communication Switch 17 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-104-024 |
| $\mathbf{0}$ | SEP reception <br> 0: Disabled <br> 1: Enabled | 0: Polling transmission to another maker's machine <br> using the SEP (Selective Polling) signal is <br> disabled. |
| $\mathbf{1}$ | SUB reception <br> 0: Disabled <br> 1: Enabled | 0: Confidential reception to another maker's <br> machine using the SUB (Sub-address) signal is <br> disabled. |
| $\mathbf{2}$ | PWD reception <br> 0: Disabled <br> 1: Enabled | 0: Disables features that require PWD (Password) <br> signal reception. |
| 3-6 | Not used | Do not change the settings. <br> $\mathbf{7}$ <br> Action when there is no box <br> with an-code that matches <br> the received SUB code <br> 0: Disconnect the line <br> 1: Receive the message <br> (using normal reception mode) |

Communication Switch 18 - Not used (do not change the settings)
Communication Switch 19 - Not used (do not change the settings)
Communication Switch 1A - Not used (do not change the settings)

| Communication Switch 1B |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | SP No. 1-104-028 |
| $\mathbf{0}$ | Extension access code (0 to 7) | If the PABX does not support V.8/V.34 protocol |
| to | to turn V.8 protocol On/Off | procedure, set this bit to "1" to disable V.8. |
| $\mathbf{7}$ | 0: On | Example: If "0" is the PSTN access code, set bit 0 |
|  | 1: Off | to 1. When the machine detects "0" as the first |
|  |  | dialed number, it automatically disables V.8 |
|  |  | protocol. (Alternatively, if "3" is the PSTN access |
|  |  |  |
|  |  |  |


| Communication Switch 1C |  | SP No. 1-104-029 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 1 \end{gathered}$ | Extension access code (8 and 9) to turn V. 8 protocol On/Off $0: \text { On }$ 1: Off | Refer to communication switch 1B. <br> Example: If " 8 " is the PSTN access code, set bit 0 to 1 . When the machine detects " 8 " as the first dialed number, it automatically disables V. 8 protocol. (If " 9 " is the PSTN access code, use bit 1.) |
| 2-7 | Not used | Do not change the settings. |


| Communication Switch 1D - Not used (do not change the settings) |
| :--- |
| Communication Switch 1E - Not used (do not change the settings) |
| Communication Switch 1F - Not used (do not change the settings) |

### 3.2.5 G3 SWITCHES

| G3 Switch 00 |  | SP No. 1-105-001 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Monitor speaker during communication (tx and rx) | ( 0,0 ): The monitor speaker is disabled all through the communication. <br> $(0,1)$ : The monitor speaker is on up to phase $B$ in the T. 30 protocol. <br> (1, 0): Used for testing. The monitor speaker is on all through the communication. Make sure that you reset these bits after testing. |
|  |  |  |
|  | $\begin{array}{ccl}\text { Brat } & \text { Bit } & \\ 0 & 0 & \text { Disabled }\end{array}$ |  |
|  | $0 \quad 1 \quad$ Up to Phase B |  |
|  | 100 All the tim |  |
|  | $1 \quad 1 \quad$ Not used |  |
| 2 | Monitor speaker during memory transmission 0: Disabled 1: Enabled | 1: The monitor speaker is enabled during memory transmission. |
| 3-7 | Not used | Do not change the settings. |


| G3 Switch 01 |  | SP No. 1-105-002 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0-3 | Not used | Do not change the settings. |
| 4 | DIS frame length 0: 10 bytes $1: 4$ bytes | 1: The bytes in the DIS frame after the 4th byte will not be transmitted (set to 1 if there are communication problems with PC-based faxes which cannot receive the extended DIS frames). |
| 5 | Not used | Do not change the setting. |
| 6 | CED/ANSam transmission <br> 0 : Disabled <br> 1: Enabled | Do not change this setting, unless the communication problem is caused by the CED/ANSam transmission. |
| 7 | Not used | Do not change the setting. |


| G3 Switch 02 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-105-003 |
| $\mathbf{0}$ | G3 protocol mode used <br> 0: Standard and non-standard <br> 1: Standard only | Change this bit to 1 only when the other end can <br> only communicate with machines that send T.30- <br> standard frames only. <br> 1: Disables NSF/NSS signals (these are used in <br> non-standard mode communication) |
| 1-4 | Not used | Do not change the settings. |
| $\mathbf{5}$ | Use of modem rate history for <br> transmission using <br> Quick/Speed Dials <br> 0: Disabled <br> 1: Enabled | 0: Communications using Quick/Speed Dials always <br> start from the highest modem rate. <br> 1: The machine refers to the modem rate history for <br> communications with the same machine when <br> determining the most suitable rate for the current <br> communication. |
| $\mathbf{6}$ | Al short protocol (transmission <br> and reception) <br> 0: Disabled 1: Enabled | Refer to Appendix B in the Group 3 Facsimile <br> Manual for details about AI Short Protocol. |
| $\mathbf{7}$ | Short preamble <br> 0: Disabled 1: Enabled | Refer to Appendix B in the Group 3 Facsimile <br> Manual for details about Short Preamble. |


| G3 Switch 03 |  | SP No. 1-105-004 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | DIS detection number (Echo countermeasure) <br> 0: 1 <br> 1:2 | $\mathbf{0}$ : The machine will hang up if it receives the same DIS frame twice. <br> 1: Before sending DCS, the machine will wait for the second DIS which is caused by echo on the line. |
| 1 | V. 8 protocol in manual reception <br> 0: Disabled <br> 1: Enabled | 0 : The machine sends CED instead of ANSam when starting a manual reception. <br> 1: The machine sends ANSam during manual reception. |
| 2 | V. 8 protocol <br> 0: Disabled <br> 1: Enabled | 0: V.8/V. 34 communications will not be possible. <br> Note: <br> Do not set to 0 unless the line condition is always bad enough to slow down the data rate to 14.4 kbps or lower. |
| 3 | ECM frame size <br> 0: 256 bytes <br> 1: 64 bytes | Keep this bit at "0" in most cases. |
| 4 | CTC transmission conditions <br> 0 : Ricoh mode (PPR x 1) <br> 1: ITU-T mode (PPR x 4) | When using ECM, the machine will choose a slower modem rate after receiving PPR once (Ricoh mode) or four times (ITU-T mode). <br> This bit is ineffective in V. 34 communications. |
| 5 | Modem rate used for the next page after receiving a negative code (RTN or PIN) <br> 0 : No change 1: Fallback | 1: The machine's tx modem rate will fall back before sending the next page if a negative code is received. This bit is ignored if ECM is being used. |
| 6 | V. 8 protocol in manual transmission <br> 0: Disabled <br> 1: Enabled | 1: The machine detects either ANSam or CED during manual transmission. |
| 7 | Not used | Do not change the setting. |


| G3 Switch 04 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-105-005 |
| $\mathbf{0}$ | Training error detection | $0-\mathrm{F}($ Hex $) ; 0-15$ bits |
| to |  |  |
| $\mathbf{3}$ | threshold | lf the number of error bits in the received TCF is |
|  |  | below this threshold, the machine informs the |
| sender that training has succeeded. |  |  |
| $4-7$ | Not used | Do not change the settings. |


| G3 Switch 05 |  | COMMENTS |
| :---: | :---: | :---: |
| No | FUNCTION |  |
| $\begin{gathered} \hline 0 \\ \text { to } \\ 3 \end{gathered}$ |  | These bits set the initial starting modem rate for transmission. <br> Use the dedicated transmission parameters if you need to change this for specific receivers. <br> If a modem rate 14.4 kbps or slower is selected, V. 8 protocol should be disabled manually. <br> Cross reference <br> V. 8 protocol on/off - G3 switch 03, bit2 |
| $\begin{gathered} \hline 4 \\ \text { to } \\ 5 \end{gathered}$ | Initial modem type for 9.6 k or $7.2 \mathrm{kbps}$. Bit 5 Bit 4 Setting | These bits set the initial modem type for 9.6 and 7.2 kbps, if the initial modem rate is set at these speeds. |
| 6-7 | Not used | Do not change the settings. |


| G3 | witch 06 | SP No. 1-105-007 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Initial Rx modem rate | These bits set the initial starting modem rate for reception. |
| to | Bit 3210 Setting (bps) |  |
| 3 | 00012.4 k |  |
|  | 00104.8 k | Use a lower setting if high speeds pose problems during reception. |
|  | 00117.2 k |  |
|  | 01009.6 k |  |
|  | 010112.0 k | If a modem rate 14.4 kbps or slower is selected, V. 8 protocol should be disabled manually. |
|  | 0118014.4 k |  |
|  | $\begin{array}{lllll}0 & 1 & 1 & 1 & 16.8 k\end{array}$ |  |
|  | $10000019.2 k$ | Cross referenceV. 8 protocol on/off - G3 switch 03, bit2 |
|  | $1{ }_{1} 0000121.6 \mathrm{k}$ |  |
|  | $\begin{array}{lllll}1 & 0 & 1 & 0 & 24.0 k \\ 1 & 0 & 1 & 1 & 26.4\end{array}$ |  |
|  | $1{ }_{1} 100028.8 \mathrm{k}$ |  |
|  | 110131.2 k |  |
|  | 111033.6 k |  |
|  | Other settings - Not used |  |


| G3 Switch 06 |  | SP No. 1-105-007 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 4 \\ \text { to } \\ 7 \end{gathered}$ |  | The setting of these bits is used to inform the transmitting terminal of the available modem type for the machine in receive mode. <br> If V .34 is not selected, V .8 protocol must be disabled manually. <br> Cross reference <br> V. 8 protocol on/off - G3 switch 03, bit2 |


| G3 | Switch 07 | SP No. 1-105-008 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \hline \text { to } \\ 1 \end{gathered}$ | PSTN cable equalizer    <br> (tx mode:    <br> Bit Internal)   <br> Bit $\mathbf{1}$ Bit $\mathbf{0}$ Setting  <br> 0 0 None  <br> 0 1 Low  <br> 1 0 Medium  <br> 1 1 High  | Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. <br> Use the dedicated transmission parameters for specific receivers. <br> Also, try using the cable equalizer if one or more of the following symptoms occurs. <br> - Communication error <br> - Modem rate fallback occurs frequently. <br> Note: This setting is not effective in V. 34 communications. |
| $\begin{gathered} \hline 2 \\ \text { to } \\ 3 \end{gathered}$ | PSTN cable equalizer   <br> (rx mode: Internal)  <br> Bit 3 Bit 2 Setting <br> 0 0 None <br> 0 1 Low <br> 1 0 Medium <br> 1 1 High | Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. <br> Also, try using the cable equalizer if one or more of the following symptoms occurs. <br> - Communication error with error codes such as $0-20,0-23$, etc. <br> - Modem rate fallback occurs frequently. <br> Note: This setting is not effective in V. 34 communications. |
| 4 | PSTN cable equalizer (V.8/V. 17 rx mode: External) <br> 0 : Disabled <br> 1: Enabled | Keep this bit at "1". |
| 5 | PSTN cable equalizer (V. 34 rx mode; External) | Keep this bit at "1". |
| $\begin{aligned} & \hline 6- \\ & 7 \\ & \hline \end{aligned}$ | Not used | Do not change the settings. |

G3 Switch 08 - Not used (do not change the settings)

| G3 Switch 09 |  | SP No. 1-105-010 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 1 \end{gathered}$ | ISDN cable equalizer (tx mode: Internal) Bit 1 Bit 0 Setting 0 None 01 Low $\begin{array}{lll}1 & 0 & \text { Medium } \\ 1 & 1 & \text { High }\end{array}$ | Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. <br> Use the dedicated transmission parameters for specific receivers. <br> Also, try using the cable equalizer if one or more of the following symptoms occurs. <br> - Communication error <br> - Modem rate fallback occurs frequently. <br> Note: This setting is not effective in V. 34 communications. |
| $\begin{gathered} \hline 2 \\ \text { to } \\ 3 \end{gathered}$ | ISDN cable equalizer (rx mode: Internal) Bit 3 Bit 2 Setting $\begin{array}{lll}0 & 0 & \text { None } \\ 0 & 1 & \text { Low } \\ 1 & 0 & \text { Medium } \\ 1 & 1 & \text { High }\end{array}$ | Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. <br> Also, try using the cable equalizer if one or more of the following symptoms occurs. <br> - Communication error with error codes such as $0-20,0-23$, etc. <br> - Modem rate fallback occurs frequently. <br> Note: This setting is not effective in V. 34 communications. |
| 4 | ISDN cable equalizer (V.8/V. 17 rx mode: External) <br> 0 : Disabled <br> 1: Enabled | Keep this bit at " 0 " in most cases. |
| 5 | ISDN cable equalizer (V. 34 rx mode: External) 0 : Disabled <br> 1: Enabled | Keep this bit at " 0 " in most cases. |
| 6-7 | Not used | Do not change the settings. |



| G3 Switch 0A |  | So not change the settings. |
| :---: | :--- | :--- |
| 2-3 | Not used | This bit set the maximum interval between EOL <br> (end-of-line) signals and the maximum interval <br> between ECM frames from the other end. <br> Try using a longer setting if error code 0-21 is <br> frequent. |
| $\mathbf{4}$ | Maximum allowable frame <br> interval during image data <br> reception. <br> 0:5 s 1: 13 s | Do not change the settings. |
| $\mathbf{5}$ | Not used | Reconstruction time for the first <br> line in receive mode <br> $\mathbf{0 : 6 ~ s ~ 1 : 1 2 ~ s ~}$ |
| When the sending terminal is controlled by a <br> computer, there may be a delay in receiving page <br> data after the local machine accepts set-up data and <br> sends CFR. This is outside the T.30 <br> recommendation. But, if this delay occurs, set this <br> bit to 1 to give the sending machine more time to <br> send data. <br> Refer to error code 0-20. <br> ITU-T T.30 recommendation: The first line should <br> come within 5 s of CFR. |  |  |
| $\mathbf{7}$ | Not used | Do not change the settings. |


| G3 Switch 0B |  | SP No. 1-105-012 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Protocol requirements: Europe 0: Disabled 1: Enabled | The machine does not automatically reset these bits for each country after a country code (System Switch OF) is programmed. Change the required bits manually at installation. |
| 1 | Protocol requirements: Spain 0: Disabled 1: Enabled |  |
| 2 | Protocol requirements: Germany 0: Disabled 1: Enabled |  |
| 3 | Protocol requirements: France 0: Disabled 1: Enabled |  |
| 4 | PTT requirements: Germany 0: Disabled 1: Enabled |  |
| 5 | PTT requirements: France <br> 0: Disabled 1: Enabled |  |
| 6 | Not used | Do not change the settings. |
| 7 | DTS requirements : Germany <br> 0: Disabled 1: Enabled | Change this bit manually if required. |


| G3 Switch 0C |  |  | SP No. 1-105-013 |
| :---: | :---: | :---: | :---: |
| No |  | NCTION | COMMENTS |
| 0 | Pulse dialing method |  | $\mathrm{P}=$ Number of pulses sent out, $\mathrm{N}=$ Number dialed. |
| 1 | Bit 1 Bit 0 | Setting |  |
|  | 00 | Normal( $\mathrm{P}=\mathrm{N}$ ) |  |
|  | 01 | Oslo ( $\mathrm{P}=10-\mathrm{N}$ ) |  |
|  |  | Sweden ( $\mathrm{N}+1$ ) |  |
|  | 11 | Not used |  |
| 2-7 | Not used |  | Do not change the settings. |


| G3 Switch OD |  | SP No. 1-105-014 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0-1 | Not used | Do not change the settings. |
| $\begin{gathered} 2 \\ \text { to } \\ 5 \end{gathered}$ | Data rate threshold during V. 34 reception <br> Bit 5432 Setting <br> 0000 Normal <br> $\begin{array}{lllll}0 & 1 & 1 & 1 & \text { Lower by }\end{array}$ one step <br> $\begin{array}{llll}1 & 1 & 1 & 1\end{array}$ Lower by two steps | The machine changes the modulation parameters in the MPh signal to lower the initial modem rate during V. 34 reception. If this switch is set to " 0111 ", the machine lowers the initial speed one step, for example, from 28,800 to 26,400 bps. <br> This switch reduces transmission time if the machine frequently sends PPR signals during V. 34 reception. |
| 6 | Not used | Do not change the settings. |
| 7 | B signal detection time for V. 34 polling transmission 0: 75 ms (default setting) 1:65 ms | Change this switch only when there are communication errors during V. 34 polling transmission to a machine with a Panasonic modem. |

G3 Switch OE - Not used (do not change the settings)

| G3 Switch 0F |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-105-016 |
| $\mathbf{0}$ | Alarm when an error occurred <br> in Phase C or later <br> 0: Disabled <br> 1: Enabled | If the customer wants to hear an alarm after each <br> error communication, change this bit to "1". |
| $\mathbf{1}$ | Alarm when the handset is off- <br> hook at the end of <br> communication <br> 0: Disabled <br> 1: Enabled | lf the customer wants to hear an alarm if the <br> handset is off-hook at the end of fax communication, <br> change this bit to "1". |
| 2-7 | Not used | Do not change the settings. |

### 3.2.6 G3-2 SWITCHES

These switches require an optional G3 interface unit.

| G3-2 Switch 00 |  | SP No. 1-106-001 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0-1 |  | ( 0,0 ): The monitor speaker is disabled all through the communication. <br> $(0,1)$ : The monitor speaker is on up to phase $B$ in the T. 30 protocol. <br> (1, 0): Used for testing. The monitor speaker is on all through the communication. Make sure that you reset these bits after testing. |
| 2 | Monitor speaker during memory transmission 0: Disabled 1: Enabled | 1: The monitor speaker is enabled during memory transmission. |
| 3-6 | Not used | Do not change the settings. |


| G3-2 Switch 01 |  | SP No. 1-106-002 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0-3 | Not used | Do not change the settings. |
| 4 | DIS frame length 0: 10 bytes 1:4 bytes | 1: The bytes in the DIS frame after the 4th byte will not be transmitted (set to 1 if there are communication problems with PC-based faxes which cannot receive the extended DIS frames). |
| 5 | Not used | Do not change the setting. |
| 6 | CED/ANSam transmission <br> 0 : Disabled <br> 1: Enabled | Do not change this setting, unless the communication problem is caused by the CED/ANSam transmission. |
| 7 | Not used | Do not change the setting. |


| G3-2 Switch 02 |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS No. 1-106-003 |
| $\mathbf{0}$ | G3 protocol mode used <br> 0: Standard and non-standard <br> 1: Standard only | Change this bit to 1 only when the other end can <br> only communicate with machines that send T.30- <br> standard frames only. <br> 1: Disables NSF/NSS signals (these are used in <br> non-standard mode communication) |
| 1-4 | Not used | Do not change the settings. |

G3-2 Switch 03
SP No. 1-106-004

| No | FUNCTION | COMMENTS |
| :---: | :--- | :--- |
| $\mathbf{0}$ | DIS detection number | 0: The machine will hang up if it receives the same |
|  | (Echo countermeasure) | DIS frame twice. |
|  | $0: 1$ | 1: Before sending DCS, the machine will wait for the |
|  | $\mathbf{1 : 2}$ | second DIS which is caused by echo on the line. |
| $\mathbf{1}$ | Not used | Do not change the settings. |
| $\mathbf{2}$ | V.8 protocol | $0:$ V.8/V.34 communications will not be possible. |
|  | $0:$ Disabled | Note: |


| 1: Enabled | Do not set to 0 unless the line condition is always <br> bad enough to slow down the data rate to 14.4 kbps <br> or lower. |
| :--- | :--- |
| O | KCM |


| $\mathbf{3}$ | ECM frame size |
| :--- | :--- |
|  | $0: 256$ bytes |
|  | $\mathbf{1 : 6 4}$ bytes |
| $\mathbf{4}$ | CTC |


| 4 | CTC transmission conditions <br> 0: After one PPR signal <br> received |
| :--- | :--- |

0 : When using ECM in non-standard (NSF/NSS) mode, the machine sends a CTC to drop back the modem rate after receiving a PPR, if the
1: After four PPR signals received (ITU-T standard)

|  | received (ITU-T standard) |
| :--- | :--- | :--- |
| $\mathbf{5}$ | Modem rate used for the next <br> page after receiving a negative <br> code (RTN or PIN) <br> 0: No change |
| $\mathbf{6}$ | 1: Fallback |$|$ following condition is met in communications at 14.4, 12.0, 9.6 , and 7.2 kbps.

$\sqrt{\text { NTransmit } \leq \text { NResend }}$
NTransmit- Number of transmitted frames NResend- Number of frames to be retransmitted

1: When using ECM, the machine sends a CTC to drop back the modem rate after receiving four PPRs.

PPR, CTC: These are ECM protocol signals.
This bit is not effective in V .34 communications.
1: The machine's tx modem rate will fall back before sending the next page if a negative code is received. This bit is ignored if ECM is being used.

Do not change the settings.
Do not change the settings.

| G3-2 Switch 04 |  | SP No. 1-106-005 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \hline \text { to } \\ 3 \end{gathered}$ | Training error detection threshold | 0-F (Hex); 0-15 bits If the number of error bits in the received TCF is below this threshold, the machine informs the sender that training has succeeded. |
| 4-7 | Not used | Do not change the settings. |


| G3-2 Switch 05 |  | SP No. 1-106-006 |
| :---: | :---: | :---: |
| No | FUNCTION |  |
| $\begin{gathered} 0 \\ \text { to } \\ 3 \end{gathered}$ |  | These bits set the initial starting modem rate for transmission. <br> Use the dedicated transmission parameters if you need to change this for specific receivers. <br> If a modem rate 14.4 kbps or slower is selected, V. 8 protocol should be disabled manually. <br> Cross reference <br> V. 8 protocol on/off - SG3 switch 03, bit2 |
| $\begin{gathered} \hline 4 \\ \text { to } \\ 5 \end{gathered}$ | Initial modem type for 9.6 k or 7.2 kbps. | These bits set the initial modem type for 9.6 and 7.2 kbps , if the initial modem rate is set at these speeds. |
| 6-7 | Not used | Do not change the settings. |


| G3-2 Switch 06 |  | SP No. 1-106-007 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 3 \end{gathered}$ |  | These bits set the initial starting modem rate for reception. <br> Use a lower setting if high speeds pose problems during reception. <br> If a modem rate 14.4 kbps or slower is selected, V. 8 protocol should be disabled manually. <br> Cross reference <br> V. 8 protocol on/off - SG3 switch 03, bit2 |


| G3-2 Switch 06 |  | SP No. 1-106-007 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} \hline 4 \\ \text { to } \\ 7 \end{gathered}$ |  | The setting of these bits is used to inform the transmitting terminal of the available modem type for the machine in receive mode. <br> If V .34 is not selected, V .8 protocol must be disabled manually. <br> Cross reference <br> V. 8 protocol on/off - SG3 switch 03, bit2 |


| G3-2 Switch 07 |  | SP No. 1-106-008 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 1 \end{gathered}$ | PSTN cable equalizer <br> (tx mode: Internal) <br> Bit $\mathbf{1}$    Bit 0 Setting <br> 0 0 None    <br> 0 1 Low    <br> 1 0 Medium    <br> 1 1 High    | Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. <br> Use the dedicated transmission parameters for specific receivers. <br> Also, try using the cable equalizer if one or more of the following symptoms occurs. <br> - Communication error <br> - Modem rate fallback occurs frequently. <br> Note: This setting is not effective in V. 34 communications. |
| $\begin{gathered} \\ \hline 2 \\ \text { to } \\ 3 \end{gathered}$ | PSTN cable equalizer <br> (rx mode: Internal) <br> Bit 3   <br> Bit 2 Setting  <br> 0 0 None <br> 0 1 Low <br> 1 0 Medium <br> 1 1 High | Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. <br> Also, try using the cable equalizer if one or more of the following symptoms occurs. <br> - Communication error with error codes such as 0-20, 0-23, etc. <br> - Modem rate fallback occurs frequently. <br> Note: This setting is not effective in V. 34 communications. |
| 4 | PSTN cable equalizer (V.8/V. 17 rx mode: External) <br> 0 : Disabled <br> 1: Enabled | Keep this bit at "1". |
| 5 | PSTN cable equalizer (V. 34 rx mode; External) | Keep this bit at "1". |
| 6-7 | Not used | Do not change the settings. |

G3-2 Switch 08 - Not used (do not change the settings)
G3-2 Switch 09 - Not used (do not change the settings)

| G3-2 Switch 0A |  | SP No. 1-106-011 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{aligned} & 0 \\ & 1 \end{aligned}$ | Maximum allowable carrier drop during image data reception | These bits set the acceptable modem carrier drop time. <br> Try using a longer setting if error code 0-22 is frequent. |
| 2-3 | Not used | Do not change the settings. |
| 4 | Maximum allowable frame interval during image data reception. $0: 5 \mathrm{~s} \mathrm{1:13s}$ | This bit set the maximum interval between EOL (end-of-line) signals and the maximum interval between ECM frames from the other end. Try using a longer setting if error code $0-21$ is frequent. |
| 5 | Not used | Do not change the settings. |
| 6 | Reconstruction time for the first line in receive mode 0: $6 \mathrm{~s} 1: 12 \mathrm{~s}$ | When the sending terminal is controlled by a computer, there may be a delay in receiving page data after the local machine accepts set-up data and sends CFR. This is outside the T. 30 recommendation. But, if this delay occurs, set this bit to 1 to give the sending machine more time to send data. <br> Refer to error code 0-20. <br> ITU-T T. 30 recommendation: The first line should come within 5 s of CFR. |
| 7 | Not used | Do not change the settings. |


| G3-2 Switch 0B |  | SP No. 1-106-012 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Protocol requirements: Europe <br> 0 : Disabled 1: Enabled | The machine does not automatically reset these bits for each country after a country code (System Switch $0 F$ ) is programmed. Change the required bits manually at installation. |
| 1 | Protocol requirements: Spain 0: Disabled 1: Enabled |  |
| 2 | Protocol requirements: Germany <br> 0: Disabled 1: Enabled |  |
| 3 | Protocol requirements: France <br> 0 : Disabled 1: Enabled |  |
| 4 | PTT requirements: Germany <br> 0: Disabled 1: Enabled |  |
| 5 | PTT requirements: France 0 : Disabled 1: Enabled |  |
| 6 | Not used | Do not change the settings. |
| 7 | Not used | Do not change the settings. |


| G3-2 Switch 0C |  |  | SP No. 1-106-013 |
| :---: | :---: | :---: | :---: |
| No | FUNCTION |  | COMMENTS |
| 0 | Pulse dialin | method | $\mathrm{P}=$ Number of pulses sent out, $\mathrm{N}=$ Number dialed. |
| 1 | Bit 1 Bit 0 | Setting |  |
|  | 00 | Normal( $\mathrm{P}=\mathrm{N}$ ) |  |
|  | 01 | Oslo ( $\mathrm{P}=10-\mathrm{N}$ ) |  |
|  | 10 | Sweden ( $\mathrm{N}+1$ ) |  |
|  | 11 | Not used |  |
| 2-7 | Not used |  | Do not change the settings. |

G3-2 Switch OD - Not used (do not change the settings)
G3-2 Switch 0E - Not used (do not change the settings)
G3-2 Switch 0F - Not used (do not change the settings)

### 3.2.7 G4 INTERNAL SWITCHES



```
G4 Internal Switch 01 - Not used (do not change these settings)
G4 Internal Switch 02 - Not used (do not change these settings)
```

| G4 Internal Switch 03 |  |  |
| :---: | :--- | :--- |
| No. | FUNCTION | COMMENTS |
| $\mathbf{0}$ | Amount of protocol dump data in <br> one protocol dump list <br> $\mathbf{0}:$ Last communication only <br> 1: Up to the limit of the memory <br> area for protocol dumping | Change this bit to 0 if you want to have a <br> protocol dump list of the last communication <br> only. <br> This bit is only effective for the dump list D + <br> Bch1. |
| $\mathbf{1 - 7}$ | Not used | Do not change these settings. |


| G4 Internal Switch 04 |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| 0-2 | Not used | Do not change these settings. |
| 3 | Auto data rate change for transmission ( 64 kbps to 56 kbps ) 0: On 1: Off | 0 : The machine automatically changes the transmission data rate from 64 kbps to 56 kbps after 3 s if the other end did not accept the call. This is to cope with 56 kbps networks in the USA. Normally, keep this bit at 0 . |
| 4 | Auto data rate change for reception ( 64 kbps to 56 kbps ) <br> 0 : Off 1: On | 1: The machine automatically changes the reception data after 6 s . Change this bit to 1 only when there is a communication error where the other terminal informs 64 kbps in the SETUP signal although it is actually 56 kbps . |
| 5-7 | Not used | Do not change these settings. |


| G4 Internal Switch 05 |  |  |
| :---: | :--- | :--- |
| No. | FUNCTION | COMMENTS |
| $\mathbf{0 - 1}$ | Not used | Do not change these settings. |
| $\mathbf{2}$ | Protocol ID check <br> 0: Yes 1: No | The Protocol ID is in the CR packet. |
| 3-7 | Not used | Do not change these settings. |


| G4 Internal Switch 06 - Not used (do not change these settings) |
| :--- |
| G4 Internal Switch $07-$ Not used (do not change these settings) |
| G4 Internal Switch $08-$ Not used (do not change these settings) |
| G4 Internal Switch $09-$ Not used (do not change these settings) |
| G4 Internal Switch 0A - Not used (do not change these settings) |
| G4 Internal Switch 0B - Not used (do not change these settings) |
| G4 Internal Switch 0C - Not used (do not change these settings) |
| G4 Internal Switch 0D - Not used (do not change these settings) |
| G4 Internal Switch 0E - Not used (do not change these settings) |
| G4 Internal Switch 0F - Not used (do not change these settings) |


| G4 Internal Switch 10 (Dch. Layer 1) |  |  |
| :---: | :--- | :--- |
| No. | FUNCTION | COMMENTS |
| $\mathbf{0 - 5}$ | Not used | Do not change these settings. |
| $\mathbf{6}$ | INFO1 signal resend | 0: Some DSUs may not reply to the INFO1 <br> 0: Resend $\quad$ 1: No resend <br> signal with INFO2, if there is noise in the <br> INFO1 signal accidentally. Try changing <br> this bit to 0, to resend INFO1 before the <br> machine displays "CHECK INTERFACE". |
| $\mathbf{7}$ | Not used | Do not change these settings. |


| G4 Internal Switch 11 (Dch. Layer 2) |  |  |
| :---: | :--- | :--- |
| No. | FUNCTION | COMMENTS |
| $\mathbf{0}$ | Not used | Do not change these settings. |
| $\mathbf{1}$ | Type of TEI used <br> 0: Dynamic TEI 1: Static TEI <br> This is normally fixed at 0. However, some <br> networks may require this bit to be set at 1 <br> (see below). In this case, you may have to <br> change the values of bits 2 to 7. |  |
| $\mathbf{2}$ | Static TEI value | Store the lowest bit of the TEI at bit 7 and the <br> highest bit of the TEI at bit 2. <br> to <br> $\mathbf{7}$ |
|  | Example: If the static TEI is 011000, set bits 3 <br> and 4 to 1 and bits $2,5,6$, and 7 to <br> 0. |  |

G4 Internal Switch 12 - Not used (do not change these settings)

| G4 Internal Switch 13: D channel layer 3 (Attachment IE in S: SETUP) |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| 0 | Not used | Do not change these settings. |
| 1 | Information transfer capability shift down to retry transmission <br> 0: Shift down procedure disabled (Default) <br> 1: Shift down and retry the call | 1: The machine changes the ISDN G3 information transfer capability informed in the [SETUP] signal to "Speech" from "3.1 kHz audio" or to " 3.1 kHz audio" from "Speech" automatically and retries the transmission. <br> The information transfer capability used in the first try is determined by the setting of G4 internal bit switch 14 bit 0 . <br> This switch is effective with some types of exchangers and T/As where they only accept calls with information transfer capability "Speech". |
| 2 | Attachment of calling ID and subaddress <br> 0 : No 1: Yes | Normally, this bit should be at 0 , because most networks add the calling ID and subaddress to the SETUP signal to the receiver. <br> However, some networks may require the machine to add this ID (and/or subaddress). Only in this case should this bit be at 1 . |
| 3 | Attachment of the Lower Layer Capabilities 0 : No 1: Yes | This bit determines whether Lower Layer Capabilities are informed in the [SETUP] signal. <br> Keep this bit at 0 in most cases. |
| 4 | Attachment of the Higher Layer Capabilities <br> 0 :Yes 1: No | This bit determines whether Higher Layer Capabilities are informed in the [SETUP] signal or not. <br> Keep this bit at 0 in most cases. |
| 5 | Attachment of the channel information element (CONN) 0 : No 1: Yes | Keep this bit at 0 in most cases. |
| 6 | Attachment of the Higher Layer Capabilities for ISDN G3 transmission <br> 0 : Same as the bit 4 setting <br> 1: Not attached | This bit determines whether Higher Layer Capabilities are informed in the [SETUP] signal for ISDN G3 transmission. This switch is effective in coping with communication problems with some types of T/A and PBX that do not respond to Higher Layer Capability "G3". <br> When this bit is set to 0 , the setting depends on the setting of bit 4 . <br> Keep this bit at 1 in most cases. |


| G4 Internal Switch 13: D channel layer 3 (Attachment IE in S: SETUP) |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| 7 | Condition for fallback from G4 to G3 <br> 0 : Refer to the CPS code setting <br> 1: Fallback in response to any CPS code | 0: Fallback occurs when a CPS code is the same as the CPS code settings specified by G4 internal switches $17,18,1 \mathrm{~A}, 1 \mathrm{~B}$, and 1 C . <br> If you wish to enable fallback when any CPS code is detected, set this bit to " 1 ". <br> This switch is effective in coping with fallback problems where the CPS code does not match those specified in the ITU-T recommendation. |


| G4 Internal Switch 14: D channel layer 3 (Selection IE in S: SETUP) |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| 0 | ISDN G3 information transfer capability <br> $0: 3.1 \mathrm{kHz}$ audio <br> 1: Speech | In tx mode, this determines the information transfer capability informed in the [SETUP] message. <br> In rx mode, this determines the information transfer capability that the machine can use to receive a call. <br> Set this bit to 1 if the ISDN does not support 3.1 kHz audio. |
| 1-2 | Not used | Do not change these settings. |
| 3-4 | Channel selection in [SETUP] in tx mode <br> Bit 43 Setting <br> 00 Any channel <br> 01 B1 channel <br> 10 B2 channel <br> 1 1 Not used | Any channel: When this is informed to the exchanger, the exchanger will select either B1 or B2. |
| 5 | Called ID mapping <br> 0 : Called party number <br> 1: Keypad facility | 0 : Called ID is mapped to the called party number. <br> 1: Called ID is mapped to the keypad facility. Note that the subaddress in not mapped. On the 5ESS network (USA), set it to 1 . |
| 6 | Numbering plan for the called party number <br> 0: Unknown <br> 1: E. 164 | E.164: This may be used in Sweden if an AXE10 exchanger is fitted with old software, and in Australia. <br> Unknown: This is the normal setting. |
| 7 | Subaddress coding type <br> 0: IA5 (NSAP) <br> 1: BCD (ISO8348) | This is normally kept at 0 . However, some networks require this bit to be at 1 . |


| G4 Internal Switch 15: D channel layer 3 (Judgement R: MSG) |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| 0 | Action when receiving [SETUP] signal containing no called subaddress <br> 0 : A reply is sent <br> 1: No reply is sent | This bit depends on user requirements. If it is at 1 , communication will be halted if the other terminal has not input the subaddress. |
| $\begin{gathered} 1 \\ \text { to } \\ 4 \end{gathered}$ | Not used | Do not change the settings |
| 5 | Global call reference <br> 0 : Ignored <br> 1: Global call number is used | Global call reference means 'call reference value $=0$ '. This bit determines how to deal with such an incoming call if received from the network. <br> Keep this bit at 1 in Germany 1TR6. |
| 6-7 | Not used | Do not change these settings. |


| G4 Internal Switch 16: D channel layer 3 (Approval) |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| 0-1 | Answer delay time    <br> Bit 1 0  <br> Setting    <br> 0 0 No delay  <br> 0 1 1.0 s delayed (1TR6)  <br> 1 0 0.5 s delayed  <br> 1 1 Not used  | In some countries, a time delay to answer a call is required. <br> Otherwise, use this switch as follows: If the machine is connected to the same bus from the DSU as a model K200 is connected, the machine receives most of the calls because the response time to a call is faster than the K200. <br> If the customer wants the K200 to receive most of the calls, adjust the response time using these bits. <br> If the customer does not want one machine to receive most of the calls, use subaddresses to identify each terminal. |
| 2 | Action when receiving [SETUP] <br> signal containing user-specific <br> called party subaddress <br> 0 : Ignores the call <br> 1: Receives the call | Normally, the 3rd octet of called party subaddress information in the [SETUP] signal is set to NSAP. However, some networks may add "user-specific" subaddress to the [SETUP] signal, and the result of this is that the machine won't answer the call if a subaddress is specified. <br> So, change this bit to 1 to let the machine receive the call if the machine is connected to such a network. |
| 3-4 | Not used | Do not change these settings. |
| 5 | Indicated bearer capabilities 0: 56 kbps 1: 64 kbps | 1: 64 kbps calling is indicated in the Bearer Capabilities, but communication is at 56 k . Use this bit if the machine is connected to a network which does not accept a 56 kbps data transfer rate as a bearer capability. |
| 6 | Not used | Do not change these settings. |


| G4 Internal Switch 16: D channel layer 3 (Approval) |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| 7 | Transfer capabilities (SI) informed in 1TR6 ISDN G3 transmission <br> 0: G3 Fax <br> 1: Analog | This bit determines whether transfer capabilities informed in the Service Indicator for 1TR6 ISDN G3 transmission. This switch is effective in coping with communication problems with some types of T/A and PBXs. Normally keep this bit at 1 in Germany 1TR6. |


| G4 Internal Switch 17: CPS Code Used for G4 to G3 Fallback - 1 |  |
| :---: | :---: |
| No. | FUNCTION COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 6 \end{gathered}$ | Condition for fallback from G4 to G3 <br> Bits 0 to 6 of bit switch 17 contain a CPS code, and bits 0 to 6 of bit switch 18 contain another CPS code. If a CPS code is received which is the same as either of these, communication will fall back from ISDN G4 mode to ISDN G3 mode. The CPS codes must be the same as those specified in table 4-13 of ITU-T recommendation Q.931. $\begin{array}{\|rrrrrrrr\|} \hline \text { Examples: Bit } 6 & 5 & 4 & 3 & 2 & 1 & 0 & \\ 1 & 0 & 0 & 0 & 0 & 0 & 1 & \text { CPS code } 65 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 & \text { CPS code } 88 \end{array}$ <br> For the codes in bits 0 to 6 of bit switches 17 and 18 to be recognized, bit 7 of bit switch 17 must be 1. Also, bit 0 of the Communication Switch 07 must be at 0 , or Fallback from G4 to G3 will be disabled. |
| 7 | This bit determines whether fallback from G4 to G3 occurs on receipt of one of the CPS codes programmed in bit switch 17 or 18, or on receipt of a certain standard code. <br> 0 : Fallback occurs on receipt of any of the following CPS codes: <br> Universal (Euro ISDN) - \#3, \#18, \#57, \#58, \# 63, \# 65, \#79, \#88, and \#127 <br> Germany 1TR6 mode - \#3, \#53, \#58, and \#90 <br> Others - \#3, \#65, and \#88 <br> 1: Fallback from G4 to G3 occurs on receipt any of above CPS codes or one of the CPS codes programmed in bit switch 17, 18, 1A, 1B, or 1C |


| G4 Internal Switch 18: CPS Code Used for G4 to G3 Fallback -2 |  |
| :---: | :---: |
| No. | FUNCTION COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 6 \end{gathered}$ | Condition for fallback from G4 to G3 <br> See the explanation for bits 0 to 6 of bit switch 17 |
| 7 | This bit helps to choose the CPS code set for G4 to G3 fallback. <br> 0 : Fallback occurs on receipt of the CPS code set, which is specified by the country code setting. <br> 1: Fallback occurs on receipt of the Universal CPS code set (\#3, \#18, \#57, \#58, \# $63, \# 65, \# 79, \# 88$, and \#127) even if another country code is programmed. If bit switch 17 bit 7 is " 1 ", fallback occurs on receipt of the Universal CPS code set or one of the CPS codes programmed in bit switches 17, 18, 1A, 1B, or 1C. |

## G4 to G3 fallback

Bit 0 of Communication Switch 07 must be at 0 , or fallback from G4 to G3 will be disabled.

The CPS codes for which fallback occurs are decided as follows.

- G4 bit switch 17, bit 7 - If set to " 0 ", fallback occurs on receipt of a code from a set that depends on the country code. If set to "1", fallback occurs for the 5 CPS codes programmed in bits 0 to 6 of $G 4$ bit switches 17, 18, 1A, 1B, and 1C, in addition to the country code set.
Note that if G4 bit switch 18 , bit 7 is set to " 1 ", the CPS code set that is used is always the Universal set, regardless of the country code setting.

| G4 Internal Switch $\mathbf{1 9}$ |  |  |
| :---: | :--- | :--- |
| No. | FUNCTION | COMMENTS |
| $\mathbf{0}$ | Permanence of the link <br> 0: Set/released each LAPD call <br> 1: Permanent | Keep this at 1 in the USA. In other areas, this <br> bit is normally 0, depending on network <br> requirements. |
| $\mathbf{1}$ | Channel used in ISDN L2 (64k) <br> mode <br> 0: B1 1: B2 | When making an IDSN L2 back-to-back test, <br> you can select either the B1 or B2 channel <br> with this bit switch. |
| $\mathbf{2 - 7}$ | Not used | Do not change the factory settings. |


| G4 Internal Switch 1A: CPS Code Used for G4 to G3 Fallback - 3 |  |  |
| :---: | :--- | :--- |
| No. | FUNCTION | COMMENTS |
| $\mathbf{0}$ | Condition for fallback from G4 to G3 |  |
| to | See the explanation for bits 0 to 6 of bit switch 17. |  |
| $\mathbf{6}$ |  |  |
| $\mathbf{7}$ | Not used | Do not change this setting. |


| G4 Internal Switch 1B: CPS Code Used for G4 to G3 Fallback - 4 |  |  |
| :---: | :--- | :--- |
| No. | FUNCTION | COMMENTS |
| $\mathbf{0}$ | Condition for fallback from G4 to G3 |  |
| to | See the explanation for bits 0 to 6 of bit switch 17. |  |
| $\mathbf{6}$ |  |  |
| $\mathbf{7}$ | Not used | Do not change this setting. |


| G4 Internal Switch 1C: CPS Code Used for G4 to G3 Fallback -5 |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| $\mathbf{0}$ | Condition for fallback from G4 to G3 |  |
| to | See the explanation for bits 0 to 6 of bit switch 17. |  |
| $\mathbf{6}$ |  |  |
| $\mathbf{7}$ | Not used | Do not change this setting. |


| G4 Internal Switch 1D - Not used (do not change these settings) |
| :--- |
| G4 Internal Switch 1E - Not used (do not change these settings) |
| G4 Internal Switch 1F - Not used (do not change these settings) |

### 3.2.8 G4 PARAMETER SWITCHES

| G4 Parameter Switch 00 |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| 0-2 | Network type     <br> Bit 1 0   <br> 2 ype     <br> $x$ 0 0   Circuit switched | Do not change the default setting. |
| 3-7 | Not used | Do not change the default settings. |


| G4 Parameter Switch 01 |  |  |
| :---: | :--- | :--- |
| No. | FUNCTION | COMMENTS |
| $\mathbf{0}$ | Voice coding <br> $\mathbf{0}: \mu$ law 1: A law | 0: This setting is used in USA. <br> 1: This setting is used in Europe and Asia. |
| $\mathbf{1}$ | Action when [SETUP] signal <br> without HLC is received <br> 0: Respond to the call <br> 1: Not respond to the call | If there are several TEs on the same bus and <br> the machine responds to calls for another TE, <br> the call may be without HLC information. <br> Identify the type of calling terminal and <br> change this bit to 1 if the caller is not a fax <br> machine. |
| $\mathbf{2 - 6}$ | Not used | Do not change these settings. |
| $\mathbf{7}$ | Signal attenuation for G3 fax <br> signals received from ISDN line (- <br> 6dB) <br> $\mathbf{0 : ~ O f f ~ 1 : ~ O n ~}$ | 0: If an analog signal comes over digital line, <br> the signal level after decoding by the TE is <br> theoretically the same as the level at the <br> entrance to the digital line. However, this <br> sometimes causes the received signal level <br> to be too high at the received end. In this <br> case, set this bit to 1 to adjust the <br> attenuation level. |


| G4 Parameter Switch 02 |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| 0-1 | Data rate (kbps) | Other settings: Not used |
|  | $\begin{array}{rll}\text { Bit } 1 & 0 & \text { Setting } \\ 0 & 0 & 64 \mathrm{kbps}\end{array}$ |  |
|  | $\begin{array}{llll}0 & 1 & 56 \mathrm{kbps}\end{array}$ |  |
| 2-7 | Not used | Do not change these settings. |

G4 Parameter Switch 03 - Not used (do not change these settings)
G4 Parameter Switch 04 - Not used (do not change these settings)

| G4 Parameter Switch 05 |  |  |
| :---: | :--- | :--- |
| No. | FUNCTION | COMMENTS |
| $\mathbf{0 - 3}$ | Not used | Do not change these settings. |
| $\mathbf{4}$ | B-channel T3 timer | 1: This switch is useful when used in |
|  | 0:30s 1:57s | combination with the Communication Bit |
|  |  | SW 07 bit 4. This is to cope with |
| communication problems where G4 |  |  |
|  |  | communication fails on the ISDN B- |
|  | channel. |  |
|  |  | Normally keep this bit at 1. |
|  |  | Do not change these settings. |
| $\mathbf{5 - 7}$ | Not used |  |


| G4 Parameter Switch $\mathbf{0 6}$ |  |  |
| :---: | :--- | :--- |
| No. | FUNCTION | COMMENTS |
| $\mathbf{0}$ | Layer 3 protocol <br> $\mathbf{0 :}$ ISO8208 1: T.70NULL | Set this bit to match the type of layer 3 <br> signaling used by the ISDN. <br> The dedicated parameters have the same <br> setting for specific destinations. <br> Normally keep this bit at 0. |
| $\mathbf{1 - 7}$ | Not used | Do not change these settings. |



| G4 Parameter Switch 08 |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| 0 | Packet window size | This is the maximum number of unacknowledged packets that the machine can send out before having to pause and wait for an acknowledgement from the other end. Normally this should be kept at 7 . |
| to | Bit $3 \quad 2 \begin{array}{llll} & 1 & 0 & \text { Value }\end{array}$ |  |
| 3 | $\begin{array}{llllll}0 & 0 & 0 & 1 & 1\end{array}$ |  |
|  | $\begin{array}{lllll}0 & 0 & 1 & 0 & 2\end{array}$ |  |
|  | and so on until |  |
|  | $\begin{array}{lllll}1 & 1 & 1 & 1 & 15\end{array}$ |  |
| 4-7 | Not used | Do not change these settings. |

## G4 Parameter Switch 09 - Not used (do not change these settings) <br> G4 Parameter Switch 0A - Not used (do not change these settings)

| G4 Parameter Switch 0B |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| No. | FUNCTION |  |  |  | COMMENTS |
| 0 | Transport block size |  |  |  | This value must match the value set in the |
| to | Bit 3 | 2 | 10 | Value | other terminal. Note that this value must be |
| 3 | 0 | 1 | 11 | 128 | the same as the value programmed for the |
|  | 1 | 0 | 0 | 256 | packet size (G4 Parameter Switch 7, bits 0 to |
|  | 1 | 0 | 01 | 512 | 3 ). Also, the transport block size is limited by |
|  | 1 | 0 | 10 | 1024 | the amount of memory in the remote terminal. |
|  | 1 | 0 | 11 | 2048 | Normally, do not change the default setting. |
| 4-7 | Not used |  |  |  | Do not change these settings. |

G4 Parameter Switch 0C - Not used (do not change these settings)

| G4 Parameter Switch 0D |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| 0-1 | Back-to-back test mode    <br> Bit 11 0 Setting       <br> 0 0 Off       <br> 1 0 ISDN L2 test mode       <br>         (TE mode) <br> Other settings - Not used           | When doing a back-to-back test or doing a demonstration without a line simulator, use these bits to set up one of the machines in TE mode, and the other in NT mode Please note that this machine can only be set to TE mode. <br> After the test, return both bits to 0 . <br> See "Back-to-back Testing" in the Troubleshooting section for full details. |
| 2-7 | Not used | Do not change these settings. |

G4 Parameter Switch 0E - Not used (do not change these settings)
G4 Parameter Switch OF - Not used (do not change these settings)

### 3.3 NCU PARAMETERS

The following tables give the RAM addresses and the parameter calculation units that the machine uses for ringing signal detection and automatic dialing. The factory settings for each country are also given. Most of these must be changed by RAM read/write (SP2-102), but some can be changed using NCU Parameter programming (SP2-103, 104 and 105); if SP2-103, 104 and 105 can be used, this will be indicated in the Remarks column. The RAM is programmed in hex code unless (BCD) is included in the Unit column.

NOTE: The following addresses describe settings for the standard NCU. Change the fourth digit from " 5 " to " 6 " (e.g. 680500 to 680600) for the settings for the first optional G3 interface unit.

| Address | Function | Unit |  | emarks |
| :---: | :---: | :---: | :---: | :---: |
| 680500 | Country/Area code for NCU parameters | Use the Hex value to program the country/area code directly into this address, or use the decimal value to program it using SP2-103-001 |  |  |
|  |  | Country/Area | Decimal | Hex |
|  |  | France | 00 |  |
|  |  | Germany | 01 | 01 |
|  |  |  | 02 | 02 |
|  |  | Italy | 03 | 03 |
|  |  | Austria | 04 | 04 |
|  |  | Belgium | 05 | 05 |
|  |  | Denmark | 06 | 06 |
|  |  | Finland | 07 | 07 |
|  |  | Ireland | 08 | 08 |
|  |  | Norway | 09 | 09 |
|  |  | Sweden | 10 | OA |
|  |  | Switzerland | 11 | OB |
|  |  | Portugal | 12 | OC |
|  |  | Holland | 13 | OD |
|  |  | Spain | 14 | OE |
|  |  | Israel | 15 | OF |
|  |  | USA | 17 | 11 |
|  |  | Asia | 18 | 12 |
|  |  | Hong Kong | 20 | 14 |
|  |  | South Africa | 21 | 15 |
|  |  | Australia | 22 | 16 |
|  |  | New Zealand | 23 | 17 |
|  |  | Singapore | 24 | 18 |
|  |  | Malaysia | 25 | 19 |
|  |  | China | 26 | 1A |
|  |  | Taiwan | 27 | 1B |
|  |  | Korea | 28 | 1C |
|  |  | Greece | 33 | 21 |
|  |  | Hungary | 34 | 22 |
|  |  | Czech | 35 | 23 |
|  |  | Poland | 36 | 24 |
| 680501 | Line current detection time | 20 ms | Line current detection is disabled. <br> Line current is not detected if 680501 contains FF. |  |
| 680502 | Line current wait time |  |  |  |
| 680503 | Line current drop detect time |  |  |  |


| Address | Function | Unit | Remarks |
| :---: | :---: | :---: | :---: |
| 680504 | PSTN dial tone frequency upper limit (high byte) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680505 | PSTN dial tone frequency upper limit (low byte) |  |  |
| 680506 | PSTN dial tone frequency lower limit (high byte) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680507 | PSTN dial tone frequency lower limit (low byte) |  |  |
| 680508 | PSTN dial tone detection time | 20 ms | If 680508 contains FF(H), the machine pauses for the pause time (address 68050D / 68050E). <br> Italy: See Note 2. |
| 680509 | PSTN dial tone reset time (LOW) |  |  |
| 68050A | PSTN dial tone reset time (HIGH) |  |  |
| 68050B | PSTN dial tone continuous tone time |  |  |
| 68050C | PSTN dial tone permissible drop time |  |  |
| 68050D | PSTN wait interval (LOW) |  |  |
| 68050E | PSTN wait interval (HIGH) |  |  |
| 68050F | PSTN ring-back tone detection time | 20 ms | Detection is disabled if this contains FF. |
| 680510 | PSTN ring-back tone off detection time | 20 ms |  |
| 680511 | PSTN detection time for silent period after ring-back tone detected (LOW) | 20 ms |  |
| 680512 | PSTN detection time for silent period after ring-back tone detected (HIGH) | 20 ms |  |
| 680513 | PSTN busy tone frequency upper limit (high byte) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680514 | PSTN busy tone frequency upper limit (low byte) |  |  |
| 680515 | PSTN busy tone frequency lower limit (high byte) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680516 | PSTN busy tone frequency lower limit (low byte) |  |  |
| 680517 | PABX dial tone frequency upper limit (high byte) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680518 | PABX dial tone frequency upper limit (low byte) |  |  |
| 680519 | PABX dial tone frequency lower limit (high byte) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 68051A | PABX dial tone frequency lower limit (low byte) |  |  |


| Address | Function | Unit | Remarks |
| :---: | :---: | :---: | :---: |
| 68051B | PABX dial tone detection time | 20 ms | If 68051B contains FF, the machine pauses for the pause time (680520 / 680521). |
| 68051C | PABX dial tone reset time (LOW) |  |  |
| 68051D | PABX dial tone reset time (HIGH) |  |  |
| 68051E | PABX dial tone continuous tone time |  |  |
| 68051F | PABX dial tone permissible drop time |  |  |
| 680520 | PABX wait interval (LOW) |  |  |
| 680521 | PABX wait interval (HIGH) |  |  |
| 680522 | PABX ringback tone detection time | 20 ms | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680523 | PABX ringback tone off detection time | 20 ms |  |
| 680524 | PABX detection time for silent period after ringback tone detected (LOW) | 20 ms | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680525 | PABX detection time for silent period after ringback tone detected (HIGH) | 20 ms |  |
| 680526 | PABX busy tone frequency upper limit (high byte) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680527 | PABX busy tone frequency upper limit (low byte) |  |  |
| 680528 | PABX busy tone frequency lower limit (high byte) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680529 | PABX busy tone frequency lower limit (low byte) |  |  |
| 68052A | Busy tone ON time: range 1 | 20 ms |  |
| 68052B | Busy tone OFF time: range 1 |  |  |
| 68052C | Busy tone ON time: range 2 |  |  |
| 68052D | Busy tone OFF time: range 2 |  |  |
| 68052E | Busy tone ON time: range 3 |  |  |
| 68052F | Busy tone OFF time: range 3 |  |  |
| 680530 | Busy tone ON time: range 4 |  |  |
| 680531 | Busy tone OFF time: range 4 |  |  |
| 680532 | Busy tone continuous tone detection time |  |  |
| 680533 | Busy tone signal state time tolerance for all ranges, and number of cycles required for detection (a setting of 4 cycles means that ON-OFF-ON or OFF-ONOFF must be detected twice). |  |  |

Bits 7, 6, 5, 4 - number of cycles required for cadence detection

| Address | Function | Unit | Remarks |
| :---: | :---: | :---: | :---: |
| 680534 | International dial tone frequency upper limit (high byte) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680535 | International dial tone frequency upper limit (low byte) |  |  |
| 680536 | International dial tone frequency lower limit (high byte) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680537 | International dial tone frequency lower limit (low byte) |  |  |
| 680538 | International dial tone detection time | 20 ms | If 680538 contains FF, the machine pauses for the pause time (68053D 68053E). <br> Belgium: See Note 2. |
| 680539 | International dial tone reset time (LOW) |  |  |
| 68053A | International dial tone reset time (HIGH) |  |  |
| 68053B | International dial tone continuous tone time |  |  |
| 68053C | International dial tone permissible drop time |  |  |
| 68053D | International dial wait interval (LOW) |  |  |
| 68053E | International dial wait interval (HIGH) |  |  |
| 68053F | Country dial tone upper frequency limit (HIGH) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680540 | Country dial tone upper frequency limit (LOW) |  |  |
| 680541 | Country dial tone lower frequency limit (HIGH) |  | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 680542 | Country dial tone lower frequency limit (LOW) |  |  |


| Address | Function | Unit | Remarks |
| :--- | :--- | :--- | :--- |
| 680543 | Country dial tone detection time | 20 ms | If 680543 contains FF, <br> the machine pauses for <br> the pause time (680548 / <br> 680549). |
|  | Country dial tone reset time (LOW) |  |  |


| Address | Function | Unit | Remarks |
| :---: | :---: | :---: | :---: |
| 680557 | Time between 68054Dh (NCU parameter 14) and 68054Eh (NCU parameter 15) | 1 ms | This parameter takes effect when the country code is set to France. |
| 680558 | Not used |  | Do not change the setting. |
| 680559 | Grounding time (ground start mode) | 20 ms | The Gs relay is closed for this interval. |
| 68055A | Break time (flash start mode) | 1 ms | The OHDI relay is open for this interval. |
| 68055B | International dial access code (High) | BCD | For a code of 100: |
| 68055C | International dial access code (Low) |  | $\begin{aligned} & 68055 \mathrm{~B}-\mathrm{F} 1 \\ & 68055 \mathrm{C}-00 \end{aligned}$ |
| 68055D | PSTN access pause time | 20 ms | This time is waited for each pause input after the PSTN access code. If this address contains FF[H], the pause time stored in address 68054F is used. <br> Do not set a number more than 7 in the UK. |
| 68055E | Progress tone detection level, and cadence detection enable flags | Bit 7 Bit 6 Bit 5 <br> 0 0 0 <br> 0 0 1 <br> 0 1 0 <br> 1 0 0 <br> 1 1 0 <br> Bits 2, $0-5 e$    | e Note 2. |
| $\begin{gathered} 68055 F \\ \text { to } \\ 680564 \end{gathered}$ | Not used |  | Do not change the settings. |
| 680565 | Long distance call prefix (HIGH) | BCD | For a code of 0: |
| 680566 | Long distance call prefix (LOW) | BCD | $\begin{aligned} & 680565 \text { - FF } \\ & 680566 \text { - F0 } \end{aligned}$ |
| $\begin{gathered} 680567 \\ \text { to } \\ 680571 \end{gathered}$ | Not used |  | Do not change the settings. |


| Address | Function | Unit | Remarks |
| :---: | :---: | :---: | :---: |
| 680572 | Acceptable ringing signal frequency: range 1, upper limit | $\begin{aligned} & 1000 / \mathrm{N} \\ & (\mathrm{~Hz}) . \end{aligned}$ | SP2-103-003 (parameter 02). |
| 680573 | Acceptable ringing signal frequency: range 1, lower limit |  | SP2-103-004 (parameter 03). |
| 680574 | Acceptable ringing signal frequency: range 2, upper limit |  | SP2-103-005 (parameter 04). |
| 680575 | Acceptable ringing signal frequency: range 2, lower limit |  | SP2-103-006 (parameter 05). |
| 680576 | Number of rings until a call is detected | 1 | SP2-103-007 (parameter 06). <br> The setting must not be zero. |
| 680577 | Minimum required length of the first ring | 20 ms | See Note 4. SP2-103-008 (parameter 07). |
| 680578 | Minimum required length of the second and subsequent rings | 20 ms | SP2-103-009 (parameter 08). |
| 680579 | Ringing signal detection reset time (LOW) | 20 ms | SP2-103-010 (parameter 09). |
| 68057A | Ringing signal detection reset time (HIGH) |  | SP2-103-011 (parameter 10). |
| $\begin{gathered} \text { 68057B } \\ \text { to } \\ 680580 \end{gathered}$ | Not used |  | Do not change the settings. |
| 680581 | Interval between dialing the last digit and switching the Oh relay over to the external telephone when dialing from the operation panel in handset mode. | 20 ms | Factory setting: 500 ms |
| 680582 | Bits 0 and 1 - Handset off-hook detection time <br> Bit 10 Setting <br> 00200 ms <br> 01800 ms <br> Other Not used <br> Bits 2 and 3 - Handset on-hook detection time <br> Bit 32 Setting <br> 00200 ms <br> 01800 ms <br> Other Not used <br> Bits 4 to 7 - Not used |  |  |
| $\begin{gathered} 680583 \\ \text { to } \\ 6805 A 0 \end{gathered}$ | Not used |  | Do not change the settings. |


| Address | Function | Unit | Remarks |
| :---: | :---: | :---: | :---: |
| 6805A1 | Acceptable CED detection frequency upper limit (high byte) | BCD (Hz) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 6805A2 | Acceptable CED detection frequency upper limit (low byte) |  |  |
| 6805A3 | Acceptable CED detection frequency lower limit (high byte) | BCD (Hz) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 6805A4 | Acceptable CED detection frequency lower limit (low byte) |  |  |
| 6805A5 | CED detection time | $\begin{aligned} & 20 \mathrm{~ms} \\ & \pm 20 \mathrm{~ms} \end{aligned}$ | Factory setting: 200 ms |
| 6805A6 | Acceptable CNG detection frequency upper limit (high byte) | BCD (Hz) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 6805A7 | Acceptable CNG detection frequency upper limit (low byte) |  |  |
| 6805A8 | Acceptable CNG detection frequency lower limit (high byte) | BCD (Hz) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 6805A9 | Acceptable CNG detection frequency lower limit (low byte) |  |  |
| 6805AA | Not used |  | Do not change the setting. |
| 6805AB | CNG on time | 20 ms | Factory setting: 500 ms |
| 6805AC | CNG off time | 20 ms | Factory setting: 200 ms |
| 6805AD | Number of CNG cycles required for detection |  | The data is coded in the same way as address 680533. |
| 6805AE | Not used |  | Do not change the settings. |
| 6805AF | Acceptable AI short protocol tone ( 800 Hz ) detection frequency upper limit (high byte) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 6805B0 | Acceptable AI short protocol tone ( 800 Hz ) detection frequency upper limit (low byte) |  |  |
| 6805B1 | Acceptable AI short protocol tone $(800 \mathrm{~Hz})$ detection frequency lower limit (high byte) | Hz (BCD) | If both addresses contain $\mathrm{FF}(\mathrm{H})$, tone detection is disabled. |
| 6805B2 | Acceptable AI short protocol tone ( 800 Hz ) detection frequency lower limit (low byte) |  |  |
| 6805B3 | Detection time for 800 Hz Al short protocol tone | 20 ms | Factory setting: 360 ms |
| 6805B4 | PSTN: Tx level from the modem | -N-3 dBm | SP2-103-002 (parameter 01). |
| 6805B5 | PSTN: 1100 Hz tone transmission level | - N 6805B4-0.5N 6805B5-3.5 (dB) See Note 7. |  |
| 6805B6 | PSTN: 2100 Hz tone transmission level | $\begin{aligned} & \hline- \text { N6805B4-0.5N 6805B6-3 (dB) } \\ & \text { See Note 7. } \\ & \hline \end{aligned}$ |  |
| 6805B7 | PABX: Tx level from the modem | -dBm |  |

NCU PARAMETERS

| Address | Function | Unit | Remarks |
| :---: | :---: | :---: | :---: |
| 6805B8 | PABX: 1100 Hz tone transmission level | - N 6805B7-0.5N 6805B8 (dB) |  |
| 6805B9 | PABX: 2100 Hz tone transmission level | - N 6805B7-0.5N 6805B9 (dB) |  |
| 6805BA | ISDN: Tx level from the modem | -dBm | The setting must be between -12dBm and 15 dBm . |
| 6805BB | ISDN: 1100 Hz tone transmission level | - N 6805BA - 0.5N 6805BB (dB) |  |
| 6805BC | ISDN: 2100 Hz tone transmission level | - N 6805BA - 0.5N 6805BC (dB) |  |
| 6805BD | Modem turn-on level (incoming signal detection level) | $\begin{aligned} & -37-0.5 \mathrm{~N} \\ & (\mathrm{dBm}) \\ & \hline \end{aligned}$ |  |
| $\begin{aligned} & \text { 6805BE } \\ & \text { to } \\ & 6805 \mathrm{C} \end{aligned}$ | Not used |  | Do not change the settings. |
| 6805C7 | Bits 0 to 3 - Not used. <br> Bit 4 - V. 34 protocol dump 0: Simple, 1: Detailed (default) <br> Bits 5 to 7 - Not used. |  |  |
| $\begin{gathered} 6805 \mathrm{C} 8 \\ \text { to } \\ 6805 \mathrm{D} 9 \end{gathered}$ | Not used |  | Do not change the settings. |
| 6805DA | T. 30 T1 timer | 1 s |  |
| $\begin{gathered} \text { 6805E0 } \\ \text { bit } 3 \end{gathered}$ | Maximum wait time for post message | $\begin{aligned} & 0: 12 \mathrm{~s} \\ & 1: 30 \mathrm{~s} \end{aligned}$ | 1: Maximum wait time for post message (EOP/EOM/MPS) can be changed to 30 s . Change this bit to " 1 " if communication errors occur frequently during V. 17 reception. |

## NOTES

1. If a setting is not required, store FF in the address.
2. Italy and Belgium only

RAM address 68055E: the lower four bits have the following meaning.
Bit 2-1: International dial tone cadence detection enabled (Belgium)
Bit 1 - Not used
Bit 0-1: PSTN dial tone cadence detection enabled (Italy)
If bit 0 or bit 2 is set to 1 , the functions of the following RAM addresses are changed.
680508 (if bit $0=1$ ) or 680538 (if bit $2=1$ ): tolerance for on or off state duration (\%), and number of cycles required for detection, coded as in address 680533.

68050 B (if bit $0=1$ ) or 68053 B (if bit $2=1$ ): on time, hex code (unit $=20 \mathrm{~ms}$ )
68050C (if bit $0=1$ ) or 68053C (if bit $2=1$ ): off time, hex code (unit = 20 ms )
3. Pulse dial parameters (addresses 68054A to 68054F) are the values for 10 pps. If 20 pps is used, the machine automatically compensates.
4. The first ring may not be detected until 1 to 2.5 wavelengths after the time specified by this parameter.
5. The calculated level must be between 0 and 10.

The attenuation levels calculated from RAM data are:
High frequency tone: $-0.5 \times$ N680552/680554-3.5 dBm
$-0.5 \times \mathrm{N} 680555 \mathrm{dBm}$
Low frequency tone: $-0.5 \times(\mathrm{N} 680552 / 680554+\mathrm{N} 680553)-3.5 \mathrm{dBm}$
$-0.5 \times(\mathrm{N} 680555+\mathrm{N} 680553) \mathrm{dBm}$
NOTE: $\mathrm{N}_{680552}$, for example, means the value stored in address 680552(H)
6. 68054A: Europe - Between Ds opening and Di opening, France - Between Ds closing and Di opening
68054D: Europe - Between Ds closing and Di closing, France - Between Ds opening and Di closing
7. Tone signals which frequency is lower than 1500 Hz (e.g., 800 Hz tone for Al short protocol) refer to the setting at 6805B5h. Tones which frequency is higher than 1500 Hz refer to the setting at 6805B6h.
8. 68054A, 68054D, 68054E: The actual inter-digit pause (pulse dial mode) is the sum of the period specified by the RAM addresses 68054A, 68054D, and 68054E.

### 3.4 DEDICATED TRANSMISSION PARAMETERS

Each Quick Dial Key and Speed Dial Code has eight bytes of programmable parameters allocated to it. If transmissions to a particular machine often experience problems, store that terminal's fax number as a Quick Dial or Speed Dial, and adjust the parameters allocated to that number.
The programming procedure will be explained first. Then, the eight bytes will be described.

### 3.4.1 PROGRAMMING PROCEDURE

1. Set the bit 0 of System Bit Switch 00 to 1 .
2. Press "Dest. Management" in the facsimile standby mode.
3. Press "Program/Change/Delete Quick Dial".
4. Select the destination key you want to program.
5. When the programmed dial number is displayed, press "Start".
Make sure that the LED of the Start button is lit as green.

6. The settings for the switch 01 are now displayed. Press the bit number that you wish to change.
7. To scroll through the parameter switches, either:
8. Select the next switch: press "Next"

or
Select the previous switch: "Prev." until the correct switch is displayed.
Then go back to step 6.
9. After the setting is changed, press "OK".
10. After finishing, reset bit 0 of System Bit Switch 00 to 0 .

### 3.4.2 PARAMETERS

The initial settings of the following parameters are all $\mathrm{FF}(\mathrm{H})$ - all the parameters are disabled.

## Switch 01 <br> FUNCTION AND COMMENTS

ITU-T T1 time (for PSTN G3 mode)
If the connection time to a particular terminal is longer than the NCU parameter setting, adjust this byte. The T 1 time is the value stored in this byte (in hex code), multiplied by 1 second.
Range:
0 to 120 s (00h to 78h)
FFh - The local NCU parameter factory setting is used.
Do not program a value between 79 h and FEh.

| Switch 02 |  |  |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} \hline 0 \\ \text { to } \\ 4 \end{gathered}$ | Tx level <br> Bit 432210 Setting $\begin{array}{llllll}0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 1 & 0 & -2 \\ 0 & 0 & 0 & 1 & 1 & -3 \\ 0 & 0 & 1 & 0 & 0 & -4\end{array}$ <br> $\begin{array}{llllll}0 & 1 & 1 & 1 & 1 & -15\end{array}$ <br> $\begin{array}{llllll}1 & 1 & 1 & 1 & 1 & \text { Disabled }\end{array}$ | If communication with a particular remote terminal often contains errors, the signal level may be inappropriate. Adjust the Tx level for communications with that terminal until the results are better. <br> If the setting is "Disabled", the NCU parameter 01 setting is used. <br> Note: Do not use settings other than listed on the left. |
| $\begin{gathered} \hline 5 \\ \text { to } \\ 7 \end{gathered}$ | Cable equalizer <br> Bit 765 Setting <br> 000 None <br> 001 Low <br> 010 Medium <br> 011 High <br> 111 Disabled | Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange when calling the number stored in this Quick/Speed Dial. <br> Also, try using the cable equalizer if one or more of the following symptoms occurs. <br> - Communication error with error codes such as $0-20,0-23$, etc. <br> - Modem rate fallback occurs frequently. <br> Note: Do not use settings other than listed on the left. <br> If the setting is "Disabled", the bit switch setting is used. |


| Switch 03 |  |  |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 3 \end{gathered}$ |  <br> Other settings: Not used | If training with a particular remote terminal always takes too long, the initial modem rate may be too high. Reduce the initial Tx modem rate using these bits. <br> For the settings 14.4 or kbps slower, Switch 04 bit 4 must be changed to 0 . <br> Note: Do not use settings other than listed on the left. <br> If the setting is "Disabled", the bit switch setting is used. |
| 4-5 | Not used | Do not change the settings. |
| 6 | Al short protocol <br> 0: Off <br> 1: Disabled | Refer to Appendix B in the Group 3 Facsimile Manual for details about AI Short Protocol. If the setting is "Disabled", the bit switch setting is used. |
| 7 | Not used | Do not change the settings. |


| Switch 04 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| No | FUNCTION |  |  | COMMENTS |
| 0 | Inch-mm conversion before tx |  |  | The machine uses inch-based resolutions for scanning. If "inch only" is selected, the printed copy may be slightly distorted at the other end if that machine uses mm-based resolutions. <br> If the setting is "Disabled", the bit switch setting is used. |
|  | Bit 1 | Bit 0 | Setting |  |
|  | 0 | 0 | Inch-mm |  |
|  |  |  | conversion |  |
|  |  |  | available |  |
|  | 0 1 | 1 | Inch only Not used |  |
|  | 1 |  | Not used Disabled |  |
| $\begin{array}{\|c\|} \hline 2 \\ \text { to } \\ 3 \end{array}$ | DIS/NSF detection method |  |  | $(\mathbf{0}, \mathbf{1})$ : Use this setting if echoes on the line are interfering with the set-up protocol at the start of transmission. The machine will then wait for the second DIS or NSF before sending DCS or NSS. <br> If the setting is "Disabled", the bit switch setting is used. |
|  | $\begin{array}{cc} \text { Bit } 3 & \text { Bit 2 } \\ 0 & 0 \end{array}$ |  | Setting |  |
|  |  |  | First DIS or |  |
|  |  |  | NSF |  |
|  | 0 | 1 | Second DIS or NSF |  |
|  | 1 | 0 | Not used |  |
|  | , | 1 | Disabled |  |


| Switch 04 |  |  |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 4 | V. 8 protocol <br> 0 : Off <br> 1: Disabled | If transmissions to a specific destination always end at a lower modem rate ( $14,400 \mathrm{bps}$ or lower), disable V. 8 protocol so as not to use V. 34 protocol. 0 : V. 34 communication will not be possible. If the setting is "Disabled", the bit switch setting is used. |
| 5 | Compression modes available in transmit mode <br> 0: MH only <br> 1: Disabled | This bit determines the capabilities that are informed to the other terminal during transmission. If the setting is "Disabled", the bit switch setting is used. |
| $\begin{aligned} & 6 \\ & 7 \end{aligned}$ | ECM during transmission  <br> Bit 7 Bit 6 Setting <br> 0 0 Off <br> 0 1 On <br> 1 0 Not used <br> 1 1 Disabled | For example, if ECM is switched on but is not wanted when sending to a particular terminal, use the $(0,0)$ setting. <br> Note that V.8/V. 34 protocol and JBIG compression are automatically disabled if ECM is disabled. If the setting is "Disabled", the bit switch setting is used. |

Switch 05 - Not used (do not change the settings)
Switch 06 - Not used (do not change the settings)


## Switch 08 - Not used

| Switch 09-Optional ISDN G4 kit required |  |  |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| $\begin{gathered} 0 \\ \text { to } \\ 3 \end{gathered}$ |       <br> Layer 3 protocol    <br> Bits $\mathbf{3}$ $\mathbf{2}$ $\mathbf{1}$ $\mathbf{0}$ Setting <br>  0 0 0 0 ISO 8208 <br> 0 0 0 1 T.70 NULL  <br>  1 1 1 1 Disabled | If the setting is "Disabled", the current setting of G4 parameter switch 6 (bit 0 ) is used. |
| $\begin{gathered} 4 \\ \text { to } \\ 7 \end{gathered}$ | Packet modulus     <br> Bits $\mathbf{3}$ $\mathbf{2}$ $\mathbf{1}$ $\mathbf{0}$ <br>  Setting    <br> 0 0 0 0 Modulo 8 <br> 0 0 0 1 Modulo 128 <br> 1 1 1 1 Disabled | If the setting is "Disabled", the current setting of G4 parameter switch 6 (bit 4) is used. |


| Switch $\mathbf{1 0}$ - Optional ISDN G4 kit required |  |  |
| :---: | :--- | :--- |
| No | FUNCTION | COMMENTS |
| $\mathbf{0}$ | Attachment of the Higher Layer <br> Capabilities | This bit determines whether Higher Layer <br> Capabilities are informed in the [SETUP] signal or <br> not. |
| $\mathbf{1}$ | Not used | Do not change the setting. |
| $\mathbf{2}$ | ISDN G3 information transfer <br> capability <br> $\mathbf{0 : 3 . 1} \mathrm{kHz}$ audio <br> $\mathbf{1 : ~ S p e e c h ~}$ | In tx mode, this determines the information transfer <br> capability informed in the [SETUP] messages. <br> In rx mode, this determines the information transfer <br> capability that the machine can use to receive a call. <br> Set this bit to 1 if the ISDN does not support 3.1 kHz <br> audio. |
| 3-7 | Not used | Do not change the settings. |

### 3.5 SERVICE RAM ADDRESSES

```
\CAUTION
Do not change the settings which are marked as "Not used" or "Read only.
680001 to 680004(H) - ROM version (Read only)
    680001(H) - Revision number (BCD)
    680002(H) - Year (BCD)
    680003(H) - Month (BCD)
    680004(H) - Day (BCD)
680006 to 680015(H) - Machine's serial number (16 digits - ASCII)
680018(H) - Total program checksum (low)
680019(H) - Total program checksum (high)
680020 to 68003F(H) - System bit switches
680040 to 68004F(H) - Scanner bit switches
680050 to 68005F(H) - Printer bit switches
680060 to 68007F(H) - Communication bit switches
680080 to 68008F(H) - G3 bit switches
680090 to 68009F(H) - G3-2 bit switches
6800D0(H) - User parameter switch 00 (SWUER_00): Not used
6800D1(H) - User parameter switch 01 (SWUSR_01): Not used
6800D2(H) - User parameter switch 02 (SWUSR_02)
Bit 0: Forwarding mark printing on forwarded messages 0: Disabled, 1: Enabled
Bit 1: Center mark printing on received copies
(This switch is not printed on the user parameter list.)
    0: Disabled, 1: Enabled
Bit 2: Reception time printing
(This switch is not printed on the user parameter list.)
    0: Disabled, 1: Enabled
Bit 3: TSI print on received messages 0: Disabled, 1: Enabled
Bit 4: Checkered mark printing
(This switch is not printed on the user parameter list.)
    0: Disabled, 1: Enabled
Bit 5: CIL printing (G4) 0: Disabled, 1: Enabled
Bit 6: TID printing (G4) 0: Disabled, 1: Enabled
Bit 7: Not used
```


## 6800D3(H) - User parameter switch 03 (SWUSR_03: Automatic report printout)

Bit 0: Transmission result report (memory transmissions) 0: Off, 1: On
Bit 1: Not used
Bit 2: Memory storage report 0: Off, 1: On
Bit 3: Polling reserve report (polling reception) 0: Off, 1: On
Bit 4: Polling result report (polling reception) 0: Off, 1: On
Bit 5: Transmission result report (immediate transmissions) 0: Off, 1: On
Bit 6: Polling clear report 0: Off, 1: On
Bit 7: Journal 0: Off, 1: On

## 6800D4(H) - User parameter switch 04 (SWUSR_04: Automatic report printout)

Bit 0: Automatic confidential reception report output 0: Off, 1: On
Bits 1 to 6: Not used
Bit 7: Inclusion of a sample image on reports 0: Off, 1: On

## 6800D5(H) - User parameter switch 05 (SWUSR_05)

Bit 0: Substitute reception when the base copier is in an SC condition
0: Enabled, 1: Disabled
Bits 1 and 2: Condition for substitute $r x$ when the machine cannot print messages (Paper end, toner end, jam, and during night mode)

Bit 21 Setting
$0 \quad 0$ The machine receives all the fax messages.
01 The machine receives the fax messages with RTI or CSI.
10 The machine receives the fax messages with the same ID code.
11 The machine does not receive anything.
Bit 3: Not used
Bit 4: Not used
Bit 5: Just size printing 0 : Off, 1 : On
Bit 6: Not used
Bit 7: Add paper display when a cassette is empty 0 : Off, 1 : On
6800D6(H) - User parameter switch 06 (SWUSR_06)
Bits 0 to 5: Not used
Bit 6: Scan sequence in Book transmission
0 : Left page then right page, 1: Right page then left page
Bit 7: Not used

## 6800D7(H) - User parameter switch 07 (SWUSR_07)

Bits 0 and 1: Not used
Bit 2: Parallel memory transmission 0: Off, 1: On
Bits 3 to 7: Not used

## 6800D8(H) - User parameter switch 08 (SWUSR_08)

Bits 0 and 1: Not used.
Bit 2: Authorized reception
0: Only faxes from senders whose RTIs/CSIs are specified for this feature are accepted.
1: Only faxes from senders whose RTIs/CSIs are not specified for this feature are accepted.
Bits 3 to 7: Not used.
6800D9(H) - User parameter switch 09 (SWUSR_09) : Not used
6800DA(H) - User parameter switch 10 (SWUSR_0A)
Bit 0: Not used
Bit 1: 2 into 1 0: Off, 1: On
Bit 2: Not used
Bit 3: Page reduction 0: Off, 1: On
Bits 4 to 7: Not used

## 6800DB(H) - User parameter switch 11 (SWUSR_0B)

Bit 0: Not used
Bit 1: Method of transmitting numbers after the "Tone" mark over an ISDN line
0: UUI, 1: Tone
Bits 2 to 5: Not used
Bit 6: Printout of messages received while acting as a forwarding station
0: Off, 1: On
Bit 7: Polling Standby duration 0: Once, 1: No limit
6800DC(H) - User parameter switch 12 (SWUSR_0C): Not used
6800DD(H) - User parameter switch 13 (SWUSR_OD)
(This switch is not printed on the user parameter list.)
Bits 0 to 4: Not used
Bit 5: Action when receiving a SETUP signal containing no called number and the G4 subscriber number was programmed in this machine.

0 : Respond to the call, 1: Do not respond to the call
Bit 6: Action when the received HLC (Higher Level Capabilities) is Tel or BC
(Bearer Capabilities) is Speech.
0: Do not respond to the call, 1: Respond to the call
This switch determines which information transfer capabilities the machine can accept when receiving a call.
1: When the received HLC is Tel (digital telephone) or BC is Speech (voice), the machine responds to the call. In short, the machine receives every call.
This switch is useful for communication problems when the other terminal informs the above transfer capabilities although it is a fax machine.
Bit 7: ISDN SPID programming (used only in the USA)

## 6800DE(H) - User parameter switch 14 (SWUSR_0E)

Bit 0: Message printout while the machine is in Night Printing mode 0: On, 1: Off
Bit 1: Maximum document length detection
0: Double letter, 1: Longer than double-letter (well log) - up to 1,200 mm
Bit 2: Batch transmission 0: Off, 1: On
Bit 3: Fax mode settings, such as resolution, before a mode key (Copy/Fax/Printer
/Scanner) is pressed
0 : Not cleared, 1: Cleared
Bits 4 to 6: Not used
Bit 7: Manual service call (sends the system parameter list to the service station)
0 : Off, 1: On

## 6800DF(H) - User parameter switch 15 (SWUSR_0F)

Bits 0, 1 and 2: Cassette for fax printout
Bit 2100 Setting
$\begin{array}{llll}0 & 0 & 1 & 1 \text { st paper feed station }\end{array}$
$0 \quad 1 \quad 0 \quad$ 2nd paper feed station
$0 \quad 1 \quad 1 \quad 3 r d$ paper feed station
1000 4th paper feed station
101 LCT
Other settings Not used
Bits 3 and 4: Not used
Bit 5: Using the cassette specified by bits 0,1 and 2 above only 0 : On, 1: Off
Bits 6 and 7: Not used

## 6800E0(H) - User parameter switch 16 (SWUSR_10)

(This switch is not printed on the user parameter list.)
Bits 0 and 1: Not used
Bit 2: Paper size selection priority for an A4 size fax message when A4/LT size paper is not available.
0 : A3 has priority, 1: B4 has priority
Bits 3 to 7: Not used
6800E1(H) - User parameter switch 17 (SWUSR_11)
Bits 0 and 1: Not used
Bit 2: Inclusion of the "Add" button when a sequence of Quick/Speed dials is selected for broadcasting
$0:$ Not needed, 1: Needed
Bits 3 to 6: Not used
Bit 7: Press "Start" key without an original when using the on hook dial or the external telephone,

0 : displays "Cannot detect original size".
1: Receives fax messages.
6800E2(H) - User parameter switch 18 (SWUSR_12)

| Bit 0: TTI date | $0:$ Off, 1: On |
| :--- | :--- |
| Bit 1: TTI sender | $0:$ Off, 1: On |
| Bit 2: TTI file number | $0:$ Off, 1: On |
| Bit 3: TTI page number | $0:$ Off, 1: On |
| Bit 4 to 7: Not used |  |

## 6800E3(H) - User parameter switch 19 (SWUSR_13)

Bit 0: Offset sort function for the fax (only using the shift tray on the 1,000 sheet finisher)

0 : Disabled, 1: Enabled
Bit 1: Journal format
0 : The Journal is separated into transmissions and receptions
1: The Journal is separated into G3-1, G3-2, G3-3 and G4 communications
Bit 2: Action when the paper cassette that was selected by the specified cassette selection feature becomes empty.
(This switch is not printed on the user parameter list.)
0 : The machine will not print any received files until paper is added.
1: The machine will use other cassettes to print received files that are not specified by this feature.
Bit 3: $90^{\circ}$ image rotation during B5 portrait Tx
(This switch is not printed on the user parameter list.)
0 : Off, 1: On
Bit 4: Reduction of sample images on reports to $50 \%$ in the main scan and subscan directions. (This switch is not printed on the user parameter list.)

0: Technician adjustment (printer switch 0E bits 3 and 4), 1:50\% reduction
Bit 5: Use of A5 size paper for reports
(This switch is not printed on the user parameter list.)
0 : Off, 1: On
Bits 6 and 7: Not used

## 6800E4(H) - User parameter switch 20 (SWUSR_14)

Bit 0: Automatic printing of the PC FAX error report
0 : Off, 1: On
Bit 1: Reprint the documents fail to print from PC Fax driver
0 : Off, 1: On
Bits 2 to 5: Store documents in memory which could not be printed from PC Fax driver

Bit 5431328 Setting
$\begin{array}{lllll}0 & 0 & 0 & 0 & 0\end{array} \mathrm{~min}$.
$\begin{array}{lllll}0 & 0 & 0 & 1 & 1\end{array} \mathrm{~min}$.
ת ת
$\begin{array}{lllll}1 & 1 & 1 & 0 & 14 \mathrm{~min} .\end{array}$
$\begin{array}{lllll}1 & 1 & 1 & 15 & \mathrm{~min} .\end{array}$
Bits 6 and 7: Not used.
6800E5(H) - User parameter switch 21 (SWUSR_15) : Not used
6800E6(H) - User parameter switch 22 (SWUSR_16): Not used
6800E7(H) - User Parameter switch 23 (SWUSR_17) : Not used

## 6800E8(H) - User parameter switch 24 (SWUSR_18)

Bits 0 and 1: File retention time (Cross reference: System switch 02 bit 4)
Bit $100 \quad$ Setting
$0 \quad 0 \quad$ File retention impossible
$0 \quad 124$ hours
10 File retention impossible
$1 \quad 1 \quad 72$ hours
Bits 2 to 7: Not used
6800E9(H) - User parameter switch 25 (SWUSR_19)
Bits 0 to 3: Not used
Bit 4: RDS operation
0 : Not acceptable
1: Acceptable for the limit specified by system switch 03
Note: This bit is only effective when RDS operation can be selected by the user (see system switch 02).
Bits 5 to 7: Not used
6800EA(H) to 6800ED(H) - User parameter switch 26 to 29 (SWUSR_1A to 1D) : Not used

## 680EE(H) - User parameter switch 30 (SWUSR_1E)

Bits 0 to 6: Not used
Bit7: On hook dialing 0: PSTN, 1: ISDN
Note: If this bit set to 1, the on hook dialing is available on the ISDN line. But, the machine cannot use the G3 standard analog line for detecting the ringing and on hook dialing.
6800F0 to 6800FF(H) - G4 Parameter Switches
680100 to $68011 F(H)$ - G4 Internal Switches
680160 to 68016E(H) - Service station's fax number (SP3-101)
See 68030C(H) for the type of network used for this number.
68016F to 68017D(H) - Own fax PABX extension number
68017E to 68018C(H) - Own fax number (PSTN)
68018D to 68019B(H) - Own fax number (ISDN G4)
68019C to 6801AA(H) - The first subscriber number (ISDN G3)
6801AB to 6801B9(H) - The second subscriber number (ISDN G3)
6801BA to 6801C8(H) - The first subscriber number (ISDN G4)
6801C9 to 6801D7(H) - The second subscriber number (ISDN G4)
6801D8 to 6801EB(H) - PSTN-1 RTI (Max. 20 characters - ASCII) - See the following note.
680217 to 680256(H) - TTI 1 (Max. 64 characters - ASCII) - See the following note.
680257 to $680296(\mathrm{H})$ - TTI 2 (Max. 64 characters - ASCII) - See the following note.
680297 to 6802AA(H) - PSTN-1 CSI (Max. 20 characters - ASCII)
6802AB to 6802BE(H) - PSTN-2 CSI (Max. 20 characters - ASCII)
6802D3(H) - Number of PSTN-1 CSI characters (Hex)
6802D4(H) - Number of PSTN-2 CSI characters (Hex)

NOTE: If the number of characters is less than the maximum ( 20 for RTI, 64 for TTI), add a stop code (FF[H]) after the last character.
6802E0 to 6802E2(H) - PSTN-1 line settings
6802E0
Bits 0 and 1: PSTN access method from behind a PABX.
Bit 100 Setting
00 Loop start
01 Ground start
10 Flash start
11 Not used
Bit 2: Telephone line type.
0: PSTN, 1: PABX
Bits 3 and 4: Dialing type.
Bit 43 Setting
$0 \quad 0 \quad$ Pulse dialing
01 Not used
10 Tone dialing
$1 \quad 1$ Not used
Bits 4 to 7: Not used
6802E1: PSTN access number for loop start
Access number Hex value to program (BCD)

0
$\sqrt{2}$
F0
9
F
00
00
ת
ת
99
99
6802E2
Bit 0: Transmission disabled
0 : Tx and Rx, 1: Rx only
Bit 1: Memory Lock reception
0: Enabled, 1: Disabled
Bits 2 to 7: Not used
6802E8 to 6802EA(H) - PSTN-2 line settings
6802F8 to 6802EA(H) - ISDN line settings
680300(H) - ID code (low - Hex)
680301(H) - ID code (high - Hex)
680302(H) - Confidential ID (low - BCD)
680303(H) - Confidential ID (high - BCD)
680304(H) - Memory Lock ID (low - BCD)
680305(H) - Memory Lock ID (high - BCD)

68030C(H) - Network type used for the service station number
01 (H) - PSTN-1
02 (H) - PSTN-2
10 (H) - G4
$07(\mathrm{H})$ - G3 auto selection
680310 to 680317(H) - Last power off time (Read only)
680310(H) - 01(H) - 24-hour clock, 00(H) - 12-hour clock (AM), 02(H) - 12-hour clock (PM)
680311(H) - Year (BCD)
680312(H) - Month (BCD)
680313(H) - Day (BCD)
680314(H) - Hour
680315(H) - Minute
680316(H) - Second
680317(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ....... , 06: Sunday
680324(H) - Optional equipment (Read only - Do not change the settings)
Bit 0 to 3: Not used
Bit 4: Function Upgrade unit 0: Not installed, 1: Installed
Bit 5 to 7: Not used
680325(H) - Optional equipment (Read only - Do not change the settings)
Bit 0: Function Upgrade unit 0: Not installed, 1: Installed
Bit 1 to 3: Not used
Bit 4: G3-2 0: Not installed, 1: Installed
Bit 5: Not used
Bit 6: ISDN unit 0: Not installed, 1: Installed
Bit 7: Not used

```
680358 to 68036F(H) - G4 terminal ID (ASCII - Max. 24 characters)
680370 to 680383(H) - ISDN CSI
680384(H) - Number of ISDN CSI characters (Hex)
680389 to 68038C(H) - ISDN G3 sub-address
68038D to 680390(H) - ISDN G4 sub-address
680391 to 680395(H) - SiG4 board ROM information (Read only)
    680391(H) - Suffix
    680392(H) - Version (BCD)
    680393(H) - Year (BCD)
    680394(H) - Month (BCD)
    680395(H) - Day (BCD)
6 8 0 3 9 6 \text { to 68039A - Option G3 board (G3-2) ROM information (Read only)}
    680396(H) - Suffix (BCD)
    680397(H) - Version (BCD)
    680398(H) - Year (BCD)
    680399(H) - Month (BCD)
    68039A(H) - Day (BCD)
6803A2(H) - Option G3 board (G3-2) modem ROM version (Read only)
```

```
6803A6 to 6803AB(H) - Modem ROM version (Read only)
    6803A6(H) - Part number (low)
    6803A7(H) - Part number (high)
    6803A8(H) - Control (low)
    6803A9(H) - Control (high)
    6803AA(H) - DSP (low)
    6803AB(H) - DSP (high)
680406(H) - Time for economy transmission (hour in 24h clock format - BCD)
680407(H) - Time for economy transmission (minute - BCD)
680422(H) - Transmission monitor volume 00-07(H)
680423(H) - Reception monitor volume 00-07(H)
680424(H) - On-hook monitor volume 00-07(H)
680425(H) - Dialing monitor volume 00-07(H)
680426(H) - Buzzer volume 00-07(H)
```


## 4. DETAILED SECTION DESCRIPTIONS

### 4.1 OVERVIEW



The basic fax unit consists of three PCBs: an FCU, an MBU and an NCU.
The FCU controls all the fax communications and fax features, in cooperation with the controller board. The MBU contains the ROM and SRAM. The NCU switches the analog line between the fax unit and the external telephone.

## Fax Options:

1. Extra G3 Interface option: This provides one more analog line interface. This allows full dual access. Only one extra G3 interface option can be installed. The optional G3 unit consists of two PCBs: G3 board and NCU.
NOTE: Either an extra G3 interface option or an ISDN unit can be installed.
2. ISDN unit: This allows the fax unit to communicate over an ISDN line.

NOTE: Either an extra G3 interface option or an ISDN unit can be installed.
3. Fax Function Upgrade Unit: JBIG compression becomes available. In addition, this expands the system's SRAM capacity to hold programmed telephone numbers, memory files, etc.
4. Memory Expansion: This expands the SAF memory and the page memory (used for image rotation); without this expansion, the page memory is not big enough for image rotation at 400 dpi , so transmission at 400 dpi is not possible.

### 4.2 BOARDS

### 4.2.1 FCU



The FCU (Facsimile Control Unit) controls fax communications, the video interface to the base copier's engine, and all the fax options.

## FACE2 (Fax Application Control Engine)

- CPU
- Data compression and reconstruction (DCR)
- DMA control
- Clock generation
- DRAM backup control
- Ringing signal/tone detection


## FBI (FACE Bridge Interface)

- Interface between the PCI bus and the FACE
- DMA control

Modem (R288F-29)

- V.34, V33, V17, V.29, V.27ter, V.21, and V. 8


## DRAM

- The 8 MB of DRAM is shared as follows.

SAF memory : 2 MB
Working memory : 2 MB
Page memory : 4 MB

- The SAF memory is backed up by a rechargeable battery.


## Memory back-up

- A rechargeable battery backs up the SAF memory (DRAM) for 1 hour.


## Switches

| Item | Description |
| :--- | :--- |
| SW1 | Reset switch, to reboot the FCU board |

### 4.2.2 MBU

On this board, the flash ROM contains the FCU firmware, and the SRAM contains the system data and user parameters. Even if the FCU is changed, the system data and user parameters are kept on the MBU board.
ROM

- 2 MB flash ROM (16 bits x 1 MB) for system software storage


## SRAM

- The 256 KB SRAM for system and user parameter storage is backed up by a lithium battery.


## Memory back-up

- A lithium battery backs up the system parameters and programmed items in the SRAM, in case the base copier's main switch is turned off.


## Switches

| Item | Description |
| :--- | :--- |
| SW1 | Switches the SRAM backup battery on/off. |

### 4.2.3 NCU (US)



## Jumpers

| Item | Description |
| :---: | :--- |
| JP7 | These jumpers should be shorted when the machine is connected to a dry |
| JP8 | line. |
| DB1 | Also remove DB1 when the machine is connected to a dry line. |

### 4.2.4 NCU (EUROPE/ASIA)



Control Signals and Jumpers

|  | CSEL1 | RSEL |
| :--- | :---: | :---: |
| Country | CN2-5 | CN1-13 |
| CTR21 | H | H |
| Australia | H | H |
| South Africa | H | H |
| Malaysia | H | H |
| Hong Kong | L | L |
| New Zealand | L | L |
| Singapore | L | L |
| Asia | L | L |

L: Low, H: High

CTR21 (Common Technical Regulation 21):
France, Germany, UK, Italy, Austria, Belgium, Denmark, Finland, Ireland, Norway, Sweden, Switzerland, Portugal, Holland, Spain, Israel, Greece

### 4.2.5 SG3 BOARD



The SG3 board allows up to two simultaneous communications when used in combination with the FCU.
CCP (Communication Control Processor)

- Controls the SG3 board.
- CPU (RU8)
- DPRAM (Dual Port RAM): Handshaking with the FCU is done through this circuit.
- DMA controller
- JBIG interface


## Flash ROM

- 512KB (4 Mbit) flash ROM for SG3 software storage.
- 512KB (4 Mbit) flash ROM for Panasonic modem software storage.

DRAM

- 512KB DRAM shared between ECM buffer, line buffer, and working memory.


## QM coder

- QM coder for JBIG compression and decompression.


## V. 34 Modem

- Panasonic V. 34 modem (MN195003MFL)


### 4.2.6 SIG4 BOARD



The SiG4 (Standard ISDN G4) board contains ICCP (ISDN Communication Control Processor), Flash ROM, DRAM, LAPD controller, CODEC, ISDN interface and analog interface. The ICCP controls the entire board.

ICCP (ISDN Communication Control Processor)

- 16-bit CPU which controls the entire board
- HDLC control
- Channel select for B channel interface control


## Codec

- A/D, D/A converter for ISDN G3 communication


## LAPD Controller

- ISDN layer 1 and LAPD control


## ROM

- 512 kB (4 Mbit) Flash ROM for system software storage


## DRAM

- 2MB (16 Mbit) DRAM used


### 4.3 VIDEO DATA PATH

### 4.3.1 TRANSMISSION



NOTE: Either an SG3 or an SiG4 option can be installed.

## Memory Transmission and Parallel Memory Transmission

The base copier's scanner scans the original at the selected resolution in inch format. The IPU processes the data and transfers it to the FCU.
NOTE: When scanning a fax original, the IPU uses the MTF, independent dot erase and thresholding parameter settings programmed in the fax unit's scanner bit switches, not the copier's SP modes.
Then, the FCU converts the data to mm format, and compresses the data in MMR or raw format to store it in the SAF memory. If image rotation will be done, the image is rotated in page memory before compression.
At the time of transmission, the FCU decompresses the stored data, then recompresses and/or reduces the data if necessary for transmission. Either the NCU or SiG4 (optional) transmits the data to the line.

## Immediate Transmission

The base copier's scanner scans the original at the resolution agreed with the receiving terminal. The IPU video processes the data and transfers it to the FCU.
NOTE: When scanning a fax original, the IPU uses the MTF, independent dot erase and thresholding parameter settings programmed in the fax unit's scanner bit switches, not the copier's SP modes.
Then the FCU stores the data in page memory, and compresses the data for transmission. Either the NCU or SiG4 (optional) transmits the data to the line.

## JBIG Transmission

- Memory transmission: If the receiver has JBIG compression, the data goes from the DCR to the QM coder on the Function Upgrade Unit for JBIG compression. Then either the NCU or SiG4 (ISDN G3) transmits the data to the line. When an optional G3 unit (SG3) is installed and PSTN2 is selected as the line type, JBIG compression is available, but only for the PSTN-2 line.
- Immediate transmission: If the receiver has JBIG compression, the data goes from the page memory to the QM-Coder on the Function Upgrade Unit for JBIG compression. Then either the NCU or SiG4 (ISDN G3) transmits the data to the line. When an optional G3 unit (SG3) is installed and PSTN2 is selected as the line type, JBIG compression is available, but only for the PSTN-2 line.


## I-G3 (ISDN G3) Transmission

G3 transmission is available through the ISDN line by using the optional G4 unit (SiG4). In this case, the G3 modem is used for the I-G3 transmission.

## Adjustments

- Line used for G3 transmissions (PSTN or ISDN): System switch 0A bit 6
- Line used for G3 transmissions (PSTN 1/PSTN 2): System switch 16 bit 1
- I-G3 modem default: System switch 16 bit 2 and 3


### 4.3.2 RECEPTION



NOTE: Either an SG3 or an SiG4 option can be installed.

First, the FCU stores the incoming data from either an analog line or an ISDN line to the SAF memory. (The data goes to the FACE at the same time, and is checked for error lines/frames.)
The FCU then decompresses the data and transfers it to page memory. If image rotation will be done, the image is rotated in the page memory. The data is transferred to the IPU.
If the optional G3 unit is installed, the line that the message comes in on depends on the telephone number dialled by the other party (the optional G3 unit has a different telephone number from the main fax board).

## JBIG Reception

When data compressed with JBIG comes in on PSTN-1 (the standard analog line), the data is sent to the Function Upgrade Unit for decompression. Then the data is stored in the page memory, and transferred to the IPU.

When data compressed with JBIG comes in on PSTN-2 (optional extra analog line), the data is sent to the QM Coder on the SG3 board for decompression.

### 4.4 FAX COMMUNICATION FEATURES

### 4.4.1 PERSONAL, INFORMATION, AND TRANSFER BOXES

When an incoming message has a SUB or SEP code attached, the machine will look for a Personal Box, Transfer Box or Information Box with an identical SUB or SEP code. If a matching code is found, the message will be stored in the box and not printed, or it will be forwarded to the receiver if registered.

## Personal Box (Confidential Box)

The user can create personal boxes in the machine's memory for receiving fax messages. Each box must have a name and a code.
If a sender knows the code that was used to create a personal box, they can specify this as the SUB code during transmission. The message will then go to this personal box. If the sender also sends a SID code, this is ignored; the receiver must input the SID code stored in the receiving machine to print the message (the receiver's SID code acts as a password).

The receiver can set up the personal box as a forwarding station - any messages entering the box will be forwarded to another station.

Items to program at the receiving machine

| Items | Note |
| :--- | :--- |
| SUB Code (Box number) | Required |
| Box name | Required |
| Password (SID) | Optional |
| Receiver (1 forwarding destination) | Optional (Quick Dial) |

Items for the sender to specify when setting up the transmission

| Items | Note |
| :--- | :--- |
| SUB Code (Box number) | Required (must be the same as the code <br> that was used to set up the personal box) |
| Password (SID) | Optional |

NOTE: 1) Group dial is not available for the forwarding destination
2) If the sender uses a SID code, this code is ignored. The communication can proceed even if the SID code stored in the machine is different. In addition, the SID code stored in the machine must be used to print the stored message, and not the SID code from the sender.
3) If a forwarding destination is programmed, the received file is deleted after delivering the documents to the pre-programmed receiver. If forwarding did not succeed, the forwarding result report is printed out but the file stays in the memory until it is printed out on the machine.

## Transfer Box

The user can create transfer boxes in the machine's memory for forwarding incoming fax messages. Each box must have a name and a code. Each box must also have destinations associated with it; any message arriving in this box will automatically be sent on to these destinations.
If a sender knows the code that was used to create a transfer box, they can specify this as the SUB code during transmission. The message will then go to this transfer box, and will be sent on to the transfer destinations associated with that transfer box.

If the sender also sends a SID code, the SID code stored in the receiver must be the same or the communication will be disconnected.

Items to program at the receiving machine

| Items | Note |
| :--- | :--- |
| SUB Code (Box number) | Required |
| Box name | Required |
| Password (SID) | Optional |
| Receiver (Final destinations) | Required (Quick Dial) |

Items for the sender to specify when setting up the transmission

| Items | Note |
| :--- | :--- |
| SUB Code (Box number) | Required (must be the same as the code <br> that was used to set up the transfer box) |
| Password (SID) | Optional |

NOTE: 1) 5 destinations can be programmed with Group or Quick Dial as the delivery destinations.
2) More than 5 destinations are available if a Group is specified as one of the destinations.
3) If the SID does not match, the communication is disconnected.
4) A result report is not sent back to the transmitter but it is printed on the receiving machine.

## FAX COMMUNICATION FEATURES

## Information Box (Polling Tx)

The user can set up documents in memory to be picked up by another machine. The user makes an information box for each document.

The information box is identified by a code. Anybody who wishes to call the fax machine and receive the document from the information box has to input this code as the SEP code when calling the machine.
In addition, the user who sets up the information box can protect it with a password. This protects the document from other people at the same location (to print the stored document, this password must be input). The person who wishes to receive the document does not have to know this PWD code, but only has to know the SEP code.

Items to program at the machine that has the document on standby for polling

| Items | Note |
| :--- | :--- |
| SEP Code (Box number) | Required |
| Box name | Required |
| Password (PWD) for printing <br> the stored document | Optional |

Items for the caller to specify when picking up the document

| Items | Note |
| :--- | :--- |
| SEP Code (Box number) | Required (must be the same as the code that <br> was used to set up the information box) |

NOTE: 1) Only one fax message can go in each information box.
2) The SEP code must be different for each box.

### 4.4.2 MULTI-PORT COMMUNICATION

When the optional ISDN unit or optional extra G3 interface unit is installed, communication can take place at the same time through the two or three lines at once.

| Option | Available Line Type | Available Protocol <br> Combinations |
| :---: | :---: | :---: |
| Standard only | PSTN | G3 |
| Extra G3 Interface Unit | PSTN + PSTN | G3 + G3 |
| ISDN Unit | PSTN + ISDN | G3 + G4 |
|  | ISDN | I-G3 + G4 |

## FAX COMMUNICATION FEATURES

### 4.4.3 DOCUMENT SERVER



The scanner unit scans the original at the selected resolution. The IPU video processes the data and then stores the data in the page memory for the copier function, and compresses the data using MMR (by software) to store it in the HDD. If image rotation will be done, the image is rotated in the page memory before compression.
For transmission, the stored image data is transferred to the FCU. The FCU decompresses the image data, then recompresses and/or reduces the data if necessary for transmission. Either the NCU or SiG4 transmits the data to the line.

Documents can be stored in the HDD (Document Server) from the fax application. The documents stored in the document server can be used for fax transmission many times. More than one document and the scanned document can be combined into one file and then the file can be transmitted.

- When using the document server, the SAF memory is not used.
- The document is compressed using MMR and stored.
- Up to 2000 pages can be stored from the fax application. (1 file: Up to 1000 pages with Fax Function Upgrade and Expansion Memory)
- Only documents stored from the fax application can be transmitted.
- Scanned documents are given a name automatically, such as "FAX001". But it is possible to change the file name, user name, and password.
- Up to 30 files can be selected at once.

NOTE: 1) The compression method of the fax application is different from the copy application. The storing time is longer than storing using the copier application.
2) When selecting "Print 1st page", the stored document will be reduced to A4 size.

### 4.4.4 LAN FAX DRIVER



## FAX COMMUNICATION FEATURES

The fax driver makes print data from an application, then compresses the print data using MMR. PJL commands are added to the compressed data and the destination telephone number and the line selection are included in the PJL commands. The telephone number can be taken from an address book application.
The fax driver uses TCP/IP protocol to transfer the print (MMR) data to the machine.

## Regular transmission

The machine stores the print (MMR) data in the SAF memory. Then, the print data is transferred using the same method as memory transfer.

## Print and transmission

The machine stores the print (MMR) data in the page memory on the controller. Then, the machine decompresses the print data and prints out. The decompressed print data is transferred to the FCU and is stored to page memory.

Even if the Expansion Memory is not installed, it is possible to transmit and print the document from the PC with 400 dpi resolution. However, the data is converted to 200 dpi and printed out if the data is stored in the SAF memory for memory transmission. This is because the page memory on the FCU is not enough to expand the print data to 400 dpi with only standard memory.

## Using Document Server

First, the machine stores the print (MMR) data in the HDD. Then the print data is transferred to the FCU. However, the FCU does not store this data in the SAF memory. Then the print data is transferred using the same method as Document Server transmission.

## SPECIFICATIONS

## 1. GENERAL SPECIFICATIONS

| Type: | Desktop type transceiver |
| :---: | :---: |
| Circuit: | PSTN (max. 2 channels) <br> PABX <br> ISDN |
| Connection: | Direct couple |
| Original Size: | Book (Face down) <br> Maximum Length: 432 mm [17 ins] <br> Maximum Width: 297 mm [11.7 ins] <br> ARDF (Face up) <br> (Single-sided document) <br> Length: 128-1200 mm [5.0-47.2 ins] <br> Width: 105-297 mm [4.1-11.7 inch] <br> (Double-sided document) <br> Length: 128-432 mm [5.0-17 inch] <br> Width: 105-297 mm [4.1-11.7 inch] |
| Scanning Method: | Flat bed, with CCD |
| Resolution: | G3 <br> $8 \times 3.85$ lines $/ \mathrm{mm}$ (Standard) <br> $8 \times 7.7$ lines $/ \mathrm{mm}$ (Detail) <br> $8 \times 15.4$ line $/ \mathrm{mm}$ (Fine) See Note1 <br> $16 \times 15.4$ line/mm (Super Fine) See Note 1 |
|  | $\begin{aligned} & 200 \times 100 \text { dpi (Standard) } \\ & 200 \times 200 \text { dpi (Detail) } \\ & 400 \times 400 \text { dpi (Super Fine) See Note } 1 \end{aligned}$ |
|  | G4 <br> $200 \times 100$ dpi (Standard) <br> $200 \times 200$ dpi (Detail) <br> $400 \times 400$ dpi (Super Fine) |
|  | NOTE: 1. Optional Expansion Memory required |
| Transmission Time: | G3: 3 s at 28800 bps; Measured with G3 ECM using memory for an ITU-T \#1 test document (Slerexe letter) at standard resolution <br> G4: 3 s at 64 kbps ; Measured with an ITU-T \#1 test document (Slerexe letter) at standard resolution |
| Data Compression: | MH, MR, MMR <br> JBIG (optional Fax Function Upgrade Unit required) |
| Protocol: | Group 3 with ECM Group 4 (ISDN unit required) |

## SPECIFICATIONS

| Modulation: | V.34, V.33, V. 17 (TCM), V. 29 (QAM), V.27ter (PHM), V.8, V. 21 (FM) |
| :---: | :---: |
| Data Rate: | G3: 33600/31200/28800/26400/24000/21600/ 19200/16800/14400/12000/9600/7200/4800/2400 bps Automatic fallback G4: $64 \mathrm{kbps} / 56 \mathrm{kbps}$ |
| I/O Rate: | With ECM: $0 \mathrm{~ms} /$ line Without ECM: $2.5,5,10,20$, or $40 \mathrm{~ms} / \mathrm{line}$ |
| Memory Capacity: | ECM: 128 KB |
|  | SAF <br> Standard: 2 MB <br> With optional Expansion Memory: 26 MB (2 MB+ 24 MB ) |
|  | Page Memory <br> Standard: 4 MB (Print: 2 MB + Scanner: 2 MB) <br> With optional Expansion Memory: 12 MB ( $4 \mathrm{MB}+8 \mathrm{MB}$ ) (Print 8 MB + Scanner: 4 MB) |

## 2. CAPABILITIES OF PROGRAMMABLE ITEMS

The following table shows how the capabilities of each programmable item will change after the optional Fax Function Upgrade Unit is installed.

| Item | Standard | With Fax Function <br> Upgrade Unit |
| :--- | :---: | :---: |
| Quick Dial | 400 | 1200 |
| Groups | 64 | 64 |
| Destination per Group | 500 | 500 |
| Boxes (Information/Personal/Transfer) | 150 | 400 |
| Destinations dialed from the ten-key pad <br> overall | 100 | 1000 |
| Programs | 100 | 200 |
| Auto Document | 6 | 18 |
| Communication records for Journal <br> stored in the memory | 200 | 1000 |
| Specific Senders | 30 | 50 |

The following table shows how the capabilities of the document memory will change after the optional Fax Function Upgrade Unit and the Expansion Memory are installed.

|  |  | Without the Expansion Memory | With the Expansion Memory |
| :---: | :---: | :---: | :---: |
| Memory Transmission file | Without the Fax Function Upgrade Unit | 400 | 400 |
| Maximum number of page for memory transmission |  | 400 | 1000 |
| Memory capacity for memory transmission (Note) |  | 160 | 1000 |
| Memory Transmission file | With the Fax Function Upgrade Unit | 800 | 800 |
| Maximum number of page for memory transmission |  | 400 | 3000 |
| Memory capacity for memory transmission (Note) |  | 160 | 2080 |

NOTE: Measured using an ITU-T \#1 test document (Slerexe letter) at the standard resolution, the auto image density mode and the Text mode.

## 3. MACHINE CONFIGURATION



| No. | Description | No. | Description | No. | Description |
| :---: | :--- | :---: | :--- | :---: | :--- |
| 1 | NCU board | 4 | Fax Function Upgrade <br> Unit | 7 | SiG4 board |
| 2 | FCU board | 5 | Expansion Memory | 8 | Optional G3 board |
| 3 | MBU board | 6 | CCUIF | 9 | Optional NCU board |


| Item | Machine Code | No. | Remarks |
| :--- | :---: | :---: | :--- |
| Fax Option | G307 | $1,2,3$ |  |
| G3 Interface Unit | G324 | $6,8,9$ | Either a G3 interface unit or an |
| ISDN interface unit can be |  |  |  |
| Installed. |  |  |  |

G082

## 1. INSTALLATION

### 1.1 INSTALLATION REQUIREMENTS

### 1.1.1 ENVIRONMENT

1. Temperature Range: $\quad 10^{\circ} \mathrm{C}$ to $32^{\circ} \mathrm{C}\left(50^{\circ} \mathrm{F}\right.$ to $\left.89.6^{\circ} \mathrm{F}\right)$
2. Humidity Range: $\quad 15 \%$ to $80 \%$ RH
3. Ambient Illumination: Less than 2,000 lux (do not expose to direct sunlight)
4. Ventilation: 3 times/hr/person or more
5. Avoid exposing the machine to sudden temperature changes, which include:
1) Direct cool air from an air conditioner
2) Direct heat from a heater
6. Avoid installing the machine in areas that might be exposed to corrosive gas.
7. Install the machine at a location lower than $2,500 \mathrm{~m}(8,200 \mathrm{ft}$.) above sea level.
8. Install the machine on a strong, level base. (Inclination on any side must be no more than 5 mm .)
9. Avoid installing the machine in areas that may be subjected to strong vibration.

### 1.1.2 MACHINE LEVEL

Front to back: Within 5 mm (0.2")
Right to left: $\quad$ Within 5 mm (0.2")

### 1.1.3 MACHINE SPACE REQUIREMENT

Place the machine near the power source, providing clearance as shown.


A: Over 460 mm (18")
B: Over 100 mm (4")
C: Over 550 mm (22")
D: Over 700 mm (28")


### 1.1.4 POWER REQUIREMENTS

## $\triangle$ CAUTION

1. Insert firmly the plug in the outlet.
2. Avoid using an outlet extension plug or cord.
3. Ground the machine.
4. Input voltage level: $120 \mathrm{~V}, 60 \mathrm{~Hz}: 11 \mathrm{~A}$

220 V ~ $240 \mathrm{~V}, 50 \mathrm{~Hz} / 60 \mathrm{~Hz}$ : 6.6 A
2. Permissible voltage fluctuation: $\pm 10 \%$
3. Do not put or place anything on the power cord.

### 1.2 OPTIONAL UNIT COMBINATIONS

| Item No. | Options | Alternative | Required |
| :---: | :---: | :---: | :---: |
| 1 | PFU (1 Tray) | Items 2, 3 |  |
| 2 | PFU (2 Trays) | Items 1, 3 |  |
| 3 | LCT | Items 1, 2 |  |
| 4 | Two-tray finisher | Item 6 | - Item 7 <br> - Item 1, 2 or 3 |
| 5 | 3 types of punch kit |  | Item 4 |
| 6 | Four-bin mailbox | Items 4, 5 |  |
| 7 | Duplex unit |  |  |
| 8 | 2 types of memory DIMM |  |  |

NOTE: Two memory DIMMs (up to 256 MB) can be installed.

### 1.3 INSTALLATION FLOW CHART

The following flow chart shows how to install the optional units more efficiently.


Two-tray Finisher: Needs the duplex unit and a paper tray unit or LCT. Punch Unit: Needs the finisher.

### 1.4 MACHINE INSTALLATION

Refer to the Operating Instructions for details.
If the customer has a service contract, change the settings of the following SP modes depending on the contract type.

| Item | SP No. | Function | Default |
| :---: | :---: | :---: | :---: |
| Meter charge | SP5-930-1 | Specifies whether the meter charge mode is enabled or disabled. <br> Important: <br> This SP can be used only once, and it cannot be changed back to the origina setting. <br> Meter charge mode enabled: <br> - The Counter menu appears immediately after the Menu key is pressed. <br> - The counter type selected by the counting method (SP5-045-1) can be displayed with the Counter menu. <br> - The counter values can also be printed with the Counter menu. <br> - The selected counter starts from a negative number. <br> Meter charge mode disabled: <br> - The Counter menu is not displayed. <br> - The total counter starts from 0 . | Off |
| Counting method | SP5-045-1 | Specifies whether the counting method used in meter charge mode is based on developments or prints. <br> Important: <br> This SP can only be done before the negative counters are reset with SP7-825-001. | Developments |
| A3/11" x 17" double counting | SP5-104-1 | Specifies whether the counter is doubled for A3/11" x 17" paper. | No: Single counting |
| PM warning display 1 | SP5-930-3 | Specifies whether the PM warning for PCUs and development units is displayed when the replacement time arrives. <br> Type 1: Displayed <br> Type 2: Not displayed | Type 1 |
| PM warning display 2 | $\begin{gathered} \text { SP5-930-4 } \\ \text { to } \\ \text { SP5-930-5 } \end{gathered}$ | Specifies whether the PM warning for the paper feed roller and transfer unit is displayed. | Off: |
| Fax No. setting | SP5-812-2 | Programs the service station fax number. <br> The number is printed on the counter list when the meter charge mode is selected, so that the user can fax the counter data to the service station. |  |


| Item | SP No. | Function | Default |
| :---: | :---: | :--- | :---: |
| Counter reset | SP7-825-1 | Resets the counters to 0. <br> Important: This must be done at <br> installation after all the above settings <br> have been finished. The negative <br> counters used in meter charge mode <br> will be reset to zero. |  |

NOTE: 1) The default setting for this machine is meter-charge mode off.
2) The meter-charge counter cannot be reset.

### 1.5 OPTIONAL UNIT INSTALLATION

### 1.5.1 LIST OF OPTIONS

The available options are listed below. Except for the punch unit and DIMM memories, installation is explained in the Operating Instructions.

- Paper Feed Unit (500 sheets x 1)
- Paper Feed Unit (500 sheets x 2)
- Large Capacity Tray
- Two-tray Finisher
- Punch Unit
- Four-bin Mailbox
- DIMM Memory (64/128 MB)


## Note for Transporting the Machine

If it is difficult to slide the machine across the floor after installing the optional paper feed unit or LCT, remove the two stands with the following procedure.


1. Remove all trays in the optional paper feed unit or LCT.
2. Remove the front stand $[A]$ ( $\mathcal{E}^{-1} \times 2$ ).
3. Remove the rear stand $[B]$ ( ${ }^{(1)} \times 2,2$ brackets).

CAUTION: Reinstall the two stands in their original positions, or the machine might tip over when drawing out the paper trays and so on.

### 1.5.2 DIMM MEMORY INSTALLATION



## $\triangle$ CAUTION

Make sure no data is coming into the machine. Turn the main switch off before removing the controller box.

1. Remove the controller box $[A](\hat{\xi} \times 2)$.
2. Remove the controller cover $[B]$ (
3. Insert the DIMM memory [C].
4. Reassemble the controller cover, and install the controller box.

### 1.5.3 PUNCH UNIT INSTALLATION

- G060 Printer Service Manual, Section 1: Installation.


## 2. PREVENTIVE MAINTENANCE

- G060 Printer Service Manual, Section 2: Preventive Maintenance.

NOTE: LED behavior is different from the G060 printer as follows.

| PRODUCT | NEAR END CONDITION | END CONDITION |
| :---: | :---: | :---: |
| G082 Printer | Blinking | Lighting |
| G060 Printer | Lighting | Lighting |

## 3．REPLACEMENT AND ADJUSTMENT

## 3．1 CONTROLLER

NOTE：After replacing the controller，remove the NVRAM，HDD，DIMM，BIOS ROM，and battery on the old board and install them on the new board．

1．Controller box $[A](\hat{\xi} \times 2)$
2．Controller cover $[B]\left(\hat{\beta}^{2} \times 18\right.$ ，気 $\mathrm{E} \times 2$ ）


3．Controller［C］（筸 $\times 11$ ，氟 $\times 1$ ）
4．After replacing the controller，remove the NVRAM［D］，HDD［E］，DIMM［F］， BIOS ROM［G］，and battery［H］on the old board and install them on the new board．
NOTE：The controller as a service part does not include the NVRAM， HDD，DIMM，BIOS ROM，and battery．


## 3．2 CONTROLLER PSU

1．Controller box $[A]\left(\hat{\beta}^{3} \times 2\right)$
2．Controller cover $[B]\left(\hat{\beta}^{2} \times 18\right.$ ，馬 $\mathbb{\#} \times 2$ ）


3．Controller PSU［C］（余 $\times 4$ ，気 Cl x 1 ）


## 3．3 PRINTER ENGINE

－G060 Printer Service Manual，Section 3：Replacement and Adjustment．

## 4. TROUBLE SHOOTING

### 4.1 CONTROLLER SELF-DIAGNOSTICS ERRORS

When a controller self-diagnostic error occurs, the error code number is displayed on the operation panel LCD and booting up stops. After pressing "Enter" key, the machine will continue to boot up.

| Error Code | Symptom | Possible Cause/ Required Action |
| :---: | :---: | :---: |
| 1 | Memory Test | 1. Turn the main switch off and on. <br> 2. Replace the memory. <br> 3. Replace the controller. |
|  | Read/write test |  |
| 2 | Memory Speed Test |  |
|  | Error if memory speed is less than $60 \mathrm{MB} / \mathrm{s}$ |  |
| 3 | CPU Tick Test | 1. Turn the main switch off and on. <br> 2. Replace the controller. |
|  | Error if CPU cycle counter is not running |  |
| 4 | System Timer Test |  |
|  | Error if vxWorks timer is not accurate |  |
| 5 | BX Host Bridge Test U3 |  |
|  | Not found on PCI bus, or error read/write to the device |  |
| 6 | BX AGP Bridge Test U3 |  |
|  | Not found on PCI bus, or error read/write to the device |  |
| 7 | PIIX4 PCI-ISA Bridge Test U5 |  |
|  | Not found on PCI bus, or error read/write to the device |  |
| 8 | 21152 PCI-PCI Bridge Test U21 |  |
|  | Not found on PCI bus, or error read/write to the device |  |
| 9 | IX Test U7 |  |
|  | Not found on PCI bus, or error read/write to the device |  |
| 12 | Strata Flash Boot Block Integrity Test U13 |  |
|  | Data checksum check |  |
| 13 | Strata Flash File System Integrity Test U13 |  |
|  | Data checksum check |  |
| 14 | Ethernet Test U27 |  |
|  | Not found on PCI bus, or error read/write to the device |  |
| 15 | Video 0 Test U9 |  |
|  | Not found on PCI bus, or error read/write to the device |  |
| 16 | Video 1 Test U10 |  |
|  | Not found on PCI bus, or error read/write to the device |  |
| 17 | Video 2 Test U12 |  |
|  | Not found on PCI bus, or error read/write to the device |  |
| 18 | Video 3 Test U11 |  |
|  | Not found on PCI bus, or error read/write to the device |  |
| 19 | JP3 Engine PCI Test |  |
|  | Not found on PCI bus, or error read/write to the device |  |


| Error Code | Symptom | Possible Cause/ Required Action |
| :---: | :---: | :---: |
| 20 | Disk Identify | 1. Turn the main switch off and on <br> 2. Replace the memory. <br> 3. Replace the controller. |
|  | Can't identify drive |  |
| 21 | Disk Read/Write Test |  |
|  | Drive has retry errors |  |
| 22 | Disk Read Capability Test |  |
|  | Can't read from drive |  |
| 23 | Disk Write Capability Test |  |
|  | Can't write to drive |  |
| 24 | Disk Data Format Check |  |
|  | Disk partition check |  |
| 25 | Memory Config Check |  |
|  | Memory DIMM configuration |  |

### 4.2 INTERNAL ERROR

When an internal error occurs, the message "Printer Error Power Off On / Error Reoccur Call Service" is displayed on the operation panel LCD.

### 4.3 SERVICE CALL CONDITIONS

- G060 Printer Service Manual, Section 4: Troubleshooting.


## 5. SERVICE TABLES

### 5.1 SERVICE PROGRAM MODE

| $\triangle$ CAUTION |
| :--- |
| Before accessing the service menu, do the following: |
| Confirm that there is no print data in the printer buffer (the Data In LED |
| must not be lit or blinking). |
| If there is data in the buffer, wait until all data has been printed. |

### 5.1.1 ENABLING AND DISABLING SERVICE PROGRAM MODE



## Entering the Service Mode

To enter the service mode, press the "Up/Down arrow" keys together for about 5 seconds, then press the right arrow key.

NOTE: 1) The machine automatically goes off line when you enter the service mode.
2) While the service mode is activated, the Online LED does not go out.

## Accessing the Required Program

Use the "Up/Down arrow" keys to scroll through the menu listing.

1. Service: Controller service modes
2. Engine: Engine service modes
3. End: Exit service mode

To select an item, press the "right-arrow" key. Then the sub-menu will appear. Scroll through the sub menu items using the "Up/Down arrow" keys.
To go back to a higher level, press the "left-arrow" key.

## Inputting a Value or Setting for a Service Program

Enter the required program mode as explained above. The setting appearing on the display is the current setting.
Select the required setting using the "Up/Down arrow" keys, then press the "rightarrow" key. The previous value remains if the "right-arrow" key is not pressed.

## Exiting Service Mode

NOTE: When you exit the service mode, the printer automatically reboots.
Select "3. End" from the service mode main menu. After the following message has appeared, press the "right-arrow" key.

```
System Reboot
Execute?
```

NOTE: If the settings of SP modes 5-993-013 to 015 are changed, these changes will affect the next line position adjustment.

### 5.2 PRINTER CONTROLLER SERVICE MODE

### 5.2.1 SERVICE MODE MENU ("1. SERVICE")

| Mode No. (Class 1 and 2) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: |
| [Clear Setting] |  |  |  |
| 1 | Clear Setting |  | Initializes settings in the "System" menu of the user mode. This is the same as "Restore Default" in user mode. |
| [Bit Switch] |  |  |  |
| 2 | Bit Switch 2 | * | When bit 4 of bit switch 2 is set to 1 , the Letterhead Mode is enabled. <br> NOTE: Currently the other bit switches are not used. These switches have to be set to " 0 ". |
| [Password Clear] |  |  |  |
| 1 | Password Clear |  | Clears the password that was specified by the user program mode - this password prevents access to some user tools. <br> NOTE: Use this function to clear the password when the user forgets it. |
| [Key Repeat] |  |  |  |
| 1 | Key Repeat | * | When enabled (On), this function allows the display to continually advance (scroll) when a key is held down, and makes the LEDs blink more slowly. This was introduced to help users who may be physically challenged operate the machine more freely. |

NOTE: An asterisk (*) to the right hand side of the mode number column means that this mode is stored in the NVRAM. If you do a RAM clear, this SP mode will be reset to the default value.

### 5.2.2 BIT SWITCH PROGRAMMING

$\Rightarrow$ NOTE: Currently, the bit switches are not being used.

1. Enter the SP mode, select "Service Menu", then press $\downarrow$, then press $\boldsymbol{\nabla}$.
<Service>
Bit Switch >>
2. Press
3. Adjust the bit switch using the following keys.

- $\mathbf{\Delta} / \boldsymbol{\nabla}$ : Move to the next bit.

```
Bit Switch
Bit switch
```

- 4: Exit without saving changes.
- : Exit and save changes.

NOTE: The left digit on the display is bit 7 and the right digit is bit 0 .
4. Press to save changes and exit.

PRINTER ENGINE SERVICE MODE

### 5.3 PRINTER ENGINE SERVICE MODE

- G060 Printer Service Manual, Section 5.3: Printer Engine Service Mode.


### 5.4 FIRMWARE UPDATE PROCEDURE

### 5.4.1 TYPE OF FIRMWARE

There are three types of firmware as shown below.

| Type of firmware |  |  | Function |
| :--- | :--- | :--- | :--- |
| Location of firmware |  |  |  |
| Printer Engine | 1. Main | Printer engine control | BCU Flash ROM |
|  | 2. MUSIC | Line position adjustment | BCU Flash ROM |
| Printer Controller | 3. Controller | Boot program <br> System program | HDD |

G060 Printer Service Manual, Section 5.4.4 Firmware Upgrade.
NOTE: When upgrading all three types of firmware at the same time, you can upgrade them in any order.

### 5.4.2 FIRMWARE UPGRADE OVERVIEW

Before attempting to upgrade the firmware, you must obtain the latest firmware version from the TSC Website at http://tsc.ricohcorp.com Download the firmware file to a location on your PC where you will refer to during the upgrade process.


Firmware upgrading requires a PC and Ethernet cross-over cable.

### 5.4.3 SUPPORTED OS AND TOOLS

|  | Windows <br> 95/98/ME | Windows NT <br> 4.0 | Windows 2000 | Windows XP |
| :--- | :---: | :---: | :---: | :---: |
| Fiery WebTools | Yes | Yes | Yes | Yes |
| Web browser |  |  |  |  |
| Ipr Command | No | Yes | Yes | Yes |

NOTE: In this section, "Web browser" indicates "Internet Explorer 5.0 or later," or "Netscape 4.5 or later."

### 5.4.4 FIRMWARE UPGRADE

## $\triangle$ CAUTION <br> 1. Open the front cover whenever updating the firmware. <br> 2. Do not turn off the machine while downloading the firmware.

## Upgrading Printer Firmware

To upgrade the firmware, you must connect the printer to your PC with an Ethernet cross-over cable. There are two methods:

1) Using Fiery WebTool: Sends the files by using a Web browser
2) Using the Ipr command: Sends the files by using a command line

NOTE: In this section, "Web browser" indicates "Internet Explorer 5.0 or later," or "Netscape 4.5 or later."

## Using Fiery WebTools

## Preparation on the printer

1. Turn the main switch on.
2. Wait until "Ready" is displayed.

## Ready

3. Print out the Configuration Page.
4. Connect the printer and PC with an Ethernet cross-over cable.
5. Select the menu "Network Protocol Setup."
6. Select the submenu "TCP/IP-Ethernet," and change the setting from "No" to "Yes."
7. Select the submenu "Eth. IP Address," and input an IP address. (e.g. 133.139.157.101)
8. Select the submenu "Eth. Subnet Mask," and input an address mask. (e.g. 255.255.255.0)
9. Select the submenu "Gateway Address," and input a gateway address. (e.g. 133.139.157.001)
10. Select the submenu "Enable AppleTalk," and change the setting from "Yes" to "No."
11. Press the Cancel key. The system reboots automatically.
12. Open the front cover.

## Preparation on the PC

1. Set the TCP/IP address for your PC (e.g. 133.139.157.010).

NOTE: Do not use the IP address of the printer.
2. Set the Subnet Mask (e.g. 255.255.255.0).
3. Reboot the PC.

## Upgrade Procedure

1. Check that the printer front cover is open.
2. Run the Web browser.
3. Type the printer IP address into the Web browser to run Fiery WebTools.

NOTE: The printer IP address is the address you have input in the submenu "Eth. IP Address."
4. Click the "Web Downloader" button of Fiery WebTool.
5. Click the "Print Connection" button, and select the following option:

## 0 : Direct Connection

6. Browse through the source file list to where you downloaded the firmware file previously, and select the firmware.
7. Click the "Send file" button.
8. Wait until the "Data In" LED blinks.
9. Check that the massages "Upgrading System" and "Do Not Power Off" are displayed.
```
Upgrading System
Do Not Power Off
```

NOTE: Do NOT turn the main switch off before the messages disappear.
10. Wait until the "Data In" LED goes out. The printer reboots automatically.
11. Close the front cover when "Close Front Cover" is displayed.

NOTE: Fiery WebTools does not output any message or indication at the end of firmware upgrading. Quit Fiery WebTools by clicking the close button $(x)$ after "Ready" is displayed on the printer display.
12. Check the firmware version by printing Configuration Page.
13. Return all printer settings that were changed in order to perform the upgrade back to their original values.

## Updating using the lpr Command

## Preparation on the printer

1. Turn the main switch on.
2. Wait until "Ready" is displayed.
3. Print out Configuration Page in case you need to refer to the current settings.
4. Connect the printer and the PC with an Ethernet cross cable.
5. Select the menu "Network Protocol Setup."
6. Select the submenu "TCP/IP-Ethernet," and change the setting from "No" to "Yes."
7. Select the submenu "Eth. IP Address," and input an IP address. (e.g. 133.139.157.101)
8. Select the submenu "Eth. Subnet Mask," and input an address mask. (e.g. 255.255.255.0)
9. Select the submenu "Gateway Address," and input a gateway address. (e.g. 133.139.157.001)
10. Select the submenu "Enable AppleTalk," and change the setting from "Yes" to "No."
11. Press the Cancel key. The system reboots automatically.
12. Open the front cover.

## Preparation on the PC

1. Set the TCP/IP address for your PC. (e.g. 133.139.157.010)

NOTE: Do not use the IP address of the printer.
2. Set the Subnet Mask (e.g. 255.255.255.0).
3. Reboot the PC.

## Upgrade Procedure

1. Check that the printer front cover is open.
2. Use the Run command in the Windows Start Menu.
3. Transfer the firmware to the printer by using the Ipr command.
(e.g. Ipr -S 133.139.157.101-P xjdirect "Firmware File Name")

NOTE: In the example, "Firmware File Name" indicates the file name of the firmware. The IP address is the address of the printer set in Step 7 of "Preparation on the printer"
4. Wait until the "Data In" LED blinks.
5. Check that the massages "Upgrading System" and "Do Not Power Off" are displayed.

Upgrading System Do Not Power Off

NOTE: Do NOT turn the main switch off before the messages disappear.
6. Wait until the "Data In" LED goes out. The printer reboots automatically.
7. Close the front cover when "Close Front Cover" is displayed.
8. Confirm the firmware version by printing Configuration Page.
9. Return all printer settings that were changed in order to perform the upgrade back to their original values.

### 5.4.5 ERROR RECOVERY

If a download attempt fails, try downloading the new firmware again using the procedure described in section 5.4.4.

### 5.4.6 HARD DISK FAILURE

The controller firmware is located on the Hard Disk. If the Hard Disk crashes, perform the following procedure to restore the machine to operating condition.

## WARNING: This procedure includes formatting the Hard Drive. Never turn off the main switch while the procedure is in process.

1. Connect the printer to the PC using a parallel cable.
2. While holding down the "Cancel" key and the "Left Arrow" key, turn on the main switch of the printer. Continue to hold down the keys until "Memory Installed xxxMB" is displayed on the printer LCD (approx. 15 sec .).
3. The printer will automatically perform a memory check and a self-diagnostics (appox. 40 sec.). "Entering...Download Mode" will then be displayed on the printer LCD.
4. On the PC, open a DOS window (Command prompt).
5. At the Command prompt, transfer the firmware to the printer using the "Copy" command "copy filename lpt1/b".

6. During the transfer process, the printer LCD will display the number of bytes that have been transferred. Upon completion, the printer displays "Download done Programming..." The machine will then reboot automatically.
7. Print out the configuration page to confirm that the correct version has been successfully installed.

### 5.5 CONTROLLER SELF-DIAGNOSTICS

### 5.5.1 OVERVIEW

There are two types of self-diagnostics for the controller.

- Power-on self-diagnostics: The machine automatically starts the self-diagnostics just after the power has been turned on.
- SC detection: The machine automatically detects SC conditions at power-on or during operation.
The following shows the workflow of the power-on and detailed self-diagnostics.


The messages "xxx MB" and "version number" depend on the memory capacity and the firmware version respectively.

While the message "Diagnostic Passed" is displayed, the following tests and checks are conducted:

- Memory Test
- Memory Speed Test
- CPU Tick Test
- System Timer Test
- BX Host Bridge Test
- BX PCI-PCI Bridge Test
- PIIX4 PCI-ISA Bridge Test
- 21152 PCI-PCI Bridge Test
- IX Test
- Parameter Flash R/W Test
- Strata Flash R/W Test
- Strata Flash Boot Block Integrity Test
- Strata Flash File System Integrity Test
- Ethernet Test
- Video 0 Test
- Video 1 Test
- Vide 2 Test
- Vide 3 Test
- Disk Identify
- Disk Read/Write Test
- Disk Read Capability Test
- Disk Write Capability Test
- Disk Data Format Check
- Memory Config Check


### 5.6 USER PROGRAM MODE

Press the "Menu" key to scroll through the menu listing.

## User Mode Tree



NOTE: 1) The arrow $(\rightarrow)$ stands for "press the Enter key."
2) Pressing the "Cancel" key exits menu operations and returns to "Ready."

## 6. DETAILED SECTION DESCRIPTIONS

### 6.1 CONTROLLER

### 6.1.1 BLOCK DIAGRAM AND FUNCTIONS



Components

| Component | Type | Configuration |
| :--- | :--- | :--- |
| Processor | Intel Pentium III | 700 MHz |
| Hard Drive | EIDE | 10 GB |
| \#DIMM slots | 2 | 64 or 128MB |
| SDRAM MHz | PC 100 | Individual 128, 256MB |
| BIOS memory | Flash | 256 KB |
| Flash memory | Flash | 16 MB |
| ASICs x 1 |  | IX |
| ASICs x 4 |  | VXMCT |
| Interface Connector | $32-$ Bit PCI | Engine I/F |
| External Ports | Parallel (in) | IEEE 1284, Type C (high density) |
|  | RJ-45 (Network) | Ethernet 10/100BaseT |
| NVRAM | Flash | $8 k B$ |

CONTROLLER

## Networking

The standard networks and cabling configuration includes:

- Ethernet 10BaseT (Unshielded Twisted Pair)
- Fast Ethernet 100Base-TX (Unshielded Twisted Pair)


## IX ASIC

Increases the speed of I/O functions including:

- Parallel Port
- Peripheral Control


## Engine Video Interface

The engine interface's responsibilities include:

- High speed data transmission
- High speed data decompression
- Engine output at maximum rated output speed
- Data buffering for fault-tolerant error recovery
- Multiple unique pages in the printer paper path

The video interface controls such aspects of the print job as:

- Hardware decompression
- Print quality enhancement technologies


## Hard Disk Drive

The hard disk drive is used to optimize many parts of the printing system as well as improving throughput and ease-of-use. The hard disk drive stores the following information:

- System software
- Non-volatile spooled print jobs
- Additional storage for compressed pages
- Non-volatile record of printed jobs (Job Log)
- Resource storage space for downloaded fonts


## Memory

The dynamic memory is used for System and Frame Buffer memory PC100 Synchronous DRAM in 168 pin DIMMs.

## Non-Volatile Memory

There are three types of nonvolatile memory used on this machine:
The 256KB Flash Memory contains the BIOS data, the 16MB Flash Memory contains the diagnostics and drivers to support firmware update, and the NVRAM contains various parameters such as SP and UP Mode data.

## System Memory

The controller 's RAM is divided between system memory and frame buffer memory. The working space for the system occupies a fixed amount of memory. This space includes memory allocated to I/O buffers, PDL interpretation, and other dynamic system structures. The hard drive in the Fiery can be utilized, at the system's discretion, for the temporary storage of overflow objects that may result as by-products of file rasterization.

## Frame Buffer Memory

Additional memory beyond the fixed system working space is allocated to frame/page buffer memory. In general, as more memory is added to the system, it is added to the page buffer memory pool. Pages are stored in memory in either compressed or uncompressed format, depending on the system configuration. In general, the more pages that can be stored in memory, the greater the throughput of the system.

The state in which the Fiery rasterizes pages or jobs while simultaneously printing is termed Rip-While-Print ${ }^{\text {TM }}$.

Rip-While-Print ${ }^{T M}$ enables the Fiery to begin processing new pages while current pages are printing, increasing throughput tremendously on multiple page documents and multiple jobs.

The state in which the Fiery controller contains enough rasterized pages in memory to maintain constant data flow to the print engine, therefore preventing the engine from cycling down between pages or jobs, is termed Continuous Print ${ }^{\mathrm{TM}}$.
Continuous Print ${ }^{\text {TM }}$ allows the Fiery to drive the copier at full rated speed by enabling the engine to print unique pages without pausing (cycle down).
The controller is designed to hold multiple pages in memory at once to guarantee full error recovery in the case of paper jam, or other copier error state.

CONTROLLER

## Compression

The Fiery uses ECT compression to optimize the use of memory by reducing file sizes using proprietary techniques. This step allows the Fiery to store many more pages in the frame buffer than would be available normally.

## Options

The printer will be available with the following types of options:

- Memory upgrades (64MB DIMM or 128MB DIMM)
- Command WorkStation (software)


### 6.1.2 BOARD LAYOUT



CONTROLLER

### 6.1.3 PRINT DATA PROCESSING



The key roles of each part of the print system are outlined below.

- The drivers are responsible for generating the page description on the host system and for transmitting data to the printer.
- The I/O manager mediates the connection between the parallel port or network interface and establishes a device or print manager connection.
- The print manager is responsible for spooling the job (if appropriate) and for feeding jobs to the correct PDL interpreter.
- The PDL interpreters are responsible for turning page descriptions into rendered pages and for parsing job management comments.
- The compression subsystem manages compressed pages in memory.
- The page manager coordinates pages for sending to the engine for the most efficient printing, finishing, and accessory handling.
- The video subsystem is responsible for decompressing pages and feeding the engine with appropriate engine signals. The video subsystem also handles certain print quality processing functions.


### 6.1.4 BUILT-IN COLOR MANAGEMENT

This controller has a full complement of built-in color management technologies.

| Component | Description | Location/Platforms |
| :---: | :--- | :--- |
| PostScript color <br> rendering <br> dictionaries <br> (CRDs) | CRDs optimized for photos, graphics, <br> presentation objects; <br> plain paper/transparency media types | Controller firmware <br> (HDD) |
| Press simulation <br> control | Lookup tables to simulate density <br> characteristics of offset printing processes | Controller firmware <br> (HDD) |
| Device profiles | ColorSync 2/ICM profiles compatible with <br> Macintosh and Windows color management <br> systems | Macintosh/Windows <br> printer drivers |

Macintosh: Mac OS 8.7.2 or later
Windows: Windows 95, 98, 2000, ME, XP, or NT (v4.0 with Service Pack 4)

### 6.1.5 POINT-TO-POINT DIAGRAM

The following shows the differences from the G060 printer.


### 6.2 PRINTER ENGINE

- G060 Printer Service Manual, Section 6: Detailed Section Descriptions.


## SPECIFICATIONS

## 1. GENERAL SPECIFICATIONS

Configuration: Desktop
Print Process: Dry electrostatic transfer system
Printer Languages: PCL5c:
CLJ5 class compatible
Adobe PostScript 3 (Genuine):
Interpreter 3011.103
Resolution: $\quad$ PCL5c : $600 \times 600 \mathrm{dpi}$
PS3 : $600 \times 600 \mathrm{dpi}, 1200 \times 1200 \mathrm{dpi}$
Gradation
1 bit/pixel
Printing speed:

|  | Resolution | Plain paper | Thick/OHP |
| :---: | :---: | :---: | :---: |
| Monochrome | $600 \times 600 \mathrm{dpi}$ | 38 ppm | 10 ppm |
|  | $1200 \times 1200 \mathrm{dpi}$ | 28 ppm | 10 ppm |
|  | $600 \times 600 \mathrm{dpi}$ | 28 ppm | 10 ppm |
|  | $1200 \times 1200 \mathrm{dpi}$ | 14 ppm | 10 ppm |


| Resident Fonts: | PCL5c $: 46$ fonts ( 45 fonts +1 bit map font) <br> PS $: 136$ fonts (126 fonts Adobe Type 1 Font +10 <br>  TrueType Font) |
| :---: | :---: |
| Host Interfaces: | $\begin{aligned} & \text { Parallel : IEEE1284 I/F Type C } \\ & \text { NIB }: 10 / 100 \text { Base-TX (RJ45) } \end{aligned}$ |
| Network Protocols: | TCP/IP, IPX/SPX, AppleTalk |
| First Print Speed: | Color $: 12.0$ seconds or less (A4 / LT - LEF, Tray 1) Monochrome : 9.0 seconds or less (A4 / LT - LEF, Tray 1) |
| Warm-up Time | Less than 190 seconds |
| Print Paper Capacity: ( $80 \mathrm{~g} / \mathrm{m} 2,20 \mathrm{lb}$ ) | Standard tray $: 500$ sheets $\times 2$ <br> By-pass tray $: 100$ sheets <br> Optional paper feed tray $: 500$ sheets $\times 1,500$ sheets $\times 2$, <br> Optional LCT $: 2000$ sheets |

Print Paper Size:
(Refer to "Supported Paper Sizes".)

|  | Minimum | Maximum |
| :---: | :---: | :---: |
| Tray 1 | $\mathrm{A} 4 / 81 / 2^{\prime \prime} \times 11^{\prime \prime}(\mathrm{LEF})$ |  |
| Tray 2 | A5 $(\mathrm{LEF}) / 81 / 2^{\prime \prime} \times 11^{\prime \prime}$ | $\mathrm{A} 3 / 11^{\prime \prime} \times 17^{\prime \prime}$ |
| By-pass | $90 \times 148 \mathrm{~mm}$ | $305 \times 458 \mathrm{~mm} / 12^{\prime \prime} \times 18^{\prime \prime}$ |
| Optional Tray | A5 (LEF)/81/2" $\times 11^{\prime \prime}$ | $\mathrm{A} 3 / 11^{\prime \prime} \times 17^{\prime \prime}$ |
| LCT | $\mathrm{A} 4 / 81 / 2^{\prime \prime} \times 11^{\prime \prime}($ LEF $)$ |  |

Printing Paper
Weight:

Output Paper
Capacity:
Memory:
Power Source:

Standard tray : 60 to $105 \mathrm{~g} / \mathrm{m}^{2}(16-28 \mathrm{lbs}$.
By-pass tray : 60 to $163 \mathrm{~g} / \mathrm{m}^{2}(16-43 \mathrm{lbs}$ )
Optional paper tray : 60 to $105 \mathrm{~g} / \mathrm{m}^{2}$ ( $16-28 \mathrm{lbs}$.)
Standard exit tray : 500 sheets (face down)
External exit tray : 100 sheets (face up)
Standard 128 MB, up to 256 MB with optional DIMM
$120 \mathrm{~V}, 60 \mathrm{~Hz}: 11 \mathrm{~A}$ (for North America)
$220 \mathrm{~V}-240 \mathrm{~V}, 50 / 60 \mathrm{~Hz}: 6.6 \mathrm{~A}$ (for Europe)
Power Consumption: Less than 1,200W (for North America)
Less than 1,550W (for Europe)

Noise Emission:
(Sound Power Level)

|  | Mainframe Only | Full System |
| :---: | :---: | :---: |
| Printing | 68 dB or less | 72 dB or less |
| Stand-by | 42 dB or less |  |
| Low power mode | 40 dB or less |  |

NOTE: The above measurements were made in accordance with Ricoh standard methodology.

Dimensions (W x D x H): $575 \times 678 \times 715 \mathrm{~mm}$ (22.7" x 26.7" x 28.2")
Weight: Less than $81 \mathrm{~kg}(179 \mathrm{lb}$.$) without consumables$

### 1.1 SUPPORTED PAPER SIZES

### 1.1.1 PAPER FEED

| Paper | Size (W x L) | North America |  |  | Europe/Asia |  |  | By-pass Tray |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Tray 1 | $\begin{aligned} & \text { Tray } \\ & 2 / 3 / 4 \end{aligned}$ | LCT | Tray 1 | $\begin{aligned} & \text { Tray } \\ & 2 / 3 / 4 \end{aligned}$ | LCT |  |
| A3 W | $12 \mathrm{l} \times 18{ }^{\text {" }}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| A3 SEF | $297 \times 420 \mathrm{~mm}$ | N | Y | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| A4 SEF | $210 \times 297 \mathrm{~mm}$ | N | $Y^{\#} / Y^{*}$ | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| A4 LEF | $297 \times 210 \mathrm{~mm}$ | $Y^{*}$ | Y | $Y^{*}$ | Y | Y | Y | $\mathrm{Y}^{\#}$ |
| A5 SEF | $148 \times 210 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| A5 LEF | $210 \times 148 \mathrm{~mm}$ | N | Y | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| A6 SEF | $105 \times 148 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| B4 SEF | $257 \times 364 \mathrm{~mm}$ | N | $Y^{\#} / Y^{*}$ | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| B5 SEF | $182 \times 257 \mathrm{~mm}$ | N | $Y^{\#} / Y^{*}$ | N | N | $\mathrm{Y}^{\#} / \mathrm{Y}^{*}$ | N | $\mathrm{Y}^{\#}$ |
| B5 LEF | $257 \times 182 \mathrm{~mm}$ | N | Y | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| B6 SEF | $128 \times 182 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| Ledger | $11^{\prime \prime} \times 17{ }^{\prime \prime}$ | N | Y | N | N | Y | N | $\mathrm{Y}^{\#}$ |
| Letter SEF | 8.5 " x 11" | N | Y | N | N | $Y^{\#} / Y^{*}$ | N | $\mathrm{Y}^{\#}$ |
| Letter LEF | $11{ }^{\prime \prime} \times 8.5$ " | Y | Y | Y | $Y^{*}$ | Y | $Y^{*}$ | $\mathrm{Y}^{\#}$ |
| Legal SEF | 8.5 " x 14" | N | Y | N | N | $Y^{\#} / Y^{*}$ | N | $\mathrm{Y}^{\#}$ |
| Half Letter SEF | $5.5 \mathrm{\prime} \mathrm{\prime} \times 8.5$ " | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| Executive SEF | 7.25" $\times 10.5$ " | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| Executive LEF | 10.5 " $\times 7.25$ " | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| F SEF | $8{ }^{\prime \prime} \times 13$ " | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| Foolscap SEF | 8.5 " x 13" | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| Folio SEF | 8.25 " x 13" | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| 8K | $267 \times 390 \mathrm{~mm}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| 16K SEF | $195 \times 267 \mathrm{~mm}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| 16K LEF | $267 \times 195 \mathrm{~mm}$ | N | $\mathrm{Y}^{\#}$ | N | N | $\mathrm{Y}^{\#}$ | N | $\mathrm{Y}^{\#}$ |
| Custom | Minimum: $90 \times 148 \mathrm{~mm}$ Maximum: $305 \times 457 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| Com10 Env. | $4.125^{\prime \prime} \times 9.5{ }^{\prime \prime}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| Monarch Env. | 3.875" x 7.5" | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| C6 Env. | $114 \times 162 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| C5 Env. | $162 \times 229 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |
| DL Env. | $110 \times 220 \mathrm{~mm}$ | N | N | N | N | N | N | $\mathrm{Y}^{\#}$ |

NOTE: To feed B6 SEF from the by-pass tray, custom setting is required.

## Remarks:

| Y | Supported: the sensor detects the paper size. |
| :--- | :--- |
| $\mathrm{Y}^{\#}$ | Supported: the user specifies the paper size. |
| $\mathrm{Y}^{*}$ | Supported: depends on a technician adjustment |
| N | Not supported |

## SPECIFICATIONS

### 1.1.2 PAPER EXIT

| Paper | Size (W x L) | Internal Tray (Face Down) | $\begin{aligned} & \hline \text { External Tray } \\ & \text { (Face Up) } \end{aligned}$ | Finisher | $\begin{gathered} \hline \text { 4-bin } \\ \text { Mailbox } \end{gathered}$ | Duplex |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A3 W | $12 \mathrm{c} \times 18{ }^{\text {" }}$ | N | Y | N | N | N |
| A3 SEF | $297 \times 420 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| A4 SEF | $210 \times 297 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| A4 LEF | $297 \times 210 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| A5 SEF | $148 \times 210 \mathrm{~mm}$ | Y | Y | N | N | N |
| A5 LEF | $210 \times 148 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| A6 SEF | $105 \times 148 \mathrm{~mm}$ | Y | Y | N | N | N |
| B4 SEF | $257 \times 364 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| B5 SEF | $182 \times 257 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| B5 LEF | $257 \times 182 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| B6 SEF | $128 \times 182 \mathrm{~mm}$ | Y | Y | N | N | N |
| Ledger | $11^{\prime \prime} \times 17{ }^{\prime \prime}$ | Y | Y | Y | Y | Y |
| Letter SEF | 8.5 " x 11" | Y | Y | Y | Y | Y |
| Letter LEF | $11^{\prime \prime} \times 8.5 "$ | Y | Y | Y | Y | Y |
| Legal SEF | 8.5 " $\times 14$ " | Y | Y | Y | Y | Y |
| Half Letter SEF | $5.5 " \mathrm{x} 8.5$ " | Y | Y | N | Y | N |
| Executive SEF | 7.25" $\times 10.5$ " | Y | Y | Y | Y | Y |
| Executive LEF | 10.5 " $\times 7.25$ " | Y | Y | N | N | N |
| F SEF | $8{ }^{\prime \prime} \times 13^{\prime \prime}$ | Y | Y | Y | Y | Y |
| Foolscap SEF | 8.5 " x 13" | Y | Y | Y | N | Y |
| Folio SEF | 8.25 " x 13" | Y | Y | Y | N | Y |
| 8K | $267 \times 390 \mathrm{~mm}$ | Y | Y | Y | N | Y |
| 16K SEF | $195 \times 267 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| 16K LEF | $267 \times 195 \mathrm{~mm}$ | Y | Y | Y | Y | Y |
| Custom | Minimum: $90 \times 148 \mathrm{~mm}$ Maximum: $305 \times 457 \mathrm{~mm}$ | Y | Y | N | N | N |
| Com10 Env. | $4.125^{\prime \prime} \times 9.5$ " | N | Y | N | N | N |
| Monarch Env. | 3.875" x 7.5" | N | Y | N | N | N |
| C6 Env. | $114 \times 162 \mathrm{~mm}$ | N | Y | N | N | N |
| C5 Env. | $162 \times 229 \mathrm{~mm}$ | N | Y | N | N | N |
| DL Env. | $110 \times 220 \mathrm{~mm}$ | N | Y | N | N | N |

## Remarks:

| Y | Supported |
| :--- | :--- |
| N | Not supported |

## 2. SOFTWARE ACCESSORIES

The printer drivers and utility software are provided on one CD-ROM. An auto-run installer allows you to select which components to install.

### 2.1 PRINTER DRIVERS

| Printer <br> Language | Windows <br> 95/98/ME | Windows NT4.0 | Windows <br> 2000/XP | Macintosh |
| :---: | :---: | :---: | :---: | :---: |
| PCL 5c | Yes | Yes | Yes | No |
| PS3 | Yes | Yes | Yes | Yes |

NOTE: 1) The printer drivers for Windows NT 4.0 are only for the Intel $x 86$ platform. There is no Windows NT 4.0 printer driver for the PowerPC, Alpha, or MIPS platforms.
2) The PS drivers are all genuine AdobePS drivers, except for Windows 2000, which uses Microsoft PS. A PPD file for each operating system is provided with the driver.
3) The PS driver for Macintosh supports Mac OS 8.6 or later versions.

### 2.2 UTILITY SOFTWARE

| Software | Description |
| :--- | :--- |
| SmartNetMonitor for Admin <br> (Win9x/Me, 2000, NT4.0, XP) | A printer management utility for network administrators. |
| SmartNetMonitor for Client | - A printer management utility for client users. |
| (Win9x/Me, 2000, NT4.0, XP) | - A utility for peer-to-peer printing over TCP/IP network. |
| (olorWise Pro Tools <br> (Windows/Macintosh) | This is a color management tool set for the Fiery 3850C. It is <br> composed of the following modules: |
|  | - Calibrator |
|  | - Color Editor |
|  | - Profile Manager |
|  | - Color Setup |

NOTE: 1) For ColorWise Pro Tools, Densitometer (X-Rite DTP32/X-Rite DTP41) is compatible.

## 3. MACHINE CONFIGURATION



| Item | Machine Code | No. | Remarks |
| :---: | :---: | :---: | :---: |
| Main Unit | G060 | A |  |
| Options |  |  |  |
| Finisher | G565 | B | Requires the duplex unit and one of the three paper feed options. <br> Finisher and mailbox cannot both be installed. |
| Four-bin Mailbox | G566 | C | Finisher and mailbox cannot both be installed. |
| Paper Feed Unit (500 x 1) | G567 | D | Install any one of these three units. |
| Paper Feed Unit (500 x 2) | G568 | E |  |
| LCT | G569 | F |  |
| Duplex Unit | G571 | G |  |
| Punch Unit | B377 |  | Requires the finisher |
| Internal Options |  |  |  |
| 64MB DIMM Memory | G346 |  |  |
| 128MB DIMM Memory | G347 |  |  |

NOTE: All the above items are user installable except for the punch unit and memories.

## 4. OPTIONAL EQUIPMENT

### 4.1 500-SHEET TRAY

Paper Size: Maximum: A3/11" x 17" (SEF) Minimum: A5 (LEF)/81/2" x 11"
Paper Weight: $\quad 60$ to $105 \mathrm{~g} / \mathrm{m}^{2}$ ( 16 to 28 lb .)
Tray Capacity: $\quad 500$ sheets ( $\left.80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}.\right)$
Paper Feed System: FRR system
Paper Height Detection: 3 steps (100\%, 50\%, Near End)
Power Source:
DC $24 \mathrm{~V}, 5 \mathrm{~V}$ (from the main unit)
Power Consumption:
50 W
Dimensions (W x D x H): $540 \times 600 \times 172 \mathrm{~mm}\left(21.3^{\prime \prime} \times 23.7^{\prime \prime} \times 6.8 "\right)$
Weight $\quad 18 \mathrm{~kg}(39.7 \mathrm{lb}$.

### 4.2 1000-SHEET TRAY

| Paper Size: | Maximum: A3/11" x 17" (SEF) <br> Minimum: A5 (LEF)/81/2" x 11" |
| :---: | :---: |
| Paper Weight: | 60 to $105 \mathrm{~g} / \mathrm{m}^{2}$ (16 to 28 lb .) |
| Tray Capacity: | 500 sheets $\times 2$ (80 g/m ${ }^{2}$, 20 lb .) |
| Paper Feed System: | FRR system |
| Paper Height Detection: | 3 steps (100\%, 50\%, Near End) |
| Power Source: | DC $24 \mathrm{~V}, 5 \mathrm{~V}$ (from the main unit) |
| Power Consumption: | 50 W |
| Dimensions (W x D $\times$ ) : | $540 \times 600 \times 270 \mathrm{~mm}$ (21.3" $\times 23.7$ " x 10.7") |
| Weight | 25 kg (55.2 lb.) |

### 4.3 2000-SHEET LARGE CAPACITY TRAY

| Paper Size: | A4/81/2" x 11" (LEF) |
| :---: | :---: |
| Paper Weight: | 60 to $105 \mathrm{~g} / \mathrm{m}^{2}$ (16 to 28 lb.$\left.\right)$ |
| Tray Capacity: | 2000 sheets ( $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$.) |
| Paper Feed System: | FRR system |
| Paper Height Detection: | 5 steps (100\%, 75\%, 50\%, 25\%, Near End) |
| Power Source: | DC $24 \mathrm{~V}, 5 \mathrm{~V}$ (from the main unit) |
| Power Consumption: | 30 W |
| Dimensions (W x $\mathrm{D} \times \mathrm{H}$ ): | $540 \times 600 \times 270 \mathrm{~mm}$ (21.3" $\times 23.7$ " $\times 10.7$ ") |
| Weight | 25 kg ( 55.2 lb.$)$ |

### 4.4 TWO-TRAY FINISHER \& PUNCH UNIT

| Print Paper Size: | No punch mode: <br> A3/11" x 17" to A5 (LEF)/81/2" x 11" <br> Punch mode: <br> 2 holes: A3/11" x 17" to A4/81/2" x 11" (SEF) <br> A4/81/2" x 11 " to A5 (LEF) <br> 3 holes: A3, B4, 11" x 17" (SEF) <br> A4, B5, 81/2" x 11" (LEF) <br> 4 holes (Europe): A3, B4, 11" x 17" (SEF) <br> A4, B5, 81/2" x 11" (LEF) <br> 4 holes (North Europe): A3, B4, 11" x 17" (SEF) <br> A4, B5, 81/2" x 11" (LEF) <br> Staple mode: <br> A3/11" x 17 " to $B 5 / 81 / 2^{\prime \prime} \times 11^{\prime \prime}$ |
| :---: | :---: |
| Paper Weight: | ```No punch mode: 60 to \(105 \mathrm{~g} / \mathrm{m}^{2}\) (16 to 28 lb .) Punch mode: 60 to \(105 \mathrm{~g} / \mathrm{m}^{2}\) (16 to 28 lb. ) Staple mode: 64 to \(90 \mathrm{~g} / \mathrm{m}^{2}\) (17 to 23 lb .) Label/Thick paper/OHP cannot be stapled``` |
| Tray Capacity: | ```Upper tray: 500 sheets: A4, 81/2" x 11" , B5, A5 (LEF) 250 sheets: \(11^{\prime \prime} \times 17^{\prime \prime}\), A3, 81/2" x 14", B4 Lower tray (default mode - stapled output only goes to tray 2): 2000 sheets: A4, 81/2" x 11" (LEF) 750 sheets: A3, B4, A4, B5, 81/2" x 14", 11" x 17", 81/2" x 11" (SEF) 500 sheets: A5 (LEF) Lower tray (multi-tray staple mode - stapled output can go to either tray): 1500 sheets: A4, 81/2" \(\times 11^{\prime \prime}\) (LEF) 750 sheets: A3, B4, A4, B5, 81/2" x 14", 11" x 17", 81/2" x 11" (SEF) 500 sheets: A5 (LEF)``` |
| Staple capacity: | Single size: <br> 50 sheets: A4, 81/2" x 11" , B5 <br> 30 sheets: A3, B4, 81/2" x 14", 11" x 17" <br> Mixed size: <br> 30 sheets: A4 (LEF) \& A3, B5 (LEF) \& B4, 81/2" x 11" (LEF) \& 11" x 17" |
| Staple position: | 7 positions <br> 1-staple: 4 positions (Top Left, Top Right, Top Left-Oblique, Top Right-Oblique) 2-staples: 3 positions (Left, Top, Right) |


| Staple replenishment: | Cartridge (5000 staples) |
| :--- | :--- |
| Power consumption: | 48 W |
| Dimensions (W x D x H): | $680 \times 620 \times 1030 \mathrm{~mm}\left(26.8^{\prime \prime} \times 24.4^{\prime \prime} \times 40.6^{\prime \prime}\right)$ |
| Weight | Without punch unit: $\quad 53 \mathrm{~kg}(116.9 \mathrm{lb})$. |
|  | With punch unit: $\quad 55 \mathrm{Kg}(121.3 \mathrm{lb})$. |

### 4.5 FOUR-BIN MAILBOX

Number of bins 4 bins

Stack Capacity: $\quad 125$ sheets $\times 4\left(80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}.\right)$
Paper Size for Trays: Maximum: A3/11" x 17" (SEF) Minimum: A5 (LEF)/81/2" x 11"
Print Paper Weight: $\quad 60$ to $105 \mathrm{~g} / \mathrm{m}^{2}$ (16 to 28 lb .)
Power Source:
DC $24 \mathrm{~V}, 5 \mathrm{~V}$ (from the main unit)
Power Consumption:
17 W
Dimensions (W x D x H): $540 \times 600 \times 400 \mathrm{~mm}$ (21.3" x 23.6" x 15.8")
(when installed in the machine)
Weight
7 kg ( 15.5 lb .)

## TECHNICAL SERVICE BULLETINS

GESTETNER - DSC38
RICOH - AP3800C
SAVIN - SLP38C

## SUBJECT: SC370

## SYMPTOM:

When replacing the black development unit (Maintenance Kit D) service code "SC370" (TD sensor adjustment) is displayed. Turning the main switch "OFF \& ON" results in the same SC condition. If this is repeated several times, toner may leak from the toner inlet into the development unit. This problem occurs only when the black development unit is replaced separately as a preventive maintenance item. This will not occur when developer initialization is done at machine installation or with any other development color.

## CAUSE:

Toner is inadvertently supplied into the development unit during the developer initialization due to a software bug in Main Engine Firmware Version B1.11F.

## SOLUTION:

Confirm that the Main Engine Firmware is version B1.11G or above. If it is not, upgrade it to this level or higher. The Main Engine Firmware version appears on the Configuration Page as shown.


The PCB ROM revision G (file name G0775611G.EXE) can be downloaded through the Technology Solution Center FTP Site http://tsc.ricohcorp.com.

NOTE: Refer to Facts Line Bulletin \# FL002 and Publication Bulletin \#023 for more information about the FTP Internet Web Site and EPROM / Flash Card Exchange program.

Serial Number cut-in not available at time of publication.

## BULLETIN NUMBER: G060-002

## APPLICABLE MODEL:

GESTETNER - DSC38
RICOH - AP3800C
SAVIN - SLP38C

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- 3-41

Updated Information

## $\Rightarrow$ <br> 3.10.2 DEVELOPMENT CLUTCHES



1. Rear cover ( -3.3 EXTERIOR COVERS)
2. Swing out the controller box ( 3.9.1 MOVING THE CONTROLLER BOX OUT OF THE WAY).
3. $K, C$, and $M$ drum gears, with the flywheels ( 3.10.1 REGISTRATION CLUTCH)
4. Y drum gear ( $\ddagger \times 1)(-3.10 .1$ REGISTRATION CLUTCH)
5. Lower gear guide ( 3.10.3 DEVELOPMENT DRIVE MOTOR - CMY)

NOTE: To remove the B, Y, and C development clutches, you do not have to remove the lower gear guide.

BULLETIN NUMBER: G060-003<br>10/30/2001<br>APPLICABLE MODEL:<br>GESTETNER - DSC38<br>RICOH - AP3800C<br>SAVIN - SLP38C

## SUBJECT: SP5-801-001 NVRAM CLEAR (ALL)

## SYMPTOM:

Strange Characters are displayed on the LCD. The printer is not usable in this condition.

## CAUSE:

Performing SP5-801-001 clears the serial number and sets the destination code to zero (Japan). The strange characters are displayed on the LCD because the Japanese language is not stored in the firmware.

## SOLUTION:

To avoid this problem, never perform SP5-801-001 (All)

The following SP modes are not affected and can be used:
SP5-801-003 (SCS) clears the system settings.
SP5-801-008 (PRT) clears the user mode system settings.
SP5-801-011 (NCS) clears the network settings.

TECHNICAL SERVICE BULLETIN

## BULLETIN NUMBER: G060-004

11/28/2001

## APPLICABLE MODEL:

GESTETNER - DSC38
RICOH - AP3800C
SAVIN - SLP38C

## SUBJECT: LONG AND SHORT HAUL TRANSPORTATION PROCEDURE

Please note the following points when transporting the machine for both short and long hauls.
The printer should be returned to the original condition as when it first arrived from the factory.

## Printer

1. Remove the toner cartridges to prevent toner from flowing into the toner supply tubes due to vibrations experienced during transport. Failure to remove the toner cartridges could lead to toner supply tube clog.
2. Place packing material (such as shrink-wrap) into the toner cartridge holder to shield the toner supply entrance. This prevents toner from flowing out to the toner cartridge holder and scattering.
3. Set the lock pin $[A]$ (which is supplied with a new machine) into the transfer belt unit.
4. Make sure that there is no paper left in the paper trays and fasten the bottom plates with a sheet of paper and tape $[\mathrm{B}]$.
5. Empty the waste toner bottle and attach securing tape to prevent the bottle from becoming dislodged.
6. Attach shipping tape to the covers and doors as shown, or shrink-wrap the machine tightly.


## NOTES:

- If pre-installing machines for some test prints at a service depot, please use a jig oil supply unit, and not the oil supply unit enclosed with the new machine.
- This is because the oil supply system uses a touch-and-release mechanism, which can cause the unit to move freely up and down during transport if shipping the printer with the oil supply unit installed. This in turn may cause damage to the white holder on the fusing unit. However, if simply moving the machine from floor to floor, the oil supply unit can be left installed.
- If shipping a used machine to a new location, please dispose of the used oil supply unit and install a new one when you install the machine at the customers location because of the reason previously explained. This is not necessary when simply moving the machine from floor to floor.
- Whenever moving the machine to a new location, be sure to perform Auto Adjust (User Program mode) or forced Line Position Adjustment (SP5-993-002) to optimize color line alignment.
- Make sure that the side fences in the trays are properly positioned to prevent color shifting.

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Page 2 of 3

## Duplex Unit:

- Do not lift the printer by the inverter unit (left side of the machine).


## Paper Supply Units:

- When transporting the machine with the Paper Supply Unit installed:
- Make sure the lock plate is properly installed.
- Make sure there is no paper left in the paper trays and fix down the bottom plates with a sheet of paper and tape.
- Attach shipping tape to the trays or shrink-wrap the printer and paper supply unit tightly.
- Do not hold the printer up by the handles. This is because the lock plate joins the printer to the paper supply unit only on the right rear corner. Lifting the printer up by the handles can cause damage to the lock plate.


## Finisher:

This finisher contains a very precise but delicate drive mechanism for the tray. Therefore, the following procedure should be followed when transporting the Finisher.

## When transporting the finisher from floor to floor:

1. Remove the output trays from the finisher to prevent stress or damage.

## When transporting the finisher (used for demonstration or show) by truck:

1. The finisher should be repacked in the carton, i.e. returned to the same condition as when it first arrived from the factory.

## When transporting finisher (used for demonstration or show) by truck without a carton:

## Transport Preparation Procedure:

1. Remove the output trays.
2. Move the trays to the proper position for transportation (procedure on next page).
3. Make sure that the main switch is turned off.
4. Turn on DIP SW 101-4 on the Finisher main board.
5. Turn on the main switch.
6. After the finisher completes the initialization, turn off
 the DIP SW 101-4.
NOTE: The Finisher automatically repositions the shift trays to the shipping position as shown.

7. Secure the trays, covers and paper transport guide, using tape to prevent movement during transport.

## When laying down the finisher for transport:

1. Set the plastic foam $[\mathrm{A}]$ (factory packing material) as shown in the picture below.
2. Set the cartons $[\mathrm{B}]$ between the lower and upper guide plates as shown in the pictures below.


## BULLETIN NUMBER: G060-005

12/26/2001

## APPLICABLE MODEL:

## GESTETNER - DSc38

RICOH - AP3800C
SAVIN - SLP38c

## SUBJECT: OIL LEAK

## SYMPTOM:

The following problem may occur soon after installing the machine.

- Oil stains on prints

NOTE: Oil marks due to accumulated oil on the pick-off pawls may appear at the trailing edges especially when a new oil supply unit is installed. This is not a problem, but a product remark.

- Oil leaks to the fusing unit, transfer belt unit, and/or black PCU.


## POSSIBLE CAUSES

| Possible Causes |  | Symptom |
| :--- | :--- | :--- |
| $\mathbf{1}$ | Excessive oil soaked through the oil supply felt <br> The oil pack in the assembled unit is pressed by unit <br> cover, causing the air pressure in the pack to <br> increase. This results in excessive oil soaked through <br> the oil supply felt. | • When removing the shield tape from the <br> oil supply roller, oil drops from the oil <br> supply felt. <br> The case of the oil supply unit is not <br> stained with oil since the oil leaked through <br> the felt. |
| $\mathbf{2}$ | Broken oil pack <br> The edges of oil pack break and oil leaks through that <br> point. <br> (As one solution, heat-tape have been adhered to the <br> edges of the oil pack) | Qhen unpacking the machine, oil has <br> already leaked and carton has been <br> stained with oil. <br> The case of the oil supply unit stains with <br> oil. |
| $\mathbf{3}$ | Oil supply unit not set properly or unit movement error <br> Oil leak problem caused by these factors has never been reported. <br> However, if oil supply unit is not released from the oil supply roller, oil is always supplied. This causes <br> the oil leak. |  |

## SOLUTION (During production)

| Possible Causes | Countermeasure | Cut-in Lot No. |
| :---: | :---: | :---: |
| Excessive oil soaked through the oil supply felt | 1. The condition of the oil supply felt with the shield tape and units without a problem have been selected. <br> (See NOTE 1.) <br> 2. The oil cartridge vendor has been instructed how to set the oil pack in the unit. <br> 3. A special jig has been used to assemble the oil pack in the unit and oil amount has been optimized. (See NOTE 3.) | 1. Z1830x <br> 2. Z1831x <br> 3. Z1921x <br> (See NOTE 2.) |
| Broken oil pack | Temporary Solution: <br> 1. The edges of oil pack have been sealed with heat tape. | 1. first mass production |

NOTE 1: Expected occurrence ratio
Oil supply units enclosed with new machines and in maintenance kit G (Oil Supply Unit) have been inspected. Any oil supply units, which exhibited oil leakage, were replaced. Therefore, it is expected that the occurrence ratio in the field is very limited.

NOTE 2: How to read the lot number of the oil supply unit
Example: Z1830J
(Z): Vendor code, (1): Year, (8): Month, (30) Day, (J): Suffix

NOTE 3: Oil pack breakage
To prevent excessive oil from soaking through the oil supply felt, a special jig has been used to assemble the oil pack in the unit and the oil amount has been optimized.

## ACTION REQUIRED (in the field)

Please check the following items when installing machines and/or replacing the oil supply unit.

1. Make sure that the carton of the oil supply unit is not stained with oil. If the carton is stained with oil, replace the oil supply unit with a new one.
2. Open the box and confirm that oil is not leaking anywhere from the unit. If an oil leak is found, replace it with a new one.
3. Before removing the shield tape (2), confirm if excessive oil has soaked through the oil supply felt by following procedure below.
(1) Lightly touch the oil supply felt from the top of the shield tape with your finger.
(2) Check whether you feel that the oil supply felt is soft or hard. If excessive oil has been soaked through the felt, you will feel that the oil supply felt is soft.

(3) If excessive oil is noticed, replace the unit with a new one.
4. Position the oil supply unit horizontally and remove the shield tape (2). Check the amount of oil on the oil supply felt. Tilt the unit, If oil drops form on the felt, replace the unit with a new one.
5. If it is difficult to judge whether the condition of the oil supply felt is OK or NG, clean the oil supply felt with a clean cloth to remove any oil on the felt as shown.
6. Make sure that the shield tape (1) has been removed and then
 install the oil supply unit onto the fusing unit.
7. Make sure that oil supply unit is properly set and the release (green) lever is moving freely. (If the release lever stops and does not return to the original position after pressing and releasing it, check for the cause of its binding.)

BULLETIN NUMBER: G060-006<br>APPLICABLE MODEL:<br>GESTETNER - DSC38<br>RICOH - AP3800C<br>SAVIN - SLP38C

03/20/2002

## SUBJECT: MACHINE DOES NOT DISPLAY READY

## SYMPTOM:

If the machine enters "Energy Saver 1 Mode" and cools down for more than 1 minute, when recovery warmup occurs, the machine does not display "Ready". The symptom occurs only when all of the following conditions are met:

1. The machine has the fusing clutch installed.
2. The main engine firmware is version B 1.15 E .
3. Energy Saver 1 Mode is set to ON; (Printer default: OFF, with CF expander installed: ON).
4. The user operates the machine (after more than 1 minute) in the following manner:

- Pressing the Energy Saver Key
- Opening and closing the platen cover
- Placing an original in the ARDF
- Sending a print job

NOTE: This does not occur when the machine is turned OFF/ON or opening and closing any covers, except the ARDF top cover.

## CAUSE:

The conditions for "Energy Saver Mode" recovery warm-up were changed when the fusing clutch modification was applied, as a result the $120 \mathrm{~V} / 60 \mathrm{~Hz}$ machine does not have enough power to reach the temperature required to trigger the "Ready" display.

## SOLUTION:

## PRODUCTION COUNTERMEASURE:

The temperature at which the display changes to "Ready" has been lowered by $1^{\circ} \mathrm{C}$. This has been applied from engine firmware version B1.17C.

NOTE: The actual operating temperature has not been changed, only the display trigger temperature.

## FIELD COUNTERMEASURE:

Update the engine firmware to version B1.17C or newer on G060-17 machines if the serial number is between P60112xxxxx - P60201xxxxx and the engine firmware is ver B1.15E.

NOTE: If the CF expander is installed, "Energy Saver 1 Mode" will automatically be activated (the default changes to $O N$ ), therefore please make sure this update is performed.

NOTE: The firmware can be downloaded through the Technology Solution Center FTP Site http://tsc.ricohcorp.com. Refer to Facts Line Bulletin \# FL002 and Publication Bulletin \#023 for more information about the FTP Internet Web Site and EPROM / Flash Card Exchange program.

## ENGINE FIRMWARE VERSION CONFIRMATION PROCEDURE:

1. See Figure 1 for key locations.
2. Press the Menu Key.
3. Press the Down Arrow and scroll to "list / test print".
4. Press the Enter Key "Config." Page is displayed.
5. Press enter again to print the Configuration Page.
6. Check the Configuration Page as illustrated in Figure 2.


Figure 1


## BULLETIN NUMBER: G060-007

04/03/2002

## APPLICABLE MODEL:

GESTETNER - DSC38
RICOH - AP3800C
SAVIN - SLP38C

## SUBJECT: INSTALLATION NOTES - COPIER FEATURE EXPANDER

## Shipping Configuration - Pre-configured Model:



To identify if the printer was pre-configured to support the copier feature expander, remove the controller and note the following:

Controller preconfigured to support the copier feature expander
IPU Board, NVRAM Board, DIMM 1 (SYSTEM), DIMM 2 (PRT/SCN), and Hard Drive have already been installed.


IPU Board is installed

Controller, which was not pre-configured to support the copier feature expander

IPU Board, NVRAM Board, DIMM 1 (SYSTEM), DIMM 2 (PRT/SCN) have not been installed


Only one *Postscript DIMM

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## Installation Workflow:



Continued...

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## Page 3 of 3

Installation Workflow continued:


Recommended service settings:

| SP 5-930-1 | Meter Charge | $0=>1$ |
| :--- | :--- | :--- |
| SP 5-930-3 | Menu | 1 (keep at default) |
| SP 5-045 | Counter Method | 1 (prints) or 0 (developments) [either one] |
| SP 5-104 | Double Count | $0=>1$ (double count) |
| SP 7-825 | Counter Reset | Execute |

Installation Complete

## APPLICABLE MODEL:

GESTETNER - DSC38F
RICOH - AP3850C
SAVIN - SLP38CDE

## SUBJECT: WHITE LINES IN BLACK HALFTONE AREAS

## SYMPTOM:

The following types of white lines may appear in black halftone areas at machine installation:

- Horizontal and Straight (broken or continuous)
- Short, Vertical or Wavy


## CAUSE:

Vibrations during transportation may cause scratches on the black OPC drum, as the image transfer belt is always contacting the black PCU during this time.

NOTE: The lines are not visible with the G060, as a different printer gamma is used -- the gamma used on the G082 is designed to show more detail in halftone areas.

## PERMANENT SOLUTION:

A modification will be applied whereby the black PCU and transport unit are separated before shipping. This modification is required to allow the units to be separated and still be able to close the front cover

## TEMPORARY SOLUTION:

Until the permanent solution can be applied, G082 machines are shipped with the transport unit separated from the black PCU. Specifically, the transport unit lever has been removed before shipping to allow the front cover to be closed.

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Page 2 of 2
Please see the following notes for machine installation and short-haul transport:

## 1. At Machine Installation:

The transport unit lever has been removed and placed inside the machine as shown in the illustration. This lever must be re-installed when the machine arrives at the customer's location.
The attachment procedure for this lever has been packaged together with the machine.

## 2. Short-Haul Transport:

The notes for short-haul transport are the same as the G060, except for the additional procedure described below.


## Additional procedure for $\mathbf{G 0 8 2}$ short-hauls:

1. Open the front cover.
2. Turn the transfer unit release lever counterclockwise to lower the transfer unit.
3. Remove the lever ( 1 screw).
4. Reinstall the lever when the machine arrives at the installation site.

## BULLETIN NUMBER: G060/G570/G082 - 008 REISSUE $\star$

06/27/2002
Please note that in the future the $\mathbf{G 0 8 2}$ will have its own bulletin numbering sequence.
This bulletin has also been issued as G082-001.
APPLICABLE MODEL:
GESTETNER - DSC38F
RICOH - AP3850C
SAVIN - SLP38CDE

## *SUBJECT: TRANSPORTATION NOTES

## SYMPTOM:

The following types of white lines may appear in black halftone areas at machine installation:

- Horizontal and Straight (broken or continuous)
- Short, Vertical or Wavy


## CAUSE:

Vibrations during transportation may cause scratches on the black OPC drum, as the image transfer belt is always contacting the black PCU during this time.

NOTE: The lines are not visible with the G060, as a different printer gamma is used -- the gamma used on the G082 is designed to show more detail in halftone areas.

## PERMANENT SOLUTION:

A modification will be applied whereby the black PCU and transport unit are separated before shipping. This modification is required to allow the units to be separated and still be able to close the front cover

## TEMPORARY SOLUTION:

Until the permanent solution can be applied, G082 machines are shipped with the transport unit separated from the black PCU. Specifically, the transport unit lever has been removed before shipping to allow the front cover to be closed.

Please see the following notes for machine installation and short-haul transport:

## 1. At Machine Installation:

The transport unit lever has been removed and placed inside the machine as shown in the illustration. This lever must be re-installed when the machine arrives at the customer's location.
The attachment procedure for this lever has been packaged together with the machine.

## 2. Short-Haul Transport:

The notes for short-haul transport are the same as the G060, except for the additional procedure described below.


## Additional procedure for $\mathbf{G 0 8 2}$ short-hauls:

1. Open the front cover.
2. Turn the transfer unit release lever counterclockwise to lower the transfer unit.
3. Remove the lever ( 1 screw).
4. Reinstall the lever when the machine arrives at the installation site.

BULLETIN NUMBER: G060/G570-009
09/17/2002
APPLICABLE MODEL:
GESTETNER - DSc38/DSc38S
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38c/SLP38cS

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

The following parts updates are being issued for all G060/G570 Parts Catalogs.

- UPDATE 1: Imaging Unit - The shape of the Imaging Unit Cover and Duct have been changed to modify the airflow around the laser optics-housing unit. This was done to ensure that the hot air from the Polygon Mirror Motor does not warp the F-theta lens, which can cause shifts in the main scan magnification for each color.

|  | REFERENCE |  |  |  |  |  |
| :---: | :---: | :--- | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0771855 | G0771856 | Imaging Unit | $1-1$ | $3 / \mathrm{S}$ | 13 | 1 |
| G0601041 | G0771041 | Imaging Unit Duct | $1-1$ | $3 / \mathrm{S}$ | 13 | 17 |

Note: All parts listed above must be replaced as a set.

## UNITS AFFECTED:

All G060 Printers manufactured after the Serial Numbers listed below will have the new style Imaging Unit installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | ---: |
| Gestetner DSc38/DSc38S | P6020600001 |
| Ricoh AP3800C/ AP3800CMF | P6020600001 |
| Savin SLP38c/SLP38cS | P6020600001 |

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- UPDATE 2: Paper Exit Gear and Bracket- To facilitate factory assembly of the Paper Exit gear train, minor changes in the dimensions of the following parts have been made.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0604462 | G0774462 | Gear-Z18/T28 | 1-1 | 3 | 53 | 33 |
| G0604464 | G0774464 | Bracket Gear | 1-1 | 3 | 53 | 32 |

Note: All parts listed above must be replaced together as a set.

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Paper Exit Gear and Bracket installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38/DSc38S | P6020400001 |
| Ricoh AP3800C/ AP3800CMF | P6020400001 |
| Savin SLP38c/SLP38cS | P6020400001 |

- UPDATE 3: Waste Toner Collection Coil - To ensure that Cyan waste toner does not build up in the collection tube, the tube coil has been lengthened and the shape of the tube changed.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0603353 | G0603355 | Pump - C toner Supply Unit | 1-1 | 3 | 55 | 12 |
| G0603386 | G0603390 | Case - C | 1-1 | 3 | 55 | 7 |

Note: All parts listed above must be replaced together as a set.

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Waste Toner Collection Coil installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38/DSc38S | P6020201389 |
| Ricoh AP3800C/ AP3800CMF | P6020201389 |
| Savin SLP38c/SLP38cS | P6020201389 |

- UPDATE 4: Transfer Belt Unit - To further ensure that the Transfer Unit is protected against excessive shock and vibration during transport, a fixing pin has been added to the unit.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0603802 | G0603841 | Transfer Unit | 1-1 | 0 | 37 | 19 |

UPDATE 5: Paper Feed Motor Unit - To ensure the rubber sheet inside the cushion of the Paper Feed Motor stays properly fixed in place, the adhesive for the cushion has been strengthened.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0771170 | G0771172 | Paper Feed Motor Unit - DC4.42W | 1-1 | 1 | 63 | 14 |
| AA161149 | AA161153 | Motor Cushion | 1-1 | 1 | 63 | 16 |

- UPDATE 6: Sheet - Jam Removal - The Decal on the inside of the Front Cover, which demonstrates how to remove jammed paper, has been changed to include more detailed illustrations for customers.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0601292 | G0771292 | Sheet - Jam Removal | 1-1 | 1 | 9 | 3 |

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Sheet Jam Removal installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38/DSc38S | P6011100001 |
| Ricoh AP3800C/ AP3800CMF | P6011100001 |
| Savin SLP38c/SLP38cS | P6011100001 |

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- UPDATE 7: Toner Supply Tube - To ensure that the magenta toner supply system stays properly sealed, the length of the magenta toner supply tube has been increased from 230 mm to 410 mm . In addition, to ensure that the tube does not bend, a Guide Coil has been added.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0603239 | G0603241 | Tube - M Toner Supply | 1-1 | 1 | 31 | 11 |
|  | AA063656 | Guide Coil - M Tube | 0-1 |  | 31 | 22* |

## *DENOTES NEW ITEM NUMBER

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Toner Supply Tube installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38/DSc38S | P6011000001 |
| Ricoh AP3800C/ AP3800CMF | P6011000001 |
| Savin SLP38c/SLP38cS | P6011000001 |

- UPDATE 8: Right Frame Transfer Unit- To minimize the back-and-forth play of Transfer Brush on the Right Frame, the shape of the attachment area on the Right Frame has been changed.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0603691 | G0603704 | Right Frame | 1-1 | 1 | 43 | 6 |

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Right Frame installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38/DSc38S | P6010800556 |
| Ricoh AP3800C/ AP3800CMF | P6010800556 |
| Savin SLP38c/SLP38cS | P6010800556 |

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- UPDATE 9: Release Lever Stopper - The Release Lever Stopper for the Transfer Unit has been deleted since there is already a stay in place preventing simple removal of the unit.

|  |  |  |  |  |  |  |  |  |  | REFERENCE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |  |  |  |  |
| G0603674 |  | Release Lever Stopper | $1-0$ |  | 37 | 20 |  |  |  |  |

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Release Lever Stopper Removed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38/DSc38S | P601070011 |
| Ricoh AP3800C/ AP3800CMF | P601070011 |
| Savin SLP38c/SLP38cS | P601070011 |

UPDATE 10: Sensor Harness - Paper Feed Unit - The Harness for the Vertical Transport Sensor has been fixed to the Transport Guide Plate with tape to ensure it does not get caught between the Guide Plate and Lower Cover during factory assembly. If this tape is necessary in the field, please order using the following (existing) part number:


Continued...

Tech Service Bulletin No. G060/G570 - 009
Page 6 of 7

|  |  |  |  |  |  |  | REFERENCE |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | PAGE | ITEM |  |  |  |  |
|  | G0123897 | Film - Toner End Sensor Harness | $0-2$ | 23 | $30^{*}$ |  |  |  |  |

*DENOTES NEW ITEM NUMBER

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Right Frame installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :---: |
| Gestetner DSc38/DSc38S | P6011200001 |
| Ricoh AP3800C/ AP3800CMF | P6011200001 |
| Savin SLP38c/SLP38cS | P6011200001 |

- UPDATE 11: Fly Wheel - CMY Stepper Motor - The size of the flywheel has been increased to improve image quality by minimizing banding.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO | NEW PART NO | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0771159 | G0771168 | Fly Wheel - CMY Stepper Motor | 1-1 | 1 | 57 | 27 |
| 05730030E 7 |  | Hexagon Headless Set Screw - M $3 \times 3$ | 1-0 |  | 57 | 112 |
|  | $\rightarrow 05740060 \mathrm{E}$ | Hexagon Headless Set Screw - M4x6 | 0-1 |  | 57 | 112 |

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style flywheel - CMY Stepper Motor installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38/DSc38S | P6010800001 |
| Ricoh AP3800C/ AP3800CMF | P6010800001 |
| Savin SLP38c/SLP38cS | P6010800001 |

- UPDATE 12: $\quad$ Shaft - Paper Sensor - The shape of the feeler for the Paper Overflow Sensor has been changed to ensure that it stays properly engaged when the paper has exited or the paper stack is removed.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0604483 | G0604479 | Shaft - Paper Sensor | 1-1 | 1 | 53 | 18 |

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Shaft Paper Sensor installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38/DSc38S | P6011200001 |
| Ricoh AP3800C/ AP3800CMF | P6011200001 |
| Savin SLP38c/SLP38cS | P6011200001 |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :--- | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## SUBJECT：PAPER JAM AT REGISTRATION AREA

## SYMPTOM：

Registration jams may occur during multi－print duplex jobs，which are then logged in the following SP modes．

$$
\begin{array}{ll}
\text { SP7-504-8 } & \text { Regist.: ON. } \\
\text { SP7-504-61 } & \text { Regist.: OFF }
\end{array}
$$

## CAUSE：

The electrical resistance of the Sheet（\＃G0602632）attached to the Guide Plate－Middle Registration is out of specification in some machines from July to September＇01 production．This may cause the static electricity generated during a multi－print run to charge the Sheet，leading to a jam at the registration area （occasionally a Z－jam）．

NOTE：The Sheet cannot be replaced individually in the field，since it is fixed to another sheet of Mylar．A new part，called the Guide Plate－Middle Registration（\＃G0602613）has been newly registered as an assembly to replace the three individual parts shown below（Guide Plate，Sheet and Guide）．． This was done because accurate replacement of the Sheet for lower registration in the field is very difficult．Therefore when one of these three parts needs replacement in the field，please replace all of them with the new（assembled）Guide Plate－Middle Registration．


＊DENOTES NEW ITEM NUMBER
Continued．．．

Tech Service Bulletin No. G060/G570-010
Page 2 of 3

## SOLUTION:

Replace the Guide Plate with the newly registered "Guide Plate - Middle Registration assembly (\#G0602613):

1. Make sure that the main switch is turned off and the power cord is unplugged.
2. Remove the following parts:

- Rear Cover [A] (4 screws)
- Upper Exit Cover [B]

Note: Also remove the Mailbox if installed.

- Upper Rear Cover [C] (4 screws)
- Right Cover [D] (2 screws)
- Upper Right Cover [E]
- Right Rear Cover [F] (3 screws)


Tech Service Bulletin No. G060 - Draft011
Page 3 of 3
3. Open the Right Door Unit [ $G$ ] and remove it (3 connectors, 1 snap-ring).
4. Replace the Guide Plate $[\mathrm{H}]$ with the new \#G0602613 assembly (2 screws).
Note: Clean the Registration Rollers with a damp cloth.
5. Reattach all parts removed above.


## UNITS AFFECTED:

B060/G570 Serial Number cut-in not available at time of publication.

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :--- | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## SUBJECT: LOW HUMMING NOISE FROM PAPER TRANSFER UNIT

## SYMPTOM:

The machine makes a low humming noise while printing. The noise tends to be louder in $62.5 \mathrm{~mm} / \mathrm{sec}$ mode ( $1200 \times 1200$ dpi, or OHP/Thick Paper mode).

## CAUSE

The Transfer Charge Brushes become dirty with toner and/or dust. This increases the friction between the fibers and Transfer Belt, causing the brush to vibrate and generate the humming noise.

## SOLUTION

Production line modification:
Cushions (\#G0603705) have been added to the Transfer Belt Unit to absorb the vibration of brushes. They are attached directly onto the unit underneath the brushes. Please refer to the following table for the cut-in serial number of this modification

## UNITS AFFECTED:

All G060 copiers manufactured after the Serial Numbers listed below will have the new style ((Part Name)) installed during production

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner DSc38/ DSc38S | P6010800001 |
| Ricoh AP3800C/ AP3800CMF | P6010800001 |
| Savin SLP38c/ SLP38cS | P6010800001 |

Troubleshooting in the field:
Attach the cushions (\#G0603705: 4pcs/machine) onto the transfer charge brushes as shown below (this is to reduce the working time in the field. Installing the cushions onto the transfer unit would require belt removal).

Please refer to the following pages for the detailed procedure.

## Cushion Installation Procedure

1. Make sure the machine's main power switch is turned off.
2. Open the front cover.
3. Turn the release lever of the Paper Transfer Belt Unit counterclockwise and pull out the Transfer Belt Unit. Place a sheet of paper underneath the Transfer Belt Cleaning Unit to catch any toner that may fall out. Next, remove the cleaning unit (1 screw).
NOTE: Also remove the Duplex Unit if installed (1 screw).
4. Remove the paper transfer unit (lock bracket, 1 screw) and place it onto a few sheets of clean paper.

NOTE: If the paper transfer unit is placed onto a dirty surface, foreign particles may get onto the transfer belt and cause damage to the OPC drums.
5. Remove the following parts from the unit.

- [A] High voltage wire NOTE: When re-securing the wire, make sure to angle it down as shown in the illustration. This will prevent it from touching the PCUs.
- [B] Wire contact
- [C] Transfer entrance guide
- [D] Tension springs

NOTE: Be careful that the springs do not pop out when removing or reinstalling.


Continued...
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Page 3 of 3
6. Remove the 4 transfer charge brushes ( 2 screws each).
7. Use a screwdriver to remove excess toner/dust from the brush fibers, being sure to stroke the fibers in the direction that they lean. Then, clean off the fibers with a dry cloth.
NOTE: If the fibers are stroked in the opposite direction this may lead to vertical white lines on the outputs.
8. Clean the cushion attachment areas on the surfaces of the metal plates with alcohol.
9. Mark a line $30 \pm 3 \mathrm{~mm}$ from the rear edge of the brush.
10. Place the brush onto a few sheets of clean paper and attach the cushion [E] onto the metal plate of each brush, aligning the edge of the cushion with the edge of the brush.


NOTE: When attaching the cushions, be careful not to push down on the brush too strongly. This is because doing so can damage the Mylar and/or flatten out the brush fibers, which can prevent contact between the fibers and transfer belt and lead to vertical white lines.
11. Reinstall the brushes.
12. Reassemble the paper transfer belt unit.

Tension springs:

1. Set the left end of the spring onto the projection.
2. Pull the transfer belt roller to the righ.
3. Set the right end of the spring on the bushing.
4. Check that the spring is straight.


Transfer entrance guide:

1. Set the transfer entrance guide into position.
2. Screw the Transfer Entrance Guide into position.
3. Perform Forced Line Position Adjustment SP5-993-002 or 'Auto Adjust' in UP Mode).
4. Make test prints in 2-dot pattern mode (SP5-997-2: '12') for each color (CMYK) and check to see that no vertical white lines appear on the outputs.


BULLETIN NUMBER:
G060/G570-012
09/18/2002
APPLICABLE MODEL:
GESTETNER - DSc38/DSc38S
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38c/SLP38cS

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

The following parts updates are being issued for all G060/G570 Parts Catalogs.

- UPDATE 1: Drive Roller - The mark used for adjusting the phase of the Transfer Drive Roller has been incorporated into the part's mold (not applied manually as before).


|  | REFERENCE |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |  |  |  |  |
| G0603866 | G0603703 | Drive Roller | $1-1$ | 0 | 39 | 7 |  |  |  |  |

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Drive Roller installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :--- |
| Gestetner DSc38/ DSc38S | P6011000006 |
| Ricoh AP3800C/ AP3800CMF | P6011000006 |
| Savin SLP38c/SLP38cS | P6011000006 |

Continued...

Tech Service Bulletin No. G060/G570 - 012

## Page 2 of 3

- UPDATE 2: Cushions for Charge Brushes - The following cushions have been newly added to absorb the vibration of the Transfer Charge Brushes, which can generate a low humming noise when a toner/dust buildup on the brush fibers increases the friction between the fibers and transfer belt.
On production machines after the cut-in numbers below, the cushions are attached directly onto the unit underneath the brushes. For machines in the field, the cushions should be attached according to the following detailed procedure.
Page 41


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
|  | G0603705 | Cushion - Transfer Brush | 0-1 |  | 41 | 25* |
|  | G0603705 | Cushion - Transfer Brush | 0-3 |  | 43 | 18* |

## *DENOTES NEW ITEM NUMBER

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Cushion - Transfer Brush installed during production

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner DSc38/ DSc38S | P6010800001 |
| Ricoh AP3800C/ AP3800CMF | P6010800001 |
| Savin SLP38c/SLP38cS | P6010800001 |

- UPDATE 3: Decal - Vertical Transport Unit -The material of the PUSH decal attached to the Vertical Transport Unit has been changed to match that of the unit itself.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| GA003029 | GA003044 | Decal - Vertical Transport 2 | 1-1 | 1 | 25 | 3 |

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Cushion - Transfer Brush installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner DSc38/ DSc38S | P6011000001 |
| Ricoh AP3800C/ AP3800CMF | P6011000001 |
| Savin SLP38c/SLP38cS | P6011000001 |


| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :--- | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER:
G060/G570-013
09/18/2002
APPLICABLE MODEL:
GESTETNER - DSc38/DSc38S
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38c/SLP38cS

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

The following parts updates are being issued for all G060/G570 Parts Catalogs.

- UPDATE 1: Right Rear Cover - Please apply the following corrections to your Parts Catalogs.

|  | REFERENCE |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | PAGE | ITEM |
| G0601267 | G0771267 | Right Rear Cover |  | 11 | 17 |

DATE 2: Lever - Vertical Transport - To facilitate assembly on the production line, the following parts have been changed.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0602670 | G0602690 | Lever - Vertical Transport | 1-1 | 3 | 23 | 1 |
| G0602673 | G0602691 | Grip Shaft | 1-1 | 3 | 23 | 2 |

Note: All parts listed above must be replaced as a set.

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Lever Vertical Transport installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner DSc38/ DSc38S | P6010800001 |
| Ricoh AP3800C/ AP3800CMF | P6010800001 |
| Savin SLP38c/SLP38cS | P6010800001 |

Tech Service Bulletin No. G060-013

## Page 2 of 2

- UPDATE 3: Transfer Unit Release Lever Shaft- To provide for smoother operation of the Transfer Unit Release Lever, the following part has been changed.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0603692 | G0603698 | Stay | 1-1 | 1 | 41 | 2 |

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Stay installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner DSc38 | P6010800001 |
| Ricoh AP3800C | P6010800001 |
| Savin SLP38c | P6010800001 |

- UPDATE 4: Harness - Fusing DC - To make the Fusing DC line Harness more durable for the assembly process, protective tape has been added to some areas of the harness.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0775453 | G0775455 | Harness - Fusing DC | 1-1 | 1 | 67 | 16 |

*DENOTES NEW ITEM NUMBER.

## UNITS AFFECTED:

All G060/G570 Printers manufactured after the Serial Numbers listed below will have the new style Harness - Fusing DC installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner DSc38 | P6010800001 |
| Ricoh AP3800C | P6010800001 |
| Savin SLP38c | P6010800001 |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :--- | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## BULLETIN NUMBER：G060／G570－014

10／09／2002

## APPLICABLE MODEL： <br> GESTETNER－DSC38 <br> RICOH－AP3800C <br> SAVIN－SLP38C

## SUBJECT：TONER END MIS－DETECTION

## SYMPTOM：

Toner end might be detected even when some amount of toner still remains in the toner cartridge．

## CAUSE：

Because of the shape of the toner cartridge，toner may accumulate on the sloping area of the cartridge and not be supplied properly．This causes a toner end to be detected with toner still remaining in the cartridge．

## FIELD COUNTERMEASURE：

Opening and closing the top right cover or reinserting the toner cartridge may recover the toner end condition due to false detection．This causes toner that may have accumulated on the sloping surface of the cartridge to fall into the supply area．In addition to these changes，remind customers to try removing and reinstalling the toner bottle if there is toner remaining in the bottle．This is mentioned in the Operating Instructions（Maintenance Guide 1，Replacing the Toner Cartridge）．

## PRODUCTION COUNTERMEASURE：

The following two modifications have been applied to minimize misdetection of Toner End conditions．
1．Engine firmware
The toner supply control has been changed in Version B1．15E．

| Old | New |
| :--- | :--- |
| The air pump motor is turned on for | The air pump motor and toner supply clutch are turned on for 1 |
| 1 second to agitate the toner in the | second each until the required amount of toner has been fed into |
| cartridge，and then the toner supply | the development unit．This ensures that the toner is kept in a <br> clutch is turned on for a calculated <br> interval to feed the required amount <br> of toner． |
|  |  |

## 2．Toner cartridges

| Modification | Cut－in |
| :--- | :---: |
| Strips of Mylar have been attached to the <br> inner package to prevent the package from <br> bending or becoming dented． <br> Note：Applied to all toner colors． | August，＇01 |
| The shape of black toner package has been <br> changed to create a steeper slope in the <br> area circled in the illustration，allowing the <br> toner to flow more easily． | April，＇02 |



RICOM TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: G060/G570-015
10/11/2002

## APPLICABLE MODEL:

GESTETNER - DSC38/DSC38S
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38CS

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- $\quad$ xi
- Tab Page
- 14-1 to 14-10

> Table of Contents Page Firmware History Added
> Tab Position Page Updated
> Firmware History Section Added

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FIRMWARE HISTORY

## FIRMWARE HISTORY

## 1. MAIN ENGINE FIRMWARE MODIFICATION HISTORY

- Please check the http://tsc.ricohcorp.com website for current firmware downloads.

| G060 MAIN ENGINE FIRMWARE MODIFICATION HISTORY |  |  |  |
| :---: | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION |
| - Installed from the first mass production. | G0775611 | July 2001 | B1.10 |
| - Charge and development bias applied during the toner end recovery mode has been changed to optimize the drum cleaning function. | G0775611 D | August 2001 | B1.11A |
| The frequency to control the color drum motor has been optimized so that the motor starts smoothly rotating. | G0775611 E | August 2001 | B1.11B |
| The following specification change has been applied: <br> - The yield target of PCUs has been changed from 100 KP to 50 KP . | G0775611 G | NA | B1.11D |
| The following problems have been fixed. <br> - The machine suddenly keeps running due to memory overflow. <br> - SC670 when the machine starts waking up from the energy saver mode | G0775611 H | NA | B1.11F |
| The following problem has been fixed. <br> - Black developer initialization fails because toner is mistakenly supplied due to software | G0775611 J | Sept. <br> 2001 <br> (See Note 1) | B1.11G |
| Initialization Error - Black). This happens when performing only the black developer initialization. (If performing the developer initialization for black and other color(s) simultaneously, this problem does not occur.) <br> - If the main switch is tuned off and on, the SC code is reset and the machine re-starts the developer initialization. In the worst case, toner flows out from development unit (the entrance area where toner is supplied) to the inside of machine. | NOTE 1 - Engine main firmware version B1.11G has been implemented from September 25th production run. The machines with Ver. B1.11F or older have been reworked in local: However, some machines have been released to the market without modification. So, please make sure that the version of the engine main firmware is "B1.11G" at installation or next visit. If not, please update it to "B1.11G" or later. |  |  |
| - A fusing clutch has been added to maximize the life of the fusing unit and oil supply unit. This firmware version was temporarily installed in production machines to keep the clutch constantly moving, until the clutch control program could be added to the next version (1.15E). <br> NOTE: Therefore this version has not been released. | G0775621 | NA | B1.11H |


| DESCRIPTION OF MODIFICATION | FIRMWARE <br> LEVEL | SERIAL <br> NUMBER | FIRMWARE <br> VERSION |
| :--- | :---: | :---: | :---: |
| - Fusing clutch control has been added to <br> start/stop the clutch. <br> The following has been corrected: | G0775621 A | December <br> 2001 | B1.15E |

- When a paper jam occurs midway through a staple job, job recovery may re-start the job from the 1st page instead.
- Over-occurrence of the following SC codes (due to software bugs) has been fixed:
- SC220/230 at the start of a job.
- SC544/554 during warm-up under low-temp conditions in $62.5 \mathrm{~mm} / \mathrm{sec}$ mode.
- SP1-916 (Idling mode) has been added.

| 916 | [Idling Mode] |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 1 | Mode Set | * | Enables or disables fusing unit idling performed after the machine reaches the Ready condition. Idling is performed for the time specified in SP1-916-2. <br> [ 0 or 1/ $\underline{0} /-$-] DFU <br> 0: OFF, 1: ON |
|  | 2 | Idling Time |  | Specifies the time for fusing unit idling. [10 to 120 / $30 / 10 \mathrm{sec} /$ step] DFU |
|  | 3 | Pre-Job Mode |  | Enables or disables the 4-second fusing unit idling performed at the start of a print job. $\text { [0 or } 1 / 0 /-] \text { DFU }$ <br> 0: OFF, 1: ON |

- To optimize the amount of oil supplied to the fusing belt in OHP mode, the number of supply cycles during idling has been reduced to 1 .
- SP1-996-6 (OHP Pre-Job mode) has been added.

| 996 | [OHP/TH Fusing] |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 6 | Pre-Job Mode | * | Enables or disables the 30-second fusing unit idling performed at the start of an OHP print job. When enabled, idling is performed even if the machine is at the Ready condition. <br> [ 0 or 1/ $0 /$-] <br> $0:$ OFF, 1: ON |

NOTE 2 - Engine main firmware version B1.17C was applied to the production line on February 18th, 2002, and most machines with Ver. B1.15E have been reworked locally: However, some of these machines have been released to the market without modification. Therefore please update the engine firmware to ver B1.17C or newer on G060-17 machines in the following serial number range: P60112xxxxx - P60201xxxxx.

| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION |
| :---: | :---: | :---: | :---: |
| Continued From Pervious Page <br> The New Coverage Counters will only display the value of 999.99 and will not function. The Coverage Counter [7-833-05 to 08] provides image coverage calculations for when Meter Charge Mode (SP9-930 set to 0) is set to "OFF." Use the Coverage Counter [SP7-833-05 to 08] if Meter Charge Mode (SP9-930 set to 0 ) is set to "OFF." Use the New Coverage Counter [SP7-908-01 to 08] when Meter Charge Mode (SP9-930 set to 1) is set to "ON." SP7-908-5 to 8 displays the same data as SP7-833-11 to -14. <br> - The machine automatically detects whether a 4 kB or 8 kB NVRAM is installed on the BCU board. <br> - A grid pattern has been added to SP mode copy images. To activate this, it is necessary to use system firmware ver1.07 or newer (for the CF expander only). <br> The following have been corrected: SC240 misdetection. <br> When the K toner cartridge is replaced, the "previous PM counter" values for CMY are all overwritten to the previous value for K toner (SP7-906-23 to -25). <br> If machine enters Energy Saver 1 Mode then cools down for more than 1 minute, it will not display "Ready" after recovery warm-up (only for G060-17 models). <br> - When a $\mathrm{B} / \mathrm{W}$ job is performed, the coverage counters (SP7-833-1 to -4) for CMY are not set to 0 as they should be, i.e. the values from the previous job remain. | G0775623 | March 2002 <br> (See Note 2) | B1.17C |
| The following have been corrected: <br> - Main scan magnification error <br> - SC471 caused by stop timing error for transfer belt contact motor. <br> - SC545 in fusing phase control mode. <br> - SC543 <br> NOTE: This version has not been released (see "side effect" in Version B1.18B). | G0775623 A | May 2002 | B1.18 |


| DESCRIPTION OF MODIFICATION | FIRMWARE <br> LEVEL | SERIAL <br> NUMBER | FIRMWARE <br> VERSION |
| :--- | :---: | :---: | :---: |
| The following have been corrected: | G0775623 B | June <br> SC230 at automatic line position <br> adjustment <br> Side effect for firmware version B1.18 <br> SC545 modification (only for G060-17 <br> models): The machine does not display <br> "Ready" after recovery warm-up from <br> Energy Saver 1 Mode in phase control |  |
| mode. |  | B1.18B |  |
| mo02 |  |  |  |

## 2. MUSIC ENGINE FIRMWARE MODIFICATION HISTORY

| MUSIC ENGINE FIRMWARE MODIFICATION HISTORY |  |  |  |
| :--- | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION | FIRMWARE <br> LEVEL | SERIAL <br> NUMBER | FIRMWARE <br> VERSION |
| - Installed from the first mass production run. | G0605612 B | July 2001 | 1.04 |
| The firmware header has been corrected to <br> allow the MUSIC firmware to be updated <br> using the IC card. | G0775624 | March <br> 2002 | 1.06 |
| The firmware header has been corrected <br> for Japanese models only. | G0775624 A | May <br> 2002 | 1.07 |

## 3. CONTROLLER FIRMWARE MODIFICATION HISTORY

| CONTROLLER FIRMWARE MODIFICATION HISTORY |  |  |  |
| :--- | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION | FIRMWARE <br> LEVEL | SERIAL <br> NUMBER | FIRMWARE <br> VERSION |
| - Installed from the first mass production run. | G0605910 G <br> G0605911 G | July 2001 | 2.00 |
| - "Asia" has been added to the destination |  |  |  |
| code. | G0605910 H <br> G0605911 H | July 2001 | 2.01 |
| The following problem has been corrected: <br> - When designating the Finisher shift tray 1 <br> for paper output tray as default, paper is not <br> fed out to shift tray 1. | G0775910 <br> G0775911 | August <br> 2001 | 2.04 |
| The counter click up specification has been | (See Note 1) |  |  |
|  |  |  |  |

## Old Specification:

- Machine counts a page up as black or color based on the color data sent from the application. Therefore if a document from the PC contains blank (but defined) spaces highlighted in red, e.g., the controller interprets this as color data and counts it as a color print.


## New Specification:

- The machine counts up the page as $B / W$ or color based on the CMYK data, i.e. the actual toner colors used to develop the image, regardless of the actual color data from the application.
- To meet the CPU specification change from 250 MHz to 300 MHz .
Color profile of the PCL driver has been changed to Ver. 1.1.2a.
The following problem has been corrected.
- B\&W prints cannot be made if color toner is empty.
- HDD format cannot be done when SC860 is detected.
- CRD version of PS3 has been updated to Ver. 1.2.1.
- Presentation color profile version of PCL has been updated to Ver. 1.2.1.
(Photographic color profile stays the same as Ver. 1.1.2a.)

NOTE 1-The Meter Click counter specification has been changed from the controller firmware (Ver. 2.04). The machines with Ver. 2.01 or older have been reworked in local. However, some machines have been released to the market without modification. So, please make sure that the version of the engine main firmware is " 2.04 " or later at installation or next visit. If not, please update it to the latest firmware.

| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION |
| :---: | :---: | :---: | :---: |
| - The following problem has been fixed. (This problem occurs only when selecting German language.) <br> When selecting the meter click mode and printing the counter sheet from the user program mode, the message of "Color" and "Black" is printed in the other way around. | $\begin{aligned} & \text { G0775910 A } \\ & \text { G0775911 A } \end{aligned}$ | October 2001 <br> (See Note 2) | 2.05A |
|  | NOTE 2- Messages "Color" and "Black" in the meter click counter is reversibly displayed on the screen and print out only when German language is selected. The machines with Ver. 2.05 or older have been reworked in local. However, some machines have been released to the market without modification. If the machine is set to German language, please make sure that the version of the engine main firmware is " 2.05 A " or later at installation or next visit. If not, please update it to the latest firmware. |  |  |
| The following problem has been fixed. <br> - When all memory clear (SP5-801-001 or 002) is done, the destination code is cleared to "0 (Japan)". Since Japanese fonts are not stored for the messages, strange characters appear. <br> - When printing A3+ (12"x18") size documents, the image is not shift to center, causing a big white margin at the trailing edge. | $\begin{aligned} & \text { G0775910 B } \\ & \text { G0775911 B } \end{aligned}$ | October, 2001 | 2.06 |
| - PS configuration page printing is now limited to plain or recycled paper (previously, it could be printed out onto any paper type). <br> - The following has been fixed: Selecting a custom paper size in the PCL may, in rare cases, cause the PC to freeze. | $\begin{aligned} & \hline \text { G0775910 B } \\ & \text { G0775911 B } \end{aligned}$ | NA | 2.07 |
| The following has been fixed: <br> - If the output tray becomes full while the machine is receiving print job data in Series Print mode, following tray-full recovery, the remaining pages may be printed out in the wrong order. | $\begin{aligned} & \text { G0775910 C } \\ & \text { G0775911 C } \end{aligned}$ | NA | 2.08 |
| The following has been fixed: <br> - Paper is not punched at the designated position in Series Print mode. <br> - Letterhead Mode has been added. | $\begin{aligned} & \hline \text { G0775910 D } \\ & \text { G0775911 D } \end{aligned}$ | January, $2002$ | 2.11 |
| The following has been fixed: <br> - While downloading PS fonts to a machine with the HDD option installed, the correct PS serial number cannot be output. | $\begin{aligned} & \hline \text { G0775910 E } \\ & \text { G0775911 E } \end{aligned}$ | NA | 2.12 |


| DESCRIPTION OF MODIFICATION | FIRMWARE <br> LEVEL | SERIAL <br> NUMBER | FIRMWARE <br> VERSION |
| :---: | :---: | :---: | :---: |
| Euro fonts PC858, ISO8859-15, L9, PS | G0775910 F | March, | 2.13 |

Math and MC Text are now supported.

- PS performance improvement.
- RMS is supported with the use of the customized controller (field monitoring machines only).
- A new Coverage Counter has been added to SP7-908-1 to -8 (SP7-908-5 to -8 are the same as SP7-833-11 to -14). With this new counter, B/W pages that follow color pages in ACS will be counted as B/W, and the CMY counters will not count up. To activate this function, it is necessary to use the 8 kB NVRAM on the BCU board and engine firmware version B1.17C or newer.

The following have been fixed:

- When the undefined command, "<ESC>\&k\#w", is received, it appears on the output as a character string [e.g. as "<ESC>\&k6w"].
- If Job Reset is selected while the first page of a multiple-page document is being processed, the panel continues to display "Printing".
- Auto Continue timer bug.
- The Punch Counter counts up by 2 for every sheet punched when using the function in Duplex Mode.
The following have been fixed:
- PCL:

1. Modified the dither size for when the UDFP command is used (GFPR\# RE02030021)
2. Modified so that some characters in symbol sets MS Text and Windows Baltic (19L) will appear exactly as they do with HP printers.

- PS:

1. The margin for Custom size has been changed from 12 to 11 points to expand the maximum printing area.
2. Modified the dither setting for when the DeviceGray command is used.

- Change in Specification:

1. Supports the Status Readback function of the PCL5e.
2. When the machine has no HDD option, the PCL HDD Directory List (and font source) will not be printed on the PCL
Configuration Page.

## 4. NIB FIRMWARE MODIFICATION HISTORY

| NIB FIRMWARE MODIFICATION HISTORY |  |  |  |
| :---: | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION |
| Installed from the first mass production run. | G0605920 J | July 2001 | 1.72 .1 |
| The followings have been corrected: <br> - When the job is canceled, the Ipr connection is terminated and a blank space is displayed in the syslog. Instead of the blank space, "Lost connection" is displayed. <br> - When 50 or more lpq/lprm commands are sent, the lpd process cannot be completed properly and the job is not printed out. <br> - If DHCP is ON and TCP/IP is OFF, the current device name (RNPXXXXXX) in SmartNetMonitor is not displayed. <br> - NIB stops printing if several prints jobs are continuously sent to the NIB via the IPP port (SmartNetMonitor for Client), and a print job sent via the standard IPP port may be canceled. | G0605920 K | July 2001 | 1.74 |
| The followings have been corrected: <br> - Nothing was displayed even though the "prnlog 0" command was done in telnet. | G0605920 L | $\begin{aligned} & \text { Sept. } \\ & 2001 \end{aligned}$ | 1.75 .1 |
| If an undefined remote printer number is input in the Netware configuration page, communication between the NIB and Netware Server will be cut off. <br> - No error message is displayed in Netscape Navigator even when an incorrect URL is input in the address bar. <br> Up to 32 characters can be input in the NetBEUI configuration screen Comment box, even though specification is 31 characters maximum. <br> If Trap is selected for the Access Type in the SNMP Configuration screen during the snmpd process, communication may be cut off. <br> - The NIB does not respond to the "Iprm -" command (root directory) from a FreeBSD host computer. <br> TCP Ports 11021 and 11023 (Design use) have been closed. <br> There were two error messages displayed when no files were available for download using FTP. The two messages were merged to " 550 : No such file or directory". <br> Continued On Next Page | G0605920 M | January 2002 | 1.78 |


| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION |
| :---: | :---: | :---: | :---: |
| Continued From Previous Page <br> - PS status can be displayed in STAT command using ftpd/ rshd/ telnetd/ Ipd. <br> - During a given FTP login session, the NIB counts up every user command issued as a new session. <br> - The length of the login user name can be up to 64 characters when using FTP. | G0605920 M | January $2002$ | 1.78 |
| The following have been fixed: <br> - Cannot connect to Novell NDS (GFPR\# RC02010007). <br> - Two or more print queues can be attached to a single printer object <br> The controller freezes if it is disconnected while the data which generates the Readback command is being printed out with $\mathrm{ftp} / \mathrm{rsh}$. <br> - The controller freezes when it cannot find the file specified for rcp transmission. <br> - The parameters of sysLocation and sysContact cannot be set correctly using the snmp command with telnet. <br> - The Fax Management Tool cannot be used for a while after any of the NIB setting(s) are changed. <br> Change in Specification: <br> - SNMP vulnerability <br> SNMP security vulnerabilities reported by CERT on Feb.12, 2002 has been resolved and tested using the PROTOS c06-snmpv1 test suite. <br> CERT :http://www.cert.org/advisories/CA-2002-03.html <br> PROTOS c06-snmpv1 test suite :http://www.ee.oulu.fi/research/ouspg/proto s/testing/c06/snmpv1/ <br> - TCP ports for disabled services (e.g. FTP) were open. <br> - An unnecessary TCP port was open. | G0605920 N | June 2002 | 1.81 |

## BULLETIN NUMBER:

G060/G570-016
10/23/2002
APPLICABLE MODEL:
GESTETNER - DSC38/DSC38S
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38CS

## SUBJECT: DOCUMENT SERVER FUNCTION ENHANCEMENT

It is now possible to retrieve transmitted facsimile and scanned documents using Desk TopBinder.

| FUNCTIONS |  |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Copy | Document <br> Server | Fax (Tx) | Fax (Rx) | Printer | Scanner |
| Storage | Yes | Yes | Yes | No | No | Yes |
| Re-Print/Copying | Yes | Yes | Yes | No | No | No |
| Distributing | No | No | No | Yes | No | Yes |
| Forwarding | No | No | No | Yes | No | No |
| Re-Faxing | No | No | Yes | No | No | No |
| Retrieving From <br> Desk Top Binder | No | No | Yes | No | No | Yes |

## Minimum Requirements for the Enhancement to Function:

- Copier Feature Expander
- 40GB Hard Disk Drive
- Desk TopBinder V2 Lite
- System/Copier/Netfile firmware, version 1.09 or later

Desk TopBinder V2 Lite can be obtained on http://www.ricoh-usa.com

System/Copier/Netfile firmware can be obtained on http://tsc.ricohcorp.com

```
BULLETIN NUMBER: G060/G570 - 016 Reissue \star
    GESTETNER - DSC38/DSC38S
    RICOH - AP3800C/AP3800CMF
    SAVIN - SLP38C/SLP38CS
```


## SUBJECT: DOCUMENT SERVER FUNCTION ENHANCEMENT

It is now possible to retrieve transmitted facsimile and scanned documents using Desk TopBinder.

| FUNCTIONS |  |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Copy | Document <br> Server | Fax (Tx) | Fax (Rx) | Printer | Scanner |
| Storage | Yes | Yes | Yes | No | No | Yes |
| Re-Print/Copying | Yes | Yes | Yes | No | No | No |
| Distributing | No | No | No | Yes | No | Yes |
| Forwarding | No | No | No | Yes | No | No |
| Re-Faxing | No | No | Yes | No | No | No |
| Retrieving From <br> Desk Top Binder | No | No | Yes | No | No | Yes |

## Minimum Requirements for the Enhancement to Function:

- Copier Feature Expander
- 40GB Hard Disk Drive
- Desk TopBinder V2 Lite from ver. 2.0.1.1 or above
- System/Copier/Netfile firmware, version 1.09 or later

Desk TopBinder V2 Lite can be obtained on http://www.ricoh-usa.com

System/Copier/Netfile firmware can be obtained on http://tsc.ricohcorp.com

BULLETIN NUMBER: G060/G570-017
11/26/2002
APPLICABLE MODEL:
GESTETNER - DSC38/DSC38S
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38CS

## SUBJECT: MANDATORY FIRMWARE UPGRADE

Please be advised that there is a bug in the System firmware on the G060 CMF version printers (from initial production through September 02 kitted versions). This bug may cause the G060 CMF to count black prints as color prints when the Meter Charge Mode set to "ON" (SP5-930-1 set to 1) in combination with Development counters set to the factory default. (SP5-045-1 set to 0).

Ricoh Corporation is requiring an immediate service visitation to perform a mandatory firmware upgrade for all G060 CMF units that are under a Cost Per Page contract.
All remaining G060 CMF units (Annual Maintenance Agreement, Time \& Material) should be upgraded during the next routine field visitation.

The following example shows how meter click charge counters are incremented for each SP setting:

| Settings |  | Results |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Meter Click Setting (SP5-930-1) | Counter Method (SP5-045-1) | Counter Display on LCD | Counter | $\begin{aligned} & \text { Pg 1: } \\ & \text { B\&W } \end{aligned}$ | Pg. 2: Color | Pg. 3: $B \& W$ | Pg. 4: B\&W | Pg. 5: Color | Total |
| $\begin{aligned} & \text { Default } \Rightarrow \text { } \\ & \text { OFF } \end{aligned}$ | Dev | Dev. | B\&W Color | $\begin{aligned} & 1 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 1 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{aligned} & 1 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{aligned} & 1 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{aligned} & 1 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{gathered} 5 \\ 12 \end{gathered}$ |
| OFF | Print | Print | B\&W Color | $\begin{aligned} & 1 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 0 \\ & 1 \end{aligned}$ | $\begin{aligned} & 0 \\ & 1 \end{aligned}$ | $\begin{aligned} & 0 \\ & 1 \end{aligned}$ | $\begin{aligned} & 0 \\ & 1 \end{aligned}$ | $\begin{aligned} & 1 \\ & 4 \\ & \hline \end{aligned}$ |
| ON | Dev | Dev. | B\&W Color | $\begin{aligned} & 1 \\ & 0 \end{aligned}$ | $\begin{aligned} & 1 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{gathered} 1 \\ 0(3)^{*} \end{gathered}$ | $\begin{gathered} 1 \\ 0(3)^{*} \end{gathered}$ | $\begin{aligned} & 1 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{gathered} 5 \\ 6(12)^{*} \end{gathered}$ |
| ON | Print | Print | B\&W Color | $\begin{aligned} & 1 \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & 1 \end{aligned}$ | $\begin{aligned} & 1 \\ & 1 \\ & 0 \end{aligned}$ | $\begin{aligned} & 1 \\ & 1 \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & 1 \end{aligned}$ | $\begin{aligned} & 3 \\ & 2 \\ & 2 \end{aligned}$ |

*Bold characters in parentheses indicate Meter click error
Ricoh Corporation will provide compensation at $\$ 45.00$ per unit for each CPP contracted G060 CMF version updated. A specific process to collect required documentation must be followed to qualify for the compensation. The required documentation collection process is as follows:

## Documentation Process:

1. Collect the SMC report- (SP5-990-1) must be generated prior to firmware upgrade.
2. Collect the Diagnostic Report- (SP5-990-5) generated after firmware ver. 1.1 is installed.
3. Complete the Compensation Profile Form at the end of the service visit.
4. Attached SMC, Diagnostic Report and Compensation Profile and mail to:

Ricoh Corporation
19 C Chapin Rd
Pinebrook, NJ 07058
Attn: TSD Administration
NOTE: Submission of the required documentation is mandatory to receive compensation.

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## Total Counter Reference:

While investigating this issue, it became apparent that there was some confusion in the field regarding the proper usage of the various meter modes for billing purposes. For all G060 CMF units, that have CPP Contracts as the billing method, the following recommended settings should be utilized.

## Development click contracts

Meter charge mode SP5-930-1 set to 1- "ON" SP5-045-1 should be set to "0"
System User Tool "B/W Page Detect" set to "ON" (ACS Mode)

## Page click contracts

Meter charge mode SP5-930-1 set to 1- "ON"
SP5-045-1 should be set to " 1 "
System User Tool "B/W Page Detect" set to "ON" (ACS Mode)

NOTE: Use of ANY other combination of the settings may result in improper meter calculations.

## AUTO COLOR SELECTION: ACS: (USER TOOL > SYSTEM > B/W PAGE DETECT)

When set to ON: When the machine detects a color page it will automatically shift from black and white to color mode. The machine shifts to color mode and does not shift back to black and white mode to maintain engine speed (constant shifting between color and black modes would greatly reduce speed).

NOTE: ACS is not available on the Copier Feature Expander, black and white or color modes are selected by the user.


Black and White Mode:
The transfer Belt is only (and always) in contact with the Black photoconductor unit. [Engine speed: 38ppm]

## Color Mode:

The transfer belt lifts to allow paper to contact the color photoconductor units. [Engine speed: 28ppm]

The total counter of the G060 printer has two different modes of operation

1. Meter Charge Mode Enabled [ON] => set to ON if the customer is charged based on page or development count
2. Meter Charge Mode Disabled [OFF] => keep this setting if the customer is not charged by page count

Meter Charge Mode ON: Must be ON when the customer is charged by cost per page or cost per development. Counts pages or developments based on what is output from the machine.


Printer

1. Press the Menu button on the Control Panel
2. Counter is displayed
3. Press the Enter Key (\#)
4. Select Show Counter or press the down arrow to select Print Counter
5. Press the Enter Key (\#) to display or print the counters

NOTE: To Access this counter, only use the Show Counter or Print Counter option, which appears in the user menu when Meter charge mode is set to ON.


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## Copier

1. Press the User Tools/Counter key
2. Touch counter
3. Display or print the counter page


Meter Charge Mode OFF: Used for customers who are not charged by cost per page or developments. Counts black and white pages as color when in color mode (after ACS occurs). The color photoconductor units and development units rotate while black prints are made in color mode and are therefore consumed. This method exists to account for consumption of the color photoconductor units and development units for customers who choose to replace maintenance kits.


|  | Counter "clicks" |  |
| ---: | :---: | :---: |
| Black | Color |  |
| Pages | 1 | 4 |
| Developments | 5 | 12 |
|  |  |  |

Reading this counter: Only use the counts printed on the configuration page. The configuration page can be printed through the User Menu.


## Compensation Profile Form

Complete this form for each of your G060 products equipped with the Copier Feature Expander.

| Dealer Name: |  |  |
| :---: | :---: | :---: |
| Address: |  |  |
| Service Manager: |  |  |
| Phone Number: |  |  |
| Serial Number: ${ }^{\text {P60 }}$ |  |  |
| Contract Type (check one) |  |  |
| $\square$ Annual Maintenance Agreement | $\square$ CPP - Prints | $\square$ CPP - Developments |
| $\square$ Time and Materials | $\square$ Other | - |

(2) Enter SP Mode.
(3) Go to SP 5-930-1 [Meter Charge Mode] and circle the current setting. $\qquad$ [0: OFF / 1: ON]
(4) Go to SP 5-045 [Counter Method] and circle the current setting. [0: Dev / 1: Prints]
(5) Enter SP Mode and print the SMC all report SP5-990-1
(6) Upgrade the system_copier_netfile firmware to version 1.11or later

7 Enter SP Mode again and print the diagnosis report SP5-990-5

8 Combine the SMC all report, the diagnosis report and this form and mail it no later than 1/15/03 to:

Ricoh Corporation
19C Chapin Road
PO Box 2008
Pinebrook, NJ 07058-2008
ATTN: TSD ADMIN

RD®OM゚
TECHNICAL SERVICE BULLETIN

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BULLETIN NUMBER:
G060/G570-018
01/30/2003

## APPLICABLE MODEL:

GESTETNER - DSC38/DSC388
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38CS

## SUBJECT: SC 999 \& SERVICE MANUAL - INSERT

## GENERAL:

The following SC code has been added to the controller (printer) and system (CF) firmware.

| Configuration | Type of firmware | Firmware Version |
| :--- | :--- | :---: |
| Printer | Controller | Ver. 2.07 |
| CF Expander | System | Ver. 1.02 (from 1 ${ }^{\text {st }}$ lot of mass production) |


| SC No. | Item | Definition | Possible Cause | $\begin{array}{\|c\|} \hline \text { Related } \\ \text { SCs } \end{array}$ | Troubleshooting Procedure |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \hline \text { SC } \\ & 999 \\ & \text { (CF) } \end{aligned}$ | Program download error | - The download (program, print data, language data) from the IC card does not execute normally. | - BCU Board installed incorrectly <br> - Engine (BCU) board defective <br> - IC card defective <br> - Incorrect IC card used (machine type/model, card ver.) <br> - NVRAM defective <br> - Incorrect destination code <br> - Defective DIMM <br> - Loss of power during downloading NOTE 1: This error is not logged because the error occurs in the download mode (different from normal operation mode). <br> NOTE 2: If the machine loses power while downloading, or if the download does not normally end for some other reason, this could damage the controller board or the target PCB of the downloading and prevent subsequent downloading. If this problem occurs, the damaged PCB must be replaced. |  | 1. Turn the main switch off and on. <br> 2. If you can download necessary programs, do it by using an appropriate card. <br> 3. Check if the type and version of firmware is correct. If correct, turn off the main switch and reinsert the IC card, then retry the update. See Caution. <br> 4. Check if the correct destination code is set (SP5-808-1). If it is not, please contact Technical Support. A Regional Rep must reprogram the destination code. <br> 5. Check the connection of connectors and PCBs. <br> 6. Replace the IC card. <br> 7. Replace the DIMM <br> 8. Replace the BCU board. <br> Caution: Whenever updating the firmware, the front cover should be opened before turning on the main switch. |

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## Page 2 of 2

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

## PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- 4-32
- 4-43

Updated Information (G060 SC Table)
Updated Information (G570 SC Table)

| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 863 | HDD: Read error | The data stored in the HDD cannot be read correctly. | - Defective HDD <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Replace the HDD. <br> 3. Replace the controller. | CTL |
| SC 864 | $\begin{aligned} & \text { HDD: CRC } \\ & \text { error } \end{aligned}$ | While reading data from the HDD or storing data in the HDD, data transmission fails. | - Defective HDD |  | 1. Turn the main switch off and on. <br> 2. Replace the HDD. | CTL |
| SC 865 | HDD: Access error | An error is detected while operating the HDD. | - Defective HDD |  | 1. Turn the main switch off and on. <br> 2. Replace the HDD. | CTL |
| SC 900 | Electric counter error | Abnormal data is stored in the counters. | - Defective NVRAM <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the NVRAM and controller. <br> 3. Replace the NVRAM. <br> 4. Replace the controller. | CTL |
| SC 990 | Software performance error | The software makes an unexpected operation. | - Defective software <br> - Defective controller <br> - Software error |  | 1. Turn the main switch off and on. <br> 2. Reinstall the controller and/or engine main firmware. <br> 3. See NOTE 1 at the end of the SC table. | CTL |
| SC 998 | Application start error | No applications start within 60 seconds after the power is turned on. | - Loose connection of RAM-DIMM, ROMDIMM <br> - Defective controller <br> - Software problem |  | 1. Turn the main switch off and on. <br> 2. Check if the RAM-DIMM and ROMDIMM are properly connected. <br> 3. Reinstall the controller system firmware. <br> 4. Replace the controller. | CTL |
| SC 999 | Firmware error | See G570 SM page 4-43 for description of SC 999 |  |  |  |  |

NOTE 1: If a problem always occurs in a specific condition (for example. printer driver setting, image file), the problem may be caused by a software error. In this case, the following data and information needs to be sent back to your product specialist.

- Symptom / Possible Causes / Action taken
- Summary sheet (SP mode '1 Service', [Print Summary])
- SMC All (SP5-990-002)
- Logging (SP5-990-004)
- Printer driver settings used when the problem occurs
- All data displayed on the screen (SC code, error code, and program address where the problem is logged.)
- Image file which causes the problem, if possible

| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { SC } 999 \\ \text { (CF) } \end{gathered}$ | Program download error | - The download (program, print data, language data) from the IC card does not execute normally. | - BCU Board installed incorrectly <br> - Engine (BCU) board defective <br> - IC card defective <br> - Incorrect IC card used (machine type/model, card ver.) <br> - NVRAM defective <br> - Incorrect destination code <br> - Defective DIMM <br> - Loss of power during downloading NOTE 1: This error is not logged because the error occurs in the download mode (different from normal operation mode). NOTE 2: If the machine loses power while downloading, or if the download does not normally end for some other reason, this could damage the controller board or the target PCB of the downloading and prevent subsequent downloading. If this problem occurs, the damaged PCB must be replaced. |  | 1. Turn the main switch off and on. <br> 2. If you can download necessary programs, do it by using an appropriate card. <br> 3. Check if the type and version of firmware is correct. If correct, turn off the main switch and reinsert the IC card, then retry the update. See Caution. <br> 4. Check if the correct destination code is set (SP5-808-1). If it is not, please contact Technical Support. A Regional Rep must reprogram the destination code. <br> 5. Check the connection of connectors and PCBs. <br> 6. Replace the IC card. <br> 7. Replace the DIMM <br> 8. Replace the BCU board. <br> Caution: Whenever updating the firmware, the front cover should be opened before turning on the main switch. | B |

## SUBJECT: DUPLEX PRINTING IN LETTERHEAD MODE

## SYMPTOM:

When printing odd pages in duplex mode with direction-sensitive paper (ex. letterhead, pre-punched, and/or pre-printed paper), the last page is printed on the rear side instead of the front.

## CAUSE:

With duplex mode, the machine prints the even-numbered page first onto the paper's rear side, inverts the paper, and then prints the odd numbered page onto the front side. However when the total number of pages is an odd number, e.g. 5 pages, the final sheet of paper is not inverted through the duplex unit, which means that it is printed out onto the paper's rear side.

## SOLUTION:

The Letterhead function is available with controller firmware (Version 2.11) only when the setting has been changed to Enabled in SP mode (default: Disabled).

When selecting direction-sensitive paper (letterhead, pre-punched, pre-printed), along with the first sheet designated as duplex, the machine also passes all sheets following this through the duplex unit.

NOTE: This does not apply to paper fed from trays for which the duplex function has been disabled.

## How to activate "Letterhead" mode

1. Access SP mode.
2. Set Bit Switch 2-4 to 1 .

## Specification \& Remarks

The following explains how the machine works with an example in each print mode.
(Illustrations show the order in which sheets are output to the internal exit tray.)
Example: 5-page duplex print job.
Printing page order: 2-- $\mathbf{1 - -} 4$-- 3 -- 5.
1st sheet: Pg 2 onto rear side ---> [inversion] --> Pg 1 onto front
2nd sheet: Pg 4 onto rear side --> [inversion] --> Pg 3 onto front
3rd sheet: (depends on paper type and feed station, as described below)

1. Normal paper from paper trays:

The last page is not passed through the duplex unit since normal paper is not direction-sensitive.


## 2. Letterhead paper from paper trays:

The last (3rd) sheet of paper is passed through the duplex unit simply to invert it, which allows Pg. 5 to be printed out on the front side (i.e. the side containing the letterhead pattern).


NOTE: $\quad$ The letterhead paper should be loaded into the tray face-up.
3. Letterhead fed as a cover sheet from the by-pass table, with normal paper from the paper tray for the remaining pages.
(Only with the RPCS driver):


NOTE: Please place the letterhead paper on the by-pass table face-up.
4. Letterhead paper fed as a cover sheet from one paper tray, with normal paper for the remaining pages from another paper tray.
(Only with RPCS driver.)
a. When selecting a one-sided cover sheet (in the driver)

NOTE: Although this operation is possible, the image will come out on the rear side of the letterhead sheet, i.e. the side without the letterhead pattern. We therefore recommend \#3 above, i.e. feeding from the bypass tray.

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## Page 3 of 3

Even though the cover sheet is one-sided, the 1st sheet of paper will still be sent through the duplex unit and inverted, as the job has been selected as a duplex job in the driver. This cover sheet image is then printed on the rear side, i.e. the side without the letterhead.

b. When selecting a double-sided cover sheet:

In this case, letterhead paper should be loaded into a tray and normal paper in another tray.


NOTE: Please load the letterhead paper in the paper tray Face up.

## Letterhead paper orientation for paper loading <br> LH: Letterhead

|  | LH - Paper tray | LH - Bypass |
| :--- | :---: | :---: |
| Simplex jobs | Face-down | Face-up |
| Duplex jobs | Face-up | 1-sided coversheet: Face-up |

BULLETIN NUMBER: G060/G570-020
01/31/2003

## APPLICABLE MODEL:

GESTETNER - DSC38/DSc38S<br>RICOH - AP3800C/AP3800CMF<br>SAVIN - SLP38C/SLP38cS

SUBJECT: BLACK DEVELOPMENT DRIVE UNIT FUSING CLUTCH

## GENERAL:

A fusing clutch has been added to the black development drive unit. The fusing clutch switches on in order to operate the fusing unit. However it is switched off during the process control self-checks, line position adjustment, and image processing for print/copy jobs. This is to maximize the life of the fusing unit and oil supply unit.
For this modification, the following major parts have been modified that also include the firmware. However, all modifications could not be implemented at the same time. Modifications have been applied as shown in the following table. Since the cut-in serial number of each part differs, there are some notes when replacing the BCU board in the field. Please read this Technical Service Bulletin carefully.

Modification History

|  | Old P/N | New P/N | Q'ty | INT | Description |
| :--- | :---: | :---: | :---: | :---: | :--- |
| 1st Modification | G0775061 | G0775069 | $1-1$ | 0 | BCU Board (See NOTE.) <br> Engine main firmware: Ver. 1.11G |
| 1 | G07 |  |  |  |  |
| 2nd Modification |  |  |  |  |  |
| 1 | G0775069 | G0775069A | $1-1$ | 1 | BCU Board (See NOTE.) <br> Engine main firmware: Ver. 1.11G -> 1.11H |
| 2 | G0601100 | G0771100 | $1-1$ | 1 | Drive Unit - K Development |

NOTE: 1. A DIP switch has been added to the BCU board (P/N G0775069 or later). The G0775069 BCU board has not been registered as a service part. The G0775067 is available as a new BCU board.
2. The machine is able to recognize whether or not the fusing clutch is being used in accordance to the DIP switch setting. The DIP switch setting is very important! If the switch has not set correctly, a paper jam or a fusing problem will occur. Please refer to section "DIP Switch Settings" on page 2 of this Technical Service Bulletin.
3. The engine main firmware has been modified twice. However, the firmware (Version 1.15E) for controlling the fusing clutch operation could not be issued at the time when the fusing clutch had been implemented in machines. Version 1.11 H firmware has temporarily been installed. The firmware will turn on the fusing clutch operation.

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## Page 2 of 3

## DIP Switch Settings

When replacing the BCU board with a new one that has DIP switch on it, check and see if the old board also has a DIP switch. If there is no DIP switch on the old board, keep the DIP switch on the new board switched OFF. If there is a DIP switch on the old board, the DIP switch setting on the new BCU board must be the same as on the old board. Otherwise, problems will occur. Please refer to the following table. The default setting of the DIP switch on the service part is switched OFF.

| Fusing Clutch |  | Not installed | Installed |
| :--- | :--- | :--- | :---: |
| Setting of <br> DIP SW 4 | Correct | OFF | ON |
| Expected problem if the <br> setting is wrong | The fusing unit is driven as usual. However, the <br> machine detects that a fusing clutch has been <br> installed. This results in the PM counter from the <br> fusing unit and oil supply unit to stop counting as <br> the machine does not send the signal to turn the <br> clutch on (at the process control self check, etc, <br> as mentioned above). | The fusing clutch does not <br> operate and the fusing <br> unit is not driven at all. <br> This causes a paper jam. |  |

NOTE: 1. The DIP SW 1 to 3 must be switched OFF (factory use only).
2. A caution sheet (BCU Board DIP Switch Settings) is enclosed with the service part of the new BCU board (P/N G0775067). (Refer to the last page of the caution sheet enclosed with the service part.)

## Cut-in serial number of each part

| 1st <br> Modification |  | 2nd <br> Modification | 3rd <br> Modification | Remarks |  |  |  |  |  |  |  |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Modification | BCU Board | New | New | New |  |  |  |  |  |  |  |
|  | DIP SW 4 Setting | OFF | ON | ON |  |  |  |  |  |  |  |
|  | Firmware Version | 1.11 G | 1.11 H | 1.15 E |  |  |  |  |  |  |  |
|  | Fusing Clutch | - | Installed | Installed |  |  |  |  |  |  |  |
| Machine Type |  |  |  |  |  |  | Machine A | Machine B | Machine C |  |  |
| Product Code |  |  |  |  |  |  | G060-17 | P6011000732 | P6011100001 | P60112XXXXX |  |

NOTE: The modification of BCU board, fusing clutch, and firmware (Version 1.11 H ) has been implemented at the same time.

| Machine A | $\bullet$ | $\quad$ Although the BCU board is new, the fusing clutch was not implemented. |
| :--- | :--- | :--- |
|  | $\bullet$ | DIP switches must always be switched OFF. |

Caution Sheet enclosed with the service parts

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Page 3 of 3
BCU Board DIP Switch Settings
A fusing clutch has been added to the G060 series. To regulate the new clutch, a DIP Switch has been added to the BCU board. The new board can be used in both new machines (with the fusing clutch) and older machines (without the clutch). However the switch setting is different as shown below.

NOTE: This setting is very important. If the switch is not set correctly, a paper jam or fusing problem will occur. See Caution below.

DIP switch settings (service parts default: All OFF)

| DIP SW No. | OFF | ON |
| :---: | :--- | :--- |
| 4 | Fusing clutch is not installed. | Fusing clutch is installed. |
| 1 to 3 | Factory Use Only: Keep these switches OFF. |  |

BCU Board Installation Procedure:

1. Make sure all DIP switches on the new BCU board are switched OFF.
2. If the board already installed in the machine has no DIP SW, simply install the new board as is, i.e. with the DIP SW switched OFF.
3. However if the board already installed has a DIP SW, set the SW on the new board to match the setting on the old board before installation.
4. After installing the BCU board, make sure the machine is able to print out the configuration page normally.

## Caution:

1. If the switch is mistakenly turned OFF in machines that have a clutch, a paper jam will occur near the fusing unit entrance. This occurs since the machine cannot drive the clutch.
2. Similarly, if the switch is mistakenly turned $\mathbf{O N}$ in
 machines that do not have the new clutch, fusing problems will occur. This will cause the machine to detect that a clutch has been installed. The machine will then release the "Clutch Off" signal to stop the drive to the fusing components, whenever they are not needed. Upon doing this, the PM counters for the fusing unit and oil supply unit will not count up, even though the parts are actually moving (as the clutch is not there to stop them). As a result, the message for the End of the PM period will come too late, overstressing these parts.

## UNITS AFFECTED:

All G060 printers manufactured after the serial numbers listed below will have the new style Fusing Clutch and BCU Board installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner DSC38 | P6011100001 |
| Ricoh AP3800C | P6011100001 |
| Savin SLP38C | P6011100001 |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

BULLETIN NUMBER:
TECHNICAL SERVICE BULLETIN

G060/G570-021
01/31/2003
APPLICABLE MODEL:
GESTETNER - DSC38/DSc38S
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38cS

## SUBJECT: BCU BOARD \& DRIVE UNIT - K DEVELOPMENT

## GENERAL:

A fusing clutch has been added to the black development drive unit (P/NG0771100). This change maximizes the life of the fusing unit and oil supply unit. For this modification, the BCU board has also been changed. For details of these changes please see TSB G060/G570-020. The following parts updates are being issued for all G060 Parts Catalogs. Please update you parts catalog with the following information.

REFERENCE

| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| :---: | :---: | :--- | :---: | :---: | :---: | :---: |
| G0775061 | G0775067 | BCU Board | 1 | 1 | 85 | $*$ |
| G0601100 | G0771100 | Drive Unit - K Development | 1 | 1 | 57 | 4 |

## UNITS AFFECTED:

All G060 printers manufactured after the serial numbers listed below will have the new style Fusing Clutch and BCU Board installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner DSC38 | P6011100001 |
| Ricoh AP3800C | P6011100001 |
| Savin SLP38C | P6011100001 |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

BULLETIN NUMBER: G060/G570-022
01/31/2003

## APPLICABLE MODEL: <br> GESTETNER - DSC38/DSc38S <br> RICOH - AP3800C/AP3800CMF <br> SAVIN - SLP38C/SLP38cS

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:
The revised areas have been highlighted by an arrow $\Rightarrow$.

- 5-60

Updated Information (DIP Switches)

### 5.7 DIP SWITCHES

## Controller Board

| DIP SW No. | OFF | ON |
| :---: | :--- | :--- |
| 1 | Boot-up from flash ROM | Boot-up from IC card |
| 2 to 4 | Factory Use Only: Keep these switches OFF. |  |

NOTE: If a download attempt failed, you must boot up the machine from the IC card. To do this, DIP SW 1 on the controller board needs to be ON.
$\Rightarrow B C U$ Board

| DIP SW No. | OFF | ON |
| :---: | :--- | :--- |
| 1 to 3 | Factory Use Only: Keep these switches OFF. |  |
| 4 | Fusing clutch is not <br> installed | Fusing clutch is installed |

NOTE: A DIP switch has been added to the BCU board (P/N G0775069 or later). This setting is very important. If the switch is not set correctly, a paper jam or fusing problem will occur.

## SUBJECT：FUSING MISFEEDS \＆DAMAGE

## GENERAL：

This Technical Service Bulletin has been issued in response to cases of fusing unit damage in the field resulting from incorrect user operation．This can in turn cause fusing jams，some of which damage the roller with the Separation Pawls．Therefore please advise users of the points described in the Cause／Solution table below at installation or when on－site for servicing．

## SYMPTOM：

－Non－fused or offset images
－Paper jam causing damage to the Fusing Belt and／or the Pressure Roller

## CAUSES／SOLUTIONS：

In addition to the following table，please also see Notes 1 and 2 on the next page．

|  | CAUSE | SOLUTION |
| :---: | :---: | :---: |
| 1 | Using coated paper <br> －Unlike plain paper，the surface of chemically treated paper is sticky and tends to wrap around the pressure roller or fusing belt． | －Please advise users not to use coated paper on this product． <br> As a reminder，please refer to Note 1 on page 2， which explains the paper types not supported on this printer．This is also mentioned on page 26 of the Operating Instructions Maintenance Guide 2. |
| 2 | Incorrect paper loading／paper type setting in printer driver <br> －Loading Normal Thick Paper（ 105 to $163 \mathrm{~g} / \mathrm{m}^{2}$ ； 28 to 43lb），Envelopes or Label Paper in a paper tray． <br> －Selecting＂Cardstock＂，＂Label＂，or＂Bond＂in the printer driver even when using Normal Thick Paper，Label paper，Cardstock or Envelopes （which are all fed from the Bypass Tray）． | Please advise users of the following： <br> ＞Always feed Envelopes，Label Paper and Normal Thick Paper（ 105 to $163 \mathrm{~g} / \mathrm{m}^{2}$ ）from the Bypass Tray． <br> ＞Always select＂Thick Paper＂in the printer driver whenever feeding Envelopes，Label Paper，Normal Thick Paper，Cardstock or Bond． Please also see Note 2 on page 2. |
| 3 | External output tray closed <br> Whenever printing from the bypass tray，the paper is fed out to the external output tray．However if this tray is closed（folded）when the paper is exited，the paper will fold up into an accordion and cause a jam at the exit area． | Please advise users to confirm that the external output tray is in the open position whenever feeding from the bypass tray． |

## Detailed Notes for the 3 Cause/Solutions from the Above Table

NOTE 1: Avoiding paper types not supported on this printer
Please advise users not to use the following paper types on this printer:

- Paper out of weight specification:

Paper weight specifications:
Paper Trays: 60 to $105 \mathrm{~g} / \mathrm{m}^{2}$ (16 to 28lb)
By-pass Tray: 60 to $163 \mathrm{~g} / \mathrm{m}^{2}$ (16 to 43lb)

- Paper meant to be used with an ink-jet printer
- Coated paper
- Thermal, carbon or conductive paper, aluminum foil
- Paper with the following characteristics:
* Bent, folded, creased, curled, twisted, torn, wrinkled, or damp
* Dry enough to generate static electricity
* Paper with preprinted images (except letterhead)
* Paper with windows, holes, perforations, cutouts, or embossing
* Label paper with any of its sticky surfaces exposed
* Paper with clips or staples

NOTE 2: How the machine interprets paper types selected in the printer driver
The printer is not able to interpret the "Cardstock," "Label" and "Envelope" paper type settings in the driver, and will treat such cases the same as Plain Paper (see table on next page).

As a result, the oil supply roller becomes dirty with toner, an insufficient amount of oil is applied to the fusing belt, and a paper jam occurs. This may also result in offset images.

Therefore advise users to:

1) Always feed Envelopes, Label Paper and Normal Thick Paper from the Bypass Tray.
2) Always use Thick Paper as the driver setting whenever feeding the following types:

| Paper Type Used | Paper Feed Station | Driver Setting |
| :--- | :---: | :---: |
| Normal Thick Paper | By-pass tray | Thick Paper |
| Labels | By-pass tray | Thick Paper |
| Cardstock | By-pass tray | Thick Paper |
| Envelope | By-pass tray | Thick Paper |

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## Reference - Paper Type Settings and Parameters

In addition to color mode and resolution, the paper type selected in the printer driver determines what processing parameters (e.g. fusing temp.) the printer uses for the job.

Table key:
Shaded Area
SP
SP "1" through "4" tags

The printer cannot interpret these paper types, which are then treated as plain paper (i.e. processing parameters for plain paper are used).
Value of each parameter is unique for the paper types.
The data for these parameters are adjustable in SP mode.
Items marked with the same number use common values.

| Paper <br> Feed <br> Station | Paper Type | Leading Edge <br> Registration | Paper <br> Buckle | Fusing Temp. | Paper Transfer <br> Current | Paper Attraction <br> Roller Bias |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: |
| Paper <br> Tray | Plain | SP | SP | SP | SP | SP |
|  | Recycled |  |  |  |  |  |
|  | Color |  | - | SP | SP | SP |
|  | Special | - |  |  |  |  |
|  | Letterhead |  |  |  |  |  |
|  | Preprinted |  |  |  |  |  |
|  | Prepunched |  |  |  |  |  |
|  | Bond |  |  |  |  |  |
|  | Cardstock |  |  |  |  |  |


| By-pass | Plain | SP 1 | SP 3 | SP | SP | SP |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Recycled |  |  |  |  |  |
|  | Color |  |  |  |  |  |
|  | Special | - | - | SP | SP | SP |
|  | Letterhead |  |  |  |  |  |
|  | Preprinted |  |  |  |  |  |
|  | Prepunched |  |  |  |  |  |
|  | Bond |  |  |  |  |  |
|  | Cardstock |  |  |  |  |  |
|  | Labels |  |  |  |  |  |
|  | OHP | SP | SP | SP | SP | SP |
|  | Thick | SP 2 | SP 4 | SP | SP | SP |
|  | Plain (Duplex) | SP 1 | SP 3 | SP | SP | SP |
|  | Thick (Duplex) | SP 2 | SP 4 | SP | SP | SP |

In addition, since the paper types described above are actually selectable in the printer driver, to prevent confusion these items may be deleted from the driver display (details TBA).

## Additional Action - Registration jams

Generally, the more frequently jams occur (even those originating outside the fusing unit), the greater the chance for fusing unit damage - as paper in transit through the fusing unit will be stopped there. When servicing the machine for fusing jams, please also check the machine history for a high occurrence of registration jams. If the $\mathrm{S} / \mathrm{N}$ is in the range mentioned in TSB G060-010 (July-Aug '01 machines), please install the new Guide Plate Middle Registration (P/N G0602613).

BULLETIN NUMBER: G060/G570-024
03/14/2003
APPLICABLE MODEL:
GESTETNER - DSC38/DSC38S
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38CS

## SUBJECT: SC220-004 AND COLOR MISSING

## SYMPTOM:

SC220-004 may occur when the first B/W page is printed out after turning on the main power switch or the machine recovers from Energy Saver Mode.

## CAUSE:

The modified EMAC (EMAC2) on the LD Unit sometimes does not work properly with Engine Firmware version B1.19 or older.

## ACTION IN THE FIELD:

Upgrade the engine firmware to version B1.21 or later on machines from the serial number ranges listed below when the problem is reported, or when installing the new Laser Optics Housing Unit (P/N \#G0801853) with EMAC2.

Machines equipped with the EMAC2 that require upgrade to version B1.21 or later:
G060-17: P6020700040 to P6020701800
G060-17: P8920700001 to P8920700100; P8920800001 to P8920800050

## UNITS AFFECTED:

All G060 Printers manufactured other than those serial numbers listed below will have the new style EMAC2 and version B1.21installed during production.
Machines equipped with the EMAC2 that require an upgrade to version B1.21 or later:

| MODEL NAME | SERIAL NUMBER |
| :---: | :--- |
| Gestetner DSC38 | $:$ P6020700040 to P6020701800 P8920700001 to |
|  | P8920700100, P89208000001 to P8920800050 |
| Ricoh AP3800C | $:$ P6020700040 to P6020701800 P8920700001 to |
|  | P8920700100, P8920800001 to P8920800050 |
| Savin SLP38C | $:$ P6020700040 to P6020701800 P8920700001 to |
|  | P8920700100, P8920800001 to P8920800050 |

Continued....

## SYMPTOM:

The following problem has recently been reported from the field.
After replacing the Laser Optics Housing Unit and when printing color images, the color(s) are missing on output prints without any SC code notification.

## CAUSE:

The third mirror(s) $[\mathrm{A}]$, which exposes the laser to the OPC, is out of position. Rough handling of the service part during transportation might cause this problem.
As shown in the pictures, the spring plate $[B]$ positions the mirror. The mirror may shift out of position,thereby changing the angle to the OPC drum.

## Action Required/Troubleshooting

When replacing the laser optic housing unit, please make a color demo page in UP Mode just after the following steps (before reassembling machines).

- Housing unit is replaced.
- Flat cables and harness are connected.
- Toner supply unit is repositioned.
- Upper cover is placed in the position.


Continued....

There is a space [C] that allows some movement along from the mounting plane [D]. However, the movement along this plane will not cause the missing color problem. If the mirror is angled away from the mounting plane, colors may be lost.

NOTE: To minimize the problem occurrence on the service parts, a modification is under investigation. The details will be announced when a modification is applied.

## ACTION REQUIRED WHEN REPLACING THE LASER OPTICS HOUSING UNIT

Be sure to remove the sponge supporting the polygon mirror motor before installing the new Laser Optics Housing Unit (P/N \#G0801853).

Caution: If the sponge is not removed, the Polygon Mirror Motor can be damaged and/or the printer may not function correctly.

1. Open the upper cover [A] (4screws).

2. Remove the red tag $[B]$ (tape).
[B]


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3. Remove the sponge [C].

Note 1: Be sure not to touch any of the mirror or lens surfaces.
Note 2: Be sure that dust does not get into the unit.

4. Reattach the upper cover.
5. If the engine firmware is version B1.19 or earlier, upgrade it to version B1.21 or later.
6. Please make a color demo page in UP Mode just after the following steps (before reassembling machines).

- Housing unit is replaced.
- Flat cables and harness are connected.
- Toner supply unit is repositioned.
- Upper cover is placed in the position.

If color(s) is missing on the output, refer to page two of this bulletin for details.

BULLETIN NUMBER:
G060/G570-025
03/14/2003
APPLICABLE MODEL:
GESTETNER - DSC38/DSC38S
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38CS

## SUBJECT: REQUIRED ACTION FOR INSTALLING CF EXPANDER

## SYMPTOM:

The right frame of the CF Rack can pinch the IPU connector, causing an SC error (mainly SC672) to occur, or a blank operation panel display at power on.

## ACTION:

Attach the cushion shown below to the backboard of the CF Rack before docking the rack and mainframe. This cushion has been packed with the CF Expander Unit Starting with the serial numbers listed below.

Backboard of the rack


NOTE 1: When adhering the cushion to the backboard, make sure to position it flush against the surface of the rear face of the right frame, just below the lowermost hole in the frame.

NOTE 2: The cushion must be attached regardless of what paper feed stations are installed (e.g. PFU, LCT) and always in the position shown above.

## UNITS AFFECTED:

All G570 printers manufactured after the serial numbers listed below will have the new style cushion installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner DSC38/DSC38S | P6720700025 |
| Ricoh AP3800C/AP3800CMF | P6720700025 |
| Savin SLP38C/SLP38CS | P6720700025 |

BULLETIN NUMBER：G060／G570－026
03／17／2003
APPLICABLE MODEL：
GESTETNER－DSC38／DSC38S
RICOH－AP3800C／AP3800CMF
SAVIN－SLP38C／SLP38CS

## SUBJECT：TOTAL COUNTER \＆IC－EEPROM

## GENERAL：

The following parts were omitted from the G060 Parts Catalog．Please update your parts catalog with the following information．The following parts updates are being issued for all G060 Parts Catalogs．

REFERENCE

| PART NUMBER | DESCRIPTION | PAGE | ITEM |
| :---: | :--- | :---: | :---: |
| G0609099 | Total Counter－RAM－STK12C68－P55 | 77 | $202^{*}$ |
| 14075404 | IC－EEPROM I2C BUS 32K DIP | 85 | $267^{*}$ |

＊DENOTES NEW ITEM NUMBER

## BULLETIN NUMBER:

G060/G570-027
03/19/2003

```
APPLICABLE MODEL:
GESTETNER - DSC38/DSC38S
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38CS
```

This Technical Service Bulletin has been issued to:

1) replace the term "image coverage ratio" with "pixel coverage ratio," so as to clear up any misunderstandings, and to
2) clarify the differences between SP7-833 and SP7-908

NOTE: $\quad$ SP7-908-1 thru 8 has been applied to the G060 from March '02 production, and both SP7-833 and 908 have been applied on the G082 from the first mass production run. Also, SP7-908-5 thru 8 contains the same data as SP7-833-11 thru 14.

## SUBJECT: "IMAGE COVERAGE" vs "PIXEL COVERAGE" RATIO

## GENERAL:

1. Terminology: Replacing "image coverage" with "pixel coverage ratio"

The original meaning of "image coverage" is simply the percent of pixels being used to write the image. However, since this refers only to the print data itself, and not the final image on the output, a more clear term is the "pixel coverage ratio."

The machine keeps track of two types of pixel coverage ratios:

1) The ratio for the most recently printed page
2) The average ratio for all pages printed up to the present

Calculation method for both \#1 and 2 above:
\# Pixels used for image areas / Total pixel area of 1-full pg. (corresponding paper size)

## NOTE:

1. To calculate \#2 above, the machine keeps a cumulative count for these 2 values.
2. The pixel coverage ratio only refers to the percent of pixels to be used for image writing in the data itself, not the finished product (output). It is not directly proportional to the amount of toner consumed, and can therefore not be used to calculate toner consumption.

The amount of toner actually consumed (i.e. used on the output) also depends on factors such as the:

- Type of image (solid, text, or lines):

The "edge effect", a general side effect of the development process whereby extra toner is attracted to the edges of images, i.e. becoming slightly darker. Of course images containing more edges will show this effect more prominently.

- Toner concentration
- Development capability

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## 2. Difference between SP7-833 and SP7-908

Both calculate the pixel coverage ratios mentioned above for each toner color, however the calculation is different for Bk pages printed in Color development mode (i.e. development with the transfer unit in contact with all 4 PCUs). Please also see the example below.

| SP7-833-5 to 8 (Coverage) | SP7-908-1 to 4 (New Coverage) |
| :--- | :--- |
| The total pixel area for Bk pages made in Color <br> development mode is added to the cumulative <br> count. | This value is $\underline{\text { not added to the cumulative count. }}$ |

- SP7-833 (existing SP mode):

The idea of this mode is to show the pixel coverage ratio for each color for pages made when the machine operates with the transfer unit in contact with all 4 PCUs. So even though no CMY toner is actually being used for Bk pages in Color development mode, this SP mode includes the total pixel area for these pages.

NOTE: This data is used for process control and toner refresh.

## - SP7-908 (newly added):

The idea of this mode is to show the pixel coverage ratio for each color for pages made when CMY toner is actually being used to develop the image.

As shown in the example below, for print data containing Bk pages, the ratio calculated by SP7-833 will be lower.

## Example:

When printing the following 3 pages, the average pixel coverage ratio will be lower with SP7-833 as shown in the table below.

| 1st Page |  |
| :---: | :---: |
| Color |  |
| C: $7 \%$ | 2nd Page |
| M: $8 \%$ |  |
| Y: $3 \%$ |  |
| K: $7 \%$ | K: $8 \%$ |
|  |  |
|  | 3rd Page <br> Color <br> C: $6 \%$ <br> $\mathrm{M}: 9 \%$ <br> $\mathrm{Y}: 4 \%$ <br> $\mathrm{~K}: 6 \%$ |

Average pixel coverage ratio:

|  | Bk | Cyan | Magenta | Yellow |
| :--- | :---: | :---: | :---: | :---: |
| SP7-833 | $(7 \%+8 \%+6 \%) / 3=7 \%$ | $(7 \%+6 \%) / 3=4.3 \%$ | $(8 \%+9 \%) / 3=5.7 \%$ | $(3 \%+4 \%) / 3=2.3 \%$ |
| SP7-908 | $(7 \%+8 \%+6 \%) / 3=7 \%$ | $(7 \%+6 \%) / 2=6.5 \%$ | $(8 \%+9 \%) / 2=8.5 \%$ | $(3 \%+4 \%) / 2=3.5 \%$ |

## REMARKS:

- To enable SP7-908 in production units, the following have been modified-
> Engine main and controller firmware (from March '02 production):
Engine: version B1.17C or later
Controller: version 2.13 or later
> BCU NVRAM: $4 \mathrm{~KB} \rightarrow 8 \mathrm{~KB}$ type for storage of paper size pixel area data. (P/N 14075751)
NOTE: The 8 KB type can be used on all machines. The machine automatically recognizes whether the NVRAM is a $4 K B$ or 8 KB type.

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- It is not recommended to upgrade pre-modification MIF for SP7-908, since it is necessary to not only install the 8 KB RAM, but also to replace all maintenance kits (kit PM counters stored in NVRAM).
- The following shows the SP7-908 displays for machines with the 4 KB NVRAM and each version of main/controller firmware:

| NVRAM $=4 \mathrm{~KB}$ |  | Controller firmware |  |
| :---: | :---: | :---: | :---: |
|  |  | 2.12 or earlier | 2.13 or later |
|  | B1.15E or earlier | (feature not displayed) | Unspecified value displayed. |
|  | B1.17C or later | (feature not displayed) | SP7-908 value is "999.99". |

## SERVICE MANUAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:
The revised areas have been highlighted by an arrow $\Rightarrow$.

- 5-43 through 45

Updated Information (Service Programs)

## PARTS INFORMATION:

SP7-908-1 thru 8 has been added to store the average Pixel Coverage Ratios for each toner color. With this new counter, B/W pages that follow color pages in ACS will not be included in pixel coverage ratios for CMY toner (only for black). For this new counter, the capacity of the NVRAM on the BCU board has been changed from 4 kB to 8 kB .

The following parts updates are being issued for all G060 Parts Catalogs.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| 14075404 |  | IC - EEPROM I2C BUS 32K DIP | 1 | 1 | 85 | 267 |
|  | -14075751 | IC - NVRAM I2C BUS 64K DIP |  |  |  |  |

## UNITS AFFECTED:

All G060 printers manufactured after the serial numbers listed below will have the new style IC - NVRAM I2C BUS 64K DIP installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner DSc38 | P6020300001 |
| Ricoh Aficio AP3800C | P6020300001 |
| Savin SLP38c | P6020300001 |


| 7 | Mode No. <br> (Class 1, 2, and 3) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 816 | [Tray Clear] Paper Tray Counter Clear |  |  |  |
|  | 1 | Tray 1 | * | Clears the counters (SP7-204) for the number of sheets fed from the paper feed stations. <br> NOTE: The LCT is counted as the 3rd feed station. |
|  | 2 | Tray 2 |  |  |
|  | 3 | Tray 3/LCT |  |  |
|  | 4 | Tray 4 |  |  |
|  | 6 | Duplex |  |  |
| 825 | [Counter Reset] |  |  |  |
|  | 1 | Counter Reset | P | Rests the total counter values to " 0 ". <br> NOTE: This SP mode can be done only once, while the counter values are less than 0 . |
| 832 | [Diag. Result] Diagnostic Result |  |  |  |
|  | 1 | Diag. Result | $\begin{aligned} & * \\ & \text { * } \end{aligned}$ | Displays the result of the diagnostics. |
| 833 | [Coverage] Pixel Coverage Ratio \& No. of Toner Cartridges |  |  |  |
|  | 1 | Last [K] | * | Displays the pixel coverage ratio for each color of the last output. <br> [ 0 to $100.00 /-/ 0.01 \% /$ step ] |
|  | 2 | Last [C] |  |  |
|  | 3 | Last [M] |  |  |
|  | 4 | Last [Y] |  |  |
|  | 5 | Average [K] |  | Displays accumulated average value of image coverage ratio for each color. [ 0 to 100.00 / - / 0.01 \%/step ] |
|  | 6 | Average [C] |  |  |
|  | 7 | Average [M] |  |  |
|  | 8 | Average [Y] |  |  |
|  | 11 | Toner [K] |  | Displays the total number of toner cartridges replaced. <br> [ 0 to 65535 / - / 1 cartridge/step ] |
|  | 12 | Toner [C] |  |  |
|  | 13 | Toner [M] |  |  |
|  | 14 | Toner [Y] |  |  |
| 901 | [Asset Info] |  |  |  |
|  | 1 | File Name | P | Records the location where a problem is detected in the program. The data stored in this SP is used for problem analysis. DFU |
|  | 2 | \# of Lines |  |  |
|  | 3 | Location |  |  |
| 905 | [Alert Display] |  |  |  |
|  | 7 | Fusing: Alert | * | Specifies the timing for displaying the near-end condition. <br> With the default setting, near-end is detected and the alert lights on the panel 2.5 K prints before detecting the end condition. The unit life is 9303 K revolutions. <br> Increment: Delays the alert display timing. Decrement: Hastens the alert display timing. 1.0K prints = approximately 93 K revolutions <br> [ 0 to 20000 / 9070 / 1 K revolutions/step ] |
|  | 9 | Oil: Alert | * | Specifies the timing for displaying the near-end condition. <br> With the default setting, near-end is detected and the alert lights on the panel 2.5 K prints before detecting the end condition. The unit life is 1860 revolutions. <br> Increment: Delays the alert display timing. <br> Decrement: Hastens the alert display timing. <br> 1.0K prints $=93$ <br> [ 0 to 10000 / $1628 / 1 \mathrm{~K}$ revolutions/step ] |



| 7 | Mode No. (Class 1, 2, and 3) |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: |
| 911 | [Firmware Ver.] |  |  |
|  | 1 | Controller | Displays the firmware version. |
|  | 2 | Engine |  |
|  | 5 | ADF |  |
|  | 7 | Finisher |  |
|  | 9 | PFU |  |
|  | 11 | Mail Box |  |
|  | 13 | Duplex |  |
|  | 14 | MUSIC |  |
|  | 18 | NIB |  |
|  | 200 | Factory |  |
|  | 204 | Printer |  |
|  | 209 | Test |  |
|  | 210 | MIB |  |

TECHNICAL SERVICE BULLETIN

## BULLETIN NUMBER: G060/G570-028

04/25/2003

## APPLICABLE MODEL:

GESTETNER - DSC38/DSC38S
LANIER - 2138AH/2138CMF
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38CS
SUBJECT: SC471

## SYMPTOM:

An SC471, Transfer Belt Home Position service code may appear in the display.

## CAUSE:

Transfer Contact Motor disconnects from bracket, causing the gear to fail. Also, when an outside force is applied to the bracket, it may deform and the gear will separate from the bracket.

## SOLUTION:

A new style DC Motor (P/N G0773706) has been released to increase the contact area with the bracket and, the bushing inside the motor has been lengthened. To prevent the bracket from deforming, a reinforcing section has also been added.

## GENERAL:

The following part update is being issued for all G060 Parts Catalogs.

|  | REFERENCE |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |  |  |  |  |
| G0603990 | G0773706 | DC Motor -1.56 W | 1 | 1 | 59 | 8 |  |  |  |  |

## UNITS AFFECTED:

All G060 printers manufactured after the serial numbers listed below will have the new style DC Motor installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | ---: |
| Gestetner DSc38 |  |
| Lanier 2138 |  |
| Ricoh Aficio AP3800C | P6011200613 |
| Savin SLP38c |  |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

BULLETIN NUMBER: G060/G570-029
04/25/2003

## APPLICABLE MODEL:

GESTETNER - DSC38/DSC38S
LANIER - 2138AH/2138CMF
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38CS

## SUBJECT: FUSING STRIPPERS

## GENERAL:

The shape of the strippers for the Fusing Belt and Pressure Roller has been changed and the spring pressure has been reduced to ensure that the strippers do not scratch the Fusing Belt or Pressure Roller. The following parts updates are being issued for all G060/G570 Parts Catalogs.

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| OLD PART NO. | NEW PART NO. | REFERENCE |  |  |  |  |
| :--- | :--- | :--- | :---: | :---: | :---: | :---: |
| AA060871 | AA060932 | Tension Spring | QTY | INT | PAGE | ITEM |
| AE044034 | AE044051 | Fusing Belt Stripper | 5 | $3 / \mathrm{S}$ | 45 | $2^{*}$ |
| AA066589 | AA066594 | Spring - Pressure Roller Stripper | 5 | $3 / \mathrm{S}$ | 45 | $3^{*}$ |
| AE044035 | AE044050 | Pressure Roller Stripper | $3 /$ S | 47 | $11^{* *}$ |  |

* Replaced as set.
* Replaced as set.
** Replaced as set.


## UNITS AFFECTED:

All G060 printers manufactured after the serial numbers listed below will have the new style Fusing Strippers installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | ---: |
| Gestetner DSc38 |  |
| Lanier 2138 | P6021200020 |
| Ricoh Aficio AP3800C |  |
| Savin SLP38c |  |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: G060/G570-030
05/07/2003

## APPLICABLE MODEL: <br> GESTETNER - DSC38/DSC38S <br> LANIER - 2138AH/2138CMF <br> RICOH - AP3800C/AP3800CMF <br> SAVIN - SLP38C/SLP38CS

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

The following parts updates are being issued for all G060 Parts Catalogs.

## - UPDATE 1:

Paper Tray 1 - The Paper Tray 1 has been changed due to standardization with other models. Please update your G060 Parts Catalog with the following information.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0602768 | G0802768 | Paper Tray 1 | 1 | 0 | 15 | 1 |
| GA003011 | - | Decal - Paper Tray 1 |  |  | 15 | 2 |
| - | GA003066 | Decal:Paper Tray:No. 1 | 1 |  | 15 | 2 |

- UPDATE 2: Paper Feed Unit 1 - The Paper Feed Unit 1 has been changed due to standardization with other models. Please update your G060 Parts Catalog with the following information.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0602700 | G0802700 | Paper Feed Unit 1 | 1 | 0 | 19 | 1 |

- UPDATE 3: Lower Middle Guide - The Lower Middle Guide and Lower Middle Guide Plate Adhesion have been registered. Please update your G060 Parts Catalog with the following information.

* DENOTES NEW ITEM NUMBER


## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## TECHNICAL SERVICE BULLETIN

## BULLETIN NUMBER: G060/G570-031

06/30/2003

## APPLICABLE MODEL: <br> GESTETNER - DSC38S <br> LANIER - 2138CMF <br> RICOH - AP3800CMF <br> SAVIN - SLP38CS

## SUBJECT: SENSOR STOPPER

## GENERAL:

The shape of the sensor stopper has been change to prevent interference with the rear scanner cover. The following part update is being issued for all G570 Parts Catalogs.

REFERENCE

| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| :---: | :--- | :--- | :---: | :---: | :---: | :---: | :---: |
| A1931793 |  | Scanner Home Sensor Stopper | $1-0$ | 1 | 7 | 23 |

## UNITS AFFECTED:

All G570 printers manufactured after the serial numbers listed below will have the new part installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :---: |
| Gestetner - DSC38s |  |
| Lanier - 2138CMF | P6720500051 |
| Ricoh - AP3800CMF |  |
| Savin- SLP38CS |  |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER：G060／G570－032
07／02／2003

## APPLICABLE MODEL：

GESTETNER－DSC38／DSC38S
LANIER－2138AH／2138CMF
RICOH－AP3800C／AP3800CMF
SAVIN－SLP38C／SLP38CS

## SUBJECT：PARTS CATALOG UPDATES

## GENERAL：

The following parts updates are being issued for all G060／G570 Parts Catalogs．
－UPDATE 1：Upper Cover－The exit tray upper cover has been changed due to parts standardization with other models．


| OLD PART NO． | NEW PART NO． | DESCRIPTION | QTY | INT | PAGEERENCE | ITEM |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| G0601275 | G0771275 | Upper Cover－Exit Tray | $1-1$ | 0 | 11 | 13 |

## UNITS AFFECTED:

All G060/G570 printers manufactured after the serial numbers listed below will have the new part installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Ricoh Aficio AP3800C | P6020500862 |
| Savin SLP38c |  |
| Gestetner DSc38 |  |
| Lanier 2138 |  |

## - UPDATE 2: Illustration Correction - The illustration on page 20 of the parts catalog is incorrect. Please apply the following changes as shown below.

## 7. 2nd Paper Feed Section (G060)



- UPDATE 3: Torsion Springs- Please delete the Rear and Front Torsion Springs (Item \#23 \& 24) from the parts catalog descriptions page. These springs are included with Item \#3; Release Shaft P/N G0603694).


|  |  | REFERENCE |  |  |
| :---: | :--- | :---: | :---: | :---: |
| DELETED PART NUMBER | DESCRIPTION | QTY | PAGE | ITEM |
| AA066344 | Rear Torsion Spring | $1-0$ | 41 | 23 |
| AA066345 | Front Torsion Spring | $1-0$ | 41 | 24 |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## TECHNICAL SERVICE BULLETIN

## BULLETIN NUMBER: G060/G570-033

07/23/2003

## APPLICABLE MODEL:

GESTETNER - DSC38/DSC38S
LANIER - 2138AH/2138CMF
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38CS

## SUBJECT: NO POWER WHEN THE MAIN SWITCH IS TURNED ON

## SYMPTOM:

Power is not supplied when the main switch is turned ON after replacing the PSU [A], Harness - AC Switch [B] or Bracket - PSU Fan [C].

NOTE: This may occur on all G060 and G080 series models.

## CAUSE:

When replacing the above-mentioned parts, the harness may be damaged when it comes in contact with the edge of the bracket or PSU bracket.

## SOLUTION:

When replacing the PSU, Harness or Bracket, wrap the area of the harness shown by the arrow with electrical tape to protect it from the bracket edges.


BULLETIN NUMBER: G060/G570-034
07/23/2003

## APPLICABLE MODEL:

GESTETNER - DSC38/DSC38S
LANIER - 2138AH/2138CMF
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38CS

## SUBJECT: COLOR SHIFT DUE TO ERROR IN INSTALLATION PROCEDURE

## SYMPTOM:

Color shift after adjusting the fusing unit line speed at unit replacement.

## CAUSE:

Fusing Maintenance Kit Installation Procedure, Offset settings, Step 22:
The two input values $(0,1)$ for adjusting the fusing roller line speed were reversed. Inputting the values in the reverse order will cause color shifting to worsen.

Note: The values described in the mainframe Operating Instructions are correct.

| PAGE | INCORRECT | CORRECT |
| :---: | :--- | :--- |
|  | Check the test sheets and <br> A-6 <br> STEP 22 | make the offset settings for A <br> through H. Select "0" for a <br> white square, and select "1" <br> for an out-of-register square. | | Check the test sheets and |
| :--- |
| make the offset settings for A |
| through H. Select "1" for a |
| white square, and select "0" |
| for an out-of-register square. |

## Affected Units:

All Fusing Unit Maintenance Kits produced in 2001 and 2002.

## SOLUTION:

The Installation Procedure bundled together with the Fusing Maintenance Kit has been revised from January 1, 2003 kit production.

## Action in the Field

- User Maintenance:

Please advise customers of the above correction at installation, the next service visit, or when customers report the symptom due to the above setting error.

- Service Maintenance:

Please make note of this correction to ensure the proper values are input.

## TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER：G060／G570－035
07／29／2003

## APPLICABLE MODEL：

GESTETNER－DSC38
LANIER－2138AH
RICOH－AP3800C
SAVIN－SLP38C

SUBJECT：ROM DIMM－PDL

## GENERAL：

The Euro currency symbol has been added to 112 fonts in the ROM DIMM－PDL．The following part update is being issued for all G060 Parts Catalogs．


| G060 only |  | REFERENCE |  |  |  |  |
| :---: | :--- | :--- | :--- | :---: | :---: | :---: |
| OLD PART NO． | NEW PART NO． | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0776120 | G0776121 | ROM DIMM－PDL | 1 | 1 | 67 | 1 |

[^2]
## UNITS AFFECTED:

All G060 printers manufactured after the serial numbers listed below will have the new style ROM DIMM PDL installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38 | P6021000151 |
| Lanier 2138 |  |
| Ricoh Aficio AP3800C |  |
| Savin SLP38c |  |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: G060/G570-036
07/29/2003
APPLICABLE MODEL:
GESTETNER - DSC38S
LANIER - 2138CMF
RICOH - AP3800CMF
SAVIN - SLP38CS

## SUBJECT: DIMM 1 - SYSTEM

## GENERAL:

The contents of the DIMM 1 - System firmware have been changed:

- The meter click counter specification has been changed so that copies made in SP mode are not counted.

NOTE: Be sure to use version 1.07 with engine main firmware version 1.15 e or later, as an SC999 will occur with earlier engine main firmware versions.

- Fixed centering problem when printing onto 12 " x 18 " paper.
- The Euro currency symbol has been added to 112 fonts in the DIMM 1 - System.

The following part update is being issued for all G570 Parts Catalogs.


| G570 only |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G5706687 | G5706691 | DIMM 1 - System | 1 | 3 | 11 | 6 |

## UNITS AFFECTED:

All G570 Copier Feature Expander Type 3800C's manufactured after the serial numbers listed below will have the new style DIMM 1 - System installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Copier Feature <br> Expander Type 3800C | P6721000387 |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: G060/G570-037
07/30/2003
APPLICABLE MODEL:
GESTETNER - DSC38S
LANIER - 2138CMF
RICOH - AP3800CMF
SAVIN - SLP38CS

## SUBJECT: SERVICE MANUAL - INSERT

The Service Manual pages listed below must be replaced with the pages supplied.

PAGES:
Updated Information (Table of Contents)

- 3-31 through 3-33

Updated Information (G367 to G570 Modification)
3.3.2 SCANNING ..... 3-2
Scanner sub-scan magnification ..... 3-2
Scanner leading edge and side-to-side registration ..... 3-2
Main scan dot position correction ..... 3-3
3.3.3 ARDF ..... 3-4
ARDF side-to-side and leading edge registration ..... 3-4
3.3.4 PRINTER GAMMA CORRECTION ..... 3-5
Printer Mode ..... 3-5
Copy Mode ..... 3-7
3.4 REPLACEMENT ..... 3-10
3.4.1 EXPOSURE GLASS ..... 3-10
3.4.2 ORIGINAL LENGTH/WIDTH SENSOR ..... 3-10
3.4.3 SENSOR BOARD UNIT (SBU) ..... 3-11
3.4.4 EXPOSURE LAMP STABILIZER ..... 3-12
3.4.5 XENON LAMP ..... 3-12
3.4.6 SCANNER POWER SUPPLY UNIT (PSU) ..... 3-14
3.4.7 SCANNER MOTOR ..... 3-14
3.4.8 FRONT SCANNER WIRE ..... 3-15
3.4.9 REAR SCANNER WIRE ..... 3-18
3.4.10 NVRAM REPLACEMENT PROCEDURE ..... 3-20
NVRAM on the Controller (IC9) ..... 3-20
NVRAM Expansion Board on the Controller (CN13) ..... 3-20
NVRAM on the BCU (IC20) ..... 3-21
3.4.11 REQUIRED ACTIONS WHEN REPLACING ITEMS ..... 3-22
3.5 PRINTER ENGINE ..... 3-23
3.5.1 TONER SUPPLY UNIT ..... 3-23
Preparation ..... 3-23
M Toner Supply Unit ..... 3-23
K, C, and Y Toner Supply Units ..... 3-27
3.5.2 BCU ..... 3-28
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3.6 OTHERS ..... 3-30
3.6.1 TOUCH PANEL POSITION ADJUSTMENT ..... 3-30
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4. TROUBLESHOOTING ..... 4-1
4.1 PROCESS CONTROL ERROR CONDITIONS ..... 4-1
4.1.1 DEVELOPER INITIALIZATION RESULT ..... 4-1
4.1.2 PROCESS CONTROL SELF-CHECK RESULT ..... 4-3
4.1.3 LINE POSITION ADJUSTMENT RESULT ..... 4-4
4.2 SCANNER TEST MODE ..... 4-7
4.2.1 VPU TEST MODE ..... 4-7
SP4-907-1 VPU Test Pattern: R ..... 4-7
SP4-907-2 VPU Test Pattern: G ..... 4-7
SP4-907-3 VPU Test Pattern: B ..... 4-7
4.2.2 IPU TEST MODE ..... 4-8
SP4-904-1 Register Write/Read Check Result ..... 4-8
SP4-904-2 Image Path Check Result ..... 4-8
4.3 SERVICE CALL CONDITIONS ..... 4-9

## $\Rightarrow$ 3.6.2 G367 TO G570 MODIFICATION

## Background

Use the following procedure when attaching a G367 Copy Feature Expander (G080) to a G060 printer.

## Preparation

Items needed for conversion.
DIMM \#1 for G570 Copy Feature P/N: G5706691 (See TSB G060/G570 - 036)
Flashcards loaded with the following G570 Copy Feature Expander firmware:
CF NIB, Scanner Application, Fax Application and Operation Panel (LCDC)

## Procedure

Turn the main power switch OFF.

1. Remove the controller ( 2 screws) $[A]$.

2. Remove the printer DIMM (Slot 1) $[B]$
3. Insert DIMM \#1 for the G570 into the upper slot [C].
4. Insert DIMM \#2 for the G570 (included) into the center slot [D].
5. Turn controller board DIP SW1 ON.

6. Install the CF Expander into the G060 mainframe.

NOTE: Note: Do not turn the main power on at this time. If it is turned on SC672/990 will be displayed but will not affect the update.
7. Upgrade to the G060 firmware as follows.

Firmware needed:
CF NIB, Scanner Application, Fax Application
Follow the five steps below (in roman numerals) and upgrade the CF NIB, Scanner Application, and Fax Application. After all three are completed, continue with step 7.
I. Make sure the main power switch is OFF.
II. Remove the IC card cover [D].
III. Fully insert the IC card [E] containing the required firmware into the IC card slot on the controller.
IV. Turn the main power ON. The upgrade will begin automatically.
V. After the firmware update is completed, "Update done" or "Power Off On" will be displayed. Turn OFF the main power and remove the IC card.

8. Turn controller board DIP SW 1 OFF.

NOTE: Please do not turn the main power on at this time. If it is turned on characters on the panel will appear garbled, but this will not affect the update.
9. Upgrade to the G570 LCD firmware (Operation Panel).

NOTE: During the LCD firmware update, the Operation Panel will not function. The Start Key will flash RED. Do not power off unit the Start Key flashes GREEN.
I. Make sure that the main switch is OFF.
II. Fully insert the IC card containing the Operation Panel firmware into the IC card slot on the controller.
III. Turn the main switch ON. After the following message is displayed, press the button for the firmware you are updating (Operation Panel, Engine, etc.).

IV. Pressing the Update button starts the firmware update. To indicate the progress, bars change to asterisks one by one.

V. After the firmware update is completed, "Update done" or "Power Off On" will be displayed. Turn OFF the main switch and remove the IC card.


Start key status indication

- When the above message disappears, the Start key will blink red. This indicates that the machine has started the firmware update. The total time for the update is approximately 5 minutes.
- When the firmware update is completed, the Start key will blink green.

10. If updating any other firmware, repeat the procedure from Step 8.

This completes the G367 to G570 modification.

## TECHNICAL SERVICE BULLETIN

## BULLETIN NUMBER：G060／G570－038

08／04／2003

## APPLICABLE MODEL：

GESTETNER－DSC38
LANIER－2138AH
RICOH－AP3800C
SAVIN－SLP38C

## SUBJECT：MAIN－SCAN MAGNIFICATION ERROR

## SYMPTOM：

The image appears further enlarged or reduced along the main scan direction in relation to the magnification setting for the original data．

## CAUSE：

The parameters for main scan magnification have not been set correctly．

## SOLUTION：

Perform the following procedure after the machine has come to a complete stop and reached Ready condition：

1．Load the following sizes for feeding：DLT or LT LEF
2．Print out the SMC report．
3．Set the following SP modes as described below，then print out the test pattern for $1200 \times 1200 \mathrm{dpi}$ ，and then for $1200 \times 600 \mathrm{dpi}$ ． SP5－997－001（Tray Selection）Choose the tray containing the target paper size． SP5－997－002（Pattern） SP5－997－003（Single Color） SP5－997－004（Color Mode） SP5－997－005（Resolution） SP5－997－007（Print） 1－dot trimming pattern Black
Single Color
$1200 \times 1200$ or $1200 \times 600$
Execute
4．Measure the vertical line interval using a ruler．
5．Adjust SP2－103－55（1200 x 1200 dpi$)$ ，and then SP2－103－59（ $1200 \times 600 \mathrm{dpi}$ ）so that the vertical line interval falls within the following targets： 293 mm （A3 or A4 LEF）， 275.4 mm （DLT or LT LEF）． Examples：

1．Interval is 1 mm shorter than target（ 1200 dpi ）：
$1 \mathrm{~mm} \times 1200 \mathrm{dpi} / 25.4 \mathrm{~mm} / \mathrm{inch}=47.2 \mathrm{dot} \rightarrow 47$
Input：（Current value of SP2－103－55）－ 47
2．Interval is 3 mm longer than target（ 600 dpi ）：
$3 \mathrm{~mm} \times 600 \mathrm{dpi} / 25.4 \mathrm{~mm} / \mathrm{inch}=70.53 \mathrm{dot} \rightarrow 71$
Input：（Current value of SP2－103－59）+71
6．Print out and check the test patterns．
7．Repeat step 3 to 5 again until the main scan magnification is acceptable．
8．Perform Line Position Adjustment（SP5－993－02）．

TECHNICAL SERVICE BULLETIN

## BULLETIN NUMBER: G060/G570-039

09/03/2003

## APPLICABLE MODEL: <br> GESTETNER - DSC38/DSC38S <br> LANIER - 2138AH/2138CMF <br> RICOH - AP3800C/AP3800CMF <br> SAVIN - SLP38C/SLP38CS

## SUBJECT: FUSING UNIT DAMAGE

## SYMPTOM:

The Fusing Unit is damaged by the Pick-Off Pawls.

## CAUSES:

There are three possible causes:

1. Pick-Off Pawls:

When a paper jam occurs in the fusing unit, paper may push the pawls up or down against the fusing belt or pressure roller, causing the belt or roller to be damaged by the pawls.
2. Fusing Belt:

The fusing belt layer may peel off from the base layer during a print run due to an insufficient amount of adhesive applied.
3. Oil Supply Unit:

The oil supply unit deforms due to heat from the fusing unit, causing the oil not to be applied evenly to the fusing belt. This may cause a paper jam or the oil supply roller to become dirty with toner.

## SOLUTIONS:

## Production line

1. Pick-Off Pawls

The edges of the pawls have been rounded to minimize belt or roller damage with a paper jam. See
Technical Service Bulletin G060/G570-029 for more information.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| AA060871 | AA060932 | Tension Spring | 5 | 3/S | 45 | 2* |
| AE044034 | AE044051 | Fusing Belt Stripper | 5 | 3/S | 45 | 3 * |
| AA066589 | AA066594 | Spring - Pressure Roller Stripper | 6 | 3/S | 47 | $11^{* *}$ |
| AE044035 | AE044050 | Pressure Roller Stripper | 6 | 3/S | 47 | $12^{* *}$ |

* Replaced as set.
** Replaced as set.

2. Fusing Belt

The amount of adhesive has been increased and is more evenly applied to the base layer.
3. Oil Supply Unit

A metal plate will be added underneath the oil supply felt to ensure the unit does not deform.

## UNITS AFFECTED:

1. Pick-Off Pawls

All G060 printers manufactured after the serial numbers listed below will have the new style Fusing Strippers installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38, DSC38S |  |
| Lanier 2138, 2138CMF | P6021200020 |
| Ricoh Aficio AP3800C, AP3800CMF |  |
| Savin SLP38c, SLP38cS |  |

Cut-in product Part Number (on the seal attached to the Fusing unit): G765-17 212 (on the box): G76517212xxx (on the fuser)

NOTE: $\quad$ This modification was applied from Part Number suffix B.
2. Fusing Belt

All G060 printers manufactured after the serial numbers listed below will have the amount of adhesive increased and more evenly applied during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38, DSC38S |  |
| Lanier 2138, 2138CMF | P6021100986 |
| Ricoh Aficio AP3800C, AP3800CMF |  |
| Savin SLP38c, SLP38cS |  |

Cut-in product Part Number (on the seal attached to the Fusing unit):
G765-17 212 (on the box): G76517212xxx (on the fuser)
NOTE: $\quad$ This modification was applied from Part Number suffix B.
3. Oil Supply Unit

The serial number cut-in information was not available at time of this publication.

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: G060/G570-040
09/04/2003
APPLICABLE MODEL:
GESTETNER - DSC38S
LANIER - 2138CMF
RICOH - AP3800CMF
SAVIN - SLP38CS

## SUBJECT: SERVICE MANUAL - INSERT

The Service Manual pages listed below must be replaced with the pages supplied.

PAGES:
Updated Information (Table of Contents)

- xiv
- 4-30
- 4-37 through 4-56

Updated Information (SC Table)
Updated Information (SC Table \& Troubleshooting Guide)
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SC Classification ..... 4-9
4.4 SC TABLE ..... 4-11
4.5 TROUBLESHOOTING GUIDE ..... 4-46
4.5.1 IMAGE QUALITY ..... 4-46
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Adjustment Standard: Max. $200 \mu \mathrm{~m}$ ..... 4-52
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5.1.1 ENABLING AND DISABLING SERVICE PROGRAM MODE ..... 5-1
5.1.2 TYPES OF SP MODES ..... 5-1
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SP1-XXX (Feed) ..... 5-9
SP2-XXX (Drum) ..... 5-16
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Main Frame Input Check: SP5-803 ..... 5-65
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5.4.4 TEST PATTERN (SP5-997) ..... 5-73
5.5 SCANNER SP ..... 5-74
5.5.1 SP MODES ..... 5-74
SP1-xxx (System and Others) ..... 5-74
SP2-XXX (Scanning-image quality) ..... 5-75
SP8-XXX (Delivery) ..... 5-82
5.6 REBOOT / SYSTEM SETTING RESET ..... 5-84

| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { SC } 642 \\ \text { (CF) } \end{gathered}$ | Communication timeout error between controller and operation panel | - The operation panel does not respond to the frame sent from the controller. | - Controller defective <br> - Operation panel defective <br> - External noise <br> - Harness between controller and operation panel disconnected |  | 1. Turn the main switch off an on. <br> 2. Check the cable connection between the controller and the operation panel. <br> 3. Shut out the external noise. <br> 4. Replace the controller. <br> 5. Replace the operation panel. | B |
| SC 660 | BCU NVRAM read/write diagnostics error | A read/write diagnostics error is detected when the main SW is turned ON. <br> Note: This only occurs with the 8 kB NVRAM. | - Defective 8kB NVRAM (BCU) |  | 1. Turn the main switch OFF/ON. <br> 2. Replace the NVRAM. |  |
| SC 670 | No response from BCU at power on | When the main power is turned on or the machine starts warming up from energy-saving mode, the controller does not receive a command signal from the BCU. | - Loose connection <br> - Defective controller <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the BCU and controller. <br> 3. Replace the controller. <br> 4. Replace the BCU. | B |


| $\Longrightarrow$ | $\begin{aligned} & \hline \hline \text { SC } 800 \\ & \text { (CF) } \end{aligned}$ | Startup without video output end error (K) | Video transfer to the engine is started, but the engine does not issue a video transmission end command within the specified time. | - Defective BCU | 1. Turn the main switch off and on. <br> 2. Check the cable connection. <br> 3. Replace the BCU. | B |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\Longrightarrow$ | $\begin{aligned} & \text { SC } 801 \\ & \text { (CF) } \end{aligned}$ | Startup without video output end error (Y) | Video transfer to the engine is started, but the engine does not issue a video transmission end command within the specified time. | - Defective BCU | 1. Turn the main switch off and on. <br> 2. Check the cable connection. <br> 3. Replace the BCU. | B |
| $\Longrightarrow$ | $\begin{aligned} & \text { SC } 802 \\ & \text { (CF) } \end{aligned}$ | Startup without video output end error (M) | Video transfer to the engine is started, but the engine does not issue a video transmission end command within the specified time. | - Defective BCU | 1. Turn the main switch off and on. <br> 2. Check the cable connection. <br> 3. Replace the BCU. | B |
| $\Longrightarrow$ | $\begin{aligned} & \hline \text { SC } 803 \\ & \text { (CF) } \end{aligned}$ | Startup without video output end error (C) | Video transfer to the engine is started, but the engine does not issue a video transmission end command within the specified time. | - Defective BCU | 1. Turn the main switch off and on. <br> 2. Check the cable connection. <br> 3. Replace the BCU. | B |
|  | $\begin{gathered} \text { SC } 804 \\ \text { (CF) } \end{gathered}$ | Video input incomplete (K) | - The scanner is requested to transfer video data, but does not issue the video transmission end command within the defined time. | - Board connector between controller and bridge board loose <br> - Board connector between bridge board and IPU loose <br> - IPU board defective <br> - Controller board defective <br> - Bridge board defective | 1. Turn the main switch off and on. <br> 2. Check the cable connection between controller and bridge board. <br> 3. Check the cable connection between bridge board and IPU. <br> 4. Replace the IPU board. <br> 5. Replace the controller board. <br> 6. Replace the bridge board. | B |
|  | $\begin{gathered} \text { SC } 805 \\ (C F) \\ \hline \end{gathered}$ | Video input incomplete (Y) |  |  |  |  |
|  | $\begin{gathered} \text { SC } 806 \\ \text { (CF) } \end{gathered}$ | Video input incomplete (M) |  |  |  |  |
|  | $\begin{gathered} \text { SC } 807 \\ (C F) \end{gathered}$ | Video input incomplete (C) |  |  |  |  |
|  | $\begin{gathered} \text { SC } 808 \\ \text { (CF) } \\ \hline \end{gathered}$ | Video input incomplete (R) |  |  |  |  |
|  | $\begin{gathered} \text { SC } 809 \\ \text { (CF) } \\ \hline \end{gathered}$ | Video input incomplete (G) |  |  |  |  |
|  | $\begin{gathered} \text { SC } 810 \\ \text { (CF) } \\ \hline \end{gathered}$ | Video input incomplete (B) |  |  |  |  |


|  |  | $\bullet$ | $\bullet$ | 7. |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SC 818 | Watch-dog error | While the system program is running, other processes do not operate at all. | - Defective controller <br> - Software error | 1. Turn the main switch off and on. <br> 2. Replace the controller. <br> 3. See NOTE 1 at the end of the SC table. | B |
| SC 819 | Fatal error |  |  |  |  |
| [696E] | Process error | System completely down | - Defective RAM DIMM <br> - Defective ROM DIMM <br> - Defective controller <br> - Software error | 1. Turn the main switch off and on. | B |
| [766D] | Memory error | Unexpected system memory size |  | 2. Check and/or replace the RAM DIMM. <br> 3. Check and/or replace the ROM DIMM. <br> 4. Replace the controller. <br> 5. See NOTE at the end of the SC table. |  |
| SC820 | Self-diagnostics error: CPU [XXXX]: Detailed error code |  |  |  |  |
| $\begin{aligned} & {[0001]} \\ & \text { to } \\ & {[06 F F]} \end{aligned}$ | CPU error | During the self-diagnostic, the controller CPU detects an error. There are 47 types of error code (0001 to 4005) depending on the cause of the error. The CPU detects an error and displays the specific error code with the program address where the error occurs). | - System firmware problem <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Reinstall the controller system firmware. <br> 3. Replace the controller. <br> When the problem cannot be fixed with the above procedure, the following information displayed on the screen needs to be fed back to a technical support center. <br> - SC code <br> - Detailed error code <br> - Program address | B |
| $\begin{aligned} & {[0702]} \\ & {[0709]} \\ & {[070 \mathrm{~A}]} \end{aligned}$ | CPU/Memory Error |  | - System firmware problem <br> - Defective RAM-DIMM <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Reinstall the controller system software. <br> 3. Replace the RAM-DIMM. <br> 4. Replace the controller. | B |


| $\begin{aligned} & \hline \hline[0801] \\ & \text { to } \\ & {[4005]} \end{aligned}$ | CPU error | Same as [0001] |  |  | B |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { SC 821 } \\ & \text { [OD05] } \end{aligned}$ | Self-diagnosis error: ASIC | The CPU checks if the ASIC timer works properly compared with the CPU timer. If the ASIC timer does not function in the specified range, this SC code is displayed. | - System firmware problem <br> - Defective RAM-DIMM <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Reinstall the controller system firmware. <br> 3. Replace the RAM-DIMM. <br> 4. Replace the controller board. | B |
| SC822 | Self-diagnostic error: HDD (Hard Disk Drive) [XXXX]: Detailed error code |  |  |  |  |
| [3003] | Timeout error | When the main switch is turned on or starting the self-diagnostic, the HDD stays busy for the specified time or more. | - Loose connection <br> - Defective HDD <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Check that the HDD is properly connected to the controller. <br> 3. Replace the HDD. <br> 4. Replace the controller. | B |
| [3004] | Command error |  |  |  |  |
| SC 823 | Self-diagnostic error: NIB [XXXX]: Detailed error code |  |  |  |  |
| [6101] | MAC address check sum error | The result of the MAC address check sum does not match the check sum stored in ROM. | - Defective controller | 1. Turn the main switch off and on. <br> 2. Replace the controller. | B |
| [6104] | PHY IC error | The PHY IC on the controller cannot be properly recognized. |  |  |  |
| [6105] | PHY IC loopback error | An error occurred during the loop-back test for the PHY IC on the controller. |  |  |  |
| $\begin{aligned} & \text { SC 824 } \\ & {[1401]} \end{aligned}$ | Self-diagnosis error: Standard NVRAM | The controller cannot recognize the standard NVRAM installed or detects that the NVRAM is defective. | - Loose connection <br> - Defective standard NVRAM <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Check the standard NVRAM is firmly inserted into the socket. <br> 3. Replace the NVRAM. <br> 4. Replace the controller. | B |




| SC 851 | IEEE1394 interface error | The 1394 interface is unusable. | - Defective IEEE1394 <br> - Defective controller. | 1. Turn the main switch off and on. <br> 2. Replace the IEEE1394 interface board. <br> 3. Replace the controller. | B |
| :---: | :---: | :---: | :---: | :---: | :---: |
| SC 860 | HDD: <br> Initialization error | The controller detects that the hard disk fails. | - HDD not initialized <br> - Defective HDD | 1. Turn the main switch off and on. <br> 2. Reformat the HDD. <br> 3. Replace the HDD. | B |
| SC 861 | HDD: Reboot error | The HDD does not become ready within 30 seconds after the power is supplied to the HDD. | - Loose connection <br> - Defective cables <br> - Defective HDD <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Check the connection between the HDD and controller. <br> 3. Check and replace the cables. <br> 4. Replace the HDD. <br> 5. Replace the controller. | B |
| SC 863 | HDD: Read error | The data stored in the HDD cannot be read correctly. | - Defective HDD <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Replace the HDD. <br> 3. Replace the controller. | B |
| SC 864 | HDD: CRC error | While reading data from the HDD or storing data in the HDD, data transmission fails. | - Defective HDD | 1. Turn the main switch off and on. <br> 2. Replace the HDD. | B |
| SC 865 | HDD: Access error | An error is detected while operating the HDD. | - Defective HDD | 1. Turn the main switch off and on. <br> 2. Replace the HDD. | B |
| SC 900 | Electric counter error | Abnormal data is stored in the counters. | - Defective NVRAM <br> - Defective controller | 1. Turn the main switch off and on. <br> 2. Check the connection between the NVRAM and controller. <br> 3. Replace the NVRAM. <br> 4. Replace the controller. | B |
| SC 990 | Software performance error | The software makes an unexpected operation. | - Defective software <br> - Defective controller <br> - Software error | 1. Turn the main switch off and on. <br> 2. Reinstall the controller and/or engine main firmware. <br> 3. See NOTE 1 at the end of the SC table. | B |


| SC 991 | $\begin{array}{\|l} \hline \hline \text { Software } \\ \text { Performance } \\ \text { Error - Logged } \end{array}$ | The software performs an unexpected operation. <br> Note: Unlike SC990, the software/machine continue to function without requiring any action. | - Incorrect program argument or other parameter <br> - Insufficient working memory |  | This SC is not displayed on the LCD (logged only). | B |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { SC } 997 \\ \text { (CF) } \end{gathered}$ | Application function selection error | - The application selected by the operation panel key does not start or ends abnormally. | - Software (including the software configuration) defective <br> - An option required by the application (RAM, DIMM, board) is not installed | SC 998 | 1. Check the devices necessary for the application program. If necessary devices have not been installed, install them. <br> 2. Check that application programs are correctly configured. <br> 3. Take necessary countermeasures specific to the application program. If the logs can be displayed on the operation panel, see the logs. | B |
| SC 998 | Application start error | No applications start within 60 seconds after the power is turned on. | - Loose connection of RAM-DIMM, ROMDIMM <br> - Defective controller <br> - Software problem |  | 1. Turn the main switch off and on. <br> 2. Check if the RAM-DIMM and ROMDIMM are properly connected. <br> 3. Reinstall the controller system firmware. <br> 4. Replace the controller. | B |



NOTE 1: If a problem always occurs in a specific condition (for example. printer driver setting, image file), the problem may be caused by a software error. In this case, the following data and information needs to be sent back to your product specialist.

- Symptom / Possible Causes / Action taken
- Summary sheet (SP mode '1 Service', [Print Summary])
- SMC All (SP5-990-1)
- Logging (SP5-990-4)
- Printer driver settings used when the problem occurs
- All data displayed on the screen (SC code, error code, and program address where the problem is logged.)
- Image file which causes the problem, if possible


### 4.5 TROUBLESHOOTING GUIDE

### 4.5.1 IMAGE QUALITY

The table below shows the troubleshooting procedure for the following image problems.

- Smeared image for 4C thin lines or White lines in solid image areas
- Dirty background
- Fireflies
- Crow marks
- Image density change
- Toner blasting

$\Rightarrow$| Subject | Symptom | Cause |  |
| :--- | :--- | :--- | :--- |
| Smeared image for 4C <br> thin lines or white lines <br> in solid image areas | 4C thin lines become <br> smeared in the paper feed <br> direction or white lines <br> appear in solid image areas. | Spurs are located just before the fusing <br> section to prevent paper from touching <br> the fusing unit. When paper touches the <br> spurs and the spurs do not rotate, the <br> spurs scratch the mage. | Clean the edges of the spurs and change the <br> position of the spurs as shown below. <br> If 4C thin lines become smeared: |


| Subject | Symptom | Cause | Action |
| :---: | :---: | :---: | :---: |
| Dirty background | Dirty background may continuously appear on the left side (relative to paper feed) under very low temperature and humidity conditions. | When the developer has deteriorated or when prints are made in a very low humidity condition, dirty background may appear continuously. | Perform forced toner refresh mode (SP3-921-1 or 2). <br> The machine automatically does this in the following sequence. (It takes about 20 minutes to complete this mode.) <br> 1. Consumes toner in the development unit without toner supply until toner end is detected. <br> 2. Starts toner recovery mode. <br> 3. Starts process control self-check. <br> NOTE: It takes about 20 minutes to complete this mode, to prevent carrier flowing out. |
|  | Dirty background may intermittently appear with originals that have a high image area ratio after making multiple prints of originals with a low image area ratio. | While making prints with a low image area ratio, the toner-carrier attraction tends to increase. Then, when a large amount of toner is supplied under this condition, the supplied toner cannot be properly charged, causing toner to flow out from the development unit. | Change the settings of the following SP modes: <br> SP3-906-1 Job End Process Control Self-check 200 (Default) to 100 <br> SP3-920-3 OPC Refresh - Prints <br> 200 (Default) to 100 |
| Fireflies | Fireflies may appear with originals that have a high image area ratio after making multiple prints of originals with a low image area ratio. | While making prints with a low image area ratio, developer is agitated with less toner supplied. This may cause some toner to coagulate and harden. Then, when switching over to originals with a high image area ratio, this toner may cause fireflies. | 0 (Default: Disable) to 1 (Enable) <br> During the above mode, toner refresh will automatically be done after job end process control self-check, and will consume the coagulated or overcharged toner. <br> SP3-125-3 Auto TD Adjust <br> Default 0 (Disable) to 1 (Initial process control) <br> Making prints with a low image area ratio causes the toner-carrier attraction to increase, resulting in low image density. Activating the Auto TD Adjustment corrects toner density within the target range; however, it takes up to 6 minutes to complete the self-check and Auto TD Adjustment. |


| Subject | Symptom | Cause | Action |
| :--- | :--- | :--- | :--- | :--- |
| Crow marks | $\begin{array}{l}\text { When making duplex prints in } \\ \text { low temperature and humidity } \\ \text { conditions, crow marks may } \\ \text { appear on black images, } \\ \text { especially in halftone areas } \\ \text { on the 2 } 2^{\text {nd }} \text { side. }\end{array}$ | $\begin{array}{l}\text { A charge is applied to the paper at each } \\ \text { color station in order to attract each } \\ \text { toner onto the paper. Therefore, the } \\ \text { initial toner colors will receive multiple } \\ \text { charging as they pass each station, } \\ \text { which increases the attractive force } \\ \text { between the toner and paper. Since } \\ \text { black is the last toner to be applied, the } \\ \text { attractive force between it and the paper } \\ \text { is lowest. Black toner moves on the } \\ \text { paper during transport to the fusing } \\ \text { section, due to discharge from the toner } \\ \text { to the surrounding guide plates. }\end{array}$ | $\begin{array}{l}\text { Using SP2-301 (Transfer Current), increase the } \\ \text { paper transfer current for black in the mode in } \\ \text { which the problem occurs. }\end{array}$ |
| NOTE: White dotted lines may appear on outputs |  |  |  |
| if the transfer current is increased too |  |  |  |
| much. Therefore, after adjusting the |  |  |  |
| transfer current, it is necessary to check |  |  |  |
| the results by making a solid or halftone |  |  |  |
| image in duplex mode. |  |  |  |$\}$


| Subject | Symptom | Cause | Action |
| :---: | :---: | :---: | :---: |
| Image density change (2) | Image density is too low or high. | If the machine has never been turned off and Energy Saver 2 (Auto Off mode) is disabled, the machine has never performed the initial process control selfcheck, causing the image density to become low or high. | Change the settings of the following SP modes: <br> SP3-906-3 Non-use Time 1 <br> 0 (Default) to 500 <br> SP3-906-4 Non-use Time 2 <br> 30 (Default) to 480 <br> - If Energy Saver 1 is activated (Default: Off), the non-use time process control self-check will not function. Therefore, make sure that Energy Saver 1 is Off (SP5-101-3 or UP mode). <br> - With the above setting, the self-check automatically starts after 500 prints and after no prints have been made for 480 minutes ( 8 hours). Based on the average daily printing volume of 500 prints, self-check would be performed first thing every morning. These settings are suitable for machines, which are used during the day and then kept On in Ready status throughout the night. Therefore, this SP mode should be set based on the particular way the customer uses the printer. |
| Toner blasting | Toner may blast, causing smeared text characters and/or lines in 2C or process black mode (depending on the PDL setting or type of paper used.) | An excessive amount of toner is used for development. | Change the toner limit setting in SP mode. <br> - If toner blasted images appear for text or lines in 2C, decrease the setting for Text from 190\% to 150-170\%. <br> - If toner blasted images for text and lines recognized as pure image data (i.e. not processed as text/line data), decrease the setting for Photo from 260\% to 170-190\%. <br> NOTE: If the toner limit is lowered too much, it may cause the density of shadow areas to be not smooth. |

### 4.5.2 COLOR SHIFT

The following briefly explain the factors causing color shifts and what to do on the machine to correct it:

- Temperature change causes the optical components in the laser optics housing unit to contract, causing the main scan magnification to change. To correct the line position, the machine automatically does the line position adjustment when the temperature changes by $5^{\circ} \mathrm{C}$ since the last position adjustment.
If the line position adjustment functions properly, no color shift occurs. If the line position adjustment fails (result: SP5-993-7), color lines may shift anywhere on the outputs.
- The process speed at each stage (registration roller, transfer belt, and fusing belt/roller) affects the paper transport speed. If the paper transport speed changes during image transfer of a color, the color line being transferred shifts with respect to the color line already transferred to the paper. The registration roller speed (adjusted by color development motor speed) and fusing belt/roller speed (adjusted by black development motor speed) are adjusted by the manufacturer.
Paper speed may slightly change due to the type of paper used or after replacing the parts related to the drive sections of the registration section, transport unit, and fusing unit. (After replacing the fusing unit, the speed adjustment should be done in the User Program mode.) Also, the position where color shift occurs depends on which section starts moving at the incorrect speed.
- Paper skew directly affects the color shift between the front and rear sides. There are several factors. One of them is the position of the side fences.

As explained on the previous page, there are several types of color shift problem. The following table shows the symptoms, factors, action required, and the page to see for details.

|  | Symptom | Factors | Action Required | Refer to \# |
| :---: | :---: | :---: | :---: | :---: |
| 1 | Color shift on entire image in main-scan and/or sub-scan directions | - Line position adjustment does not function properly. <br> - Transfer belt unit has just been replaced. | - Check the result of the line position adjustment (SP5-993-7) and solve the problem if an error was detected. <br> - Check which color lines are shifted from black line and adjust the SP modes for registration and magnification. | Page 4-4 <br> Main-scan <br> Page 4-42/43 <br> Sub-scan <br> Page 40/41 <br> Transfer Unit <br> Page 4-46 |
| 2 | Color shifts only at the leading edge area (sometimes causing shock jitter, magenta or cyan lines) | Registration roller speed is not appropriate. | Adjust the color development motor speed (SP1-004-4, 5, and SP1-005-3) depending on the process speed. | Page 4-40 |
| 3 | Color shifts only at the trailing edge area | Fusing belt/roller speed is not appropriate. | Adjust the black development motor speed (SP1-004-1, 2, and 7, or "Fuser Adjust" in the User Program mode) depending on the process speed. | Page 4-40 |
| 4 | Color shifts between the front and rear sides | Paper skew on transfer belt <br> - Side fences are not properly set. <br> - Pressure between the paper attraction roller and transfer belt is not even at the front and rear sides. | Reposition the side fences. Reposition the paper attraction roller unit. | Page 4-43 |

## Adjustment Standard: Max. $200 \mu m$

As a machine capability, maximum amount of color shift is $200 \mu \mathrm{~m}$. Adjusting the SP modes (motor speed, registration, and magnification) can improve the color shifts level; however, there is a limit.

## Preparation

When color shift is reported, the following procedure should be done before adjusting the machine and/or SP modes.

1. Print out the SMC sheets (SP5-990-2).
2. Do the forced line position adjustment (SP5-993-2 or 'Auto Adjust' in the User Program mode). NOTE: Make sure that the result (SP5-993-7) is "0101". If not, solve the problem by referring to pages 4-2 and 4-3.
3. Print a 1 -dot grid pattern using $\mathrm{A} 3 / 11^{\prime \prime} \times 17^{\prime \prime}$ paper. Refer to the following table for the detailed SP mode settings.

| Mode | SP5-997 (Test Pattern) Setting |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | Tray <br> selection | Pattern | Color mode | Resolution | Paper size <br> (By-pass) |
| Normal, color, 600 dpi | 2 | 05 | Full Color | $600 \times 600$ | - |
| Normal, color, 1200 dpi | 2 | 05 | Full Color | $1200 \times 1200$ | - |
| Thick paper | 0 | 05 | Full Color | $1200 \times 1200$ | A3/11 $\times 17$ |

NOTE: When making prints on thick paper from the by-pass tray, the type of paper should be selected in the User Program mode. Any adjustment needs to be done by using the type of paper which the customer normally uses.
4. Check the tendency of color shift in the grid pattern printed in step 3 . Sometimes, a magnification scope must be used to measure the amount of color shift between colors.
5. Take the required action explained in each section depending on the type of color shift.
6. Do the 'Auto Adjust' in the User Program mode after the adjustment is done in step 5, and check the result.
7. Repeat steps 3 to 6 until the color shift is acceptable.

| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Sub-scan | Leading edge | Color shift, especially 100 mm from the leading edge. <br> pattern 1 on page 4-44 for the symptom) | Registration roller speed is not suitable for the paper used. | Normal Paper <br> 1200 dpi <br> Normal Paper <br> 600 dpi <br> Thick Paper <br> 1200 dpi <br> (by-pass feed) | SP1-004-4 <br> SP1-004-5 <br> SP1-005-3 | Check the magenta line position against the black line. If the registration roller is too fast or slow, the magenta line appears above or below the black line. <br> Above: Speed is too fast: Decrease speed <br> Below: Speed is too slow: Increase Speed <br> When adjusting the speed, change the setting in 0.1 steps, and check the result by printing the grid pattern. Then, repeat this until the shift between magenta and black is minimized. <br> NOTE: If the registration roller is too fast, magenta jitter may appear at 67 mm and/or cyan jitter at 165 mm from the trailing edge. This is caused by the mechanical shock when the trailing edge of the paper passes the registration rollers. |
|  | Trailing edge | Color shift, especially 100 mm from the trailing edge. <br> pattern 2 on page 4-44 for the symptom) | Fusing roller speed is not suitable for the paper used. | Normal Paper <br> 1200 dpi <br> Normal Paper <br> 600 dpi | SP1-004-1 | Check the magenta line position against the black line. If the fusing roller is too fast or slow, the magenta line appears above or below the black line. <br> Above: Speed is too fast: Decrease speed <br> Below: Speed is too slow: Increase Speed <br> When adjusting the speed, change the setting in 0.1 steps, and check the result by printing the grid pattern. Then, repeat this step until the shift between magenta and black is minimized. <br> NOTE: Fusing roller speed can be adjusted with ''Custom Adjust' in Fuser Adjust in the User Program Mode, instead of with SP mode. |
|  |  |  |  | Thick Paper 1200 dpi (by-pass feed) | SP1-004-7 |  |


| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Sub-scan | Entire image | Color shift on the entire image, and the amount of shift from leading to trailing edge is almost the same. | SP mode setting is not suitable for the paper used. | Normal Paper 600 dpi | $\begin{aligned} & \text { SP5-993- } \\ & 016 \text { (Y) } \\ & \text { SP5-993- } \\ & 017 \text { (M) } \\ & \text { SP5-993- } \\ & 018 \text { (C) } \end{aligned}$ | Measure the gap between the black line and other colors (YMC) using a magnification scope. <br> Convert the measured value from [ $\mu \mathrm{m}$ ] to [dots] with the following formula. Then, add or subtract the calculated dot value in the SP mode. <br> Correction [dots] = Measured value [ $\mu \mathrm{m}$ ] / 21.2 or 42.4 |
|  |  |  |  | Normal Paper 1200 dpi | $\begin{aligned} & \text { SP5-993- } \\ & 019 \text { (Y) } \\ & \text { SP5-993- } \\ & 020 \text { (M) } \\ & \text { SP5-993- } \\ & 021 \text { (C) } \end{aligned}$ | 1200 dpi mode: 1 dot $=21.2 \mu \mathrm{~m}$ <br> If color (YMC) has shifted up in relation to black, add the above value to the current value. <br> If color (YMC) has shifted down in relation to black, subtract the above value from the current value. <br> Examples <br> - If the magenta line has shifted up in relation to black by $40 \mu \mathrm{~m}$ in 600 dpi mode, add 1 to the current setting of SP5-993-17. <br> Correction [dots] = +(40/42.4) = Approx. +1 <br> - If the magenta line has shifted down in relation to black by $70 \mu \mathrm{~m}$ in 600 dpi mode, subtract 2 from the current setting of SP5-993-17. <br> Correction [dots] = -(70/42.4) = Approx. -2 |


| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Main-scan | Entire image | Color shifts on the entire image, and the amount of shift differs at front, center, and rear. <br> pattern 3 on page 4-45 for the symptom) | Main-scan magnification is not correctly adjusted. | - | $\begin{aligned} & \text { SP5-993- } \\ & 013 \text { (Y) } \\ & \text { SP5-993- } \\ & 014 \text { (M) } \\ & \text { SP5-993- } \\ & 015 \text { (C) } \end{aligned}$ | Measure the gap between the black line and other colors (YMC) using a magnification scope. <br> Convert the measured value [ mm ] to [\%] with the following formula. Then, add or subtract the calculated value in the SP mode <br> Correction [\%] = Measured value [mm] / $287 \times 10000$ <br> If the color line is enlarged in relation to black, add the correction value to the current setting. <br> If the color line is reduced in relation to black, subtract the correction value from the current setting. <br> NOTE: Line position adjustment (SP5-993-2 or 'Auto Adjust' in User Program mode) should be done to check the result after changing the main-scan magnification data. This is because the changes will affect the line position adjustment. <br> Examples <br> - If the magenta line is enlarged by 0.1 mm in relation to the black line, add " 4 " to the current setting of SP5-993-14. <br> Correction [\%] $=(0.1 / 287) \times 10000=$ Approx. +4 <br> - If the magenta line is reduced by 0.05 mm in relation to the black line, subtract " 2 " from the current setting of SP5-993-14. <br> Correction [\%] $=-(0.05 / 287) \times 10000=$ Approx. -2 |


| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Main-scan | Entire image | Color shifts on the entire image and amount of shifts is almost the same at front, center, and rear sides. <br> pattern 4 on page 4-45 for the symptom) | Main-scan registration is not correctly adjusted. | - | $\begin{aligned} & \text { SP5-993- } \\ & 010 \text { (Y) } \\ & \text { SP5-993- } \\ & 011 \text { (M) } \\ & \text { SP5-993- } \\ & 012 \text { (C) } \end{aligned}$ | Measure the gap between the black line and other colors (YMC) using a magnification scope. <br> Convert the measured value [ $\mu \mathrm{m}$ ] to [dots] with the following formula. Then, add or subtract the calculated dot value in the SP mode. <br> Correction [dots] = Measured value [ $\mu \mathrm{m}$ ] / 21.2 <br> If color (YMC) has shifted to the left in relation to black, add the above value to the current setting. <br> If color (YMC) has shifted to the right in relation to black, subtract the above value from the current setting. <br> Examples <br> - If the magenta line has shifted to the left by $40 \mu \mathrm{~m}$, add 4 to the current setting of SP5-993-011 Correction [dots] = +(40/21.2) = Approx. +2 <br> - If the magenta line has shifted to the right by $70 \mu \mathrm{~m}$, subtract 3 from the current setting of SP5-993-011. Correction [dots] = -(70/21.2) = Approx. -3 |
|  | Front or rear | The amount of color shift at the front and rear sides becomes gradually bigger toward the trailing edge. | - Side fence position <br> - Transfer belt position | - | - | - Check if the side fences of the paper trays are properly positioned. If there is clearance between the paper and the side fences, this causes paper to skew during paper transport. <br> - Check if the transfer belt is in correct position, if the tension springs are properly set, or if the paper attraction roller is properly installed.. <br> (-3.7.4 Transfer Belt in the service manual for the printer mainframe) |

BULLETIN NUMBER: G060/G570-041
09/05/2003
APPLICABLE MODEL:
GESTETNER - DSC38
LANIER - 2138AH
RICOH - AP3800C
SAVIN - SLP38C

## SUBJECT: SERVICE MANUAL - INSERT

The Service Manual pages listed below must be replaced with the pages supplied.

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- 4-24 through 4-52

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| SC No. | Item | Definition | Possible Cause | Related SCs | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 670 | No response from BCU at power on | When the main power is turned on or the machine starts warming up from energy-saving mode, the controller does not receive a command signal from the BCU. | - Loose connection <br> - Defective controller <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the BCU and controller. <br> 3. Replace the controller. <br> 4. Replace the BCU. | CTL |
| SC 680 | BCU/ MUSIC communication error | After the engine CPU sends a message, the Music CPU does not respond within five seconds three consecutive times. | - Toner cartridge memory chip loose connection <br> - Memory chip problem <br> - Memory chip cable wiring problem |  | 1. Turn the main switch off and on. <br> 2. Check if the toner cartridge is installed correctly. <br> 3. Replace the toner cartridge. <br> 4. Check if the harnesses are not damaged. <br> 5. Replace the BCU. |  |
| SC 687 | Memory address command error | The BCU does not receive a memory address command from the controller 60 seconds after paper is in the position for registration. | - Loose connection <br> - Defective controller <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check if the controller is firmly connected to the BCU. <br> 3. Replace the controller. <br> 4. Replace the BCU. |  |
| SC 722 | Finisher jogger motor error | - The jogger fences of the finisher donot return to home position within a specific time. <br> - The finisher jogger motor does not leave home position within a given time. | - Defective jogger H.P. sensor <br> - Loose connection <br> - Defective jogger motor |  | 1. Turn the main switch off and on. <br> 2. Check the connection of jogger H.P. sensor and jogger motor connectors <br> 3. Replace the jogger H.P. sensor. <br> 4. Replace the jogger motor. |  |
| SC 724 | Finisher staple hammer motor error | Stapling does not finish within 150 ms after the staple hammer motor turns on. | - Staple jam <br> - Loose connection <br> - Overload caused by stapling too many pages <br> - Defective staple hammer motor |  | 1. Turn the main switch off and on. <br> 2. Check if the staple hammer motor connector is properly connected. <br> 3. Check if the staple jam occurs. <br> 4. Replace the staple hammer motor. |  |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \hline \text { Related } \\ \text { SCs } \\ \hline \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 725 | Finisher stack feed-out motor error | The stack feed-out belt H.P. sensor does not activate within a specified time after the stack feed-out motor turns on. | - Defective stack feedout H.P. sensor <br> - Loose connection <br> - Stack feed-out motor overload <br> - Defective stack feedout motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the stack feed-out H.P. sensor and motor are properly connected. <br> 3. Replace the stack feed-out H.P. sensor. <br> 4. Replace the stack feed-out motor. |  |
| SC 726 | Finisher shift tray 1 lift motor error | - The upper stack height 1 sensor is activated consecutively (detecting paper) for 15 seconds after the shift tray starts moving up. <br> - The upper stack height sensor 1 is deactivated consecutively (not detecting paper) for 15 seconds after the shift tray starts moving down. <br> - When the upper tray moves from lower paper exit to the upper paper exit, the upper stack height 1 sensor is activated. | - Loose connection <br> - Defective upper stack height 1 sensor <br> - Defective shift tray 1 lift motor <br> - Motor overload |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the upper stack height 1 sensor. <br> 4. Replace the shift tray 1 lift motor. |  |
| SC 727 | Finisher stapler rotation motor error | The stapler cannot return to its home position within a specified time after the stapler rotation motor starts rotating. | - Loose connection <br> - Defective stapler rotation motor <br> - Motor overload |  | 1. Turn the main switch off and on. 2. Check if the stapler rotation motor connector is properly connected. <br> 3. Replace the stapler rotation motor. |  |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 729 | Finisher punch motor error | The punch home position is not detected within 250 ms after the punch clutch turns on. | - Loose connection <br> - Defective punch H.P. sensor <br> - Defective punch clutch <br> - Defective punch hole motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of sensor, clutch and/or motor are properly connected. <br> 3. Replace the punch H.P. sensor. <br> 4. Replace the punch clutch. <br> 5. Replace the punch hole motor. |  |
| SC 730 | Finisher stapler motor error | The stapler home position is not detected within a specified time after the staple motor turns on. | - Loose connection <br> - Defective stapler H.P. sensor <br> - Defective stapler motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the stapler H.P. sensor. <br> 4. Replace the stapler motor. |  |
| SC 731 | Finisher exit guide plate motor error | The exit guide plate open sensor is not activated within a specified time after the exit guide plate motor turns on. | - Loose connection <br> - Defective exit guide plate open sensor <br> - Defective exit guide plate motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the exit guide plate open sensor. <br> 4. Replace the exit guide plate motor. |  |
| SC 732 | Finisher tray 1 shift motor error | Tray 1 home position is not detected within a specified time after the tray 1 shift motor turns on. | - Loose connection <br> - Defective tray shift 1 sensor <br> - Defective tray 1 shift motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the tray shift 1 sensor. <br> 4. Replace the tray 1 shift motor. |  |
| SC 733 | Finisher tray 2 lift motor error | - The lower stack height 1 sensor is activated consecutively (detecting paper) for 15 seconds after the shift tray starts moving up. <br> - The lower stack height sensor 1 is deactivated consecutively (not detecting paper) for 15 seconds after the shift tray starts moving down. | - Loose connection <br> - Defective lower stack height 1 sensor <br> - Defective tray 2 lift motor <br> - Motor overload |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the lower stack height 1 sensor. <br> 4. Replace the tray 2 lift motor. |  |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 734 | Finisher tray 2 shift motor error | Tray 2 home position is not detected within a specified time after the tray 2 shift motor turns on. | - Loose connection <br> - Defective tray shift 2 sensor <br> - Defective tray 2 shift motor |  | 1. Turn the main switch off and on. <br> 2. Check if the connectors of the sensor and motor are properly connected. <br> 3. Replace the tray shift 2 sensor. <br> 4. Replace the tray 2 shift motor. |  |
| SC 818 | Watch-dog error | While the system program is running, other processes do not operate at all. | - Defective controller <br> - Software error |  | 1. Turn the main switch off and on. <br> 2. Replace the controller. <br> 3. See NOTE 1 at the end of the SC table | CTL |
| SC 819 | Fatal error |  |  |  |  |  |
| [696E] | Process error | System completely down | - Defective RAM DIMM <br> - Defective ROM DIMM <br> - Defective controller <br> - Software error | 1. Turn the main switch off and on. <br> 2. Check and/or replace the RAM DIMM. <br> 3. Check and/or replace the ROM DIMM. <br> 4. Replace the controller. <br> 5. See NOTE at the end of the SC table. |  | CTL |
| [766D] | Memory error | Unexpected system memory size |  |  |  |  |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC820 | Self-diagnostics error: CPU [XXXX]: Detailed error code |  |  |  |  |  |
| $\begin{array}{\|l\|} \hline[0001] \\ \text { to } \\ {[06 F F]} \end{array}$ | CPU error | During the self-diagnostic, the controller CPU detects an error. There are 47 types of error code (0001 to 4005) depending on the cause of the error. The CPU detects an error and displays the specific error code with the program address where the error occurs). | - System firmware problem <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Reinstall the controller system firmware. <br> 3. Replace the controller. <br> When the problem cannot be fixed with the above procedure, the following information displayed on the screen needs to be fed back to a technical support center. <br> - SC code <br> - Detailed error code <br> - Program address | CTL |
| $\begin{aligned} & {[0702]} \\ & {[0709]} \\ & {[070 A]} \end{aligned}$ | CPU/Memory Error |  | - System firmware problem <br> - Defective RAM-DIMM <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Reinstall the controller system software. <br> 3. Replace the RAM-DIMM. <br> 4. Replace the controller. | CTL |
| $\begin{array}{\|l} \hline[0801] \\ \text { to } \\ {[4005]} \\ \hline \end{array}$ | CPU error | Same as [0001] |  |  |  | CTL |
| $\begin{aligned} & \text { SC 821 } \\ & \text { [OD05] } \end{aligned}$ | Self-diagnosis error: ASIC | The CPU checks if the ASIC timer works properly compared with the CPU timer. If the ASIC timer does not function in the specified range, this SC code is displayed. | - System firmware problem <br> - Defective RAM-DIMM <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Reinstall the controller system firmware. <br> 3. Replace the RAM-DIMM. <br> 4. Replace the controller board. | CTL |


| SC No. | Item | Definition | Possible Cause | $\begin{aligned} & \hline \text { Related } \\ & \text { SCs } \end{aligned}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC822 | Self-diagnostic error: HDD (Hard Disk Drive) [ |  | [ XXXX ]: Detailed error code |  |  |  |
| [3003] | Timeout error | When the main switch is turned on or starting the selfdiagnostic, the HDD stays busy for the specified time or more. | - Loose connection <br> - Defective HDD <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Check that the HDD is properly connected to the controller. <br> 3. Replace the HDD. <br> 4. Replace the controller. | CTL |
| [3004] | Command error |  |  |  |  |  |
| SC 823 | Self-diagnostic error: NIB [XXXX]: Detailed error code |  |  |  |  |  |
| [6101] | MAC address check sum error | The result of the MAC address check sum does not match the check sum stored in ROM. | - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Replace the controller. | CTL |
| [6104] | PHY IC error | The PHY IC on the controller cannot be properly recognized. |  |  |  |  |
| [6105] | PHY IC loopback error | An error occurred during the loop-back test for the PHY IC on the controller. |  |  |  |  |
| $\begin{aligned} & \text { SC } 824 \\ & \text { [1401] } \end{aligned}$ | Self-diagnosis error: <br> Standard <br> NVRAM | The controller cannot recognize the standard NVRAM installed or detects that the NVRAM is defective. | - Loose connection <br> - Defective standard NVRAM <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Check the standard NVRAM is firmly inserted into the socket. <br> 3. Replace the NVRAM. <br> Replace the controller. | CTL |
| SC 827 | Self-diagnostic error: Standard SRAM DIMM [XXXX]: Detailed error code |  |  |  |  |  |
| [0201] | Verification error | Error detected during a write/verify check for the standard RAM (SRAM DIMM). | - Loose connection <br> - Defective SRAM DIMM <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Replace the SRAM DIMM. <br> 3. Replace the controller. | CTL |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 828 | Self-diagnostic error : ROM [XXXX]: Detailed error code |  |  |  |  |  |
| [0101] | Check sum error 1 | The boot monitor and OS program stored in the ROM DIMM is checked. If the check sum of the program is incorrect, this SC code is displayed. | - Defective ROM DIMM <br> - Defective controller |  | 1. Turn the main switch on and off. <br> 2. Replace the ROM DIMM <br> 3. Replace the controller. | CTL |
| [0104] | Check sum error 2 | All areas of the ROM DIMM are checked. If the check sum of all programs stored in the ROM DIMM is incorrect, this SC code is displayed. |  |  |  |  |
| [0105] | ROM error | The ROM DIMM is not of the recognized type. |  |  |  |  |
| SC829 | Self-diagnosis error: optional RAM [XXXX]: Detailed error code |  |  |  |  |  |
| [0302] | Composition error (Slot 0) | The result of checking the composition data of the RAM in Slot 0 (CN5) on the controller is incorrect. | - Not specified RAM DIMM installed <br> - Defective RAM DIMM |  | 1. Turn the main switch off and on. <br> 2. Replace the RAM DIMM. <br> 3. Replace the controller board. | CTL |
| [0401] | Verification error (Slot 1) | The data stored in the RAM in Slot 1 does not match the data when reading. |  |  |  |  |
| [0402] | Composition error (Slot 1) | The result of checking the composition data of the RAM in Slot 1 (CN6) on the controller is incorrect. |  |  |  |  |
| $\begin{aligned} & \hline \text { SC } 833 \\ & \text { [OF21] } \end{aligned}$ | Self-diagnostic error: I/F error | The controller detects that the BCU is not properly connected. | - Loose connection <br> - Defective controller <br> - Defective BCU |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the BCU and controller. <br> 3. Replace the controller. <br> 4. Replace the BCU | CTL |


| SC No. | Item | Definition | Possible Cause | $\begin{gathered} \hline \text { Related } \\ \text { SCs } \end{gathered}$ | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 835 | Self-diagnosis error: Centronics interface [XXXX]: Detailed error code |  |  |  |  |  |
| [1102] | Verification error | The controller detects that the loop-back connector is not properly connected. | - Loose connection <br> - Defective loop-back connector <br> - Defective Centronics connector <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the Centronics connector and loop-back connector. <br> 3. Reconnect the loop-back connector. <br> 4. Replace the controller. | CTL |
| [110C] | DMA verification error | A DMA data abnormality is detected even when the loopback connector is properly set. |  |  |  |  |
| [1120] | Loop-back connector error | The loop-back connector is not set when starting the detailed self-diagnostics. |  |  |  |  |
| $\begin{aligned} & \text { SC } 836 \\ & {[1601]} \end{aligned}$ | Self-diagnosis error: Font ROM (standard) | The data in the font ROM (standard ROM-DIMM) is damaged. . | - Defective standard ROM-DIMM |  | 1. Turn the main switch off and on. <br> 2. Replace the standard ROM-DIMM. | CTL |
| $\begin{aligned} & \text { SC 837 } \\ & {[1602]} \end{aligned}$ | Self-diagnosis error: Font ROM (option) | The data in the font ROM (optional ROM-DIMM) is damaged. | - Defective optional ROM-DIMM |  | 1. Turn the main switch off and on. <br> 2. Replace the optional ROM-DIMM. | CTL |
| SC 850 | Network interface error | The network is unusable. | - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Replace the controller. | CTL |
| SC 851 | IEEE1394 interface error | The 1394 interface is unusable. | - Defective IEEE1394 <br> - Defective controller. |  | 1. Turn the main switch off and on. <br> 2. Replace the IEEE1394 interface board. <br> 3. Replace the controller. | CTL |
| SC 860 | HDD: <br> Initialization error | The controller detects that the hard disk fails. | - HDD not initialized <br> - Defective HDD |  | 1. Turn the main switch off and on. <br> 2. Reformat the HDD. <br> 3. Replace the HDD. | CTL |
| SC 861 | HDD: Reboot error | The HDD does not become ready within 30 seconds after the power is supplied to the HDD. | - Loose connection <br> - Defective cables <br> - Defective HDD <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the HDD and controller. <br> 3. Check and replace the cables. <br> 4. Replace the HDD. <br> 5. Replace the controller. | CTL |


| SC No. | Item | Definition | Possible Cause | Related SCs | Troubleshooting Procedure | Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SC 863 | HDD: Read error | The data stored in the HDD cannot be read correctly. | - Defective HDD <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Replace the HDD. <br> 3. Replace the controller. | CTL |
| SC 864 | HDD: CRC error | While reading data from the HDD or storing data in the HDD, data transmission fails. | - Defective HDD |  | 1. Turn the main switch off and on. <br> 2. Replace the HDD. | CTL |
| SC 865 | HDD: Access error | An error is detected while operating the HDD. | - Defective HDD |  | 1. Turn the main switch off and on. <br> 2. Replace the HDD. | CTL |
| SC 900 | Electric counter error | Abnormal data is stored in the counters. | - Defective NVRAM <br> - Defective controller |  | 1. Turn the main switch off and on. <br> 2. Check the connection between the NVRAM and controller. <br> 3. Replace the NVRAM. <br> 4. Replace the controller. | CTL |
| SC 990 | Software performance error | The software makes an unexpected operation. | - Defective software <br> - Defective controller <br> - Software error |  | 1. Turn the main switch off and on. <br> 2. Reinstall the controller and/or engine main firmware. <br> 3. See NOTE 1 at the end of the SC table. | CTL |
| SC 991 | Software Performance Error - Logged | The software performs an unexpected operation. <br> Note: Unlike SC990, the software/machine continue to function without requiring any action. | - Incorrect program argument or other parameter <br> - Insufficient working memory |  | This SC is not displayed on the LCD (logged only). | CTL |
| SC 998 | Application start error | No applications start within 60 seconds after the power is turned on. | - Loose connection of RAM-DIMM, ROMDIMM <br> - Defective controller <br> - Software problem |  | 1. Turn the main switch off and on. <br> 2. Check if the RAM-DIMM and ROMDIMM are properly connected. <br> 3. Reinstall the controller system firmware. <br> 4. Replace the controller. | CTL |
| SC 999 | Firmware error | See G570 SM page 4-43 for description of SC 999 |  |  |  |  |

NOTE 1: If a problem always occurs in a specific condition (for example. printer driver setting, image file), the problem may be caused by a software error. In this case, the following data and information needs to be sent back to your product specialist.

- Symptom / Possible Causes / Action taken
- Summary sheet (SP mode '1 Service', [Print Summary])
- SMC All (SP5-990-002)
- Logging (SP5-990-004)
- Printer driver settings used when the problem occurs
- All data displayed on the screen (SC code, error code, and program address where the problem is logged.)
- Image file which causes the problem, if possible


### 4.4 TROUBLESHOOTING GUIDE

### 4.4.1 IMAGE QUALITY

The table below shows the troubleshooting procedure for the following image problems.

- Smeared image for 4C thin lines or White lines in solid image areas
- Dirty background
- Fireflies
- Crow marks
- Image density change
- Toner blasting

| Subject | Symptom | Cause | Action |
| :--- | :--- | :--- | :--- |
| Smeared image for 4C <br> thin lines or white lines <br> in solid image areas | 4C thin lines become <br> smeared in the paper feed <br> direction or white lines <br> appear in solid image areas. | Spurs are located just before the fusing <br> section to prevent paper from touching <br> the fusing unit. When paper touches the <br> spurs and the spurs do not rotate, the <br> spurs scratch the mage. | Clean the edges of the spurs and change the <br> position of the spurs as shown below. <br> If 4C thin lines become smeared: |


| Subject | Symptom | Cause |  |
| :--- | :--- | :--- | :--- |
| Dirty background | $\begin{array}{l}\text { Dirty background may } \\ \text { continuously appear on the } \\ \text { left side (relative to paper } \\ \text { feed) under very low } \\ \text { temperature and humidity } \\ \text { conditions. }\end{array}$ | $\begin{array}{l}\text { When the developer has deteriorated or } \\ \text { when prints are made in a very low } \\ \text { humidity condition, dirty background may } \\ \text { appear continuously. }\end{array}$ | $\begin{array}{l}\text { Action } \\ \text { Perform forced toner refresh mode (SP3-921-001 }\end{array}$ |
| The machine automatically does this in the |  |  |  |
| following sequence. (It takes about 20 minutes to |  |  |  |
| complete this mode.) |  |  |  |
| 1. Consumes toner in the development unit |  |  |  |
| without toner supply until toner end is detected. |  |  |  |$\}$


| Subject | Symptom | Cause | Action |
| :---: | :---: | :---: | :---: |
| Crow marks | When making duplex prints in low temperature and humidity conditions, crow marks may appear on black images, especially in halftone areas on the $2^{\text {nd }}$ side. | A charge is applied to the paper at each color station in order to attract each toner onto the paper. Therefore, the initial toner colors will receive multiple charging as they pass each station, which increases the attractive force between the toner and paper. Since black is the last toner to be applied, the attractive force between it and the paper is lowest. Black toner moves on the paper during transport to the fusing section, due to discharge from the toner to the surrounding guide plates. | Using SP2-301 (Transfer Current), increase the paper transfer current for black in the mode in which the problem occurs. <br> NOTE: White dotted lines may appear on outputs if the transfer current is increased too much. Therefore, after adjusting the transfer current, it is necessary to check the results by making a solid or halftone image in duplex mode. |
| Image density change (1) | When the machine is tuned on in the morning (having been unused for a while), the ID of the initial outputs may be relatively low or high, in which case the machine needs to compensate by raising or lowering the ID during machine operation. | When the machine is off, the environmental conditions can begin to affect the machine's development capability. When the main switch is tuned on, the machine starts a process control self-check and adjusts the development parameters to achieve the proper development potential gap without adjusting the toner concentration. Over the course of the print operation, the ID will then get closer and closer to the target level. | If this is often pointed out by users who are very particular about image density, turn on Auto TD Adjustment (SP3-125-003) as a solution. <br> NOTE: It takes about 5 minutes to complete the self-check. |


| Subject | Symptom | Cause | Action |
| :---: | :---: | :---: | :---: |
| Image density change (2) | Image density is too low or high. | If the machine has never been turned off and Energy Saver 2 (Auto Off mode) is disabled, the machine has never performed the initial process control selfcheck, causing the image density to become low or high. | Change the settings of the following SP modes: <br> SP3-906-003 Non-use Time 1 <br> 0 (Default) to 500 <br> SP3-906-004 Non-use Time 2 <br> 30 (Default) to 480 <br> - If Energy Saver 1 is activated (Default: Off), the non-use time process control self-check will not function. Therefore, make sure that Energy Saver 1 is Off (SP5-101-3 or UP mode). <br> - With the above setting, the self-check automatically starts after 500 prints and after no prints have been made for 480 minutes ( 8 hours). Based on the average daily printing volume of 500 prints, self-check would be performed first thing every morning. These settings are suitable for machines, which are used during the day and then kept On in Ready status throughout the night. Therefore, this SP mode should be set based on the particular way the customer uses the printer. |
| Toner blasting | Toner may blast, causing smeared text characters and/or lines in 2C or process black mode (depending on the PDL setting or type of paper used.) | An excessive amount of toner is used for development. | Change the toner limit setting in SP mode. <br> - If toner blasted images appear for text or lines in 2C, decrease the setting for Text from 190\% to 150-170\%. <br> - If toner blasted images for text and lines recognized as pure image data (i.e. not processed as text/line data), decrease the setting for Photo from 260\% to 170-190\%. <br> NOTE: If the toner limit is lowered too much, it may cause the density of shadow areas to be not smooth. |

### 4.4.2 COLOR SHIFT

The following briefly explain the factors causing color shifts and what to do on the machine to correct it:

- Temperature change causes the optical components in the laser optics housing unit to contract, causing the main scan magnification to change. To correct the line position, the machine automatically does the line position adjustment when the temperature changes by $5^{\circ} \mathrm{C}$ since the last position adjustment. If the line position adjustment functions properly, no color shift occurs. If the line position adjustment fails (result: SP5-993-007), color lines may shift anywhere on the outputs.
- The process speed at each stage (registration roller, transfer belt, and fusing belt/roller) affects the paper transport speed. If the paper transport speed changes during image transfer of a color, the color line being transferred shifts with respect to the color line already transferred to the paper. The registration roller speed (adjusted by color development motor speed) and fusing belt/roller speed (adjusted by black development motor speed) are adjusted by the manufacturer.
Paper speed may slightly change due to the type of paper used or after replacing the parts related to the drive sections of the registration section, transport unit, and fusing unit. (After replacing the fusing unit, the speed adjustment should be done in the User Program mode.) Also, the position where color shift occurs depends on which section starts moving at the incorrect speed.
- Paper skew directly affects the color shift between the front and rear sides. There are several factors. One of them is the position of the side fences.

As explained on the previous page, there are several types of color shift problem. The following table shows the symptoms, factors, action required, and the page to see for details.

|  | Symptom | Factors | Action Required | Refer to \# |
| :---: | :---: | :---: | :---: | :---: |
| 1 | Color shift on entire image in main-scan and/or sub-scan directions | - Line position adjustment does not function properly. <br> - Transfer belt unit has just been replaced. | - Check the result of the line position adjustment (SP5-993-007) and solve the problem if an error was detected. <br> - Check which color lines are shifted from black line and adjust the SP modes for registration and magnification. | Page 4-4 <br> Main-scan <br> Page 4-42/43 <br> Sub-scan <br> Page 40/41 <br> Transfer Unit <br> Page 4-46 |
| 2 | Color shifts only at the leading edge area (sometimes causing shock jitter, magenta or cyan lines) | Registration roller speed is not appropriate. | Adjust the color development motor speed (SP1-004-4, 5, and SP1-005-003) depending on the process speed. | Page 4-40 |
| 3 | Color shifts only at the trailing edge area | Fusing belt/roller speed is not appropriate. | Adjust the black development motor speed (SP1-004-001, 002, and 007, or "Fuser Adjust" in the User Program mode) depending on the process speed. | Page 4-40 |
| 4 | Color shifts between the front and rear sides | Paper skew on transfer belt <br> - Side fences are not properly set. <br> - Pressure between the paper attraction roller and transfer belt is not even at the front and rear sides. | Reposition the side fences. Reposition the paper attraction roller unit. | Page 4-43 |

## Adjustment Standard: Max. $200 \mu m$

As a machine capability, maximum amount of color shift is $200 \mu \mathrm{~m}$. Adjusting the SP modes (motor speed, registration, and magnification) can improve the color shifts level; however, there is a limit.

## Preparation

When color shift is reported, the following procedure should be done before adjusting the machine and/or SP modes.

1. Print out the SMC sheets (SP5-990-002).
2. Do the forced line position adjustment (SP5-993-002 or 'Auto Adjust' in the User Program mode).

NOTE: Make sure that the result (SP5-993-007) is "0101". If not, solve the problem by referring to pages 4-2 and 4-3.
3. Print a 1 -dot grid pattern using $\mathrm{A} 3 / 11$ " $\times 17^{\prime \prime}$ paper. Refer to the following table for the detailed SP mode settings.

| Mode | SP5-997 (Test Pattern) Setting |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | Tray <br> selection | Pattern | Color mode | Resolution | Paper size <br> (By-pass) |
| Normal, color, 600 dpi | 2 | 05 | Full Color | $600 \times 600$ | - |
| Normal, color, 1200 dpi | 2 | 05 | Full Color | $1200 \times 1200$ | - |
| Thick paper | 0 | 05 | Full Color | $1200 \times 1200$ | A3/11x17 |

NOTE: When making prints on thick paper from the by-pass tray, the type of paper should be selected in the User Program mode. Any adjustment needs to be done by using the type of paper which the customer normally uses.
4. Check the tendency of color shift in the grid pattern printed in step 3. Sometimes, a magnification scope must be used to measure the amount of color shift between colors.
5. Take the required action explained in each section depending on the type of color shift.
6. Do the 'Auto Adjust' in the User Program mode after the adjustment is done in step 5, and check the result.
7. Repeat steps 3 to 6 until the color shift is acceptable.

| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Sub-scan | Leading edge | Color shift, especially 100 mm from the leading edge. <br> (Refer to pattern 1 on page 4-44 for the symptom.) | Registration roller speed is not suitable for the paper used. | Normal Paper <br> 1200 dpi$\|$Normal Paper <br> 600 dpi <br> Thick Paper <br> 1200 dpi <br> (by-pass feed) | SP1-004- <br> 004 <br> SP1-004- <br> 005 <br> SP1-005- <br> 003 | Check the magenta line position against the black line. If the registration roller is too fast or slow, the magenta line appears above or below the black line. <br> Above: Speed is too fast: Decrease speed <br> Below: Speed is too slow: Increase Speed <br> When adjusting the speed, change the setting in 0.1 steps, and check the result by printing the grid pattern. Then, repeat this until the shift between magenta and black is minimized. <br> NOTE: If the registration roller is too fast, magenta jitter may appear at 67 mm and/or cyan jitter at 165 mm from the trailing edge. This is caused by the mechanical shock when the trailing edge of the paper passes the registration rollers. |
|  | Trailing edge | Color shift, especially 100 mm from the trailing edge. <br> (Refer to pattern 2 on page 4-44 for the symptom.) | Fusing roller speed is not suitable for the paper used. | Normal Paper <br> 1200 dpi <br> Normal Paper <br> 600 dpi | $\begin{array}{\|l\|} \hline \begin{array}{l} \text { SP1-004- } \\ 001 \end{array} \\ \hline \begin{array}{l} \text { SP1-004- } \\ 002 \end{array} \\ \hline \end{array}$ | Check the magenta line position against the black line. If the fusing roller is too fast or slow, the magenta line appears above or below the black line. <br> Above: Speed is too fast: Decrease speed <br> Below: Speed is too slow: Increase Speed <br> When adjusting the speed, change the setting in 0.1 steps, and check the result by printing the grid pattern. Then, repeat this step until the shift between magenta and black is minimized. <br> NOTE: Fusing roller speed can be adjusted with ''Custom Adjust' in Fuser Adjust in the User Program Mode, instead of with SP mode. |
|  |  |  |  | Thick Paper <br> 1200 dpi <br> (by-pass feed) | $\begin{aligned} & \text { SP1-004- } \\ & 007 \end{aligned}$ |  |


| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Sub-scan | Entire image | Color shift on the entire image, and the amount of shift from leading to trailing edge is almost the same. | SP mode setting is not suitable for the paper used. | Normal Paper 600 dpi | $\begin{aligned} & \text { SP5-993- } \\ & 016 \text { (Y) } \\ & \text { SP5-993- } \\ & 017 \text { (M) } \\ & \text { SP5-993- } \\ & 018 \text { (C) } \end{aligned}$ | Measure the gap between the black line and other colors (YMC) using a magnification scope. <br> Convert the measured value from $[\mu \mathrm{m}]$ to [dots] with the following formula. Then, add or subtract the calculated dot value in the SP mode. <br> Correction [dots] = Measured value [ $\mu \mathrm{m}$ ] / 21.2 or 42.4 600 dpi mode: 1 dot $=42.4 \mu \mathrm{~m}$ |
|  |  |  |  | Normal Paper 1200 dpi | $\begin{aligned} & \text { SP5-993- } \\ & 019 \text { (Y) } \end{aligned}$ | 1200 dpi mode: 1 dot $=21.2 \mu \mathrm{~m}$ |
|  |  |  |  |  | $\begin{aligned} & \text { SP5-993- } \\ & 020 \text { (M) } \end{aligned}$ | above value to the current value. |
|  |  |  |  |  | $\begin{aligned} & \text { SP5-993- } \\ & 021 \text { (C) } \end{aligned}$ | subtract the above value from the current value. <br> Examples |
|  |  |  |  |  |  | - If the magenta line has shifted up in relation to black by $40 \mu \mathrm{~m}$ in 600 dpi mode, add 1 to the current setting of SP5-993-017. <br> Correction [dots] = +(40/42.4) = Approx. +1 <br> - If the magenta line has shifted down in relation to black by $70 \mu \mathrm{~m}$ in 600 dpi mode, subtract 2 from the current setting of SP5-993-17. <br> Correction [dots] $=-(70 / 42.4)=$ Approx. -2 |


| Direction | Area | Symptom | Possible Cause | Action Required |  | Procedure / Remarks |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Output Mode | SP Mode |  |
| Main-scan | Entire image | Color shifts on the entire image, and the amount of shift differs at front, center, and rear. <br> (Refer to pattern 3 on page 4-45 for the symptom.) | Main-scan magnification is not correctly adjusted. | - | $\begin{aligned} & \text { SP5-993- } \\ & 013 \text { (Y) } \\ & \text { SP5-993- } \\ & 014 \text { (M) } \\ & \text { SP5-993- } \\ & 015 \text { (C) } \end{aligned}$ | Measure the gap between the black line and other colors (YMC) using a magnification scope. <br> Convert the measured value [ mm ] to [\%] with the following formula. Then, add or subtract the calculated value in the SP mode <br> Correction [\%] = Measured value [mm] / $287 \times 10000$ <br> If the color line is enlarged in relation to black, add the correction value to the current setting. <br> If the color line is reduced in relation to black, subtract the correction value from the current setting. <br> NOTE: Line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program mode) should be done to check the result after changing the main-scan magnification data. This is because the changes will affect the line position adjustment. <br> Examples <br> - If the magenta line is enlarged by 0.1 mm in relation to the black line, add "4" to the current setting of SP5-993-014. <br> Correction [\%] $=(0.1 / 287) \times 10000=$ Approx. +4 <br> - If the magenta line is reduced by 0.05 mm in relation to the black line, subtract " 2 " from the current setting of SP5-993-014. <br> Correction [\%] $=-(0.05 / 287) \times 10000=$ Approx. -2 |



## How to measure the gap between color lines

When using a magnification scope, measure the gap $[A]$ between the two lines. Measure from the same place on each line. For example (see the illustration), measure between the left edges of the lines.


## Pattern 1

Color shift in the sub-scan direction at the leading edge

This illustration shows that the colored (dotted) line is above the black line. This means that the registration roller speed is too high for the paper used. Therefore, the registration roller speed needs to be reduced by decreasing the setting (percentage) of SP1-004-004, 005, and SP1-005-003 depending on the mode selected.

- SP1-004-004 Normal paper, Color mode, $1200 \mathrm{dpi}(62.5 \mathrm{~mm} / \mathrm{s})$

- SP1-004-005 Normal Paper,

Color mode, $600 \mathrm{dpi}(125 \mathrm{~mm} / \mathrm{s})$

- SP1-005-003 Thick Paper ( $62.5 \mathrm{~mm} / \mathrm{s}$ )


## Pattern 2

Color shift in the sub-scan direction at the trailing edge
This illustration shows that the colored (dotted) line is above the black line. This means that the fusing roller speed is too high for the paper used. Therefore, the fusing roller speed needs to be slower by decreasing the setting (percentage) of SP1-004-001, 002, or 007 depending on the mode selected.

- SP1-004-001 Normal paper,
 Color mode, $1200 \mathrm{dpi}(62.5 \mathrm{~mm} / \mathrm{s})$
- SP1-004-002 Normal Paper, Color mode, $600 \mathrm{dpi}(125 \mathrm{~mm} / \mathrm{s})$
- SP1-004-007 Thick Paper ( $62.5 \mathrm{~mm} / \mathrm{s}$ )


## Pattern 3

Color shift (magnification change) in the main-scan direction

Fig. 1 and 2 show that the colored (dotted line) has shifted away from the black line and the amount of shift differs at the front, center, and rear. Both Fig. 1 and Fig. 2 show the color grid is larger than the black grid. Yellow becomes larger from left to right in Fig. 1, but cyan and magenta become larger from right to left. This is because the laser writing direction for $\mathrm{B} \& \mathrm{Y}$ is different from $\mathrm{C} \& \mathrm{M}$.

Fig. 1 (Yellow)


## Pattern 4

Color shift (registration) in the mainscan direction

Colored line shifts in the main-scan direction and the amount of shift is the same at left, center, and right.
This is caused by incorrect color registration.

Fig. 2 (Cyan \& Magenta)


Trouble-
shooting


### 4.4.3 COLOR SHIFT AFTER TRANSFER UNIT REPLACEMENT

If the color shift level is not within the target range (max $200 \mu \mathrm{~m}$ ) after replacing the transfer unit and performing the forced line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program Mode), follow the procedure explained below.

## Check the color shift level

1. Make sure that OPC Refresh (SP3-920-005) has been done.
2. Print out the SMC sheets (SP5-990-002).
3. Print a 1 -dot grid pattern using $\mathrm{A} 3 / 11$ "x17" paper. Refer to the following table for detailed SP mode settings.

| Mode | SP5-997 (Test Pattern) Setting |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | Tray <br> selection | Pattern | Color mode | Resolution | Paper size <br> (By-pass) |
| Normal, color, 600 dpi | 2 | 05 | Full Color | $600 \times 600$ | - |
| Normal, color, 1200 dpi | 2 | 05 | Full Color | $1200 \times 1200$ | - |

NOTE: Any adjustment needs to be done by using the paper type which the customer normally uses.
4. Check the tendency of color shift in the grid pattern printed in step 3.

Sometimes, a magnification scope must be used to measure the amount of color shift between colors.
5. If the result is not within the target, go to the next step.

## Fusing/ Registration Roller Speed Adjustment

## SP mode (sub-scan registration) reset

1. Make sure that the SMC sheets (SP5-990-002) have been printed out.
2. Reset the setting of SP5-993-016 to 021 to " 0 ".

## Transfer belt aging

1. Remove all PCUs. Place them on clean sheets of paper and cover the drums with a few sheets of paper to prevent the drums from light fatigue. Then, secure the drum positioning plate ( 2 screws) and return the transfer unit release lever to the original position.
2. Perform the transfer belt idling with SP5-804-074 (Drum M H CW) for about 3 minutes. (This is to stabilize the transfer belt side-to-side movement.)
3. Reinstall the PCUs.
4. Perform the line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program mode).
5. Print a 1-dot grid pattern using $\mathrm{A} 3 / 11$ "x17" paper in 600 dpi mode.
6. If the color shift in the main-scan direction is not within the adjustment standard, follow the troubleshooting guide.

## Fusing roller speed adjustment

1. Perform the line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program mode).
2. Print a 1-dot grid pattern for each of the following modes using $\mathrm{A} 3 / 11$ " x 17 " paper.
(1) Normal, 600 dpi
(2) Normal, 1200 dpi
(3) Thick, 1200 dpi
3. If the color has shifted within 100 mm from the trailing edge, follow the troubleshooting procedure (Sub-scan/Trailing edge).
NOTE: Instead of steps 2 to 3 , you can adjust the fusing roller speed in the User Program mode (Maintenance/Fuser Adjust/Custom Adjust).

## Registration roller speed adjustment (for color mode)

1. Perform the line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program mode).
2. Print a 1-dot grid pattern for each of the following modes using $A 3 / 11$ " $x 17$ " paper.
(1) Normal, 600 dpi
(2) Normal, 1200 dpi
3. If the color has shifted within 100 mm from the leading edge, follow the troubleshooting procedure (Sub-scan/Leading edge).
NOTE: The registration roller speed for by-pass paper feed is the same as for normal 1200 dpi mode.

## Line position fine adjustment for sub-scan

1. Print a 1-dot grid pattern each for each of the following modes using A3/11"x17" paper.

| Mode | SP5-997 (Test Pattern) Setting |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | Tray <br> selection | Pattern | Color <br> mode | Resolution | Paper size <br> (By-pass) |
| Normal, color, 600 dpi | 2 | 05 | Full Color | $600 \times 600$ | - |
| Normal, color, 1200 dpi | 2 | 05 | Full Color | $1200 \times 1200$ | - |
| Thick paper | 0 | 05 | Full Color | $1200 \times 1200$ | A3/11x17 |

2. Check if there is any color which has shifted from the black line by the same amount all the way down the page from leading to trailing edge. If there is, follow the troubleshooting procedure (Sub-scan/Whole image).

## Registration roller speed adjustment (For B\&W mode)

1. Input the following values in the SP modes.

SP1-004-006 $=($ Value of SP1-004-005 $)$
SP1-005-002 $=($ Value of SP1-004-005 $)-0.2 \%$
2. Print a 2-dot pattern (pattern 12) using $\mathrm{A} 3 / 11$ " $\times 17$ " paper.

| Mode | SP5-997 (Test Pattern) Setting |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  | Tray <br> selection | Pattern | Single <br> Color | Color Mode | Resolution |
| Normal color 600 dpi | 2 | 12 | 6 (Black) | Single Color | $600 \times 600$ |

3. Depending on the paper used, a horizontal band may appear at $60 \mathrm{~mm}(2.76$ ") from the leading edge on A3 (11"x17") paper. If the horizontal band is observed on the 2-dot pattern, decrease the setting of SP1-004-006 in 0.1\% steps until the problem is solved.

### 4.5 ELECTRICAL COMPONENT DEFECTS

### 4.5.1 SENSORS

| Component | CN | Condition | Symptom |
| :---: | :---: | :---: | :---: |
| LD H.P. sensor | 220-B12 | Open | SC261 |
|  |  | Shorted | SC260 |
| TD sensor | $\begin{array}{\|l\|} \hline \text { K:208-A3 } \\ \text { Y:208-B10 } \\ \text { M:207-A19 } \\ \text { C:208-A9 } \end{array}$ | Open | SC370/371/372/373 |
|  |  | Shorted | $\begin{aligned} & \text { SC370/371/372/373 or } \\ & \text { SC374/375/376/377 } \end{aligned}$ |
| Transfer belt set sensor | 208-B2 | Open | SC471 |
|  |  | Shorted |  |
| Transfer belt H.P. sensor | 212-2 | Open | SC471 |
|  |  | Shorted |  |
| ID sensor | $\begin{aligned} & \text { Rear:213-11 } \\ & \text { Front:213-14 } \end{aligned}$ | Open | SC385 |
|  |  | Shorted |  |
| Paper end sensor | Tray1:202-A5 <br> Tray2:202-B7 <br> By-pass:207- <br> A15 | Open | The Paper End indicator lights even if paper is placed in the paper tray. |
|  |  | Shorted | The Paper End indicator does not light even if there is no paper in the paper tray. |
| Paper lift sensor | Tray1:202-A2 <br> Tray2:202-B4 | Open | The bottom plate of the paper feed unit is not lifted up. |
|  |  | Shorted | SC501/502 |
| Relay sensor | 202-A8 | Open | Paper Jam is detected whenever a print is made. |
|  |  | Shorted | Paper Jam is detected even if there is no paper. |
| Vertical transport sensor | 202-B10 | Open | Paper Jam is detected whenever a print is made. |
|  |  | Shorted | Paper Jam is detected even if there is no paper. |
| Registration sensor | 207-B2 | Open | Paper Jam is detected whenever a print is made. |
|  |  | Shorted | Paper Jam is detected even if there is no paper. |
| Fusing exit sensor | 210-A11 | Open | Paper Jam is detected whenever a print is made. |
|  |  | Shorted | Paper Jam is detected even if there is no paper. |
| Paper exit sensor | 210-B2 | Open | Paper Jam is detected whenever a print is made. |
|  |  | Shorted | Paper Jam is detected even if there is no paper. |
| Exit upper limit sensor | 210-A6 | Open | The paper overflow message is not displayed even when a paper overflow condition exists, causing paper jam. |
|  |  | Shorted | The paper overflow message is displayed. |

The CN numbers are the connector numbers on the BCU.

### 4.6 BLOWN FUSE CONDITIONS

| Fuse | Rating |  | Symptom when turning on the main switch |
| :---: | :---: | :---: | :---: |
|  | 115 V | 220-240 V |  |
| Power Supply Unit |  |  |  |
| FU1 | 15A/125V | --- | No response (No power is supplied to the electrical components.) |
| CB1 | --- | 8A/250V |  |
| FU2 | 10A/125V | 5 A/250V | No response (No DC power is supplied to the electrical components.) |
| FU81 | 3.15 A/250 V | 3.15A/250V | Only 12V DC power is not supplied. SC260 or SC261 may occur. <br> (This fuse is directly soldered on the PSU.) |

### 4.7 LEDS (BCU)

| LED | Status |  |
| :---: | :--- | :--- |
|  | Blinking | Stays OFF or ON |
| LED1 (RED) | The Main CPU functions <br> correctly. | The Main CPU does not function <br> properly. |
| LED (Green) | The MUSIC CPU functions <br> correctly. | The MUSIC CPU does not function <br> properly. |

## TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER：G060／G570－042
09／05／2003
APPLICABLE MODEL：
GESTETNER－DSC38
LANIER－2138AH
RICOH－AP3800C
SAVIN－SLP38C

## SUBJECT：SERVICE MANUAL－INSERT

The Service Manual pages listed below must be replaced with the pages supplied．

PAGES：

Updated Information（Table of Contents）
－Tab Positions
Updated Information（Firmware History removed from Tab Positions）
－Remove pages 14－1 through 14－10 from the G060 Service Manual．The＂Firmware History Section，＂in the G060 Service Manual has been replaced by the G060 Firmware History document released on 09／05／2003．
1 REPLACEMENT AND ADJUSTMENT ..... 12-1
1.1 EXTERIOR COVER REMOVAL ..... 12-1
1.2 TRAY PAPER/OVERFLOW/VERTICAL TRANSPORT SENSORS ..... 12-2
1.3 MAIN MOTOR REPLACEMENT ..... 12-3
2 DETAILED DESCRIPTIONS ..... 12-4
2.1 COMPONENT LAYOUT ..... 12-4
2.1.1 MECHANICAL COMPONENT LAYOUT ..... 12-4
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| :--- | :--- | :---: |
|  | TWO-TRAY PAPER FEED UNIT G568 |  |
|  |  |  |
|  |  |  |


| PREVENTIVE MAINTENCE G060 |  |  |  |
| :--- | :--- | :---: | :---: |
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| REPLACEMENT AND ADJUSTMENT G060 |  |  |  |  |
| :--- | :--- | :---: | :---: | :---: |
|  |  |  |  | TWO-TRAY FINISHER G565 |


| TROUBLESHOOTING G060 |  |  |  |  |
| :--- | :--- | :---: | :---: | :---: |
|  |  |  |  | FOUR-BIN MAILBOX G566 |


| SERVICE TABLES G060 |  |  |  |
| :--- | :--- | :---: | :---: |
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| DETAILED DESCRIPTIONS G060 |  |  |  |  |
| :--- | :--- | :---: | :---: | :---: |
|  |  |  |  | COPIER FEATURE EXPANDER G570 |


| DUPLEX UNIT G571 |  |
| :--- | :--- |
| ARDF G564 |  |
|  |  |

ONE-TRAY PAPER FEED UNIT G567

## TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER：G060／G570－043
09／16／2003

## APPLICABLE MODEL：

GESTETNER－DSC38／DSC38S
LANIER－2138AH／2138CMF
RICOH－AP3800C／AP3800CMF
SAVIN－SLP38C／SLP38CS

## SUBJECT：PARTS CATALOG UPDATES

## GENERAL：

The following parts updates are being issued for all G060／G570 Parts Catalogs．
－UPDATE 1：Rear Side Plate－The Rear Side Plate has been changed due to parts catalog correction．Please update your G060／G570 Parts Catalog with the following information．


| OLD PART NO． | NEW PART NO． | DESCRIPTION | RTY | INT | PAGE | ITEM |
| :--- | :--- | :--- | :---: | :---: | :---: | :---: |
| G0602664 | G0602665 | Rear Side Plate－Paper Feed | 1 | 1 | 23 | 17 |

- UPDATE 2: Transfer Release Lever - The following changes have been made to ensure that the transfer belt is not scratched from vibration during transport, which can occur as the machine is shipped from the factory with the belt and drum contacting each other.

1) The machine is now shipped with the drum released from the transfer belt, i.e. with the release lever secured with tape in a second (new) unlocked position.
2) The parts listed below have been modified so that the front door can be closed with the lever in the second unlocked position for shipping. At installation, the lever must then be set to the locked position for the door to close.
Please update your G060/G570 Parts Catalog with the following information.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| - | G0603712 | Torsion Spring | 1 | 3/S | 41 | 23 * |
| G0603694 | G0773697 | Shaft - Release | 1 | 3/S | 41 | 3 |
| - | 07200040 | Retaining Ring - M4 | 1 | 3/S | 41 | 109 * |
| G0603923 | G0773923 | Release Lever | 1 | 3/S | 37 | 15 |

## * DENOTES NEW ITEM NUMBER

## UNITS AFFECTED:

All G060/G570 printers manufactured after the serial numbers listed below will have the new style Transfer Release Lever installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38 | P6020600330 |
| Lanier 2138 |  |
| Ricoh Aficio AP3800C |  |
| Savin SLP38c |  |

## UPDATE 3:

Transfer Unit- The Left Stay Sheets have been added to ensure a proper gap between the Left Stay and Transfer Belt, as toner accumulated on the stay from toner scattering can be transferred to the transfer belt and cause an ID sensor misdetection. The Transfer Unit has also been changed to ensure the Backup Roller and Bushing stay properly fixed in position despite drop shock during shipping.
Note: The four sheets are attached to the Left Stay, just to the left and right of both ID sensors (see illustration below).
Please update your G060/G570 Parts Catalog with the following information.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| G0603840 | G0773841 | Transfer Unit | 1 | 1 | 37 | 19 |
| - | G0603707 | Sheet: Stay: Left | 4 | - | 39 | 35 * |

* DENOTES NEW ITEM NUMBER


## UNITS AFFECTED:

All G060/G570 printers manufactured after the serial numbers listed below will have the new style Transfer Unit installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38 | P6020900401 |
| Lanier 2138 |  |
| Ricoh Aficio AP3800C |  |
| Savin SLP38c |  |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: G060/G570-044
10/09/2003
APPLICABLE MODEL:
GESTETNER - DSC38/DSC38S
LANIER - 2138AH/2138CMF
RICOH - AP3800C/AP3800CMF
SAVIN - SLP38C/SLP38CS

## SUBJECT: SERVICE MANUAL - INSERT

The Service Manual pages listed below must be replaced with the pages supplied.

PAGES:
Updated Information (G060 Bit Switch Programming)

- 5-8

Updated Information (G570 Bit Switch Programming)

| Mode No. (Class 1 and 2) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: |
| [Toner Limit] |  |  |  |
| 1 | Photo | *P | Adjusts the maximum toner amount for image development. <br> [ 100 to $400 / \underline{260 / 1 \% / s t e p]}$ ] |
| 2 | Text |  | [ 100 to $400 / 190 / 1 \% /$ step ] |

### 5.2.3 BIT SWITCH PROGRAMMING

$\Rightarrow$ NOTE: Currently, the bit switches are not being used except for Bit Switch 2 bit 3, (See PUB(C)-051 for details) and Bit Switch 3 bit 0 (See PUB(C)-045 for details).

1. Enter the SP mode, select "Service Menu", then press [Enter] twice.
```
<Service>
Bit Switch >>
```

2. Select \#1, \#2, \#3, or \#4 for the desired bit switch, then press [Enter].

- [ $\mathbf{A}][\mathbf{\nabla}]$ : Move to the next switch.

```
Bit Switch
Bit switch 1
```

3. Adjust the bit switch using the following keys.

- [ $\mathbf{\Delta}][\mathbf{\nabla}]$ : Move to the next bit.

```
Sw#1 00000000
bit0
```

- [Escape]: Exit without saving changes.
- [Enter]: Exit and save changes.

NOTE: The left digit on the display is bit 7 and the right digit is bit 0 .
4. Press [Enter] to save changes and exit.

| 1 | Mode No. (Class 1 and 2) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: | :---: |
| 105 | [Data Save] |  |  |  |
|  | 1 | Data Save |  | Stores the print gamma adjusted with the "Gamma Adj." menu item as the current setting. Before the machine stores the new 'current setting', it moves the data currently stored as the 'current setting' to the 'previous setting' memory storage location. |
| 106 | [Toner Limit] |  |  |  |
|  | 1 | Toner Limit: Photo | $\stackrel{*}{\mathrm{CT}}$ | Adjusts the maximum toner amount for image development. <br> [ 100 to $400 / 260 / 1 \% /$ step ] |
|  | 2 | Toner Limit: Text |  | [ 100 to $400 / 190 / 1 \% /$ step ] |

### 5.3.2 BIT SWITCH PROGRAMMING

NOTE: Currently, the bit switches are not being used except for Bit Switch 2 bit 3, (See PUB(C)-051 for details) and Bit Switch 3 bit 0 (See PUB(C)-045 for details).

1. Press the numeral key $(0$ to 7$)$ corresponding to the bit number you wish to change.
Pressing the numeral key changes the setting to either " 0 " or " 1 ".
NOTE: The left digit on the display is bit 7 and the right digit is bit 0 .
2. Press [Enter] to save changes and exit.

## TECHNICAL SERVICE BULLETIN

## BULLETIN NUMBER: G060/G570-045

11/05/2003

## APPLICABLE MODEL:

GESTETNER - DSC38S
LANIER - 2138CMF
RICOH - AP3800CMF
SAVIN - SLP38CS

## SUBJECT: XENON LAMP

## GENERAL:

The density of the coating applied to the Xenon lamp electrodes has been increased to further improve the efficiency of lamp warm-up. The following part update is being issued for all G570 Parts Catalogs. Please update your parts catalog with the following information.


|  |  |  |  | REFERENCE |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |  |  |  |  |  |  |
| G5702725 | B1161800 | Xenon Lamp - MM8 | 1 | 1 | 9 | 8 |  |  |  |  |  |  |

## UNITS AFFECTED:

The serial number cut-in information was not available at the time of this publication.

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## APPLICABLE MODEL:

GESTETNER - DSC38F
RICOH - AP3850C
SAVIN - SLP38CDE

## SUBJECT: TRANSPORTATION NOTES

## SYMPTOM:

The following types of white lines may appear in black halftone areas at machine installation:

- Horizontal and Straight (broken or continuous)
- Short, Vertical or Wavy


## CAUSE:

Vibrations during transportation may cause scratches on the black OPC drum, as the image transfer belt is always contacting the black PCU during this time.

NOTE: The lines are not visible with the G060, as a different printer gamma is used -- the gamma used on the G082 is designed to show more detail in halftone areas.

## PERMANENT SOLUTION:

A modification will be applied whereby the black PCU and transport unit are separated before shipping. This modification is required to allow the units to be separated and still be able to close the front cover

## TEMPORARY SOLUTION:

Until the permanent solution can be applied, G082 machines are shipped with the transport unit separated from the black PCU. Specifically, the transport unit lever has been removed before shipping to allow the front cover to be closed.

Tech Service Bulletin No. G082-001

## Page 2 of 2

Please see the following notes for machine installation and short-haul transport:

## 1. At Machine Installation:

The transport unit lever has been removed and placed inside the machine as shown in the illustration. This lever must be re-installed when the machine arrives at the customer's location.
The attachment procedure for this lever has been packaged together with the machine.

## 2. Short-Haul Transport:

The notes for short-haul transport are the same as the G060, except for the additional procedure described below.


## Additional procedure for G082 short-hauls:

1. Open the front cover.
2. Turn the transfer unit release lever counterclockwise to lower the transfer unit.
3. Remove the lever (1 screw).
4. Reinstall the lever when the machine arrives at the installation site.

## APPLICABLE MODEL：

GESTETNER－DSC38F
RICOH－AP3850C
SAVIN－SLP38CDE

## SUBJECT：BLACK TONER BLASTING

## SYMPTOM：

Areas of black bitmap Images may exhibit visible toner blasting．

## CAUSE：

The toner limit amounts for the G082 are Text $190 \%$ ，Graphics $260 \%$ and Photo $260 \%$ ．These settings work well for reproducing the details in the high－density areas of graphics and photographs．However，they may cause black toner blasting in bitmap Images as a side effect．

## SOLUTION：

Download and use the 600 dpi $100 \%$ GCR or 1200 dpi $100 \%$ GCR output profiles．These output profiles remove gray components that have the data of $\mathrm{R}=\mathrm{G}=\mathrm{B}$ or $\mathrm{Y}=\mathrm{M}=\mathrm{C}$ and print them with black toner． $\mathbf{G C R}=$ Gray Component Replacement．

## PROCEDURE：

The following operator instructions are required before beginning the procedure：

|  |  |  |
| :--- | :--- | :--- |
|  |  | Getting Started |
|  |  | Color Guide |
|  |  | Fiery 3850C User Software CD |

The procedure begins on the following page．．．．

## (1) Install and Configure Fiery ColorWise Pro Tools

A. Install the Fiery ColorWise Pro Tools: Follow the instructions in the Getting Started manual page 49 (135/861) - page 52 (138/861).
B. Configure the Connection: Follow the instructions in the Getting Started manual page 51.

## NOTES:

Nickname: Enter a name for the Fiery 3850C; it does not have to match the actual Server Name of the Fiery 3850C. However, The nickname cannot contain any of the following seven characters:


Protocol: Choose the type of network protocol you are using from the pop-up menu.
Fiery utilities for the Fiery 3850C: Not supported over IPX/SPX. Command WorkStation software is supported on Windows computers over TCP/IP.
Server Name: Enter the IP address (or DNS name) of the Fiery 3850C.
New Device: Enter 3850C, the device name for the Fiery 3850C.


Download the Profiles: Follow the instructions in the Color Guide pages 4-5 (505/861)
A. Launch ColorWise Pro Tools and click on the Profile Manager. The left side of the main Profile Manager windows lists the ICC profiles in the default directory of your workstation. If the profile you want does not appear, click browse and go the ICM directory of the Fiery 3850C User software CD.
B. Browse to the directory and select the profile you want to download and click OK.

- Fiery 3850C 600 100GCR.ICM
- Fiery 3850C 1200 100GCR.ICM


## Page 3 of 4

C. Click the green arrow to download the output profile, and click OK when the download is complete, the new output profile appears on the list of output profiles on the right side of the Profile Manager main window.


Defining Profiles: Follow the instructions in the Color Guide pages 4-8 (508/861)
A. Launch ColorWise Pro Tools and click Profile Manager.
B. Select the downloaded file (Fiery 3850C 600 dpi 100\%GCR v1F or Fiery 3850C 1200 dpi $100 \%$ GCR v1F) in the Output list, and click Profile Settings or double-click the selected file.
C. Select a resolution in Use the Calibration Set pull down menu to allocate the profile.

- Set 600x600 dpi for Fiery 3850C 600 dpi 100\%GCR v1F.
- Set $1200 \times 1200$ dpi for Fiery 3850C 1200 dpi 100\%GCR v1F.
D. Select the "Appear in Driver as" checkbox, choose one of the predefined custom Output names (Output-1 through Output-10) from the pull-down menu, and then click Apply.

Recommendation: Output-1 for Fiery 3850C 600 dpi 100\%GCR v1F Output-2 for Fiery 3850C 1200 dpi 100\%GCR v1F

## E. Click OK.

Once these output profiles have been downloaded to the Printer HDD and associated with specific output names, these output files can be used from any client PC.

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## (4) Apply the settings:

A. Open the ColorWise bar of Fiery Printing in the PS driver's printer properties.
B. Click Expert Settings.

C. Select the output profile (Output-1 or Output-2) in the pull down menu of Output Profile.
D. Click OK and Print out files.

- A printed image is associated with the selected profile.
- Black components that have the data of $\mathrm{R}=\mathrm{G}=\mathrm{B}$ or $\mathrm{Y}=\mathrm{M}=\mathrm{C}$ are printed with Black toner.


## (5) If you want to use the $\mathbf{6 0 0} \mathrm{dpi} \mathbf{1 0 0 \% G C R}$ or $1200 \mathrm{dpi} 100 \%$ GCR output profile as a default printer setting:

A. Launch ColorWise Pro Tools and click Color Setup.
B. Select Fiery 3850C 600 dpi 100\%GCR v1F or Fiery 3850C 1200 dpi $100 \%$ GCR v1F from the pull-down menu of Output Profile.
C. Click OK.


Select Fiery 3850C 600 dpi 100\%GCR v1F or Fiery 3850C 1200 dpi 100\%GCR v1F

## BULLETIN NUMBER: G082-003

10/09/2002

## APPLICABLE MODEL: <br> GESTETNER - DSc38F <br> RICOH - AP3850C <br> SAVIN - SLP38cDE

## SUBJECT: TONER END MIS-DETECTION

## SYMPTOM:

Toner end might be detected even when some amount of toner still remains in the toner cartridge.

## CAUSE:

Because of the shape of the toner cartridge, toner may accumulate on the sloping area of the cartridge and not be supplied properly. This causes a toner end to be detected with toner still remaining in the cartridge.

## FIELD COUNTERMEASURE:

Opening and closing the top right cover or reinserting the toner cartridge may recover the toner end condition due to false detection. This causes toner that may have accumulated on the sloping surface of the cartridge to fall into the supply area. In addition to these changes, remind customers to try removing and reinstalling the toner bottle if there is toner remaining in the bottle. This is mentioned in the Operating Instructions (Maintenance Guide 1, Replacing the Toner Cartridge).

## PRODUCTION COUNTERMEASURE:

The following two modifications have been applied to minimize misdetection of Toner End conditions.

1. Engine firmware

The toner supply control has been changed in Version B1.15E.

| Old | New |
| :--- | :--- |
| The air pump motor is turned on for | The air pump motor and toner supply clutch are turned on for 1 |
| 1 second to agitate the toner in the | second each until the required amount of toner has been fed into |
| cartridge, and then the toner supply | the development unit. This ensures that the toner is kept in a <br> clutch is turned on for a calculated <br> interval to feed the required amount <br> of toner. |
|  |  |

## 2. Toner cartridges

| Modification | Cut-in |
| :--- | :---: |
| Strips of Mylar have been attached to the <br> inner package to prevent the package from <br> bending or becoming dented. <br> Note: Applied to all toner colors. | August, '01 |
| The shape of black toner package has been <br> changed to create a steeper slope in the <br> area circled in the illustration, allowing the <br> toner to flow more easily. | April, '02 |



## SUBJECT: FIRMWARE MODIFICATION

## GENERAL:

The latest firmware version can be downloaded at the Technology Solution Center FTP Site http://tsc.ricohcorp.com. Be sure to check the README file for important notes and explanations.

NOTE: Refer to Facts Line Bulletin \# FLOO2 and Publication Bulletin \#023 for more information about the FTP Internet Web Site and EPROM/Flash Card Exchange program.

| G082 FIRMWARE MODIFICATION (MAIN ENGINE) |  |  |  |
| :---: | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION |
| Corrects the following: <br> - Paper jam with series printing when the exit tray is not the same for all individual jobs. | GO775623 E | $\begin{gathered} \text { October } \\ 2002 \\ \text { Production } \end{gathered}$ | B1.22 |


| G082 FIRMWARE MODIFICATION (MUSIC) |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION |  |  |  | $\begin{array}{c}\text { FIRMWARE } \\ \text { LEVEL }\end{array}$ | \(\left.\left.\begin{array}{c}SERIAL <br>

NUMBER\end{array}\right) $$
\begin{array}{c}\text { FIRMWARE } \\
\text { VERSION }\end{array}
$$\right]\)

| G082 FIRMWARE MODIFICATION (CONTROLLER) |  |  |  |
| :--- | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION |  | FIRMWARE <br> LEVEL | SERIAL <br> NUMBER |
| - Installed from the first mass production. | G0825769 | NA | 1.01 |

## APPLICABLE MODEL:

GESTETNER - DSC38F
RICOH - AP3850C
SAVIN - SLP38CDE

## SUBJECT: "IMAGE COVERAGE" vs "PIXEL COVERAGE" RATIO

## GENERAL:

This Technical Service Bulletin has been issued to:

1) replace the term "image coverage ratio" with "pixel coverage ratio," so as to clear up any misunderstandings, and to
2) clarify the differences between SP7-833 and SP7-908

NOTE: SP7-908-1 thru 8 has been applied to the G060 from March '02 production, and both SP7-833 and 908 have been applied on the G082 from the first mass production run. Also, SP7-908-5 thru 8 contains the same data as SP7-833-11 thru 14.

1. Terminology: Replacing "image coverage" with "pixel coverage ratio"

The original meaning of "image coverage" is simply the percent of pixels being used to write the image. However, since this refers only to the print data itself, and not the final image on the output, a more clear term is the "pixel coverage ratio."

The machine keeps track of two types of pixel coverage ratios:

1) The ratio for the most recently printed page
2) The average ratio for all pages printed up to the present

Calculation method for both \#1 and 2 above:
\# Pixels used for image areas / Total pixel area of 1 -full pg. (corresponding paper size)

## NOTE:

1. To calculate \#2 above, the machine keeps a cumulative count for these 2 values.
2. The pixel coverage ratio only refers to the percent of pixels to be used for image writing in the data itself, not the finished product (output). It is not directly proportional to the amount of toner consumed, and can therefore not be used to calculate toner consumption.

The amount of toner actually consumed (i.e. used on the output) also depends on factors such as the:

- Type of image (solid, text, or lines):

The "edge effect", a general side effect of the development process whereby extra toner is attracted to the edges of images, i.e. becoming slightly darker. Of course images containing more edges will show this effect more prominently.

- Toner concentration
- Development capability

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## 2. Difference between SP7-833 and SP7-908

Both calculate the pixel coverage ratios mentioned above for each toner color, however the calculation is different for Bk pages printed in Color development mode (i.e. development with the transfer unit in contact with all 4 PCUs). Please also see the example below.

| SP7-833-5 to 8 (Coverage) | SP7-908-1 to 4 (New Coverage) |
| :--- | :---: |
| The total pixel area for Bk pages made in Color <br> development mode is added to the cumulative <br> count. | This value is not added to the cumulative count. |

- SP7-833 (existing SP mode):

The idea of this mode is to show the pixel coverage ratio for each color for pages made when the machine operates with the transfer unit in contact with all 4 PCUs. So even though no CMY toner is actually being used for Bk pages in Color development mode, this SP mode includes the total pixel area for these pages.

NOTE: This data is used for process control and toner refresh.

- SP7-908 (newly added):

The idea of this mode is to show the pixel coverage ratio for each color for pages made when CMY toner is actually being used to develop the image.

As shown in the example below, for print data containing Bk pages, the ratio calculated by SP7-833 will be lower.

## Example:

When printing the following 3 pages, the average pixel coverage ratio will be lower with SP7-833 as shown in the table below.

| 1st Page |
| :---: |
| Color |
|  |
| C: $7 \%$ |
| M: $8 \%$ |
| Y: $3 \%$ |
| K: $7 \%$ |


| 2nd Page |
| :---: |
| B\&W |
| K: $8 \%$ |
|  |


| 3rd Page |
| :---: |
| Color |
| C: $6 \%$ |
| M: $9 \%$ |
| Y: $4 \%$ |
| K: $6 \%$ |

Average pixel coverage ratio:

|  | Bk | Cyan | Magenta | Yellow |
| :---: | :---: | :---: | :---: | :---: |
| SP7-833 | $(7 \%+8 \%+6 \%) / 3=7 \%$ | $(7 \%+6 \%) / 3=4.3 \%$ | $(8 \%+9 \%) / 3=5.7 \%$ | $(3 \%+4 \%) / 3=2.3 \%$ |
| SP7-908 | $(7 \%+8 \%+6 \%) / 3=7 \%$ | $(7 \%+6 \%) / 2=6.5 \%$ | $(8 \%+9 \%) / 2=8.5 \%$ | $(3 \%+4 \%) / 2=3.5 \%$ |

## REMARKS:

- To enable SP7-908 in production units, the following have been modified-
$>$ Engine main and controller firmware (from March '02 production):
Engine: version B1.17C or later
Controller: version 2.13 or later
$>$ BCU NVRAM: $4 \mathrm{~KB} \rightarrow 8 \mathrm{~KB}$ type for storage of paper size pixel area data. (P/N 14075751)
NOTE: The 8 KB type can be used on all machines. The machine automatically recognizes whether the NVRAM is a $4 K B$ or $8 K B$ type.

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## Page 3 of 3

- It is not recommended to upgrade pre-modification MIF for SP7-908, since it is necessary to not only install the 8 KB RAM, but also to replace all maintenance kits (kit PM counters stored in NVRAM).
- The following shows the SP7-908 displays for machines with the 4 KB NVRAM and each version of main/controller firmware:

| NVRAM $=4 \mathrm{~KB}$ |  | Controller firmware |  |
| :---: | :---: | :---: | :---: |
|  |  | 2.12 or earlier | 2.13 or later |
|  | B1.15E or earlier | (feature not displayed) | Unspecified value displayed. |
|  | B1.17C or later | (feature not displayed) | SP7-908 value is "999.99". |

## TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: G082-006
09/03/2003

## APPLICABLE MODEL:

GESTETNER - DSC38F
LANIER - 2138E
RICOH - AP3850C
SAVIN - SLP38CDE

## SUBJECT: FUSING UNIT DAMAGE

## SYMPTOM:

The Fusing Unit is damaged by the Pick-Off Pawls.

## CAUSES:

There are three possible causes:

1. Pick-Off Pawls:

When a paper jam occurs in the fusing unit, paper may push the pawls up or down against the fusing belt or pressure roller, causing the belt or roller to be damaged by the pawls.
2. Fusing Belt:

The fusing belt layer may peel off from the base layer during a print run due to an insufficient amount of adhesive applied.
3. Oil Supply Unit:

The oil supply unit deforms due to heat from the fusing unit, causing the oil not to be applied evenly to the fusing belt. This may cause a paper jam or the oil supply roller to become dirty with toner.

## SOLUTIONS:

Production line

1. Pick-Off Pawls

The edges of the pawls have been rounded to minimize belt or roller damage with a paper jam.
2. Fusing Belt

The amount of adhesive has been increased and is more evenly applied to the base layer.
3. Oil Supply Unit

A metal plate will be added underneath the oil supply felt to ensure the unit does not deform.

## UNITS AFFECTED:

1. Pick-Off Pawls

All G082 printers manufactured after the serial numbers listed below will have the new style Fusing
Strippers installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :---: |
| Gestetner DSc38F |  |
| Lanier 2138E | P8930200001 |
| Ricoh Aficio AP3850C |  |
| Savin SLP38cDE |  |

Cut-in product Part Number (on the seal attached to the Fusing unit): G765-17 212 (on the box): G76517212xxx (on the fuser)

NOTE: $\quad$ This modification was applied from Part Number suffix B.
2. Fusing Belt

All G082 printers manufactured after the serial numbers listed below will have the amount of adhesive increased and more evenly applied during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner DSc38F |  |
| Lanier 2138E | P8930200001 |
| Ricoh Aficio AP3850C |  |
| Savin SLP38cDE |  |

Cut-in product Part Number (on the seal attached to the Fusing unit):
G765-17 212 (on the box): G76517212xxx (on the fuser)
NOTE: $\quad$ This modification was applied from Part Number suffix B.
3. Oil Supply Unit

The serial number cut-in and part number information was not available at the time of this publication.

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :---: | :---: | :---: | :---: |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

BULLETIN NUMBER: G082-007
10/06/2003
APPLICABLE MODEL:
GESTETNER - DSC38F
LANIER - 2138E
RICOH - AP3850C
SAVIN - SLP38CDE

## SUBJECT: SERVICE MANUAL - INSERT

The Service Manual pages listed below must be replaced with the pages supplied.

The revised areas have been highlighted by an arrow $\Rightarrow$.

PAGES:

Updated Information (Bit Switch Programming)

### 5.2 PRINTER CONTROLLER SERVICE MODE

### 5.2.1 SERVICE MODE MENU ("1. SERVICE")

| Mode No. (Class 1 and 2) |  |  | Function / [ Setting ] |
| :---: | :---: | :---: | :---: |
| [Clear Setting] |  |  |  |
| 1 | Clear Setting |  | Initializes settings in the "System" menu of the user mode. This is the same as "Restore Default" in user mode. |
| [Bit Switch] |  |  |  |
| 2 | Bit Switch 2 | * | When bit 4 of bit switch 2 is set to 1 , the Letterhead Mode is enabled. <br> NOTE: Currently the other bit switches are not used. These switches have to be set to " 0 ". |
| [Password Clear] |  |  |  |
| 1 | Password Clear |  | Clears the password that was specified by the user program mode - this password prevents access to some user tools. <br> NOTE: Use this function to clear the password when the user forgets it. |
| [Key Repeat] |  |  |  |
| 1 | Key Repeat | * | When enabled (On), this function allows the display to continually advance (scroll) when a key is held down, and makes the LEDs blink more slowly. This was introduced to help users who may be physically challenged operate the machine more freely. |

NOTE: An asterisk (*) to the right hand side of the mode number column means that this mode is stored in the NVRAM. If you do a RAM clear, this SP mode will be reset to the default value.

### 5.2.2 BIT SWITCH PROGRAMMING

$\Rightarrow$ NOTE: Currently, the bit switches are not being used.

1. Enter the SP mode, select "Service Menu", then press $\downarrow$, then press $\boldsymbol{\nabla}$.
```
<Service>
Bit Switch >>
```

2. Press
3. Adjust the bit switch using the following keys.

- $\mathbf{\Delta} / \boldsymbol{\nabla}$ : Move to the next bit.

```
Bit Switch
Bit switch
```

- 4: Exit without saving changes.
- : Exit and save changes.

NOTE: The left digit on the display is bit 7 and the right digit is bit 0 .
4. Press to save changes and exit.

## TECHNICAL SERVICE BULLETIN

PRODUCT CODE: G307-001<br>11/19/2003

## APPLICABLE MODEL:

GESTETNER - FAX OPTION TYPE 3800C FOR DSC38S/DSC38US LANIER - FAX OPTION TYPE 3800C FOR 2138CMF/LP138C CMF
RICOH - FAX OPTION TYPE 3800C FOR AP3800CMF/ AFICIO CL7000CMF
SAVIN - FAX OPTION TYPE 3800C FOR SLP38CS/CLP28S

## SUBJECT: SERVICE MANUAL - INSERT

The Service Manual pages listed below must be replaced with the pages supplied.

PAGES:

Updated Information New System Switch

| System Switch 16 |  | SP No. 1-101-023 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0 | Parallel Broadcasting <br> 0 : Disabled <br> 1: Enabled | 1: When the G4 or/and G3 unit is installed, the machine sends messages simultaneously using both available ports (PSTN/ISDN) during broadcasting. |
| 1 | Priority setting for the G3 line. <br> 0: PSTN-1 > PSTN-2 <br> 1: PSTN-2 > PSTN-1 | This function allows the user to select the default G3 line type. The optional SG3 unit is required to use the PSTN-2 setting. |
| 2 | Changing the l-G3 modem default. <br> 0: PSTN-1 <br> 1: PSTN-2 | This function allows the user to select the default IG3 modem. The optional SG3 unit and ISDN unit are required to use the PSTN-2 setting. |
| 3 | Line used for I-G3 transmissions 0 : Allowed to change 1: Fixed | 0: The machine will place priority on the line selected by the above bit 2 for I-G3 transmissions. <br> 1: The machine will always use the line selected by the above bit 2 for I-G3 transmissions. |
| 4-7 | Not used | Do not change the settings. |

System Switch 17 - Not used (do not change the settings)
System Switch 18 - Not used (do not change the settings)

| System Switch 19 |  | SP No. 1-101-026 |
| :---: | :---: | :---: |
| No | FUNCTION | COMMENTS |
| 0-3 | Not used | Do not change the settings. |
| 4 | Number of jobs controlled for PC-FAX TX <br> 0: 64 Jobs <br> 1: No limitations (But conforms to device limitations) | Sets the number of jobs controlled for PC-FAX transactions. If " 1 " is selected (no limitations), control is relinquished to the device (standard 400, expandable to 800). |
| 5 | Not used | Do not change the settings. |
| 6 | Extended scanner page memory after memory option is installed <br> 0: Disabled <br> 1: Enabled | 0 : After installing the memory expansion option, the scanner page memory is extended to 4 MB from 2 MB. <br> 1: If this bit is set to 1 after installing the memory expansion option, the scanner page memory is extended to 12 MB . But the SAF memory decreases to 18 MB . |
| 7 | Special Original mode <br> 0: Disabled <br> 1: Enabled | 1: If the customer frequently wishes to transmit a form or letterhead which has a colored or printed background, change this bit to " 1 ". "Original 1" and "Original 2" can be selected in addition to the "Text", "Text/Photo" and "Photo" modes. |

```
System Switch 1A - Not used (do not change the settings)
System Switch 1B - Not used (do not change the settings)
System Switch 1C - Not used (do not change the settings)
```

FIRMWARE HISTORY

## FIRMWARE HISTORY

PUBLISHED DATE：11／05／2003

## PRODUCT CODE： G060

## APPLICABLE MODEL：

GESTETNER－DSC38
LANIER－2138AH
RICOH－AP3800C
SAVIN－SLP38C

## GENERAL：

The latest firmware version can be downloaded at the Technology Solutions Center FTP Site at

NOTE：Refer to Facts Line Bulletin \＃FL002 and Publication Bulletin \＃023 for more information about the FTP Internet Web Site and EPROM／Flash Card Exchange program．

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## MAIN ENGINE FIRMWARE HISTORY:

| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION | CHECK SUM |
| :---: | :---: | :---: | :---: | :---: |
| - Installed from the first mass production. | G0775611 | July 2001 | B1.10 | -- |
| - Charge and development bias applied during the toner end recovery mode has been changed to optimize the drum cleaning function. | G0775611 D | August 2001 | B1.11A | -- |
| - The frequency to control the color drum motor has been optimized so that the motor starts smoothly rotating. | G0775611 E | August 2001 | B1.11B | -- |
| The following specification change has been applied: <br> - The yield target of PCUs has been changed from 100KP to 50KP. | G0775611 G | NA | B1.11D | -- |
| The following problems have been fixed. <br> - The machine suddenly keeps running due to memory overflow. <br> - SC670 when the machine starts waking up from the energy saver mode | G0775611 H | NA | B1.11F | -- |
| The following problem has been fixed. <br> - Black developer initialization fails because toner is mistakenly supplied due to software | G0775611 J | Sept. 2001 (See Note 1) | B1.11G | 45A0 |
| Initialization Error - Black). This happens when performing only the black developer initialization. (If performing the developer initialization for black and other color(s) simultaneously, this problem does not occur.) <br> - If the main switch is tuned off and on, the SC code is reset and the machine re-starts the developer initialization. In the worst case, toner flows out from development unit (the entrance area where toner is supplied) to the inside of machine. | NOTE 1 - Engine main firmware version B1.11G has been implemented from September 25th production run. The machines with Ver. B1.11F or older have been reworked in local: However, some machines have been released to the market without modification. So, please make sure that the version of the engine main firmware is "B1.11G" at installation or next visit. If not, please update it to "B1.11G" or later. |  |  | -- |
| - A fusing clutch has been added to maximize the life of the fusing unit and oil supply unit. This firmware version was temporarily installed in production machines to keep the clutch constantly moving, until the clutch control program could be added to the next version (1.15E). <br> NOTE: Therefore this version has not been released. | G0775621 | NA | B1.11H | -- |


| DESCRIPTION OF MODIFICATION | FIRMWARE <br> LEVEL | SERIAL <br> NUMBER | FIRMWARE <br> VERSION | CHECK <br> SUM |
| :--- | :---: | :---: | :---: | :---: |
| Fusing clutch control has been added to <br> start/stop the clutch. <br> The following has been corrected: | G0775621 A | December |  |  |
| 2001 |  |  |  |  | B1.15E | 171 C |
| :---: |

- When a paper jam occurs midway through a staple job, job recovery may re-start the job from the 1st page instead.
- Over-occurrence of the following SC codes (due to software bugs) has been fixed:
- SC220/230 at the start of a job.
- SC544/554 during warm-up under low-temp conditions in $62.5 \mathrm{~mm} / \mathrm{sec}$ mode.
- SP1-916 (Idling mode) has been added.

| 916 | [Idling Mode] |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 1 | Mode Set | * | Enables or disables fusing unit idling performed after the machine reaches the Ready condition. Idling is performed for the time specified in SP1-916-2. <br> [0 or 1/ $\underline{0} /$-] DFU <br> 0: OFF, 1: ON |
|  | 2 | Idling Time |  | Specifies the time for fusing unit idling. [10 to $120 / 30 / 10 \mathrm{sec} / \mathrm{step}$ DFU |
|  | 3 | Pre-Job Mode |  | Enables or disables the 4-second fusing unit idling performed at the start of a print job. <br> [0 or 1/ $\underline{0} /-$-] DFU <br> 0: OFF, 1: ON |

- To optimize the amount of oil supplied to the fusing belt in OHP mode, the number of supply cycles during idling has been reduced to 1.
- SP1-996-6 (OHP Pre-Job mode) has been

| G0775623 | March <br> 2002 <br> (See Note <br> 2) | B1.17C | 169B |
| :--- | :--- | :--- | :--- | added.


| 996 | [OHP/TH Fusing] |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | 6 | Pre-Job Mode | ${ }^{*}$ | Enables or disables the 30-second fusing unit idling performed at <br> the start of an OHP print job. When enabled, idling is performed <br> even if the machine is at the Ready condition. <br> [0 or 1/ O/-] <br> $0:$ OFF, 1: ON |

NOTE 2 - Engine main firmware version B1.17C was applied to the production line on February 18th, 2002, and most machines with Ver. B1.15E have been reworked locally: However, some of these machines have been released to the market without modification. Therefore please update the engine firmware to ver B1.17C or newer on G060-17 machines in the following serial number range: P60112xxxxx - P60201xxxxx.

| DESCRIPTION OF MODIFICATION | F |
| :--- | :--- |

- The New Coverage Counters will only display the value of 999.99 and will not function. The Coverage Counter [7-833-05 to 08] provides image coverage calculations for when Meter Charge Mode (SP9-930 set to 0 ) is set to "OFF." Use the Coverage Counter [SP7-833-05 to 08] if Meter Charge Mode (SP9-930 set to 0 ) is set to "OFF." Use the New Coverage Counter [SP7-908-01 to 08] when Meter Charge Mode (SP9-930 set to 1 ) is set to "ON." SP7-908-5 to 8 displays the same data as SP7-833-11 to -14.
- The machine automatically detects whether a 4 kB or 8 kB NVRAM is installed on the BCU board.
- A grid pattern has been added to SP mode copy images. To activate this, it is necessary to use system firmware ver1.07 or newer (for the CF expander only).

The following have been corrected:

- SC240 misdetection.
- When the K toner cartridge is replaced, the "previous PM counter" values for CMY are all overwritten to the previous value for K toner (SP7-906-23 to -25).
- If machine enters Energy Saver 1 Mode then cools down for more than 1 minute, it will not display "Ready" after recovery warm-up (only for G060-17 models).
- When a $B / W$ job is performed, the coverage counters (SP7-833-1 to -4) for CMY are not set to 0 as they should be, i.e. the values from the previous job remain.

| The following have been corrected: | G0775623 A | May 2002 | B1.18 | F284 |
| :--- | :--- | :--- | :--- | :--- |
| Main scan magnification error |  |  |  |  |
| SC471 caused by stop timing error for |  |  |  |  |
| transfer belt contact motor. |  |  |  |  |
| SC545 in fusing phase control mode. |  |  |  |  |
| SC543 |  |  |  |  |
| NOTE: This version has not been released <br> (see "side effect" in Version B1.18B). |  |  |  |  |


| DESCRIPTION OF MODIFICATION | FIRMWARE <br> LEVEL | SERIAL <br> NUMBER | FIRMWARE <br> VERSION | CHECK <br> SUM |
| :--- | :--- | :--- | :--- | :---: |
| The following have been corrected: <br> SC230 at automatic line position <br> adjustment <br> Side effect for firmware version B1.18 <br> SC545 modification (only for G060-17 <br> models): The machine does not display <br> "Ready" after recovery warm-up from <br> Energy Saver 1 Mode in phase control <br> mode. | G0775623 B | June 2002 | B1.18B | D7B1 |
| The following have been corrected: <br> When SP1-916-1 is set to 1, the machine <br> may not reach the Ready condition after <br> the main SW is turned on in low-temp, low- <br> humidity environments. <br> Upgrade error recovery cannot be <br> performed with version 4 of the BCU ASIC <br> (Gate Array PCI). | G0775623 C | August | B1.19 | BB39 |
| The following have been corrected: |  | 2002 |  |  |

- SC220-4 for machines with LD unit EMAC2 installed.
- Destination code for China added.
- New SP mode added: SP3-922
(OPU_Refresh2). To activate this function, it is necessary to use controller firmware version 2.17 and CF system firmware version 1.10 or newer.

| 922 | [OPU_Refresh2] |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 1 | Mode_Set | * | Enables or disables the filming removal mode (CMY), which forcibly creates a temporary 15 mm -wide toner line on the drum surface by applying the development bias and turning on the development clutch at the end of a job. <br> [0 to 2/ $\underline{0}$ /-] <br> 0 : Disabled <br> 1: Performed at end of job only when ave. pixel cov. ratio of previous job is low. <br> 2: Performed at end of every job |
|  | 2 | Bias_Set | * | Development bias setting for filming removal mode (CMY) [100 to 400/ 200 / 10] DFU <br> 0: OFF, 1: ON |


| The following have been corrected: <br> Paper jam with Series Printing when the <br> exit tray setting is not the same for all <br> individual jobs. | G0775623 E | October <br> 2002 | B1.22 | CCAA |
| :--- | :--- | :--- | :--- | :--- |


| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION | CHECK SUM |
| :---: | :---: | :---: | :---: | :---: |
| The following have been corrected: <br> - The target PM intervals for SP7-803 (PM counter) have been changed as follows on China models only. <br> PCU: <br> SP7-803-1--PCU [K] Target sheets: 25000 <br> SP7-803-2, 3, 4--PCU [CMY] Target sheets: 25000 <br> SP7-803-17--PCU [K] Target revolutions: 137669 <br> SP7-803-18, 19, 20--PCU [CMY] <br> Target revolutions: 147953 <br> Development Unit: <br> SP7-803-5--Dev [K] Target sheets: 50000 <br> SP7-803-6, 7, 8--Dev [CMY] Target sheets: 50000 <br> SP7-803-21--Dev [K] Target revolutions: 538051 <br> SP7-803-22, 23, 24--Dev [CMY] <br> Target revolutions: 586693 <br> Fusing Unit: <br> SP7-803-15--Fusing, Target sheets: 50000 <br> SP7-803-26--Fusing, Target revolutions: 4651000 <br> - The target number revolutions for the Fusing near end for SP-7-905-7 has been changed as follows for the China models only. <br> Fusing: Alert <br> SP7-905-7 Fusing near end, <br> Target revolutions: 4418000 | G0775623 F | $\begin{aligned} & \text { November } \\ & 2002 \end{aligned}$ | B1.23 | 3D1F |
| The following have been corrected: <br> - Supports 2-level European cabinet paper feeder: <br> Firmware modified so that if the destination code is set to Europe, the paper will be exited from the lower position whenever the Finisher and feed station other than the paper feed unit is installed (EU cabinet feeder is the same height as a 2 level PFU, i.e. requires lower-position exit). | G0775623 G | $\begin{aligned} & \text { December } \\ & 2002 \end{aligned}$ | B1.24 | 514B |


| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION | $\begin{gathered} \text { CHECK } \\ \text { SUM } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: |
| The following have been corrected: <br> - Fusing belt rotation timing (warm-up) and lamp off timing (job end) have been changed to prevent unnecessary occurrences of SC543 (heating roller fusing lamp overheat). <br> - Occurrence conditions for SC552 changed from 150 sec to 210 sec to prevent unnecessary occurrences. <br> - Fusing jam misdetection with left door closed due to vibration of fusing exit sensor feeler. | G0775623 H | March 2003 | B1.25 | 094B |
| The following have been corrected: <br> - "Copying" displayed for about 30 seconds before copying begins- <br> - Color drum lock at first color print following a 3hour interval when energy saver is disabled. | G0775623 J | $\begin{aligned} & \text { April } \\ & 2003 \end{aligned}$ | B1.26 | 4ED0 |

## MUSIC ENGINE FIRMWARE HISTORY:

| DESCRIPTION OF MODIFICATION | FIRMWARE <br> LEVEL | SERIAL <br> NUMBER | FIRMWARE <br> VERSION | CHECK <br> SUM |
| :--- | :---: | :---: | :---: | :---: |
| The following have been corrected: <br> - Installed from the first mass production run. | G0605612 B | July <br> 2001 | 1.04 | -- |
| The following have been corrected: <br> - The firmware header has been corrected to <br> allow the MUSIC firmware to be updated <br> using the IC card. | G0775624 | March <br> 2002 | 1.06 | 62 FD |
| The following have been corrected: <br> - The firmware header has been corrected <br> for Japanese models only. | G0775624 A | May <br> 2002 | 1.07 | 6576 |

## CONTROLLER FIRMWARE HISTORY:

| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION | CHECK SUM |
| :---: | :---: | :---: | :---: | :---: |
| - Installed from the first mass production run. | $\begin{aligned} & \text { G0605910 G } \\ & \text { G0605911 G } \end{aligned}$ | $\begin{gathered} \text { July } \\ 2001 \end{gathered}$ | 2.00 | -- |
| The following have been corrected: <br> "Asia" has been added to the destination code. | $\begin{aligned} & \text { G0605910 H } \\ & \text { G0605911 H } \end{aligned}$ | $\begin{gathered} \text { July } \\ 2001 \end{gathered}$ | 2.01 | -- |
| The following problem has been corrected: <br> When designating the Finisher shift tray 1 for paper output tray as default, paper is not fed out to shift tray 1. | $\begin{aligned} & \text { G0775910 } \\ & \text { G0775911 } \end{aligned}$ | August 2001 <br> (See Note 1) | 2.04 | -- |

## Old Specification:

- Machine counts a page up as black or color based on the color data sent from the application. Therefore if a document from the PC contains blank (but defined) spaces highlighted in red, e.g., the controller interprets this as color data and counts it as a color print.


## New Specification:

- The machine counts up the page as B/W or color based on the CMYK data, i.e. the actual toner colors used to develop the image, regardless of the actual color data from the application.
- To meet the CPU specification change from 250 MHz to 300 MHz .

Color profile of the PCL driver has been
changed to Ver. 1.1.2a.
The following problem has been corrected.

- B\&W prints cannot be made if color toner is empty.
- HDD format cannot be done when SC860 is detected.
- CRD version of PS3 has been updated to Ver. 1.2.1.
- Presentation color profile version of PCL has been updated to Ver. 1.2.1.
(Photographic color profile stays the same as Ver. 1.1.2a.)

| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION | CHECK SUM |
| :---: | :---: | :---: | :---: | :---: |
| The following have been corrected: <br> - (This problem occurs only when selecting German language.) <br> When selecting the meter click mode and printing the counter sheet from the user program mode, the message of "Color" and "Black" is printed in the other way around. | $\begin{aligned} & \text { G0775910 A } \\ & \text { G0775911 A } \end{aligned}$ | October 2001 <br> (See Note 2) | 2.05A | $\begin{aligned} & 28 \mathrm{EO} \\ & 176 \mathrm{D} \end{aligned}$ |
|  | NOTE 2- Messages "Color" and "Black" in the meter click counter is reversibly displayed on the screen and print out only when German language is selected. The machines with Ver. 2.05 or older have been reworked in local. However, some machines have been released to the market without modification. If the machine is set to German language, please make sure that the version of the engine main firmware is " 2.05 A " or later at installation or next visit. If not, please update it to the latest firmware. |  |  |  |
| The following have been corrected: <br> - When all memory clear (SP5-801-001 or 002) is done, the destination code is cleared to "0 (Japan)". Since Japanese fonts are not stored for the messages, strange characters appear. <br> - When printing A3+ (12"x18") size documents, the image is not shift to center, causing a big white margin at the trailing edge. | $\begin{aligned} & \text { G0775910 B } \\ & \text { G0775911 B } \end{aligned}$ | $\begin{gathered} \text { October } \\ 2001 \end{gathered}$ | 2.06 | $\begin{aligned} & \text { A556 } \\ & \text { Ra65 } \end{aligned}$ |
| The following have been corrected: <br> - PS configuration page printing is now limited to plain or recycled paper (previously, it could be printed out onto any paper type). <br> - The following has been fixed: Selecting a custom paper size in the PCL may, in rare cases, cause the PC to freeze. | $\begin{aligned} & \text { G0775910 B } \\ & \text { G0775911 B } \end{aligned}$ | NA | 2.07 | -- |
| The following have been corrected: <br> - If the output tray becomes full while the machine is receiving print job data in Series Print mode, following tray-full recovery, the remaining pages may be printed out in the wrong order. | $\begin{aligned} & \text { G0775910 C } \\ & \text { G0775911 C } \end{aligned}$ | NA | 2.08 | -- |
| The following have been corrected: <br> - Paper is not punched at the designated position in Series Print mode. <br> - Letterhead Mode has been added. | $\begin{aligned} & \text { G0775910 D } \\ & \text { G0775911 D } \end{aligned}$ | January 2002 | 2.11 | $\begin{aligned} & \text { CCB1 } \\ & 2519 \end{aligned}$ |
| The following have been corrected: <br> - While downloading PS fonts to a machine with the HDD option installed, the correct PS serial number cannot be output. | $\begin{aligned} & \text { G0775910 E } \\ & \text { G0775911 E } \end{aligned}$ | NA | 2.12 | -- |


| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION | CHECK SUM |
| :---: | :---: | :---: | :---: | :---: |
| The following have been corrected: <br> - Euro fonts PC858, ISO8859-15, L9, PS Math and MC Text are now supported. <br> - PS performance improvement. <br> - RMS is supported with the use of the customized controller (field monitoring machines only). <br> - A new Coverage Counter has been added to SP7-908-1 to -8 (SP7-908-5 to -8 are the same as SP7-833-11 to -14). With this new counter, B/W pages that follow color pages in ACS will be counted as B/W, and the CMY counters will not count up. To activate this function, it is necessary to use the 8 kB NVRAM on the BCU board and engine firmware version B1.17C or newer. <br> When the undefined command, "<ESC>\&k\#w", is received, it appears on the output as a character string [e.g. as " $<E S C>\& k 6 w$ "]. <br> - If Job Reset is selected while the first page of a multiple-page document is being processed, the panel continues to display "Printing". <br> - Auto Continue timer bug. <br> - The Punch Counter counts up by 2 for every sheet punched when using the function in Duplex Mode. | $\begin{aligned} & \text { G0775910 F } \\ & \text { G0775911 F } \end{aligned}$ | $\begin{gathered} \text { March } \\ 2002 \end{gathered}$ | 2.13 | $\begin{aligned} & \text { 412E } \\ & \text { C03D } \end{aligned}$ |
| The following have been corrected: <br> PCL: <br> 1. Modified the dither size for when the UDFP command is used. <br> 2. Modified so that some characters in symol sets MS Text and Windows Baltic (19L) will appear exactly as they do with HP printers. <br> PS: <br> 1. The margin for Custom size has been changed from 12 to 11 points to expand the maximum printing area. <br> 2. Modified the dither setting for when the DeviceGray command is used. <br> Change in Specification: <br> 1. Supports the Status Readback function of the PCL5e. <br> 2. When the machine has no HDD option, the PCL HDD Directory List (and font source) will not be printed on the PCL Configuration Page. | $\begin{aligned} & \text { G0775910 G } \\ & \text { G0775911 G } \end{aligned}$ | June <br> 2002 | 2.14 | $\begin{aligned} & \text { AB1E } \\ & 2573 \end{aligned}$ |


| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION | $\begin{aligned} & \text { CHECK } \\ & \text { SUM } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: |
| The following have been corrected: <br> - The printing speed of a PS job slows down after a PS3 job is reset. | $\begin{aligned} & \text { G0775910 H } \\ & \text { G0775911 H } \end{aligned}$ | $\begin{aligned} & \text { July } \\ & 2002 \end{aligned}$ | 2.16 | $\begin{aligned} & \text { F270 } \\ & 7677 \end{aligned}$ |
| The following have been corrected: <br> - When paper size error occurs using PCL printing, the printer error message of SNM for Client is not displayed on the PC | $\begin{aligned} & \text { G0775910 J } \\ & \text { G0775911 J } \end{aligned}$ | September 2002 | 2.17 | 9A5A BDF1 |
| The following have been corrected: <br> - PCL- Slow Printing from AutoCAD. <br> - PS- Euro symbol is not printed. Please refer to "PUB (C) - 045 EURO SYMBOL NOT PRINTED WITH PS DRIVER" for the procedure of how to fix this issue. <br> PS print file is printed as text. | $\begin{aligned} & \text { G0775910 K } \\ & \text { G0775911 K } \end{aligned}$ | $\begin{aligned} & \text { October } \\ & 2002 \end{aligned}$ | 2.18 | $\begin{aligned} & 2 \mathrm{~A} 77 \\ & 4 \mathrm{BAB} \end{aligned}$ |
| The following have been corrected: <br> - After using User Tool on operation panel, PCL print jobs may keep showing "Printing..." on operation panel. <br> - Form Lines value (under PCL Menu) change after reboot the Machine. <br> - PCL: <br> Response to PJL INFO CONFIG command does not include serial number. <br> The print may stop during the processing of the file when using "INFICO". <br> The work area of RAM is reduced whenever fonts that have been downloaded to HDD are used <br> - PS: <br> 16bit color blend data does not print correctly. <br> Slow Printing from AutoCAD. <br> Printing may not work correctly when a protocol other than EtherTalk is used on Macintosh 8.x/9.x. <br> The printer controller locks-up when printing from Unix Acrobat. <br> Lines may be printed on the blank pages. <br> The error log is not described in <br> "Configuration Page" when the punch error occurred. <br> When data is sent that outputs 3 hole punch to the European models (which supports $2 \& 4$ hole punch), output has 2 -hole punch. (Now output has no punch). <br> Printing on envelope may not work correctly. <br> - PJL: <br> Response to PJL INFO CONFIG command does not include serial number. | $\begin{aligned} & \text { G0775910 L } \\ & \text { G0775911 L } \end{aligned}$ | $\begin{aligned} & \text { December } \\ & 2002 \end{aligned}$ | 2.19 | $\begin{aligned} & 1421 \\ & 2 \mathrm{E} 85 \end{aligned}$ |

$\left.\begin{array}{|l|c|c|c|c|}\hline \begin{array}{c}\text { DESCRIPTION OF MODIFICATION }\end{array} & \begin{array}{c}\text { FIRMWARE } \\ \text { LEVEL }\end{array} & \begin{array}{c}\text { SERIAL } \\ \text { NUMBER }\end{array} & \begin{array}{c}\text { FIRMWARE } \\ \text { VERSION }\end{array} & \begin{array}{c}\text { CHECK } \\ \text { SUM }\end{array} \\ \hline \begin{array}{l}\text { The following have been corrected: } \\ \text { PCL } \\ \text { - The following problems with the CAD } \\ \text { print file were fixed. } \\ \text { 1) Modified the available pen number } \\ \text { from } 8 \text { to } 256 \text { when BitSw \#3-3 is ON. } \\ \text { 2) The "null" character is ignored } \\ \text { when it is included in HP/GL2 data. } \\ \text { 3) The status flag for the bold } \\ \text { selection command is refreshed when } \\ \text { the bold selection command In } \\ \text { HP/GL2 data is selected. }\end{array} & \begin{array}{c}\text { G0775910 M }\end{array} & - & 2.20 & - \\ \text { - Supports mixed binding orientations } \\ \text { with duplex jobs using cover sheets. } \\ \text {-The downloaded PCL Barcode fonts } \\ \text { are not printed correctly on the PCL font } \\ \text { list. }\end{array}\right)$

## NIB FIRMWARE HISTORY:

| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION | CHECK SUM |
| :---: | :---: | :---: | :---: | :---: |
| Installed from the first mass production run. | G0605920 J | July 2001 | 1.72 .1 | B453 |
| The followings have been corrected: <br> When the job is canceled, the Ipr connection is terminated and a blank space is displayed in the syslog. Instead of the blank space, "Lost connection" is displayed. <br> - When 50 or more lpq/lprm commands are sent, the lpd process cannot be completed properly and the job is not printed out. <br> If DHCP is ON and TCP/IP is OFF, the current device name (RNPXXXXXX) in SmartNetMonitor is not displayed. <br> - NIB stops printing if several prints jobs are continuously sent to the NIB via the IPP port (SmartNetMonitor for Client), and a print job sent via the standard IPP port may be canceled. | G0605920 K | July 2001 | 1.74 | 3355 |
| The followings have been corrected: <br> - Nothing was displayed even though the "prnlog 0" command was done in telnet. | G0605920 L | $\begin{aligned} & \text { September } \\ & 2001 \end{aligned}$ | 1.75 .1 | 64F4 |
| The following have been corrected: <br> If an undefined remote printer number is input in the Netware configuration page, communication between the NIB and Netware Server will be cut off. No error message is displayed in Netscape Navigator even when an incorrect URL is input in the address bar. <br> Up to 32 characters can be input in the NetBEUI configuration screen Comment box, even though specification is 31 characters maximum. <br> If Trap is selected for the Access Type in the SNMP Configuration screen during the snmpd process, communication may be cut off. <br> - The NIB does not respond to the "Iprm -" command (root directory) from a FreeBSD host computer. <br> TCP Ports 11021 and 11023 (Design use) have been closed. <br> There were two error messages displayed when no files were available for download using FTP. The two messages were merged to "550: No such file or directory". | G0605920 M | January $2002$ | 1.78 | AB29 |


| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION | CHECK SUM |
| :---: | :---: | :---: | :---: | :---: |
| Continued From Previous Page <br> - PS status can be displayed in STAT command using ftpd/ rshd/ telnetd/ Ipd. <br> - During a given FTP login session, the NIB counts up every user command issued as a new session. <br> - The length of the login user name can be up to 64 characters when using FTP. | G0605920 M | January 2002 | 1.78 | AB29 |
| The following have been corrected: <br> - Cannot connect to Novell NDS. <br> - Two or more print queues can be attached to a single printer object <br> - The controller freezes if it is disconnected while the data which generates the Readback command is being printed out with $\mathrm{ftp} / \mathrm{rsh}$. <br> - The controller freezes when it cannot find the file specified for rcp transmission. <br> - The parameters of sysLocation and sysContact cannot be set correctly using the snmp command with telnet. <br> - The Fax Management Tool cannot be used for a while after any of the NIB setting(s) are changed. <br> Change in Specification: <br> - SNMP vulnerability <br> SNMP security vulnerabilities reported by CERT on Feb.12, 2002 has been resolved and tested using the PROTOS c06-snmpv1 test suite. <br> CERT :http://www.cert.org/advisories/CA-2002-03.html <br> PROTOS c06-snmpv1 test suite: <br> http://www.ee.oulu.fi/research/ouspg/protos/ testing/c06/snmpv1/ <br> - TCP ports for disabled services (e.g. FTP) were open. <br> - An unnecessary TCP port was open. | G0605920 N | $\begin{aligned} & \text { June } \\ & 2002 \end{aligned}$ | 1.81 | 8FA3 |


| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION | $\begin{aligned} & \text { CHECK } \\ & \text { SUM } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: |
| The following have been corrected: <br> - HTTP and telnet protocols can be opened/closed using telnet. <br> NOTE: After making the setting to disable HTTP, you cannot access the target device through a web browser. If your want to change this settings, please use telnet to open HTTP. When telnet port is disabled, you have to do clear the network settings (SP5-801-11) to open the telnet protocol. <br> - Changed the default setting of DHCP to ON. <br> NOTE: There is no change when updating the firmware. This feature is for the factory default. <br> - It does not work in a UNIX environment even if the install Script in the controller is downloaded. | G0605920 P | October 2002 | 1.82 | 384B |
| The following have been corrected: <br> - Access Mask does not work. | G0605920 Q | $\begin{aligned} & \text { July } \\ & 2003 \end{aligned}$ | 1.83 | E5D7 |

FIRMWARE HISTORY

PUBLISHED DATE: 11/06/2003

## PRODUCT CODE:

## APPLICABLE MODEL:

GESTETNER - DSC38S
LANIER - 2138CMF
RICOH - AP3800CMF
SAVIN - SLP38CS

## GENERAL:

The latest firmware version can be downloaded at the Technology Solutions Center FTP Site at http://tsc.ricohcorp.com. Be sure to check the README file for important notes and explanations.

NOTE: Refer to Facts Line Bulletin \# FL002 and Publication Bulletin \#023 for more information about the FTP Internet Web Site and EPROM/Flash Card Exchange program.

The revised areas have been highlighted by an arrow $\Rightarrow$.

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3. Scanner Application Firmware ................................................. 9
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5. LCDC Firmware........................................................................ 11

This publication explains the firmware modification history for the G570 that consists of the following items:

| G570 |  |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Controller DIMM1 | Controller DIMM 2 | IPU | Operation Panel |  |  |
| Firmware <br> Type | System, <br> Copier Application, <br> Netfile Application | Printer <br> Application | Scanner <br> Application | Scanner IPU | LCDC |  |

## 1. SYSTEM, COPY APPLICATION, NETFILE APPLICATION FIRMWARE

| P/N | System Version | Check Sum | Contents of Modification | Production |
| :---: | :---: | :---: | :---: | :---: |
| G5705388B | 1.02 | - | Firmware from the first mass production run. | $\begin{gathered} \hline \text { December, } \\ 2001 \\ \hline \end{gathered}$ |
| G5705388C | 1.05 | - | - Letterhead Mode has been added (See TSB G060/G570-019 for details). <br> - Date and time display format for Asia has been changed to that of Europe. <br> - SP7-904 [Print: Printer Gamma] deleted. <br> - SP7-807 [SC Jam Counter Clear] added. <br> - The following has been fixed: <br> - The staple LED on the operation panel does not light at staple end condition. | January, 2002 |
| G5706688 | 1.07 | 0CC4 | - The meter click counter specification has been changed so that copies made in SP mode are not counted up. With this modification, SC999 is detected when updating the engine main firmware from ver1.15E or older to 1.07 or later (see TSB G060/G570-018 for details). <br> - A grid pattern has been added to SP mode copy images. To activate this, it is necessary to use system firmware ver1.07 or newer. <br> - Specification changed so that the red LED for the printer application key top lights up when an alert condition is detected (e.g. fusing/oil supply unit near end). Just as with the G060 printer, the LED lighting conditions depend on the setting of SP5-930-3. <br> - RMS is supported with the use of the customized controller (field monitoring machines only). <br> - The following have been fixed: <br> - The Punch Counter counts up by 2 for every sheet punched when using the function in Duplex Mode. <br> - Executing system settings reset does not clear the password settings for stored documents or change the setting for Auto-off (energy saver 2) back to default. <br> - Printed sheets are fed out to shift tray 2 of the finisher in punch/staple mode. <br> - Centering problem when printing onto $12^{\prime \prime}$ x $18^{\prime \prime}$ paper. | March, 2002 |


| P/N | System <br> Version | Check <br> Sum | Contents of Modification | Production |
| :--- | :---: | :---: | :---: | :---: | :---: |
| G5706688A <br> $\ll$ A $\gg$ | 1.08 | $0 E 02$ | $\bullet$The following have been fixed: <br> When scanning originals in color <br> mode, the machine freezes if the <br> HDD is in the near-full condition and <br> the scanned data is saved in JPEG <br> format. | May, 2002 |
| "8 1/4 x 14 SEF" is displayed when the <br> machine detects 8 1/2 x 14 SEF. |  |  |  |  |
| <<C>> |  |  |  |  |

## 2. PRINTER APPLICATION FIRMWARE

| P/N | Version | Check Sum | Contents of Modification | Production |
| :---: | :---: | :---: | :---: | :---: |
| G5705391B | 1.02 | - | Firmware installed from the first mass production run. | $\begin{gathered} \hline \text { December, } \\ 2001 \\ \hline \end{gathered}$ |
| G5705391C | 1.05 | - | - The following has been fixed: Paper is not punched at the designated position in Series Print mode (see TSB PUB(C) - 043 for details on Series Print mode). | January, 2002 |
| G5705391D | 1.06 | - | - The following has been fixed: While downloading PS fonts to a machine with the HDD option installed, the correct PS serial number cannot be output. | $\begin{aligned} & \text { February, } \\ & 2002 \end{aligned}$ |
| G5705391E | 1.07 | 2EB8 | - Euro fonts PC858, ISO8859-15, L9, PS Math and MC Text are now supported. <br> - PS performance improvement. <br> - The followings have been fixed: <br> - When the undefined command, " $<E S C>\& k \# w$ ", is received, it appears on the output as a character string [e.g. as "<ESC>\&k6w"]. <br> - If Job Reset is selected while the first page of a multiple-page document is being processed, the panel continues to display "Printing". <br> - AutoContinue timer bug. | March, 2002 |
| $\begin{aligned} & \begin{array}{l} \text { G5705391F } \\ \text { <<A>> } \end{array} \end{aligned}$ | 1.08 | 972E | - The following have been fixed: <br> - The panel indicates an Offline status when recovering from Energy Saver mode. <br> - The software allows a password of less than 4 characters to be set for Locked Printing. <br> - The panel freezes when the following is performed: <br> - Several tabs are accessed in User Tools - Printer Features. <br> - Bypass Paper Size is selected in the Paper Input tab and the custom paper size is set. <br> - The panel freezes when a punch error occurs in Series Print mode. <br> - Certain characters do not print <br> - Change in Specification: <br> - The icon for Letterhead with duplex on the initial display for Copier mode has been changed to match that of the other paper icons. <br> - PCL <br> - Modified so that all characters in symbol sets MS Text and Windows Baltic (19L) print out the same as with HP. | May, 2002 |


| P/N | Version | Check Sum | Contents of Modification | Production |
| :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \hline \text { G5705391F } \\ & \text { <<A>> } \end{aligned}$ | 1.08 | 972E | - When the HDD option is not installed, PCL HDD Directory List and Font Source sections will not appear on the PCL Configuration Page. <br> - PS <br> - The black dither will not be used with the DeviceGray command. | May, 2002 |
| $\begin{aligned} & \text { G5705391G } \\ & \text { <<B>> } \end{aligned}$ | 1.08 .5 | FD19 | - Counter values displayed on the configuration sheet for "Pages Printed" have been changed as follows: <br> - SP7-003-01 [-20 / -21] $\rightarrow$ SP7-003-01 [-30/-23]. <br> - The following have been fixed: <br> - PCL <br> - Modified the dither size for when the UDFP command is used <br> - PS <br> - Margin for Custom size has been changed from 12 to 11 points to expand the maximum printing area. <br> - Modified the dither setting for when the DeviceGray command is used. <br> - Change in Specification: <br> Supports the Status Readback function of the PCL5e. | June, 2002 |
| $\begin{aligned} & \text { G5705391H } \\ & \text { <<B>> } \end{aligned}$ | 1.09 | 9809 | - The following has been fixed: <br> - The printing speed of a PS job slows down after a PS3 job is reset. | July, 2002 |
| $\begin{aligned} & \text { G5705391J } \\ & \text { <<D>> } \end{aligned}$ | 1.11 | C775 | - Counter values displayed on the configuration sheet for "Pages Printed" have been changed as follows for when Meter Click Charge mode is on and development count method has been selected: SP7-003-01 [-30 / -23] $\rightarrow$ SP7-003-01 [-20 / -21] <br> - Does not go Online when the time setting is changed greatly on the operation panel. <br> - When paper size error occurs using PCL printing, the printer error message of SNM for Client is not displayed on the PC. <br> - The following have been fixed: <br> - Toner near end alert of the replaced toner doesn't disappear even if one of the toner cartridges is replaced when more than one toner are toner near end condition. <br> - PCL <br> - Euro font does not print correctly. <br> - Line Spacing Command, <br> "Esc\&I\#D", causes incorrect output. <br> - Slow Printing from AutoCAD. <br> - PS <br> - Euro symbol is not printed. Please refer to TSB PUB(C) - 045 <br> - PS print file is printed as text. | $\begin{aligned} & \text { October, } \\ & 2002 \end{aligned}$ |


| P/N | Version | Check Sum | Contents of Modification | Production |
| :---: | :---: | :---: | :---: | :---: |
| $\begin{array}{\|l\|} \hline \text { G5705391J } \\ \text { <<D>> } \end{array}$ | 1.11 | C775 | - Counter values displayed on the configuration sheet for "Pages Printed" have been changed as follows for when Meter Click Charge mode is on and development count method has been selected: <br> SP7-003-01 [-30 / -23] $\rightarrow$ SP7-003-01 [-20 /-21] <br> - It does not go Online when the time setting is changed greatly on the operation panel. <br> - When paper size error occurs using PCL printing, the printer error message of SNM for Client is not displayed on the PC. <br> - The following have been fixed: <br> - Toner near end alert of the replaced toner doesn't disappear even if one of the toner cartridges is replaced when more than one toner are toner near end condition. <br> - PCL <br> - Euro font does not print correctly. <br> - Line Spacing Command, <br> "Esc\&l\#D", causes incorrect output. Slow Printing from AutoCAD. <br> - PS <br> - Euro symbol is not printed. Please refer to TSB PUB(C) - 045, for the procedure of how to fix this issue. <br> - PS print file is printed as text. | $\begin{gathered} \hline \text { October, } \\ 2002 \end{gathered}$ |
| $\begin{aligned} & \text { G5705391K } \\ & \text { <<E>> } \end{aligned}$ | 1.12 | EE00 | - The following have been fixed: <br> - After using User Tool on operation panel, PCL print jobs may keep showing "Printing..." on operation panel. <br> - Form Lines value (under PCL Menu) change after reboot the Machine. <br> - PCL <br> - Response to PJL INFO CONFIG command does not include serial number. <br> - The print may stop during the processing of the file when using "INFICO". <br> - The work area of RAM is reduced whenever fonts that have been downloaded to HDD are used. | $\begin{gathered} \hline \text { December, } \\ 2002 \end{gathered}$ |


| P/N | Version | Check Sum | Contents of Modification | Production |
| :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { G5705391K } \\ & \text { <<E>> } \end{aligned}$ | 1.12 | EE00 | - PS <br> - 16bit color blend data does not print correctly. <br> - Slow Printing from AutoCAD. <br> - Printing may not work correctly when a protocol other than EtherTalk is used on Macintosh 8.x/9.x. <br> - The printer controller locks-up when printing from Unix Acrobat. <br> - Lines may be printed on the blank of page. <br> - The error log is not described in Configuration page when the punch error occurred. <br> - When data is sent that outputs 3 hole punch to the European model (which supports $2 \& 4$ hole punch), output has 2 hole punch. (Now output has no punch). <br> - Printing on envelope may not work correctly. <br> - PJL <br> - Response to PJL INFO CONFIG command does not include serial number. | $\begin{gathered} \hline \text { December, } \\ 2002 \end{gathered}$ |
| $\begin{aligned} & \text { G5705391L } \\ & \ll G \gg \end{aligned}$ | 1.13 | - | - The following have been fixed: <br> - PCL <br> - The following problems with the CAD print file were fixed. <br> 1) Modified the available pen number from 8 to 256 when BitSw \#3-3 is ON. <br> 2) The "null" character is ignored when it is included in HP/GL2 data. <br> 3) The status flag for the bold selection command is refreshed when the bold selection command In HP/GL2 data is selected. <br> - Supports mixed binding orientations with duplex jobs using cover sheets. <br> - When using the "PageLength" command, duplex print does not work. -The downloaded PCL Barcode fonts are not printed correctly on the PCL font list. <br> - The Barcodes are printed with shift. <br> - Selecting HDD font may reduce available memory. <br> - Supported SAP Barcode \& OCR printing. <br> - PS <br> - PS error occurs when unknown media type is specified. <br> - The default setting of mainframe System/Resolution is "1200 x 600dpi". | Not available |


| P/N | Version | Check <br> Sum | Contents of Modification | Production |
| :--- | :---: | :---: | :---: | :---: |
| G5705391M <br> <<G>> | 1.14 | 1BD2 | - Change in specification <br> - Changing Adobe PostScript 3 Logo in <br> PS config page to red. | April, 2003 |

## 3. SCANNER APPLICATION FIRMWARE

| P/N | Version | Check Sum | Contents of Modification | Production |
| :---: | :---: | :---: | :---: | :---: |
| G5705386A | 1.00 |  | Firmware installed from the first mass production run. | $\begin{gathered} \hline \text { December, } \\ 2001 \end{gathered}$ |
| G5705386B | 1.03 | DCB6 | - The following has been fixed: <br> - PP mode software bug | January, 2002 |
| $\begin{aligned} & \text { G5705386C } \\ & \text { <<G>> } \end{aligned}$ | 1.06 | F1BB | - The following bug is fixed. <br> - SC990 will occur when scanning from the TWAIN driver and the defined document size on TWAIN is larger than the paper size that the ADF detected. An error message, "The length of the original exceeds limit." is displayed in the TWAIN driver U/I. <br> - e.g. Document size on TWAIN Driver: A3 Portrait (A3 SEF), ADF detected paper size: A4 SEF <br> - When printing a job while scanning from the TWAIN driver, the scanning process is interrupted. An error message, "Scanner memory is in use for other function. Check the scanner." is displayed in the TWAIN driver U/I. <br> - Scanner terminates connection and SC997 is displayed when the data load on the MFP is high, such as at the full condition for recovery delivery jobs or delivery requests, continuous memory transmissions, memory/substitute receptions of over 1000 pages, or transfer station for over 1000 pages. | July, 2002 |

## 4. SCANNER IPU FIRMWARE

| P/N | Version | Check Sum | Contents of Modification | Cut-in Month |
| :---: | :---: | :---: | :---: | :---: |
| G5705350H | 1.10 | - | Firmware installed from the first mass production run. | $\begin{gathered} \hline \text { December, } \\ 2001 \\ \hline \end{gathered}$ |
| G5705350J | 1.12 | 507A | - Scanner software modified to effectively minimize variations in SBU board scanner controller output. <br> - The following has been fixed: <br> - A color misalignment appears when the full-page cover sheet and combine functions are selected. | $\begin{gathered} \text { February, } \\ 2002 \end{gathered}$ |
| $\begin{aligned} & \text { G5705350K } \\ & \text { <<F>> } \end{aligned}$ | 1.18 | EFE2 | - Firmware modified for use with the next model. | $\begin{gathered} \text { December, } \\ 2002 \end{gathered}$ |
| $\begin{aligned} & \text { G5705350L } \\ & \text { <<F>> } \end{aligned}$ | 1.20 | A856 | - The following has been fixed: <br> * Shading correction error with ADF copies sometimes causes paleness or horizontal black or white bands. | $\begin{gathered} \text { January, } \\ 2003 \end{gathered}$ |
| $\begin{aligned} & \text { G5705350M } \\ & \text { <<H>> } \end{aligned}$ | 1.21 | AAA2 | - The following has been fixed: <br> The filter coefficient for text/photo separation has been changed in text mode. | March, 2003 |

## 5. LCDC FIRMWARE

| P/N | Version | Check <br> Sum | Contents of Modification | Production |
| :--- | :---: | :---: | :---: | :---: |
| G5705426 | 2.10 | 2DFD | Firmware installed from the first mass <br> production run. | December, <br> 2001 |
| G5705426A <br> <<A>> | 2.12 | 920 A | The following has been fixed: <br> Characters preceding a backslash <br> appear as a " $¥$ " on the User Program <br> SMC report. | May, 2002 |

## FIRMWARE HISTORY

PUBLISHED DATE：11／13／2003

## PRODUCT CODE：G307

## APPLICABLE MODEL：

GESTETNER－FAX OPTION TYPE 3800C FOR DSC38S／DSC38US
LANIER－FAX OPTION TYPE 3800C FOR 2138CMF／LP138C CMF
RICOH－FAX OPTION TYPE 3800C FOR AP3800CMF／AFICIO CL7000CMF
SAVIN－FAX OPTION TYPE 3800C FOR SLP38CS／CLP28S

## GENERAL：

The latest firmware version can be downloaded at the Technology Solutions Center FTP Site at http：／／tsc．ricohcorp．com．Be sure to check the README file for important notes and explanations．

NOTE：$\quad$ Refer to Facts Line Bulletin \＃FL002 and Publication Bulletin \＃023 for more information about the FTP Internet Web Site and EPROM／Flash Card Exchange program．

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FAX FCU： .2

FAX FCU:

| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION | CHECK SUM |
| :---: | :---: | :---: | :---: | :---: |
| - Installed from the first mass production. | G3075771 B | $\begin{gathered} \hline \text { December } \\ 2001 \\ \hline \end{gathered}$ | 2.00.04 | 8EAD |
| Corrects the following: <br> - The Al tone is sent 1 db higher than the value set in the modem. <br> - The machine sometimes freezes if the operator attempts to cancel the printing out of a report containing image data <br> - If communication is interrupted (ECM disabled) while the machine is receiving MMR compressed data, the machine prints out blank sheets or no sheets at all. <br> - Even when paper is reloaded following paper end during the printout of the power failure report, the machine does not continue printing and the job is cancelled. <br> - If the Printing Numbers have been set for reception mode or special sender and Transfer Request is enabled, the machine will print out the programmed number of sheets in addition to transferring the data to the proper destination. | G3075771 C | $\begin{aligned} & \text { February } \\ & 2002 \end{aligned}$ | 3.00 .02 | 6FFB |
| Corrects the following: <br> - Broadcasting sometimes fails when sending through PCFax. <br> - Memory transmission sometimes fails following repetition of On-hook \# reg Off-hook. | G3075771 D | $\begin{gathered} \text { October } \\ 2002 \end{gathered}$ | 4.00 .00 | 672A |

- The following bit switch has been added.

| SYSTEM SWITCH 19 |  |  |
| :---: | :---: | :---: |
| No. | FUNCTION | COMMENTS |
| 4 | Number of jobs controlled for PC-FAX TX <br> 0: 64 Jobs <br> 1: No limitations (but conforms to device limitations) | Sets the number of jobs controlled for PC-FAX transactions. If " 1 " is selected (no limitations), control is relinquished to the device (standard 400, expandable to 800). |


[^0]:    Communication Switch 15 - Not used (do not change the settings)

[^1]:    * This DIMM is removed and replaced with DIMM 1 (SYSTEM) and DIMM 2 (PRT/SCN) when configured to support the Copier Feature Expander

[^2]:    ＊DENOTES NEW ITEM NUMBER

