

# TOSHIBA

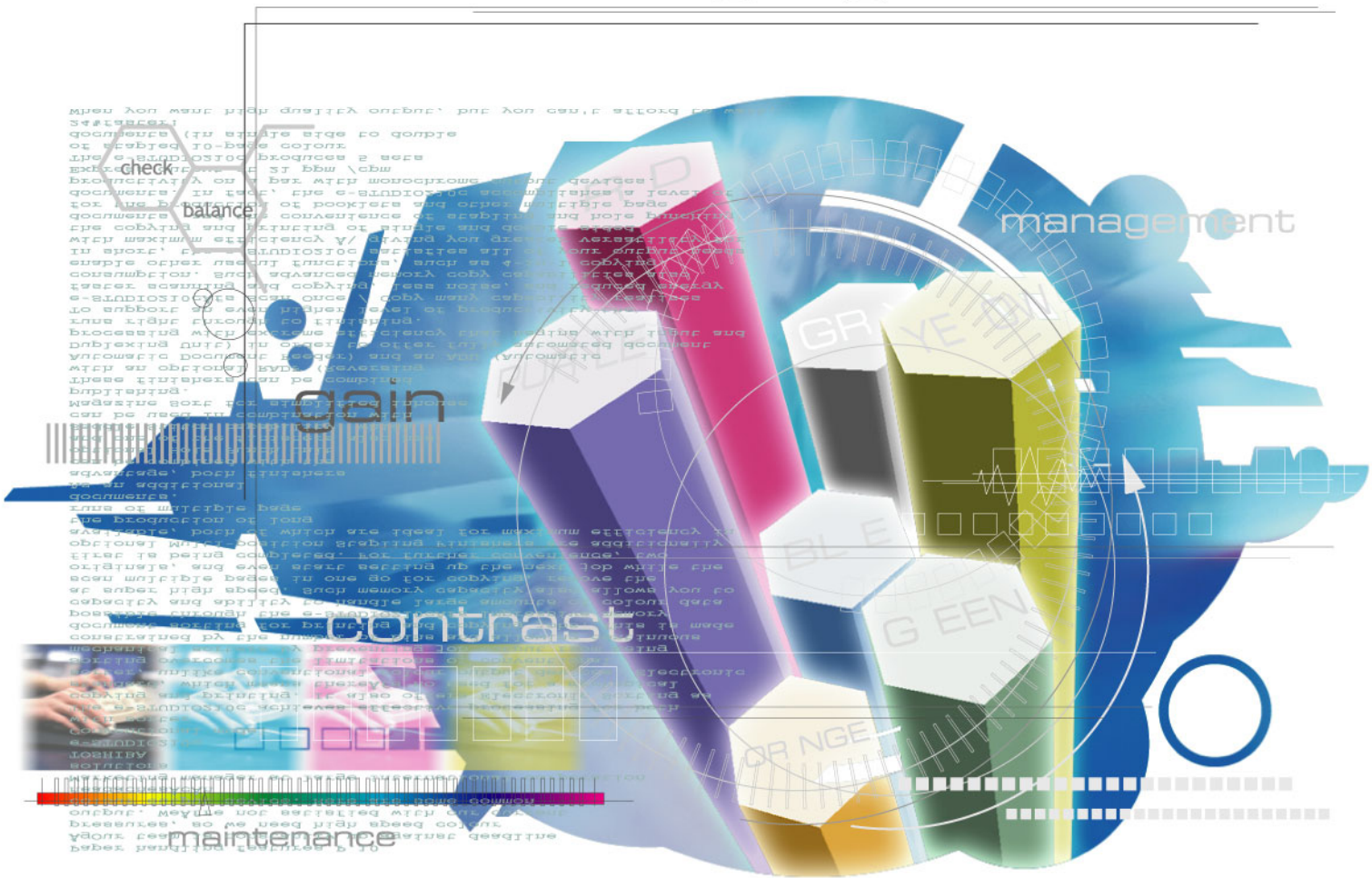


## e-STUDIO281c/351c/451c

Think in colour™  
Think in color™

Satisfying Specific Customer Needs for Designed Image Quality

# Imaging Manual



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# Revision Record

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# Purpose of the Imaging Manual

The Imaging Manual is intended for customers using the Toshiba e-STUDIO281c/351c/451c with a variety of specific needs and inquiries for high image quality, such as:

- How to obtain a clearer copy image
- How to maintain the current image quality
- How to make the text look sharper on the copy

The Toshiba MFPs are factory-configured to provide image quality settings that satisfy the majority of customers. However, these settings may not be necessarily optimal for all specific needs from customers. Proper image quality adjustments can satisfy such needs. Most of the adjustments described in this manual must be performed by a service technician, but a few of them can also be performed by the customer.

It is strongly recommended that this manual be fully utilized by not only the service technician, but also the sales representative, who also has opportunities of obtaining customer feedback on the image quality. This manual helps the sales representative to study and comprehend what kind of customer needs for the image quality can be satisfied, to make a proposal to the customer for improving image quality, and to communicate the customers needs with ease to the service technician. In addition, this manual is expected to facilitate the marketing of the Toshiba MFPs to prospective customers that have specific demand for image quality and the expansion of sales.

The adjustments described in this manual are all based on the needs of actual customers. Meeting their specific needs will increase their satisfaction.

Please remember to read "Cautions after the completion of the adjustment," which you must pay close attention to, after the completion of the adjustment.













## Precautions in Servicing

- For adjustments to be performed by the service technician, the cautions mentioned in the Service Manual must be stringently followed. The adjustments must be performed by a qualified service technician who has completed the service training course.
- The default values mentioned in this manual may be different from the actual ones, due to the timing of shipping (firmware version). But note that the values recommended and acceptable value range mentioned in this manual remain the same.



## Icons

The following icons used in this manual denotes the following:

-  :
  - Copy — An adjustment having an effect on copying in Black mode (excluding Image smoothing mode)
  - Printer — An adjustment having an effect on black-and-white printing
    - \*The adjustment will be effective, if "Mono" is selected from among the "Color" options on the Windows printer driver or if "Mono" is selected from among the "Color Resolution Type" options on the Macintosh printer driver.
  - Scan — An adjustment having an effect on scanning in Black mode
  
-  :
  - Copy — An adjustment having an effect on copying in Image smoothing mode in Black mode
  - Scan — An adjustment having an effect on scanning in Gray scale mode
  
-  :
  - Copy — An adjustment having an effect on copying in Full color mode
  - Printer — An adjustment having an effect on full-color printing
    - \*The adjustment will be effective, if "Automatic" is selected from among the "Color" options on the Windows printer driver or if "Color" is selected from among the "Color Resolution Type" options on the Macintosh printer driver.
  - Scan — An adjustment having an effect on scanning in Full color mode
  
-  :
  - Copy — An adjustment having an effect on copying in Auto color mode
  - Scan — An adjustment having an effect on scanning in Auto color mode
  
-  : An adjustment having an effect on printing on the Windows PCL5c emulation printer driver
  
-  : An adjustment having an effect on printing on the Windows PCL6 emulation printer driver
  
-  : An adjustment having an effect on printing on the Windows PS3 emulation printer driver
  
-  : An adjustment having effect on printing on the Macintosh printer driver
  
-  : An adjustment having an effect on the image stored in the e-Filing box by the scanning functions (including Scan to Box, Scan to File and Scan to E-mail)
  
-  : An adjustment having an effect on the image stored in the e-Filing box by the copying functions (Copy to Box)
  
-  : An adjustment having an effect on the image stored in the e-Filing box by the printing functions (Print to Box)
  
-  : An adjustment having an effect on the image stored in the e-Filing box by the Fax and Internet Fax functions (including Received Fax to Box and Received Internet Fax to Box)

## 1. General Adjustments – Copying, Printing and e-Filing (Output from Box)

- 1.1 To Obtain a Darker Image
- 1.2 To Achieve the Image Quality Most Suitable for Paper Used
  - 1.2.1 To Adjust the Blurred or Grained Image
  - 1.2.2 To Adjust the Light Image at the Trailing Edge/Splattering of Toner
- 1.3 To Minimize Variations in the Image Quality after Power-on (To optimally program image quality control)
- 1.4 To Minimize Variations in the Image Quality under the Operating Conditions (To optimally program image quality control)
- 1.5 To Correct Out-of-Register Colors
  - 1.5.1 Color Registration Control Procedure 1: To Correct Out-of-register colors on A3/LD-sized Paper with Test Print Pattern 63 (05-63)
  - 1.5.2 Color Registration Control Procedure 1: To Correct Out-of-register colors on A4/LT -sized Paper with Test Print Pattern 68 (05-68)
  - 1.5.3 Color Registration Control Procedure 2: To Correct Out-of-register colors with Test Print Pattern 64 (05-64)

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  - 2.1.1 To Adjust the Copy Image Quality in Black Mode
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- 2.2 To Closely Match with the Color Balance of the Original
- 2.3 To Improve the Reproducibility of Gray
- 2.4 To Copy in Vivid Colors
- 2.5 To Make the Pale Area of the Original Look Darker and Sharper (To improve the highlight reproducibility)
- 2.6 To Eliminate the Background Color
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- 2.11 To Make Solid Filled Bold Text (Logo) Highly Colored
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- 2.13 To Obtain a Good Color Balance on Thick Paper
- 2.14 To Obtain Smooth Gray-scale Photo Images
- 2.15 To Change the Threshold in Auto Color Mode

(To change the threshold between Full color mode and Black mode to meet the user's needs)

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- 2.17 To Adjust the Twin Color Copy Image Quality (To adjust the image quality in red and black mode)
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  - 2.17.2 To Adjust the Tint of Red in Red and Black Mode
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- 3.11 To Print Illegible Gray or Colored Text in Black
- 3.12 To Ignore Blank Pages for Printing
- 3.13 To Sharply Print Black Text

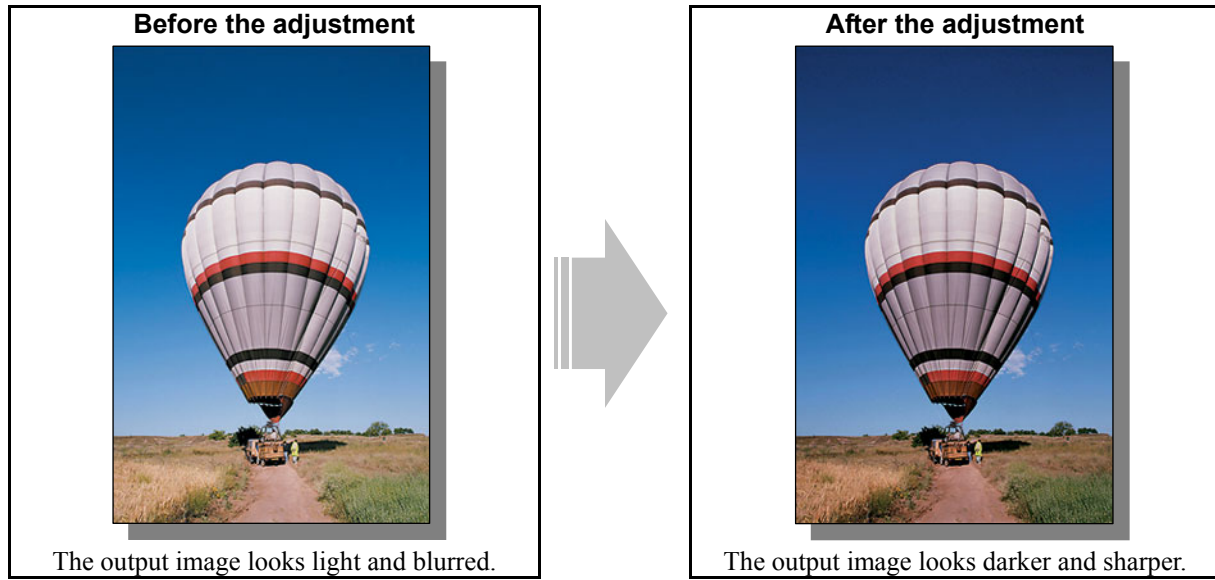
### **4. e-Filing-specific Adjustments**

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## 1.1 To Obtain a Darker Image



### □ Explanation

When an original containing photo images or gradational images is printed, the output image sometimes looks light and blurred. Perform image quality control or automatic calibration, and adjust the transfer roller bias output, in order to obtain a darker and sharper image.

### □ Procedures

- \* Perform the adjustment in accordance with the procedures below.
- \* Procedures (1), (3) and (4) are used by the service technician only.
- \* Procedure (2) is used by the service technician, and by the user.

- ■ ■ ■ ■ (1) Enter adjustment mode [05]. Select code [395]. Press the [START] button.
- Image quality control will be forcibly performed to correct variations in density.

After exercising image quality control, print and check the image quality.

If further image quality adjustments are still necessary, use the next procedure.

- ■ ■ ■ ■ (2) Perform the automatic calibration to correct variations in image density.
- \* [ADMIN] is selected from among the [CALIBRATION DISPLAY LEVEL] options by default. In other words, an administrator is authorized to operate the automatic calibration. But the [USER] option can also be selected to allow the user to operate it. Refer to the User Functions Guide for further information regarding how to select the [CALIBRATION DISPLAY LEVEL] option.

**To adjust the copy image quality**

Use steps (a) through (i) to perform the automatic calibration.

- (a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
- (b) Press the [ADMIN] button.
- (c) Enter the 6-digit administrator password. Press the [ENTER] button.
- (d) Press the [GENERAL] button.
- (e) Press the [CALIBRATION] button.
- (f) Press the [COPY] button.
- (g) Press the [CALIBRATION] button to print out the test chart.
- (h) Place the printed test chart on the original glass.
- (i) Press the [START] button to perform calibration. When the calibration comes to an end, the message "Scanning and calibrating" will disappear.

\* As a result of the above steps, both the full-color and black-and-white copy image quality will be corrected simultaneously.

**To adjust the print image quality**

Use steps (a) through (k) to perform the automatic calibration.

- (a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
- (b) Press the [ADMIN] button.
- (c) Enter the 6-digit administrator password. Press the [ENTER] button.
- (d) Press the [GENERAL] button.
- (e) Press the [CALIBRATION] button.
- (f) Press the [PRINT] button.
- (g) Press the desired resolution button ([600 x 600] or [1200 x 600]) of the PDL ("PS3" or "PCL" emulation), which will be based on the calibration.
- (h) Press the [CALIBRATION] button to print out the test chart.
- (i) Place the printed test chart on the original glass.
- (j) Press the [START] button to perform calibration. When the calibration comes to an end, the message "Scanning and calibrating" will disappear.
- (k) The message "Is a result made to reflect?" will appear. Press the [YES] button.

\* Automatic calibration correction will be applied to printing performed under the following conditions:

PC		Printer driver	Printing type	Automatic calibration correction	
Windows	PCL5c	Color: Automatic	Color	Applied	
			Mono	Applied	
		Color: Mono	Mono	Not applied	
	PS3	---	Color: Automatic	Mono	Not applied
			Color: Automatic	Color	Applied
				Mono	Applied
Color: Mono	Mono	Not applied			
Macintosh	Color Resolution Type: Color	Color	Color	Applied	
			Mono	Applied	
		Color Resolution Type: Mono	Mono	Not applied	

\* The [1200 x 600] button will be displayed, provided that the optional GC-1181 and GC-1230 expansion memories are installed.

\* Repeat the above steps to correct the resolution of the PDL ("PS3" or "PCL" emulation), if necessary.

After performing the automatic calibration, print and check the image quality.

If further image quality adjustments are still necessary, use the next procedure.



(3) Enter adjustment mode [05]. Change the values for codes [234/236/237/238/239] to adjust the transfer (2nd transfer) roller bias output.

(Adjust the offset voltage of transfer roller bias so as to increase the density of the image.)

- The code to use varies, according to a type of paper used. Adjust the value for the [05] code corresponding to the paper type for which you would like to improve the image quality. Set the value within a range of "2" to "8" to obtain the highest density of the image.

Paper type			[05] code	Subcode	Value recommended	Acceptable value range	Default
Plain paper	Black	Front	05-234	0	2 to 8	0 to 10	5
		Back		1			
	Full color	Front		2			
		Back		3			
Thick 1	Black	Front	05-236	0	2 to 8	0 to 10	5
		Back		1			
	Full color	Front		2			
		Back		3			
Thick 2	Black	05-237	0	2 to 8	0 to 10	5	
	Full color		1				
Thick 3	Black	05-238	0	2 to 8	0 to 10	5	
	Full color		1				
OHP	Black	05-239	0	2 to 8	0 to 10	5	
	Full color		1				

\*"Front" refers to the printed side in simplex mode or the side that is delivered facing upwards in duplex mode.

"Back" refers to the printed side that is delivered facing downwards in duplex mode.

\*The table below shows you the acceptable paper weight for the paper types.


Paper type	Acceptable paper weight	
Plain paper	64 to 80 g/m <sup>2</sup>	17 to 20 lb. Bond
Thick 1	81 to 105 g/m <sup>2</sup>	Max. 28 lb. Bond
Thick 2	106 to 163 g/m <sup>2</sup>	Max. 43 lb. Bond / 90 lb. Index
Thick 3	164 to 209 g/m <sup>2</sup>	Max. 55 lb. Bond / 110 lb. Index

- After adjusting the transfer roller bias output, perform the automatic calibration in the same manner as in procedure (2).

**<Hint>** The transfer voltage increases as the set value is increased. It is usually recommended that the set value be increased, when printing on thick paper or paper with asperities on its surface. On the other hand, the set value should be decreased, when printing on thin paper.

After adjusting the density, print and check the image quality.

If further image quality adjustments are still necessary, use the next procedure.

 (4) Check the life of the consumables (particularly the drum, developer material and fuser unit) and replace them, if necessary.

- When replacing any consumable, use steps (a) to (c) below.
  - (a) Enter PM support mode. Reset the counter corresponding to the replaced consumable to "0."
    - \* For further information regarding PM support mode, refer to the Service Handbook.
  - (b) Enter adjustment mode [05]. Select code [396]. Press the [START] button.
    - Image quality control will be performed and the image quality control value will be initialized.
  - (c) Perform the automatic calibration in the same manner as in procedure (2).

\* After replacing any consumable, remember to reset the counter corresponding to it to "0." Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

\* While replacing any consumable, also check the slit glass in the laser optical unit, and thoroughly clean it, if it is soiled.

#### **□ Cautions after the completion of the adjustment**

Nothing in particular.

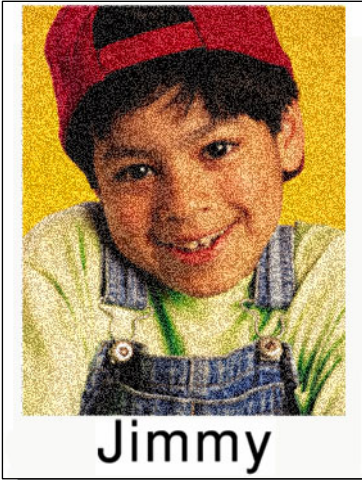
#### **□ Remarks**

- Enter the value mentioned in the procedures or one within the recommended value range for the adjustment. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.
- If printing on another type of paper causes a problem with the image quality after the adjustment, return the set values (for 05-234 to 239) to the default (set value: 5) and then perform the adjustment again.
- When replacing any consumable, refer to the relevant information in the Service Manual and Service Handbook.



## 1.2 To Achieve the Image Quality Most Suitable for Paper Used

**Before the adjustment**




Jimmy

The image looks grained, depending on the type of paper.

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Printing direction ↓

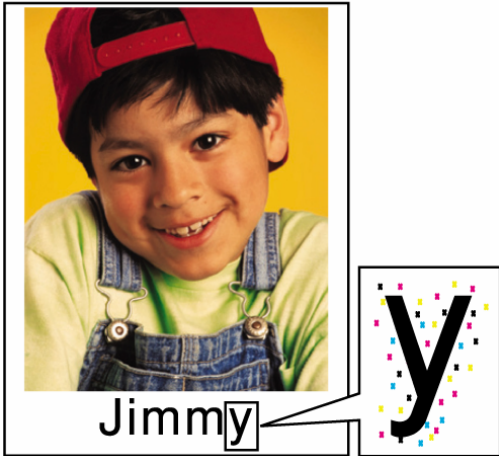


Jimmy

The image quality at the trailing edge of the paper may become lighter, depending on the type of paper used.

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Printing direction ↓




Jimmy

Toner is splattered in the image, depending on the type of paper, used.



**After the adjustment**



Jimmy

The clear image quality, most suitable for a type of paper used, is obtained.



### **□ Explanation**

The image sometimes looks slightly blurred or grained on the copy or printout, depending on the type of paper used. In addition, it may become lighter at the trailing edge of the paper. Adjust the transfer roller bias output, in order to achieve the image quality most suitable for the paper used.

### **□ Procedures**

- \*The service technician must perform the adjustment in accordance with the procedures below.
- \*The procedure to use varies, depending on whether the image looks blurred/grained or becomes lighter at the trailing edge of the paper. Use the procedures, according to the image quality problem you have.

## 1.2.1 To Adjust the Blurred or Grained Image



(1) Enter adjustment mode [05]. Change the values for codes [234/236/237/238/239] to adjust the transfer (2nd transfer) roller bias output.

(Adjust the offset voltage of transfer roller bias so as to optimize the halftones.)

- The code to use varies, according to a type of paper used. Adjust the value for the [05] code corresponding to the paper type for which you would like to improve the image quality. Set the value within a range of "2" to "8" to optimize the halftones.

Paper type			[05] code	Subcode	Value recommended	Acceptable value range	Default
Plain paper	Black	Front	05-234	0	2 to 8	0 to 10	5
		Back		1			
	Full color	Front		2			
		Back		3			
Thick 1	Black	Front	05-236	0	2 to 8	0 to 10	5
		Back		1			
	Full color	Front		2			
		Back		3			
Thick 2	Black	05-237	0	2 to 8	0 to 10	5	
	Full color		1				
Thick 3	Black	05-238	0	2 to 8	0 to 10	5	
	Full color		1				
OHP	Black	05-239	0	2 to 8	0 to 10	5	
	Full color		1				

\*"Front" refers to the printed side in simplex mode or the side that is delivered facing upwards in duplex mode.

"Back" refers to the printed side that is delivered facing downwards in duplex mode.

\*The table below shows you the acceptable paper weight for the paper types.

Paper type	Acceptable paper weight	
Plain paper	64 to 80 g/m <sup>2</sup>	17 to 20 lb. Bond
Thick 1	81 to 105 g/m <sup>2</sup>	Max. 28 lb. Bond
Thick 2	106 to 163 g/m <sup>2</sup>	Max. 43 lb. Bond / 90 lb. Index
Thick 3	164 to 209 g/m <sup>2</sup>	Max. 55 lb. Bond / 110 lb. Index

- After adjusting the transfer roller bias output, perform the automatic calibration.

\*For further information regarding the procedures, refer to procedure (2) in 1.1 To Obtain a Darker Image.

**<Hint>** The transfer voltage increases as the set value is increased. It is usually desirable that the set value be decreased to obtain a clearly highlighted area.

After performing the adjustment, print and check the image quality.

If further image quality adjustments are still necessary, use the next procedure.



(2) Check the life of the consumables (particularly the drum, developer material and fuser unit) and replace them, if necessary.

- When replacing any consumable, use steps (a) to (c) below.
  - (a) Enter PM support mode. Reset the counter corresponding to the replaced consumable part to "0."
    - \* For further information regarding PM support mode, refer to the Service Handbook.
  - (b) Enter adjustment mode [05]. Select code [396]. Press the [START] button.
    - Image quality control will be performed and the image quality control value will be initialized.
  - (c) Perform the automatic calibration.
    - \* For further information regarding the procedures, refer to procedure (2) in 1.1 To Obtain a Darker Image.

\* After replacing any consumable, remember to reset the counter corresponding to it to "0." Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

\* While replacing any consumable, also check the slit glass in the laser optical unit, and thoroughly clean it, if it is soiled.

#### ❑ Cautions after the completion of the adjustment

Nothing in particular.

#### ❑ Remarks

- Enter the value mentioned in the procedures or one within the recommended value range for the adjustment. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.
- The desired image quality may not be obtained, depending on the type of paper used. In this case, use the recommended paper and then print or adjust the image quality.
- If printing on another type of paper causes a problem with the image quality after the adjustment, return the set values (for 05-234 to 239) to the default (set value: 5) and then perform the adjustment again.
- The adjustment will make up for the gap in the image quality and density between the front and back of the paper in duplex copying/printing. Particularly, if the image on the back is lighter than on the front, the image quality may be improved by increasing the set value for the transfer roller bias output.
- When replacing any consumable, refer to the relevant information in the Service Manual and Service Handbook.

### 1.2.2 To Adjust the Light Image at the Trailing Edge/Splattering of Toner

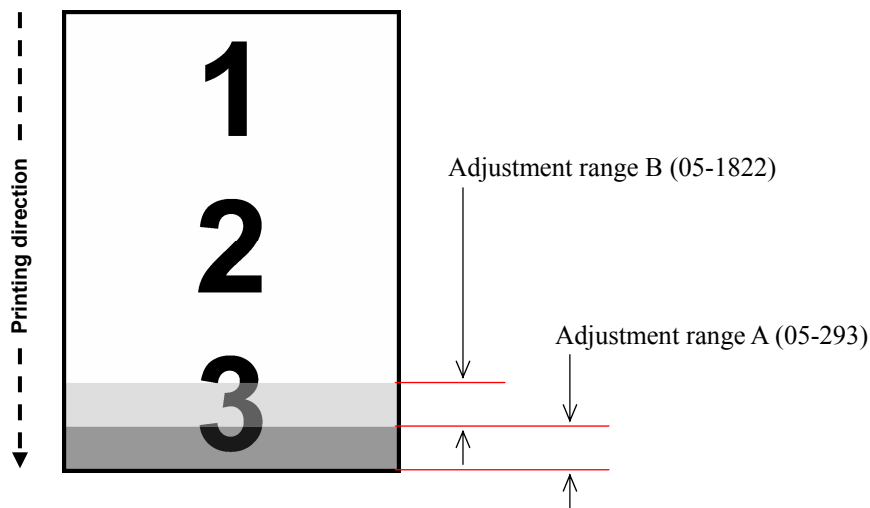


(1) Enter adjustment mode [05]. Change the value for code [293] or [1822] to adjust the transfer roller bias output at the trailing edge of the paper. (Adjust the ratio (%) of the transfer roller bias output at the center to the trailing edge of the paper, in order to ensure a uniform density between them.)

- The code to use varies, according to a type of paper used. Adjust the value for the [05] code corresponding to the paper type for which you would like to improve the image quality. Set the value within the recommended value range, in order to ensure a uniform density between the center and trailing edge of the paper.

• Use steps (a) to (b) to adjust the transfer roller bias output.

\*The adjustment ranges of the transfer roller bias output at the trailing edge of the paper are as illustrated below.



(a) Enter adjustment mode [05]. Change the value for code [293] to correct the transfer roller bias output at the trailing edge of the paper in adjustment range A.

Paper type	[05] code	Subcode	Value recommended	Acceptable value range	Default
Plain paper	05-293	0	60 to 85	0 to 100	85
Thick 1		1			75
Thick 2		2			80
Thick 3		3			80
OHP		4			80

- (b) Enter adjustment mode [05]. Change the value for code [1822] to correct the transfer roller bias output in adjustment range B. (Specify an average factor, in order to prevent the transfer roller bias output from being rapidly changed between the center and trailing edge of the paper.)

Paper type	[05] code	Subcode	Value recommended	Acceptable value range	Default
Plain paper	05-1822	0	75 to 100	0 to 100	92
Thick 1		1			
Thick 2		2			
Thick 3		3			
OHP		4			

\*The value for code 05-1822 must be larger than the one for code 05-293, if the same subcodes are used.

Example: Value for subcode 0 of 05-1822  $\geq$  Value for subcode 0 of 05-293

\*The table below shows you the acceptable paper weight for the paper types.

Paper type	Acceptable paper weight	
Plain paper	64 to 80 g/m <sup>2</sup>	17 to 20 lb. Bond
Thick 1	81 to 105 g/m <sup>2</sup>	Max. 28 lb. Bond
Thick 2	106 to 163 g/m <sup>2</sup>	Max. 43 lb. Bond / 90 lb. Index
Thick 3	164 to 209 g/m <sup>2</sup>	Max. 55 lb. Bond / 110 lb. Index

**<Hint>** As the set value is decreased, the transfer voltage at the trailing edge of the paper becomes low and eventually the image quality will vary. (If the transfer voltage is too high relative to the paper weight, a transfer void will occur. (The density will be decreased.) To avoid this problem, decrease the transfer voltage.)

After performing the adjustment, print and check the image quality.

If further image quality adjustments are still necessary, use the next procedure.



(2) Enter adjustment mode [05]. Change the value for code [434] to adjust the bottom margin.

\* This adjustment will have an effect only on the image printed on the back of the paper (printed side delivered facing downwards) in duplex copying. Remember that it will not affect the image printed in simplex copying, the one printed on the front of the paper (printed side delivered facing upwards) in duplex copying, and the print image quality.

\* In duplex copying, the bottom margin on the back of the paper may be narrower than on the front in simplex or duplex copying, depending on the paper size and how much paper is moistened. This results in the faint image at the trailing edge on the back of the paper. Adjust the bottom margin, in order to clearly copy at the trailing edge on the back of the paper.

• Use steps (a) to (b) to adjust the bottom margin.

(a) With the platen cover or RADF opened, make a double-sided copy. (Copy a solid black image.)

• Checking the copy image, determine how much the bottom margin should be increased.

\* Select the best paper size for duplex copying, if necessary. It is recommended to use the paper, which is most frequently used for duplex copying.

\* When making a double-sided copy of the solid black image, place blank paper on the original glass, allowing the solid black image to be copied only at the trailing edge on the back of the paper, for toner saving purposes.

(b) Enter adjustment mode [05]. Change the value for subcode "0" of code [434] to adjust the bottom margin on the back of the paper.

• The amount of change per step varies, depending on the paper size.

• Long size (A3/B4/LD/LG): The bottom margin will be increased by 0.042 mm per step.

• Short size (A4/LT): The bottom margin will be increased by 0.028 mm per step.

• Middle size (A4-R/LT-R, etc.): The bottom margin determined for the short size will be applied.

[05] code	Subcode	Value recommended	Acceptable value range	Default
05-434	0	Set a value larger than the current one to increase the bottom margin.	0 to 255	UC: 28 EUR: 45 Others: 45

\* Set the value in increments of approximately 12, while checking the copy image until the optimum value is obtained.

\* Set "0" for the subcode. Setting "1" for the subcode allows you to adjust the right margin on the back in duplex copying, but it is not necessary here. Therefore, never change the value for subcode 1.

• After the adjustment, make a double-sided copy again, with the platen cover or RADF opened and check the image at the trailing edge on the back of the paper. If further image quality adjustments are still necessary, repeat step (b).

**<Hint>** If the user is concerned regarding the image quality at the trailing edge on the back of the paper, set a slightly wider bottom margin (3 to 4 mm). If not, it is recommended to set it to 2 to 3 mm.



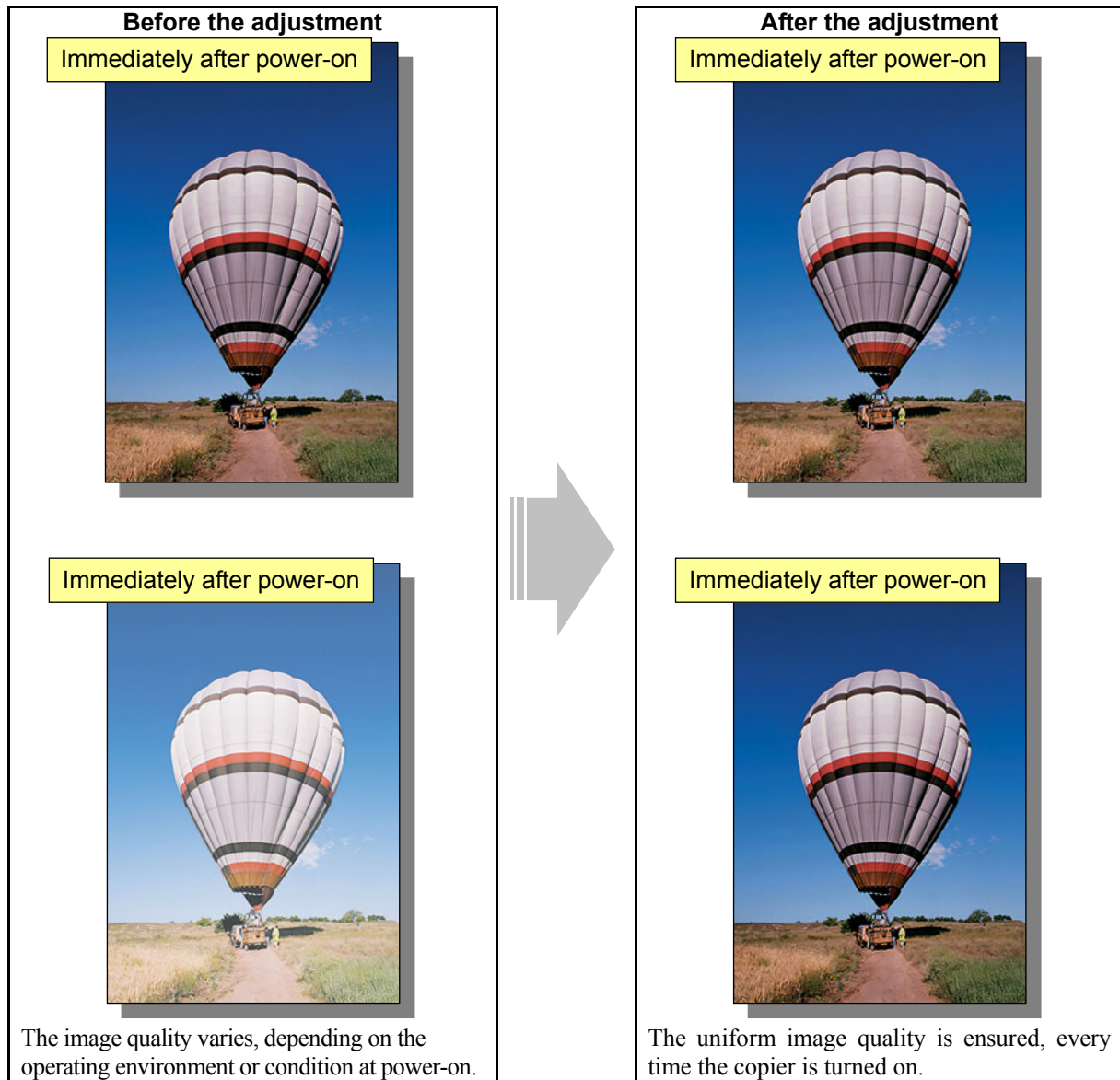
**❑ Cautions after the completion of the adjustment**

Too small a set value may possibly cause the image to become light, if a darker image is laid out at the trailing edge of the original. Therefore, carefully perform the adjustment, while checking the copy image.

**❑ Remarks**

- Enter the value mentioned in the procedures or one within the recommended value range for the adjustment. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.
- The desired image quality may not be obtained, depending on the type of paper used. In this case, use the recommended paper and then print or adjust the image quality.
- If printing on another type of paper causes a problem with the image quality after the adjustment, return the set values (for codes 05-239 and 1822) to the defaults and then perform the adjustment again.
- The adjustment will make up for the gap in the image quality and density at the trailing edge between the front and back of the paper in duplex copying. Particularly, if the image at the trailing edge on the back of the paper is light, the image quality may be improved by decreasing the set value for the transfer roller bias output.

## 1.3 To Minimize Variations in the Image Quality after Power-on (To optimally program image quality control)



### □ Explanation


If copying or printing is performed immediately after the copier is turned on or when it is returned from energy saving mode, there will be variations in the density of the image. (It will not occur when the copier is temporarily turned off and on for releasing jammed paper or when it is shortly returned from energy saving mode.) Switch the image quality control mode to the mode, which gives a higher priority to accuracy in image quality control, in order to ensure the uniform image quality, every time the copier is turned on.

\* Image quality control is performed in mode 1 by default, which is intended to reduce the warm-up time.

Switch it to mode 2, which is intended to increase the interval during which image quality control is performed.

**□ Procedures**

\*The service technician must perform the adjustment in accordance with the procedures below.

-  (1) Enter setting mode [08]. Change the value for code [559] to "2" to place image quality control in mode 2. It is intended to increase the interval during which image quality control is performed.


Value for 08-559	Image quality control immediately after the copier is turned on
0	Invalid
1	Valid: Mode 1 (default)
2	Valid: Mode 2

- After switching to mode 2, forcibly perform image quality control, as follows:

Enter adjustment mode [05]. Select code [395]. Press the [START] button.

After forcibly exercising image quality control, print and check the image quality.

If further image quality adjustments are still necessary, use the next procedure.

-  (2) Check the life of the consumables (particularly the drum, developer material and transfer belt unit) and replace them, if necessary.

- When replacing any consumable, use steps (a) to (c) below.

(a) Enter PM support mode. Reset the counter corresponding to the replaced consumable to "0."

\*For further information regarding PM support mode, refer to the Service Handbook.

(b) Enter adjustment mode [05]. Select code [396]. Press the [START] button.

- Image quality control will be performed and the image quality control value will be initialized.

(c) Perform the automatic calibration.

\*For further information regarding the procedures, refer to procedure (2) in 1.1 To Obtain a Darker Image.

\*After replacing any consumable, remember to reset the counter corresponding to it to "0." Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

\*While replacing any consumable, also check the slit glass in the laser optical unit, and thoroughly clean it, if it is soiled.

**□ Cautions after the completion of the adjustment**

Switching image quality control mode will increase the warm-up time by approximately 25 seconds at maximum, immediately after the copier is turned on or returned from energy saving mode. In addition, it will increase the interval during which image quality control is performed. This may possibly shorten the life of the consumables. Pay special attention to these factors and perform the adjustment, while checking the image quality.

**□ Remarks**

When replacing any consumable, refer to the relevant information in the Service Manual and Service Handbook.

## 1.4 To Minimize Variations in the Image Quality under the Operating Conditions (To optimally program image quality control)

Before the adjustment	After the adjustment
	
	
	
<p>The image contrast varies, depending on the date and time when copying or printing is performed or the type of job.</p>	<p>The image quality is constantly maintained.</p>

**□ Explanation**

The image contrast may vary, depending on the date and time when copying or printing is performed or the type of copy/print job. To constantly maintain image quality, shorten the waiting period until image quality control is performed.

**□ Procedures**

\*The service technician must perform the adjustment in accordance with the procedures below.



- (1) Enter setting mode [08]. Change the value for code [570], [571] or [572] to specify the best interval during which image quality control is performed, according to use of the copier. In addition, change the value for code [565] or [566] to switch image quality control mode to mode 2. It gives a higher priority to accuracy in image quality control.

**The copier is installed in a place where the temperature and humidity vary widely:**

Use steps (a) to (b) and perform the adjustment of image quality control.

- (a) Change the value for 08-405 within the range from "1" to "3" (value × %R.H.) to increase the frequency of image quality control, in response to a change in humidity.

\* Image quality control will be performed, when the relative humidity changes in accordance with the specified difference from the previous image quality control. If the difference in the relative humidity exceeds the specified value, image quality control is performed, first. Then a copy or print job will be performed.

Value for 08-570	Difference in relative humidity
1 to 3	5%R.H. to 15%R.H.
4	20%R.H. (default)

- (b) Change the value for code 08-565 to "2" to place image quality control in mode 2. It is intended to increase the interval during which image quality control is performed.

Value for 08-565	Image quality control when the relative humidity varies
0	Invalid
1	Valid: Mode 1 (default)
2	Valid: Mode 2

- After switching to mode 2, forcibly perform image quality control, as follows:  
Enter adjustment mode [05]. Select code [395]. Press the [START] button.

**A very small number of copies are output (approx. one copy per hour):**

Use steps (a) to (b) and perform the adjustment of image quality control.

(a) Change the value for 08-571 within the range from "1" to "3" to reduce the waiting period until image quality control is performed.

\* When a copy or print job is initiated, if the waiting period until image quality control is performed has already elapsed, image quality control is performed, first. Then a copy or print job will be performed.

Value for 08-571	Waiting period until image quality control is performed
1 to 3	1 to 3 hours
4	4 hours (default)

(b) Change the value for code 08-566 to "2" to place image quality control in mode 2. It is intended to increase the interval during which image quality control is performed.

Value for 08-566	Image quality control when the specified waiting period has already elapsed
0	Invalid
1	Valid: Mode 1 (default)
2	Valid: Mode 2

• After switching to mode 2, forcibly perform image quality control, as follows:

Enter adjustment mode [05]. Select code [395]. Press the [START] button.

**A large number of sheets are printed (hundreds of copies or more per day) and the image quality needs to be constantly maintained:**

Change the value for code 08-572 to "1" to "9" (Value  $\times$  100 sheets) to reduce the accumulated number of sheets printed. It will determine the interval until the next image quality control is performed.

\* After a copy or print job is completed, if the accumulated number of sheets printed exceeds the specified value, image quality control will be performed.

Value for 08-572	Accumulated number of sheets printed until image quality control is performed
1 to 9	100 to 900 sheets
10	1,000 sheets (default)

\* Use code 08-567 to define in which mode image quality control is performed, when the accumulated number of sheets printed exceeds the specified value. Mode 2 is selected by default. It is intended to increase the interval during which image quality control is performed and maintain the image quality with high accuracy. Therefore, never change the value for this code, unless otherwise required.

Value for 08-567	Image quality control when the accumulated number of sheets printed exceeds the specified value
0	Invalid
1	Valid: Mode 1
2	Valid: Mode 2 (default)

• After changing the value for code 08-572, forcibly perform image quality control, as follows:

Enter adjustment mode [05]. Select code [395]. Press the [START] button.

After performing the adjustment, print and check the image quality.

If further image quality adjustments are still necessary, use the next procedure.



(2) Check the life of the consumables (particularly the drum, developer material and transfer belt unit) and replace them, if necessary.

- When replacing any consumable, use steps (a) to (c) below.

(a) Enter PM support mode. Reset the counter corresponding to the replaced consumable to "0."

\* For further information regarding PM support mode, refer to the Service Handbook.

(b) Enter adjustment mode [05]. Select code [396]. Press the [START] button.

• Image quality control will be performed and the image quality control value will be initialized.

(c) Perform the automatic calibration.

\* For further information regarding the procedures, refer to procedure (2) in 1.1 To Obtain a Darker Image.

\* After replacing any consumable, remember to reset the counter corresponding to it to "0." Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

\* While replacing any consumable, also check the slit glass in the laser optical unit, and thoroughly clean it, if it is soiled.

#### ❑ Cautions after the completion of the adjustment

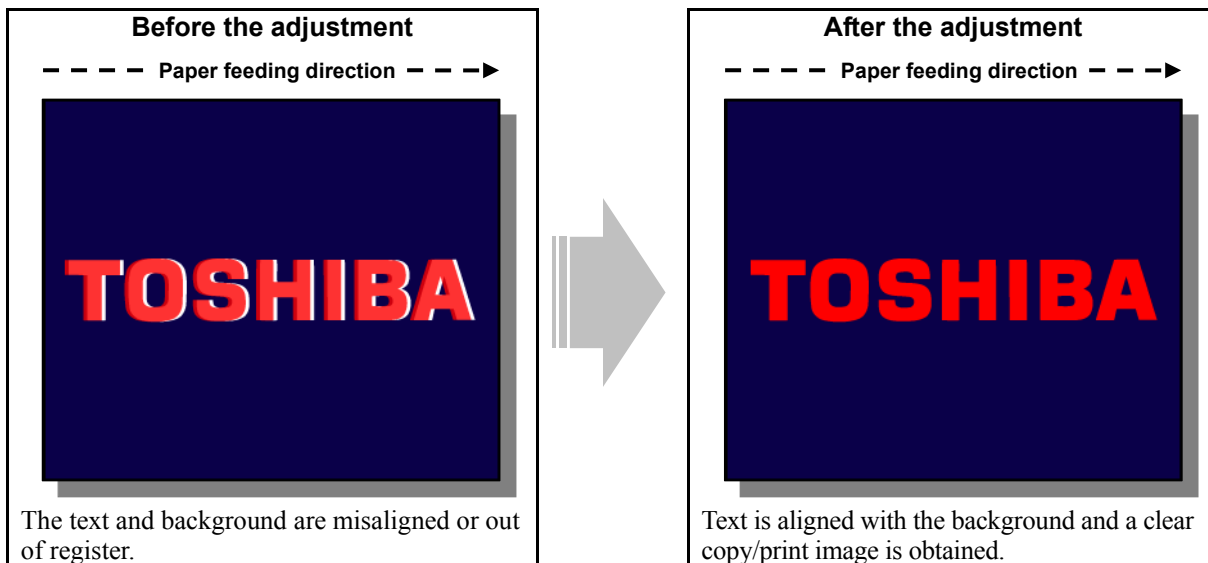
- The adjustment may possibly slow down the copying or printing speed and shorten the life of the consumables. Therefore, carefully perform the adjustment, while checking the image.
- Switching image quality control mode will increase the interval of image quality control by approximately 25 seconds at maximum. It is performed before or after a copy or print job is performed. This may possibly cause loss in the life of consumables. Pay special attention to these factors and perform the adjustment, while checking the image quality.

#### ❑ Remarks

- Enter the value mentioned in the procedures or one within the recommended value range for the adjustment. Otherwise, it may cause a loss in copier performance, including slowdown in the copying or printing speed.
- When replacing any consumable, refer to the relevant information in the Service Manual and Service Handbook.



## 1.5 To Correct Out-of-Register Colors



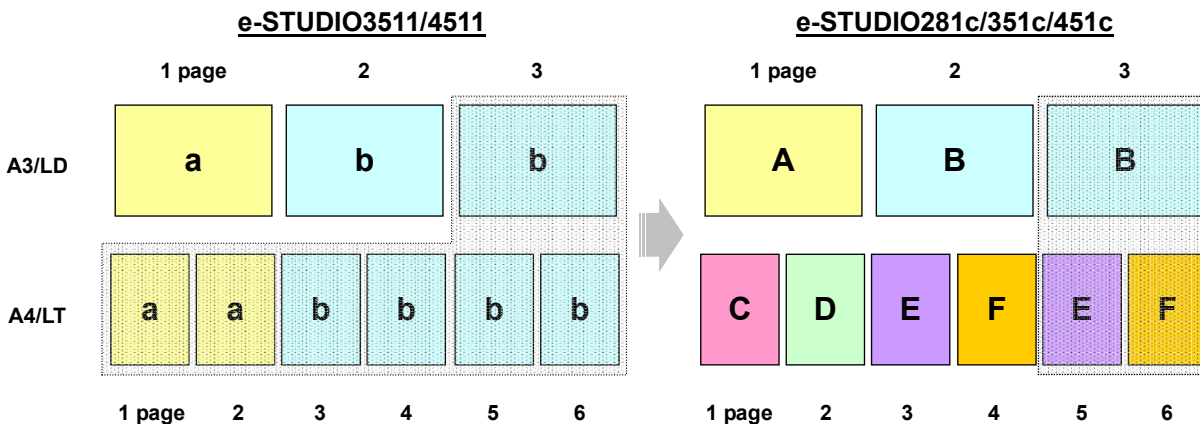
### □ Explanation


Colors of text or a thin line are sometimes printed out of register. Perform color registration control, in order to print or copy without out-of-register colors.

\*The e-STUDIO281c/351c/451c provides more accurate color registration control than the e-STUDIO3511/4511 (conventional models).

e-STUDIO3511/4511: Only A3/LD-sized paper can be corrected (a and b as illustrated below). The value set for A3/LD-sized paper will be automatically applied to the A4/LT-sized paper.

e-STUDIO281c/351c/451c: A3/LD-sized paper (A and B as illustrated below) and A4/LT-sized paper (C to F as illustrated below) can be individually corrected.



 : Pages where the value is automatically applied

**□ Procedure**

\*The service technician must perform the adjustment in accordance with the procedure below.

(1) Make sure that no out-of-register colors are recognized on an original.

(2) Check a direction in which colors are misaligned.

\*This adjustment is intended to correct the print start timing of the toner colors in the secondary scanning direction, in order to align the print positions of 3 toner colors (K, C and Y) with magenta (M). Therefore, it will be effective, only if colors are misaligned in the paper feeding direction (or the secondary scanning direction). If colors are misaligned in the direction perpendicular to the paper feeding direction (or the primary scanning direction), refer to <Hint> below.

**<Hint>** If colors are misaligned in the direction perpendicular to the paper feeding direction, enter test mode [03] and rotate the transfer belt for 5 minutes. (The main motor drives the transfer belt. Use 03-101 to rotate the main motor or 03-151 to stop it.) After that, check the copy or print image. If the colors still misaligned, replace the transfer belt or transfer belt unit. For further information regarding how to use test mode [03] and transfer belt replacement procedures, refer to the Service Manual and Service Handbook.

(3) Correct out-of-register colors in the secondary scanning direction.

\*Two types of the color registration control procedures are provided (one type for A4/LT-sized paper), and the test print pattern varies according to the procedures. Either of the patterns is available to correct out-of-register colors. Therefore, print out whichever one is easier to use.

Procedure	[05] code	Test print pattern	Printing image	Paper size	No. of copies to be printed	Referred to
Procedure 1	05-63	Test print pattern 63	Ladder	A3/LD	2	1.5.1
	05-68	Test print pattern 68		A4/LT	4	1.5.2
Procedure 2	05-64	Test print pattern 64	Block	A3/LD	2	1.5.3

\*Use steps in order, as listed below. If you start with other than step "1," use subsequent steps to the primary one. (e.g. If you start with step "2," subsequently use steps "3," "4," "5" and "6" in order.)

Order	[05] code	Procedure	Paper and range to be corrected	Remarks*
1	05-417	Procedure 1 or 2	A3/LD, 1st page	A
2	05-418		A3/LD, 2nd page	B
3	05-953	Procedure 1	A4/LT, 1st page	C
4	05-954		A4/LT, 2nd page	D
5	05-955		A4/LT, 3rd page	E
6	05-956		A4/LT, 4th page	F

\*The alphabet in Remarks in the table above indicates a page to be printed as illustrated in "□ Explanation" in the previous page.

- <Hint>**
- First, change the values for codes 05-417 and 418 to "correct out-of-register colors on A3/LD-sized paper" and "roughly correct out-of-register colors on A4/LT-sized paper." Next, change the values for codes 05-953 to 956 to "further correct out-of-register colors on A4/LT-sized paper."
  - The values for codes 05-417 and 418 are applied, in order to print or copy an original, on which a page data is pasted, on the transfer belt. The values for codes 05-953 to 956 are applied, in order to print or copy an original, on which a two-page data is pasted, on transfer belt.

\*Refer to the color registration control procedures described later for further information regarding each procedure.

### 1.5.1 Color Registration Control Procedure 1: To Correct Out-of-register colors on A3/LD-sized Paper with Test Print Pattern 63 (05-63)

(1) Enter adjustment mode [05] and print out the test print pattern to correct out-of-register colors.

- Use steps (a) to (b) to print out the test print pattern.

(a) Select A3/LD-sized paper.

(b) Enter a code corresponding to a desired test print pattern. Press the [FAX] button.

- Print out any of the following test print patterns in the table below.

[05] code	Test print pattern	Paper size	No. of copies to be printed
05-62	Grid pattern (for identifying out-of-register colors)	A3/LD	2
05-63	Test print pattern 63 (ladder pattern)	A3/LD	2

\* Use code 05-62. The grid pattern will be printed on the entire copy, with all toner colors (C, M, Y and K) overlaid. Check the printed grid pattern (or whether the toner colors are accurately overlaid) to discover out-of-register colors on the entire copy.

\* Jot down a "page number" and "paper feeding direction" on the printed test print pattern beforehand. This facilitates identifying out-of-register colors in the subsequent adjustment.



(2) Enter adjustment mode [05]. Change the values for codes [417] and [418] to correct out-of-register colors.

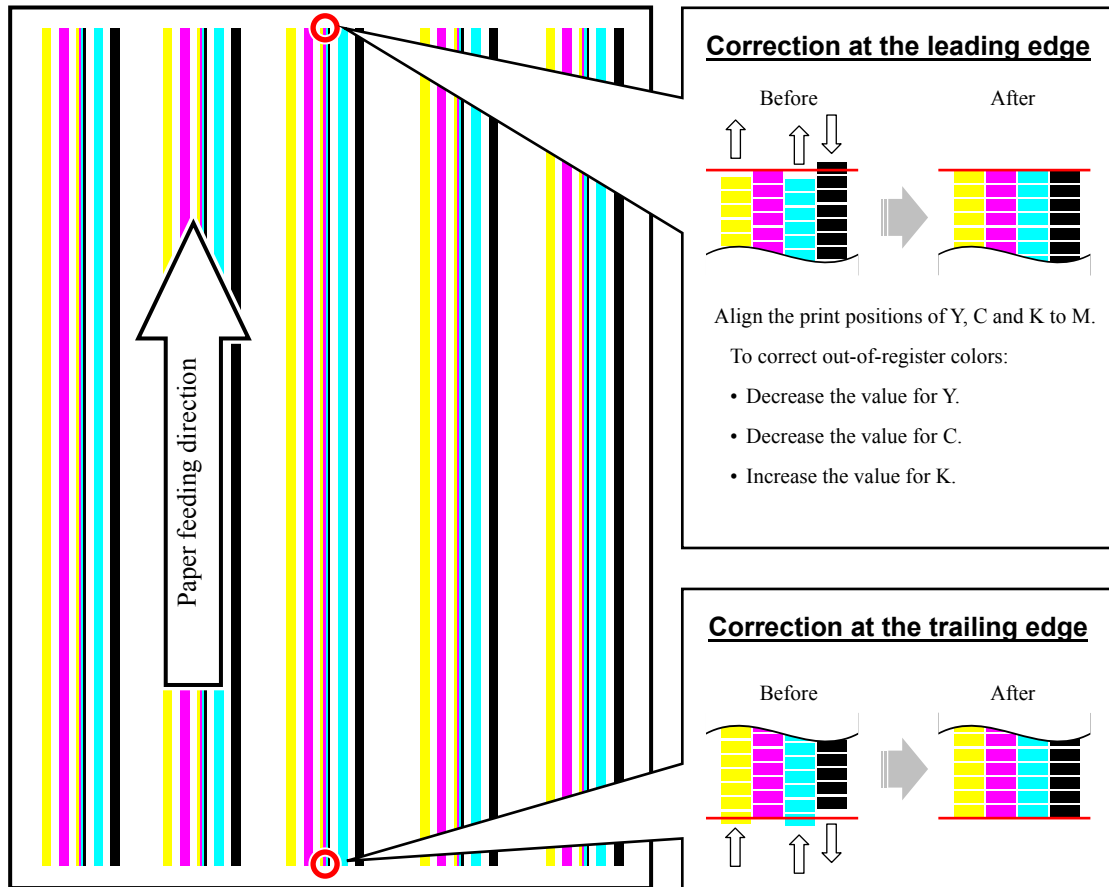
- Align 3 toner colors (Y, C and K) with magenta (M). First, change the value for code 05-417 and correct out-of-register colors on the first page of the test print pattern. Next, print out the 2 copies of test print pattern again. Change the value for code 05-418 and correct out-of-register colors on the second page.

Color	[05] code	Subcode	Value recommended	Acceptable value range
Y (yellow)	05-417	3	125 to 131	118 to 138
M (magenta)		2		
C (cyan)		1		
K (black)		0		
Y (yellow)	05-418	3	125 to 131	118 to 138
M (magenta)		2		
C (cyan)		1		
K (black)		0		

\* If the set value is increased by 1, the print position of the color will be shifted for 0.0423 mm toward the trailing edge of the paper. (For instance, if the value for code 05-417-1 is increased by 3, the print position of cyan will be shifted for 0.1269 mm (0.0423mm x 3) toward the trailing edge of the paper. This correction will affect all pages.

**How to use test print pattern for correcting out-of-register colors (ladder pattern)**

Align 3 toner colors (Y, C and K) with magenta (M) at the leading edge and trailing edge of the test print pattern.



\*If the colors cannot be aligned at the leading edge and trailing edge of the test print pattern, change the value to equalize the amount of out-of-register colors between the leading edge and trailing edge.

\*If the direction or the amount of out-of-register colors is not consistent, print out several copies of the test print pattern to identify a pattern for the out-of-register colors (direction and amount). Then perform the adjustment most suitable for it.

## 1.5.2 Color Registration Control Procedure 1: To Correct Out-of-register colors on A4/LT -sized Paper with Test Print Pattern 68 (05-68)

(1) Enter adjustment mode [05] and print out the test print pattern to correct out-of-register colors.

- Use steps (a) to (b) to print out the test print pattern.

(a) Select A4/LT-sized paper.

(b) Enter a code corresponding to a desired test print pattern. Press the [FAX] button.


- Print out any of the following test print patterns in the table below.

[05] code	Test print pattern	Paper size	No. of copies to be printed
05-69	Grid pattern (for identifying out-of-register colors)	A4/LT	4
05-68	Test print pattern 68 (ladder pattern)	A4/LT	4

\* Use code 05-69. The grid pattern will be printed on the entire copy, with all toner colors (C, M, Y and K) overlaid. Check the printed grid pattern (or whether the toner colors are accurately overlaid) to discover out-of-register colors on the entire copy.

\* Jot down a "page number" and "paper feeding direction" on the printed test print pattern beforehand. This facilitates identifying out-of-register colors in the subsequent adjustment.

\* Refer to procedure (2) of "1.5.1 Color Registration Control Procedures 1: To Correct Out-of-register colors on A3/LD-sized Paper with Test Print Pattern 63 (05-63)" for further information regarding the test print pattern sample and adjustment procedures.

 (2) Enter adjustment mode [05]. Change the values for codes [953 to 956] to correct out-of-register colors.

- Align 3 toner colors (Y, C and K) with magenta (M). First, change the value for code 05-953 and correct out-of-register colors on the first page of the test print pattern. Next, print out the 4 copies of test print pattern again. Change the value for code 05-954 and correct out-of-register colors on the second page. Similarly, print out the 4 copies of test print pattern at each time of correction. Change the value for code 05-955 and correct out-of-register colors on the third page, and change the value for code 05-956 and correct out-of-register colors on the fourth page.

Color	[05] code	Subcode	Value recommended	Acceptable value range
Y (yellow)	05-953	3	125 to 131	118 to 138
M (magenta)		2		
C (cyan)		1		
K (black)		0		
Y (yellow)	05-954	3	125 to 131	118 to 138
M (magenta)		2		
C (cyan)		1		
K (black)		0		
Y (yellow)	05-955	3	125 to 131	118 to 138
M (magenta)		2		
C (cyan)		1		
K (black)		0		
Y (yellow)	05-956	3	125 to 131	118 to 138
M (magenta)		2		
C (cyan)		1		
K (black)		0		

\* If the set value is increased by 1, the print position of the color will be shifted for 0.0423 mm toward the trailing edge of the paper. (For instance, if the value for code 05-953-1 is increased by 3, the print position of cyan will be shifted for 0.1269 mm (0.0423mm x 3) toward the trailing edge of the paper. This correction will affect all pages.

### 1.5.3 Color Registration Control Procedure 2: To Correct Out-of-register colors with Test Print Pattern 64 (05-64)

(1) Enter adjustment mode [05] and print out the test print pattern to correct out-of-register colors.

- Use steps (a) to (b) to print out the test print pattern.

(a) Select A3/LD-sized paper.

(b) Enter a code corresponding to a desired test print pattern. Press the [FAX] button.

- Print out any of the following test print patterns in the table below.

[05] code	Test print pattern	Paper size	No. of copies to be printed
05-62	Grid pattern (for identifying out-of-register colors)	A3/LD	2
05-64	Test print pattern 64 (block pattern)	A3/LD	2

\* Use code 05-62. The grid pattern will be printed on the entire copy, with all toner colors (C, M, Y and K) overlaid. Check the printed grid pattern (or whether the toner colors are accurately overlaid) to discover out-of-register colors on the entire copy.

\* Jot down a "page number" and "paper feeding direction" on the printed test print pattern beforehand. This facilitates identifying out-of-register colors in the subsequent adjustment.



(2) Enter adjustment mode [05]. Change the values for codes [417] and [418] to correct out-of-register colors.

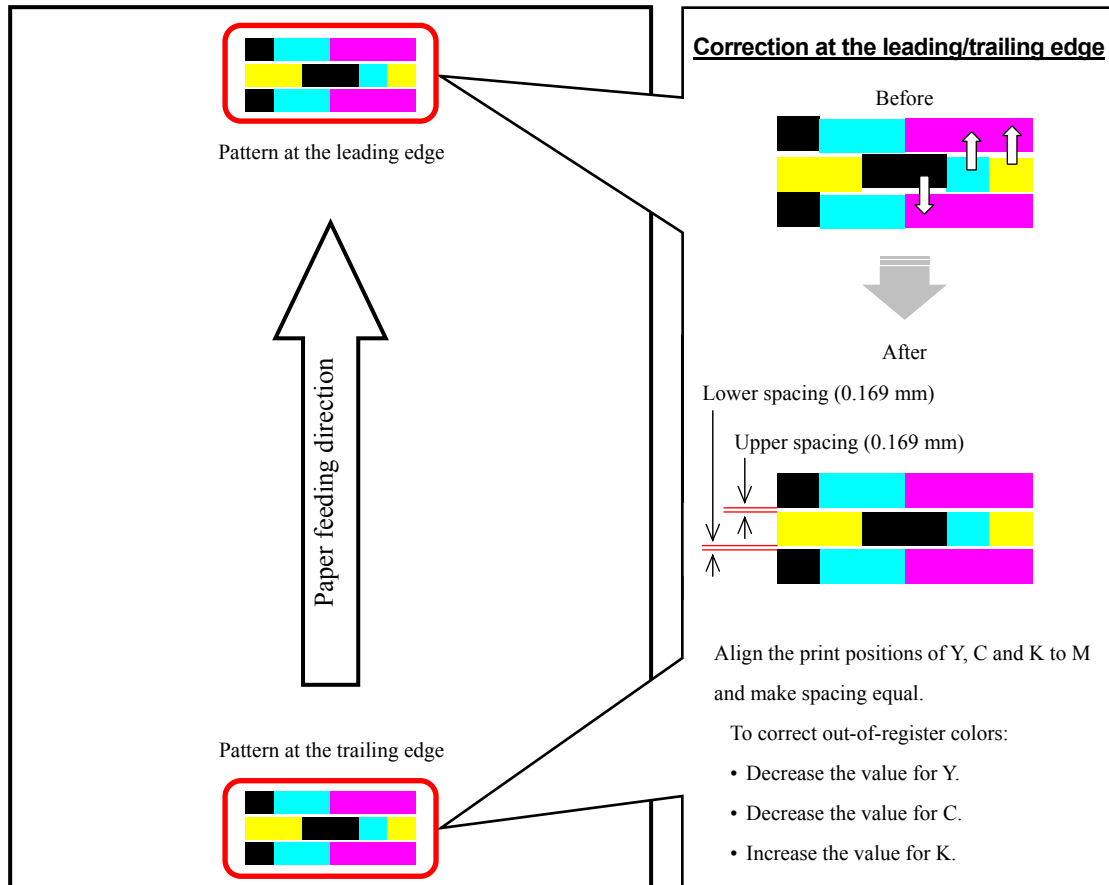
- Align 3 toner colors (Y, C and K) with magenta (M). First, change the value for code 05-417 and correct out-of-register colors on the first page of the test print pattern. Next, print out the 2 copies of test print pattern again. Change the value for code 05-418 and correct out-of-register colors on the second page.

Color	[05] code	Subcode	Value recommended	Acceptable value range
Y (yellow)	05-417	3	125 to 131	118 to 138
M (magenta)		2		
C (cyan)		1		
K (black)		0		
Y (yellow)	05-418	3	125 to 131	118 to 138
M (magenta)		2		
C (cyan)		1		
K (black)		0		

\* If the set value is increased by 1, the print position of the color will be shifted for 0.0423 mm toward the trailing edge of the paper. (For instance, if the value for code 05-417-1 is increased by 3, the print position of cyan will be shifted for 0.1269 mm (0.0423mm x 3) toward the trailing edge of the paper. This correction will affect all pages.

### How to use test print pattern for correcting out-of-register colors (block pattern)

Align 3 toner colors (Y, C and K) with magenta (M) to make spacing equal at the leading edge and trailing edge of the test print pattern.



\* If spacing of the patterns at the leading edge and trailing edge of the printed pattern cannot be equalized at a time, adjust the spacing to meet either of the following conditions:

- Make the upper spacing of the pattern at the leading edge equal to the lower spacing of the pattern at the trailing edge.
- Make the lower spacing of the pattern at the leading edge equal to the upper spacing of the pattern at the trailing edge.

\* If the direction or the amount of out-of-register colors is not consistent, print out several copies of the test print pattern to identify a pattern for the out-of-register colors (direction and amount). Then perform the adjustment most suitable for it.



**❑ Cautions after the completion of the adjustment**

Nothing in particular.

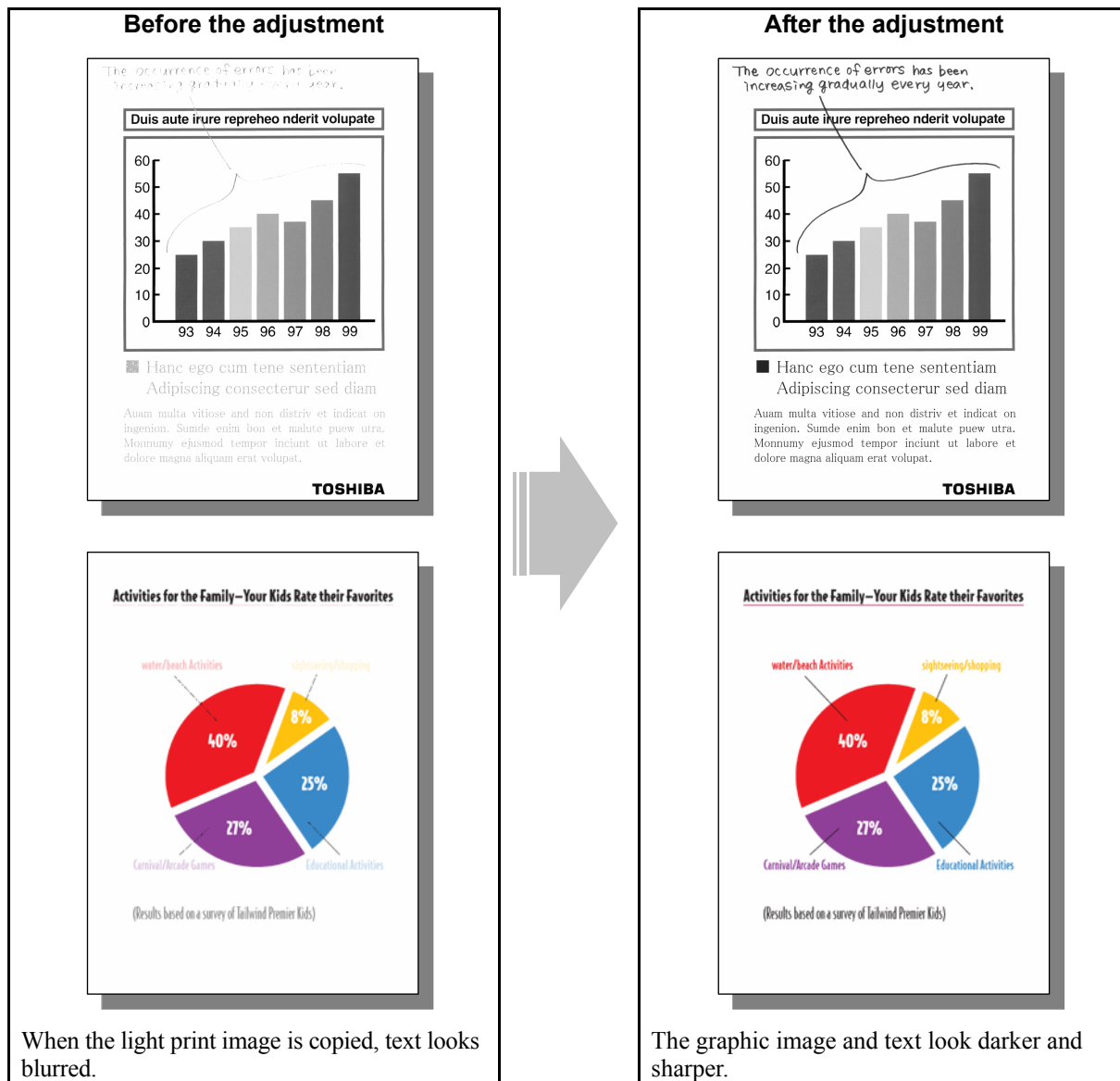
**❑ Remarks**

- Out-of-register colors may possibly occur after replacing the consumables such as the drum, drum cleaning blade and transfer belt cleaning blade, or parts such as the transfer belt, 1st transfer roller, transfer belt drive roller and transfer belt cleaning blade pressure spring during the preventive maintenance (PM). In this case, use the above procedures to correct them.
- Out-of-register colors cannot be perfectly corrected, depending on the type of text or lines to print.
- Also, refer to the relevant information in the Service Manual and Service Handbook for further information regarding the color registration control procedures.

## 2. Copier-specific Adjustments

### 2.1 To Sharply Copy Light Text or Thin Lines

(To darken handwritten text or thin lines in the graphic image)



#### □ Explanation

Perform an adjustment regarding the image processing, in order to obtain a sharp and dark copy image, when copying an original containing light text and graphic images.

#### □ Procedures

\* The procedure to use varies, depending on whether to adjust the copy image quality in Black mode, Full color mode or Auto color mode. Refer to the procedure corresponding to a user's request.

## 2.1.1 To Adjust the Copy Image Quality in Black Mode

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.


\* Procedures (1), (2) and (5) are used by the service technician, and by the user.

\* Procedures (3), (4), (6) and (7) are used by the service technician only.

-  (1) Press the [BASIC] button on the Control Panel. Press the [D] button to increase the copy density.


After increasing the copy density, copy and check the copy image quality.

With the copy density set to the maximum, if further image quality adjustments are still necessary, use the next procedure.

-  (2) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.  
Press the [SHARP] button to increase the sharpness intensity.

After increasing the sharpness intensity, copy and check the copy image quality.

With the sharpness intensity set to the maximum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

-  (3) Enter adjustment mode [05]. Increase the values for codes [604 to 606] to increase the copy density of text (or increase the sharpness intensity).
- The code to use varies, according to original mode (Text/Photo, Photo or Text). Adjust the value for the [05] code corresponding to original mode for which you would like to improve the image quality and set a value larger than "16" for it.

Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-604	Set a value larger than 16.	0 to 31	0
Photo	05-605			
Text	05-606			

\* Setting "1" provides the softest image, while setting "31" provides the sharpest image. The default value ("0") provides an image as sharp as the one provided by setting "16."

Changing the values for these codes will change the sharpness intensity, when the "Sharpness" indicator in the "IMAGE" menu is set to the center. Remember that 1 step of the indicator will increase or decrease the sharpness intensity by 3. If the sharpness intensity of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is increased by 5 (sharper), the value of each step of the indicator will also be increased by 5 (sharper).)

After increasing the sharpness intensity, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

- (4) Enter adjustment mode [05]. Increase the value for code [648] to increase the copy density of text.

(To improve faint, smudged text or thin lines)

- Initially, set a value larger than 180 for code 05-648. Copy and check the copy image quality. Next, finely adjust the value, in accordance with the original density. Up to 255 can be set for this code.

Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-648	Approx. 180	0 to 255	30

After increasing the copy density, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

- (5) Press the [BASIC] button on the Control Panel. Select "TEXT" from among the original mode options.

- \* To have "TEXT" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

After selecting Text mode, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

- (6) Enter adjustment mode [05]. Change the values for codes [590 to 592] to adjust the gamma curve balance of the medium- and high-density areas.

Original mode	[05] code	Subcode	Value recommended	Acceptable value range	Default
Text/Photo	05-590	1/2	Set a value larger than 128.	0 to 255	128
Text	05-591	1/2			
Photo	05-592	1/2			

- \* Set the value in increments of approximately 20, while checking the copy image until the optimum value is obtained.

(Please be careful that the gradation (or density) of the medium-density area may exceed that of the high-density area, depending on the set value.)

- \* The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted. The density of light text or a graphic image will vary, if the medium- or high-density area is mainly adjusted. Setting "0" for the subcode allows you to adjust the low-density area. But it will not affect the light text or graphic images. Therefore, never change the value for the low-density area.

Subcode	Area for the density to be adjusted
1	Medium-density area
2	High-density area

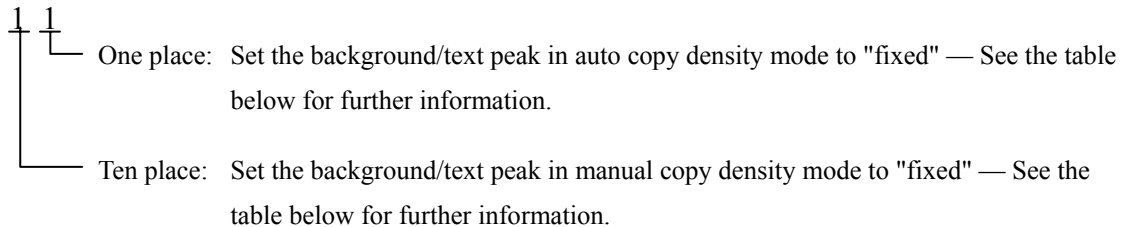
After adjusting the gamma curve balance, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

- (7) Enter adjustment mode [05]. Change the values for codes [570 to 572] or [693 to 695] to set the background peak of range correction to "fixed" in manual copy density mode.

- The code to use varies, according to the density option (auto or manual), original mode, (Text/Photo, Photo or Text) and use of the RADF (MR-3018). Adjust the value for the [05] code corresponding to the condition for which you would like to improve the image quality and set "1" in ten place.

\*Set value (Ex.: To set the background/text peak in manual and auto copy density mode to "fixed")



Value	Background peak	Text peak
1	Fixed	Fixed
2	Varied	Fixed
3	Fixed	Varied
4	Varied	Varied

\*Change the values only for manual copy density mode (ten place). Never change the values for auto copy density mode (one place).

#### **To scan an original manually placed on the original glass**

Original mode	[05] code	Copy density mode	Value recommended		Default	
			Ten place	One place	Ten place	One place
Text/Photo	05-570	Manual	1	Current value	2	2
Photo	05-571	Manual	1	Current value	1	2
Text	05-572	Manual	1	Current value	2	2

#### **To scan an original fed from the RADF**

Original mode	[05] code	Copy density mode	Value recommended		Default	
			Ten place	One place	Ten place	One place
Text/Photo	05-693	Manual	1	Current value	2	2
Photo	05-694	Manual	1	Current value	1	2
Text	05-695	Manual	1	Current value	2	2

#### **□ Cautions after the completion of the adjustment**

The adjustment may possibly cause an increase in the amount of toner used, moiré, blurred text (small, dark text blurred), diminished photo images or gradational images (less accurate reproduction of halftones). Therefore, carefully perform the adjustment, while checking the copy image.

#### **□ Remarks**

Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

## 2.1.2 To Adjust the Copy Image Quality in Full Color Mode

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.

\* Procedures (1), (2) and (4) are used by the service technician, and by the user.

\* Procedure (3) is used by the service technician only.

-  (1) Press the [BASIC] button on the Control Panel. Press the [D] button to increase the copy density.

After increasing the copy density, copy and check the copy image quality.


With the copy density set to the maximum, if further image quality adjustments are still necessary, use the next procedure.

-  (2) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.

Press the [SHARP] button to increase the sharpness intensity.

After increasing the sharpness intensity, copy and check the copy image quality.

With the sharpness intensity set to the maximum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

-  (3) Enter adjustment mode [05]. Increase the values for codes [1737 to 1741] to increase the copy density of text (or increase the sharpness intensity).

• The code to use varies, according to original mode (Text/Photo, Text, Printed image, Photo or Map).

Adjust the value for the [05] code corresponding to original mode for which you would like to improve the image quality and set a value larger than "16" for it.


Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-1737	Set a value larger than 16.	0 to 31	0
Text	05-1738			
Printed image	05-1739			
Photo	05-1740			
Map	05-1741			

\* Setting "1" provides the softest image, while setting "31" provides the sharpest image. The default value ("0") provides an image as sharp as the one provided by setting "16."

Changing the values for these codes will change the sharpness intensity, when the "Sharpness" indicator in the "IMAGE" menu is set to the center. Remember that 1 step of the indicator will increase or decrease the sharpness intensity by 3. If the sharpness intensity of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is increased by 5 (sharper), the value of each step of the indicator will also be increased by 5 (sharper).)

After increasing the sharpness intensity, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

-  (4) Press the [BASIC] button on the Control Panel. Select "TEXT" from among the original mode options.
- \*To have "TEXT" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

#### **□ Cautions after the completion of the adjustment**

The adjustment may possibly cause an increase in the amount of toner used, moiré, blurred text (small, dark text blurred), diminished photo images or gradational images (less accurate reproduction of halftones). Therefore, carefully perform the adjustment, while checking the copy image.

#### **□ Remarks**

Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

### 2.1.3 To Adjust the Copy Image Quality in Auto Color Mode

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.


\* Procedures (1) and (2) are used by the service technician, and by the user.

\* Procedure (3) is used by the service technician only.

-  (1) Press the [BASIC] button on the Control Panel. Press the [D] button to increase the copy density.


After increasing the copy density, copy and check the copy image quality.

With the copy density set to the maximum, if further image quality adjustments are still necessary, use the next procedure.

-  (2) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.  
Press the [SHARP] button to increase the sharpness intensity.

After increasing the sharpness intensity, copy and check the copy image quality.

With the sharpness intensity set to the maximum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

-  (3) Enter adjustment mode [05]. Increase the value for code [1757] to increase the copy density of text (or increase the sharpness intensity).

- Only the Text/Photo mode option is available in Auto color mode. Set a value larger than "16" for code 05-1757.

Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-1757	Set a value larger than 16.	0 to 31	0

\* Setting "1" provides the softest image, while setting "31" provides the sharpest image. The default value ("0") provides an image as sharp as the one provided by setting "16."

Changing the value for these codes will change the sharpness intensity, when the "Sharpness" indicator in the "IMAGE" menu is set to the center. Remember that 1 step of the indicator will increase or decrease the sharpness intensity by 3. If the sharpness intensity of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is increased by 5 (sharper), the value of each step of the indicator will also be increased by 5 (sharper).)



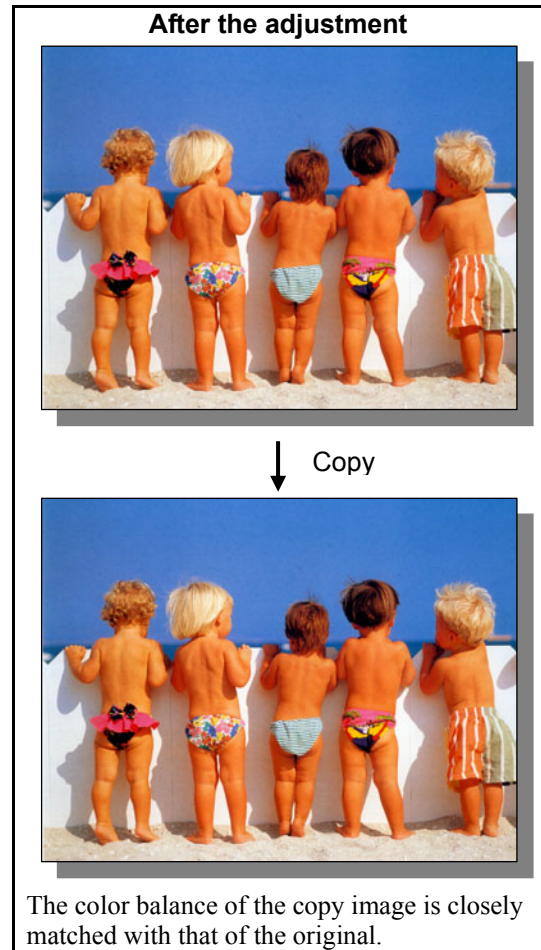
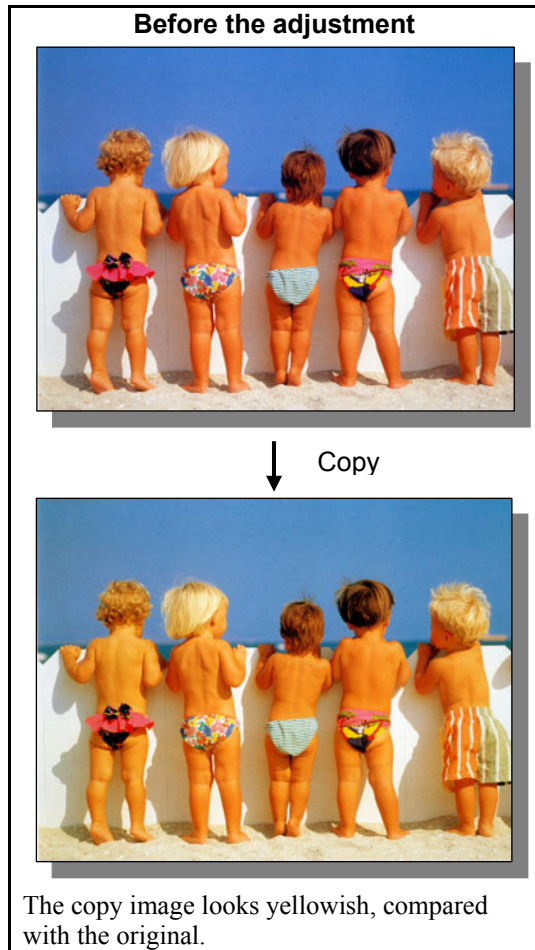
**❑ Cautions after the completion of the adjustment**

The adjustment may possibly cause an increase in the amount of toner used, moiré, blurred text (small, dark text blurred), diminished photo images or gradational images (less accurate reproduction of halftones). Therefore, carefully perform the adjustment, while checking the copy image.

**❑ Remarks**

Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

## 2.2 To Closely Match with the Color Balance of the Original



### □ Explanation


Depending on the color balance of the original, the copy image sometimes looks different from the original. Perform image quality control, automatic calibration, hue adjustment (color balance adjustment or RGB adjustment) and the color density adjustment, in order to match the color balance of the copy image with that of the original.

## □ Procedures

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.

\* Procedures (1) and (4) are used by the service technician only.


\* Procedures (2) and (3) are used by the service technician, and by the user.

 (1) Enter adjustment mode [05]. Select code [395]. Press the [START] button.

- Image quality control will be forcibly performed to correct the color balance and copy density.

After exercising image quality control, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

 (2) Perform the automatic calibration to correct variations in the copy density.

\* [ADMIN] is selected from among the [CALIBRATION DISPLAY LEVEL] options by default. In other words, an administrator is authorized to operate the automatic calibration. But the [USER] option can also be selected to allow the user to operate it. Refer to the User Functions Guide for further information regarding how to select the [CALIBRATION DISPLAY LEVEL] option.

- Use steps (a) through (i) to perform the automatic calibration.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(b) Press the [ADMIN] button.

(c) Enter the 6-digit administrator password. Press the [ENTER] button.

(d) Press the [GENERAL] button.

(e) Press the [CALIBRATION] button.

(f) Press the [COPY] button.

(g) Press the [CALIBRATION] button to print out the test chart.


(h) Place the printed test chart on the original glass.

(i) Press the [START] button to perform calibration. When the calibration comes to an end, the message "Scanning and calibrating" will disappear.

\* As a result of the above steps, the both full-color and black-and-white copy image quality will be corrected simultaneously.


After performing the automatic calibration, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

-  (3) Perform the color balance adjustment or RGB adjustment to adjust the hue in general.
  - Use steps (a) through (d) to perform the adjustment.
    - (a) Press the [IMAGE] button on the Control Panel.
    - (b) Press the [COLOR BALANCE] button to adjust the color balance by changing the amount of toner (C, M, Y and K) or the [RGB ADJUSTMENT] button to adjust the color balance by changing the intensity of R, G and B.
    - (c) Press the [+] button to enhance the tint of the color or the [□] button to decrease it.
    - (d) Press the [ENTER] button.

After adjusting the hue, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

-  (4) Enter adjustment mode [05]. Change the values for codes [1779 to 1798] to adjust the color density.

Color to be adjusted	Original mode	[05] code	Subcode	Value recommended	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1/2	Set a value larger than 128 to increase the density.  Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-1780	0/1/2			
	Printed image	05-1781	0/1/2			
	Photo	05-1782	0/1/2			
	Map	05-1783	0/1/2			
M (Magenta)	Text/Photo	05-1784	0/1/2			
	Text	05-1785	0/1/2			
	Printed image	05-1786	0/1/2			
	Photo	05-1787	0/1/2			
	Map	05-1788	0/1/2			
C (Cyan)	Text/Photo	05-1789	0/1/2			
	Text	05-1790	0/1/2			
	Printed image	05-1791	0/1/2			
	Photo	05-1792	0/1/2			
	Map	05-1793	0/1/2			
K (Black)	Text/Photo	05-1794	0/1/2			
	Text	05-1795	0/1/2			
	Printed image	05-1796	0/1/2			
	Photo	05-1797	0/1/2			
	Map	05-1798	0/1/2			

\* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

\* Changing the values for the codes corresponding to Text/Photo mode will affect the copy image quality in Full color mode and Auto color mode.

\* The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area
2	High-density area

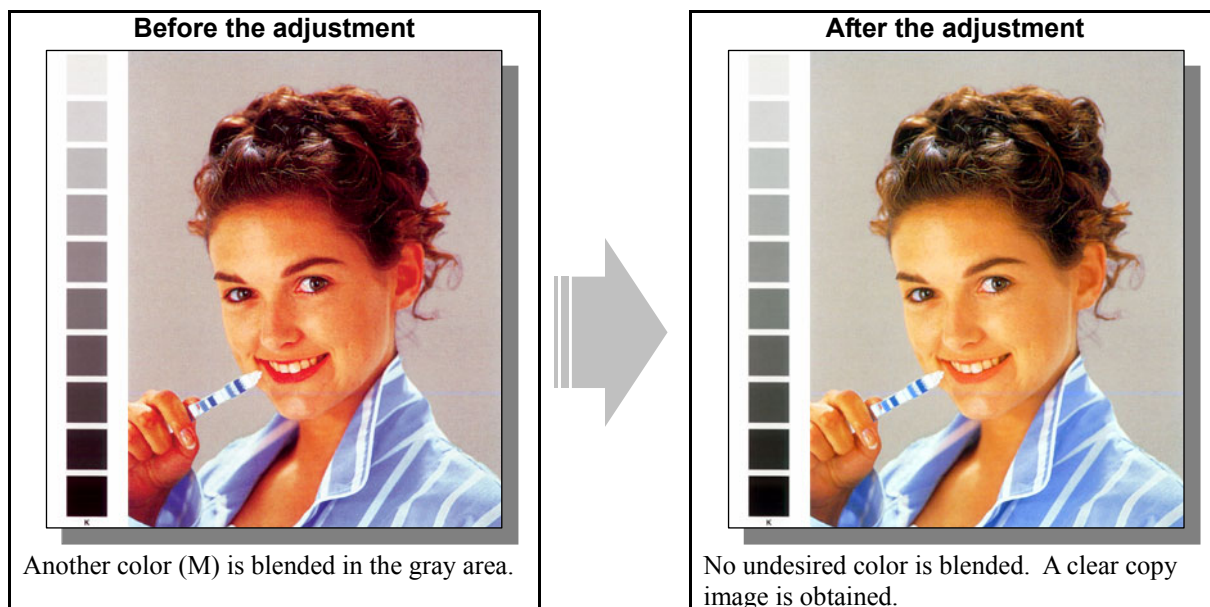
**❑ Cautions after the completion of the adjustment**

The adjustment may possibly cause offset failure, particularly when the highly colored original is copied in Photo mode. Therefore, carefully perform the adjustment, while checking the copy image.

**❑ Remarks**

Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

## 2.3 To Improve the Reproducibility of Gray



### □ Explanation


When an original containing gray is copied, another color may be blended in the gray area. Perform image quality control and perform the automatic calibration, hue adjustment (color balance adjustment or RGB adjustment) and color density adjustment, in order to avoid this problem (or to obtain an achromatic color, for instance).

### □ Procedures

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.

\* Procedures (1) and (4) are used by the service technician only.


\* Procedures (2) and (3) are used by the service technician, and by the user.

 (1) Enter adjustment mode [05]. Select code [395]. Press the [START] button.

- Image quality control will be forcibly performed to correct the color balance and copy density.

After exercising image quality control, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.


 (2) Perform the automatic calibration to correct variations in the copy density.

\* For further information regarding the adjustment procedures, refer to procedure (2) in 2.2 To Closely Match with the Color Balance of the Original.

\* [ADMIN] is selected from among the [CALIBRATION DISPLAY LEVEL] options by default. In other words, an administrator is authorized to operate the automatic calibration. But the [USER] option can also be selected to allow the user to operate it. Refer to the User Functions Guide for further information regarding how to select the [CALIBRATION DISPLAY LEVEL] option.

After performing the automatic calibration, copy and check the copy image quality.


If further image quality adjustments are still necessary, use the next procedure.

-  (3) Perform the color balance adjustment or RGB adjustment to adjust the hue.

\* For further information regarding the adjustment procedures, refer to procedure (2) in 2.2 To Closely Match with the Color Balance of the Original.

After adjusting the hue, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

-  (4) Enter adjustment mode [05]. Change the values for codes [1779 to 1798] to adjust the color density.

Color to be adjusted	Original mode	[05] code	Subcode	Value recommended	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1/2	Set a value larger than 128 to increase the density.  Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-1780	0/1/2			
	Printed image	05-1781	0/1/2			
	Photo	05-1782	0/1/2			
	Map	05-1783	0/1/2			
M (Magenta)	Text/Photo	05-1784	0/1/2			
	Text	05-1785	0/1/2			
	Printed image	05-1786	0/1/2			
	Photo	05-1787	0/1/2			
	Map	05-1788	0/1/2			
C (Cyan)	Text/Photo	05-1789	0/1/2			
	Text	05-1790	0/1/2			
	Printed image	05-1791	0/1/2			
	Photo	05-1792	0/1/2			
	Map	05-1793	0/1/2			
K (Black)	Text/Photo	05-1794	0/1/2			
	Text	05-1795	0/1/2			
	Printed image	05-1796	0/1/2			
	Photo	05-1797	0/1/2			
	Map	05-1798	0/1/2			

\* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

\* Changing the values for the codes corresponding to Text/Photo mode will affect the copy image quality in Full color mode and Auto color mode.

\* The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area
2	High-density area

### ❑ Cautions after the completion of the adjustment

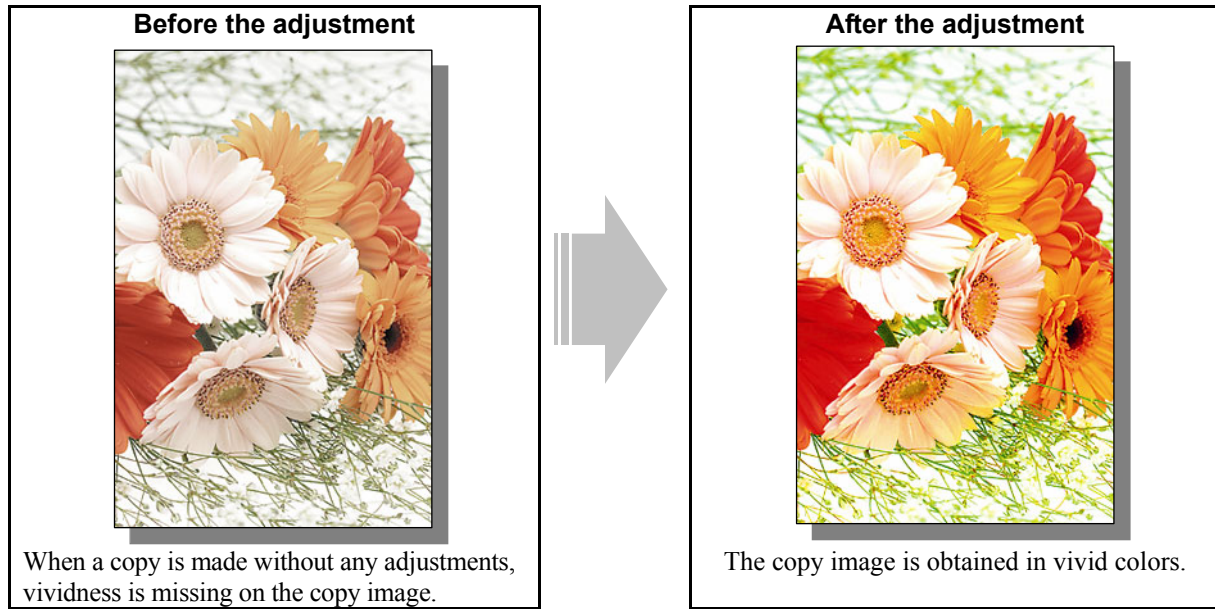
The adjustment may possibly cause offset failure, particularly when the highly colored original is copied in Photo mode. Also, it may cause degradation in the color reproducibility. (Excessively enhancing the tint of black makes other colors, such as skin tones, look dull.) Therefore, carefully perform the adjustment, while checking the copy image.

### ❑ Remarks

Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.



## 2.4 To Copy in Vivid Colors




### □ Explanation

When a copy is made without any adjustments, vividness may be missing on the copy image. Perform the hue adjustment (color balance adjustment or RGB adjustment) and color density adjustment, in order to obtain a copy image in vivid colors.

### □ Procedures

- \* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.
- \* Procedures (1) and (2) are used by the service technician, and by the user.
- \* Procedure (3) is used by the service technician only.

-  (1) Press the [IMAGE] button on the Control Panel. Press the [ONE TOUCH ADJUSTMENT] button. Press the [VIVID] button.

After selecting the "Vivid" option, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.


-  (2) Perform the color balance adjustment or RGB adjustment to adjust the hue.

\* For further information regarding the adjustment procedures, refer to procedure (3) in 2.2 To Closely Match with the Color Balance of the Original.

After adjusting the hue, copy and check the copy image quality.

If further image quality adjustments are still necessary, the service technician must use the next procedure.



 (3) Enter adjustment mode [05]. Change the values for codes [1779 to 1798] to adjust the color density.

Color to be adjusted	Original mode	[05] code	Subcode	Value recommended	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1/2	Set a value larger than 128 to increase the density.  Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-1780	0/1/2			
	Printed image	05-1781	0/1/2			
	Photo	05-1782	0/1/2			
	Map	05-1783	0/1/2			
M (Magenta)	Text/Photo	05-1784	0/1/2			
	Text	05-1785	0/1/2			
	Printed image	05-1786	0/1/2			
	Photo	05-1787	0/1/2			
	Map	05-1788	0/1/2			
C (Cyan)	Text/Photo	05-1789	0/1/2			
	Text	05-1790	0/1/2			
	Printed image	05-1791	0/1/2			
	Photo	05-1792	0/1/2			
	Map	05-1793	0/1/2			
K (Black)	Text/Photo	05-1794	0/1/2			
	Text	05-1795	0/1/2			
	Printed image	05-1796	0/1/2			
	Photo	05-1797	0/1/2			
	Map	05-1798	0/1/2			

\* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

\* Changing the values for the codes corresponding to Text/Photo mode will affect the copy image quality in Full color mode and Auto color mode.

\* The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area
2	High-density area

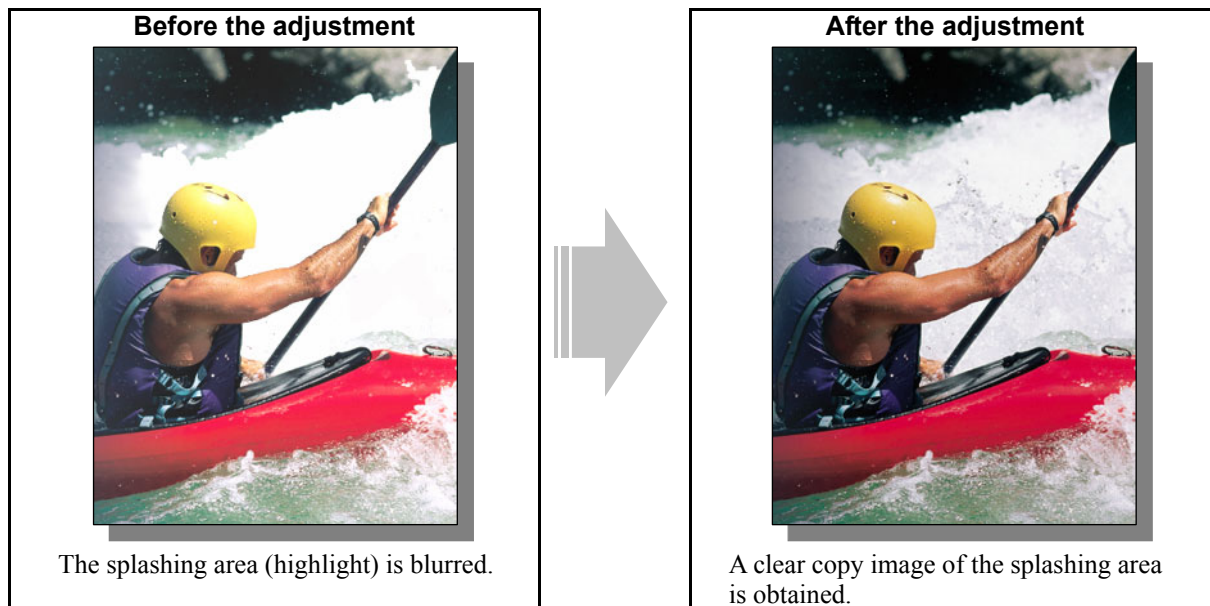
#### Cautions after the completion of the adjustment

The adjustment may possibly cause offset failure, particularly when the highly colored original is copied in Photo mode. Therefore, carefully perform the adjustment, while checking the copy image.

#### Remarks

Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

## 2.5 To Make the Pale Area of the Original Look Darker and Sharper (To improve the highlight reproducibility)



### □ Explanation


Perform the copy density adjustment and background adjustment, in order to make the pale area (highlight) of the original look darker and sharper on the copy.

### □ Procedures

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.


\* Procedures (1) and (3) are used by the service technician, and by the user.

\* Procedures (2) and (4) are used by the service technician only.

-  (1) Press the [IMAGE] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [DARK] button to darken the background.

After increasing the background density, copy and check the copy image quality.

With the background density set to the maximum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

-  (2) Enter adjustment mode [05]. Change the values for codes [1688 to 1692] and [1698 to 1702] to adjust the background density.

\* The highlighted area will become highly visible, if the background density is increased.

Adjustment	Original mode	[05] code	Value recommended	Acceptable value range	Default
Automatic offsetting adjustment for background processing	Text/Photo	05-1688	Set a value larger than 128 to increase the density.	0 to 255	128
	Text	05-1689			
	Printed image	05-1690			
	Photo	05-1691			
	Map	05-1692			
Manual offsetting adjustment for background processing	Text/Photo	05-1698			
	Text	05-1699			
	Printed image	05-1700			
	Photo	05-1701			
	Map	05-1702			

\* The value for the automatic offsetting adjustment for background processing will be applied, only if automatic copy density mode is selected. On the other hand, the value for the manual offsetting adjustment for background processing will be applied, only if manual copy density mode is selected.

\* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

\* The outcome of the adjustment will affect only copying in Full color mode.

**<Note>** "Making the highlighted area more visible (or increasing the background density)" and "eliminating the background color (or decreasing the background density)" are mutually contradictory. If the background color is darkened to make the highlighted area more visible, the hue of the background may change.


After adjusting the background density, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

-  (3) Press the [BASIC] button on the Control Panel. Press the [D] button to increase the copy density.

After increasing the copy density, copy and check the copy image quality.

With the copy density set to the maximum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

-  (4) Enter adjustment mode [05]. Change the values for codes [1779 to 1798] to adjust the color density.

Color to be adjusted	Original mode	[05] code	Subcode	Value recommended	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1	Set a value larger than 128 to increase the density.  Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-1780	0/1			
	Printed image	05-1781	0/1			
	Photo	05-1782	0/1			
	Map	05-1783	0/1			
M (Magenta)	Text/Photo	05-1784	0/1			
	Text	05-1785	0/1			
	Printed image	05-1786	0/1			
	Photo	05-1787	0/1			
	Map	05-1788	0/1			
C (Cyan)	Text/Photo	05-1789	0/1			
	Text	05-1790	0/1			
	Printed image	05-1791	0/1			
	Photo	05-1792	0/1			
	Map	05-1793	0/1			
K (Black)	Text/Photo	05-1794	0/1			
	Text	05-1795	0/1			
	Printed image	05-1796	0/1			
	Photo	05-1797	0/1			
	Map	05-1798	0/1			

\* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

\* Changing the values for the codes corresponding to Text/Photo mode will affect the copy image quality in Full color mode and Auto color mode.

\* The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted. The density of the highlighted area will vary, if the low- or medium-density area is mainly adjusted. Setting "2" for subcode allows you to adjust the high-density area. But it will not affect the highlighted area. Therefore, never change the values for the high-density area.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area

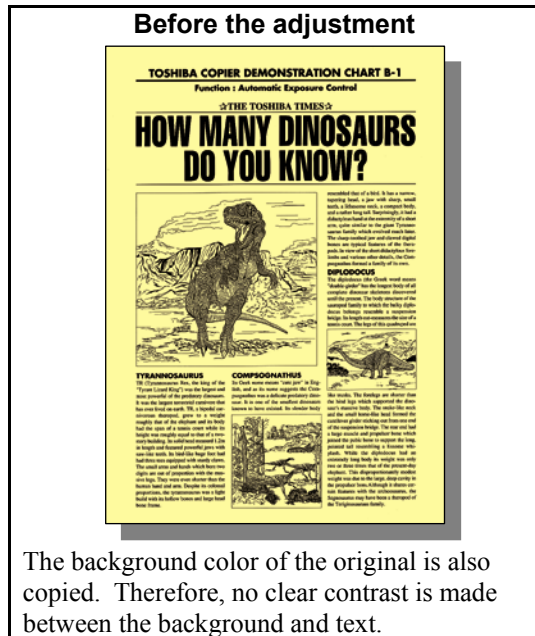
**❑ Cautions after the completion of the adjustment**

The adjustment may possibly cause the background color to become excessively dark. Therefore, carefully perform the adjustment, while checking the copy image.

**❑ Remarks**

Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

## 2.6 To Eliminate the Background Color



### □ Explanation

When a full-color original, such as color paper, is copied, its background color is also copied. Therefore, no clear contrast is made between the background and text on the copy. Perform the background adjustment, in order to copy the original with the highly colored background, while eliminating the background color or making it white.

### □ Procedures

\*The procedure to use varies, depending on whether to adjust the copy image quality in Black mode or Full color mode. Refer to the procedure corresponding to a user's request.

## 2.6.1 To Adjust the Copy Image Quality in Black Mode

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.

\* Procedure (1) is used by the service technician, and by the user.

\* Procedures (2) to (4) are used by the service technician only.

- (1) Press the [IMAGE] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [LIGHT] button to decrease the background density.

After decreasing the background density, copy and check the image quality.

With the background density set to the minimum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

- (2) Enter adjustment mode [05]. Change the values for codes [600 to 602] to adjust the background density.

Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-600	Set a value smaller than 5.	1 to 9	5
Text	05-601			
Photo	05-602			

\* Set the value in increments of approximately 1, while checking the copy image until the optimum value is obtained.

After adjusting the background density, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

- (3) Enter adjustment mode [05]. Change the values for codes [590 to 592] to adjust the gamma curve balance of the low- and medium-density areas.

Original mode	[05] code	Subcode	Value recommended	Acceptable value range	Default
Text/Photo	05-590	0/1	Set a value smaller than 128.	0 to 255	128
Text	05-591	0/1			
Photo	05-592	0/1			

\* Set the value in increments of approximately 20, while checking the copy image until the optimum value is obtained.

\* The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted. The background density will vary, if the low- or medium-density area is mainly adjusted. Setting "2" for the subcode allows you to adjust the high-density area. But it will not affect the background density. Therefore, never change the values for the high-density area.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area

After adjusting the gamma curve balance, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

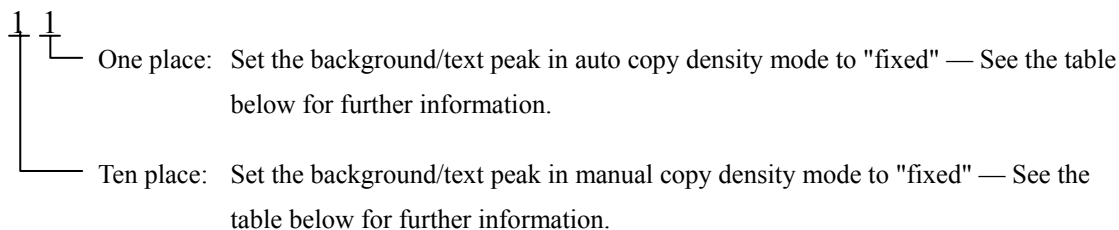
■ (4) Adjust the background peak of range correction to lighten the copy image.

- Use steps (a) to (b) to adjust the background peak of range correction.

(a) Enter adjustment mode [05]. Change the values for codes [570 to 572] or [693 to 695] to set the background peak of range correction to "fixed."

- The code to use varies, according to the density option (auto or manual), original mode, (Text/Photo, Photo or Text) and use of the RADF (MR-3018). Adjust the value for the [05] code corresponding to the condition for which you would like to improve the image quality and set "1" in one or ten place.

\*Set value (Ex.: To set the background/text peak in manual and auto copy density mode to "fixed")



Value	Background peak	Text peak
1	Fixed	Fixed
2	Varied	Fixed
3	Fixed	Varied
4	Varied	Varied

**To scan an original manually placed on the original glass**

Original mode	[05] code	Copy density mode	Value recommended		Default	
			Ten place	One place	Ten place	One place
Text/Photo	05-570	Manual	1	Current value	2	2
		Auto	Current value	1		
Photo	05-571	Manual	1	Current value	1	2
		Auto	Current value	1		
Text	05-572	Manual	1	Current value	2	2
		Auto	Current value	1		

**To scan an original fed from the RADF**

Original mode	[05] code	Copy density mode	Value recommended		Default	
			Ten place	One place	Ten place	One place
Text/Photo	05-693	Manual	1	Current value	2	2
		Auto	Current value	1		
Photo	05-694	Manual	1	Current value	1	2
		Auto	Current value	1		
Text	05-695	Manual	1	Current value	2	2
		Auto	Current value	1		



(b) Enter adjustment mode [05]. Increase the values for codes [532 to 534] to adjust the background peak of range correction and lighten the copy image.

(Increase the number of pixels to be identified as "white" by range correction.)

- The code to use varies, according to original mode (Text/Photo, Photo or Text). Adjust the value for the [05] code corresponding to original mode for which you would like to improve the image quality and increase the current value by 10 to 30.

Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-532	Current value + 10 or more	0 to 255	40
Photo	05-533	Current value + 10 or more		16
Text	05-534	Current value + 10 or more		40

#### ❑ Cautions after the completion of the adjustment

The adjustment may possibly cause text handwritten with a pencil or light text to become illegible on the copy. Therefore, carefully perform the adjustment, while checking the copy image.

#### ❑ Remarks


Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality.

## 2.6.2 To Adjust the Copy Image Quality in Full Color Mode

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.


\* Procedures (1) and (3) are used by the service technician, and by the user.

\* Procedure (2) is used by the service technician only.

-  (1) Press the [IMAGE] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [LIGHT] button to decrease the background density.

After decreasing the background density, copy and check the image quality.

With the background density set to the minimum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

-  (2) Enter adjustment mode [05]. Change the values for codes [1688 to 1692] and [1698 to 1702] to adjust the background density.

Adjustment	Original mode	[05] code	Value recommended	Acceptable value range	Default
Automatic offsetting adjustment for background processing	Text/Photo	05-1688	Set a value smaller than 128.	0 to 255	128
	Text	05-1689			
	Printed image	05-1690			
	Photo	05-1691			
	Map	05-1692			
Manual offsetting adjustment for background processing	Text/Photo	05-1698			
	Text	05-1699			
	Printed image	05-1700			
	Photo	05-1701			
	Map	05-1702			

\* The value for the automatic offsetting adjustment for background processing will be applied, only if automatic copy density mode is selected. On the other hand, the value for the manual offsetting adjustment for background processing will be applied, only if manual copy density mode is selected.


\* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

\* The outcome of the adjustment will affect only copying in Full color mode.

**<Note>** "Making the highlighted area more visible (or increasing the background density)" and "eliminating the background color (or decreasing the background density)" are mutually contradictory. If the density of the background color is decreased, the highlighted area may become less visible.

After adjusting the background density, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

-  (3) Press the [BASIC] button on the Control Panel. Select "TEXT" from among the original mode options.
- \*To have "TEXT" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

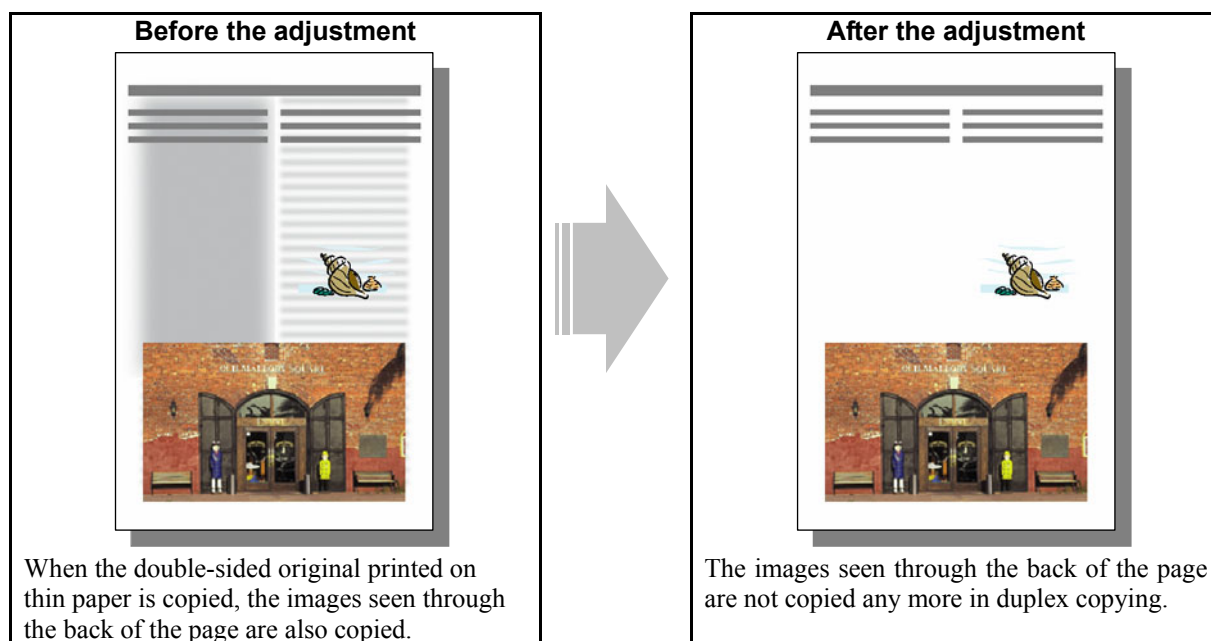
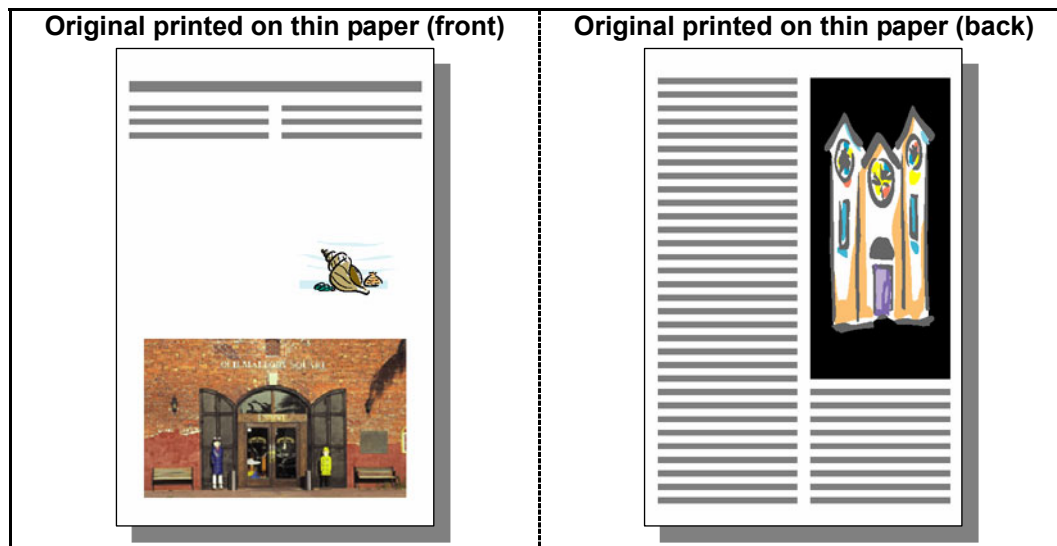
#### **□ Cautions after the completion of the adjustment**

The adjustment may possibly cause the highlighted area to become less visible on the copy. Therefore, carefully perform the adjustment, while checking the copy image.

#### **□ Remarks**

Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality.

## 2.7 To Avoid Copying the Image Seen through the Back of the Page Printed on Thin Paper



### □ Explanation

When a double-sided original printed on thin paper, such as a brochure and leaflet, is copied, the images seen through the back of the page are also copied. Perform the background adjustment, in order to avoid this problem.

### □ Procedures

\*The procedure to use varies, depending on whether to adjust the copy image quality in Black mode or Full color mode. Refer to the procedure corresponding to a user's request.

## 2.7.1 To Adjust the Copy Image Quality in Black Mode

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.

\* Procedure (1) is used by the service technician, and by the user.

\* Procedures (2) to (5) are used by the service technician only.

- (1) Press the [IMAGE] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [LIGHT] button to decrease the background density.

After decreasing the background density, copy and check the image quality.

With the background density set to the minimum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

- (2) Enter adjustment mode [05]. Change the values for codes [600 to 602] to adjust the background density.

Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-600	Set a value smaller than 5.	1 to 9	5
Text	05-601			
Photo	05-602			

\* Set the value in increments of approximately 1, while checking the copy image until the optimum value is obtained.

After adjusting the background density, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

- (3) Press the [BASIC] button on the Control Panel. Press the [C] button to decrease the copy density.

\* Move the copy density indicator to the [C] side for 1 or 2 steps. The images seen through the back of the page will no longer be copied. But remember that text will also be lightly copied, depending on the type of original.

After decreasing the copy density, copy and check the copy image quality.

With the copy density set to the minimum, if the images seen through the back of the page are still copied, or if you would like to prevent this problem without changing the copy density of text, use the next procedure.

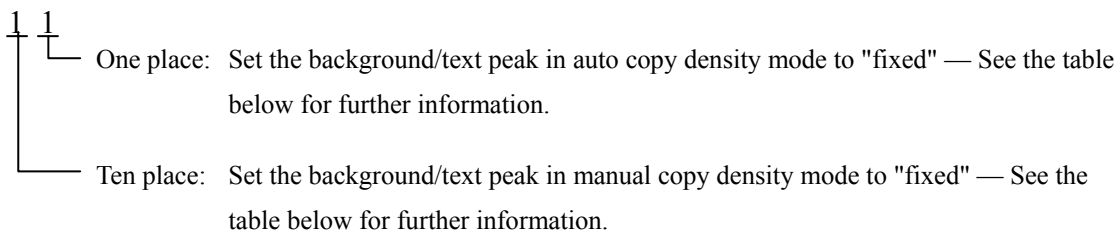
■ (4) Adjust the background peak of range correction to lighten the copy image.

- Use steps (a) to (b) to adjust the background peak of range correction.

(a) Enter adjustment mode [05]. Change the values for codes [570 to 572] or [693 to 695] to set the background peak of range correction to "fixed."

- The code to use varies, according to the density option (auto or manual), original mode, (Text/Photo, Photo or Text) and use of the RADF (MR-3018). Adjust the value for the [05] code corresponding to the condition for which you would like to improve the image quality and set "1" in one or ten place.

\* Set value (Ex.: To set the background/text peak in manual and auto copy density mode to "fixed")



Value	Background peak	Text peak
1	Fixed	Fixed
2	Varied	Fixed
3	Fixed	Varied
4	Varied	Varied

**To scan an original manually placed on the original glass**

Original mode	[05] code	Copy density mode	Value recommended		Default	
			Ten place	One place	Ten place	One place
Text/Photo	05-570	Manual	1	Current value	2	2
		Auto	Current value	1		
Photo	05-571	Manual	1	Current value	1	2
		Auto	Current value	1		
Text	05-572	Manual	1	Current value	2	2
		Auto	Current value	1		

**To scan an original fed from the RADF**

Original mode	[05] code	Copy density mode	Value recommended		Default	
			Ten place	One place	Ten place	One place
Text/Photo	05-693	Manual	1	Current value	2	2
		Auto	Current value	1		
Photo	05-694	Manual	1	Current value	1	2
		Auto	Current value	1		
Text	05-695	Manual	1	Current value	2	2
		Auto	Current value	1		

(b) Enter adjustment mode [05]. Increase the values for codes [532 to 534] to adjust the background peak of range correction and lighten the copy image.

(Increase the number of pixels to be identified as "white" by range correction.)

- The code to use varies, according to original mode (Text/Photo, Photo or Text). Adjust the value for the [05] code corresponding to the condition for which you would like to improve the image quality and increase the current value by 10 to 30.

Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-532	Current value + 10 or more	0 to 255	40
Photo	05-533	Current value + 10 or more		16
Text	05-534	Current value + 10 or more		40

After adjusting the background peak, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

- (5) Enter adjustment mode [05]. Change the values for codes [590 to 592] to adjust the gamma curve balance of the low- and medium-density areas.

Original mode	[05] code	Subcode	Value recommended	Acceptable value range	Default
Text/Photo	05-590	0/1	Set a value smaller than 128.	0 to 255	128
Text	05-591	0/1			
Photo	05-592	0/1			

\* Set the value in increments of approximately 20, while checking the copy image until the optimum value is obtained.

\* Since the subcode varies, according to the area for which the density is adjusted, refer to the table below and set the appropriate subcode. Remember that mainly adjusting the low- or medium-density area will change the copy density of the images seen through the back of the page. Setting "2" for the subcode will allow you to adjust the high-density area. But this will not solve the problem. Therefore, never change the values for the high-density area.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area

#### □ Cautions after the completion of the adjustment

The adjustment may possibly cause text handwritten with a pencil or light text to become illegible on the copy. Therefore, carefully perform the adjustment, while checking the copy image.

#### □ Remarks


Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables.

## 2.7.2 To Adjust the Copy Image Quality in Full Color Mode

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.


\* Procedures (1) and (3) are used by the service technician, and by the user.

\* Procedure (2) is used by the service technician only.

-  (1) Press the [IMAGE] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [LIGHT] button to decrease the background density.

After decreasing the background density, copy and check the copy image quality.

With the background density set to the minimum, if the images seen through the back of the page are still copied, the service technician must use the next procedure.

-  (2) Enter adjustment mode [05]. Change the values for codes [1688 to 1692] and [1698 to 1702] to adjust the background density.

Adjustment	Original mode	[05] code	Value recommended	Acceptable value range	Default
Automatic offsetting adjustment for background processing	Text/Photo	05-1688	Set a value smaller than 128.	0 to 255	128
	Text	05-1689			
	Printed image	05-1690			
	Photo	05-1691			
Map	05-1692				
Manual offsetting adjustment for background processing	Text/Photo	05-1698			
	Text	05-1699			
	Printed image	05-1700			
	Photo	05-1701			
	Map	05-1702			

\* The value for the automatic offsetting adjustment for background processing will be applied, only if automatic copy density mode is selected. On the other hand, the value for the manual offsetting adjustment for background processing will be applied, only if manual copy density mode is selected.

\* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.


\* The outcome of the adjustment will affect only on copying in Full color mode.

**<Note>** "Making the highlighted area more visible (or increasing the background density)" and "eliminating the background color (or decreasing the background density)" are mutually contradictory. If the density of the background color is decreased, the highlighted area may become less visible.

After adjusting the background density, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.



-  (3) Press the [BASIC] button on the Control Panel. Select "TEXT" from among the original mode options.
- \*To have "TEXT" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

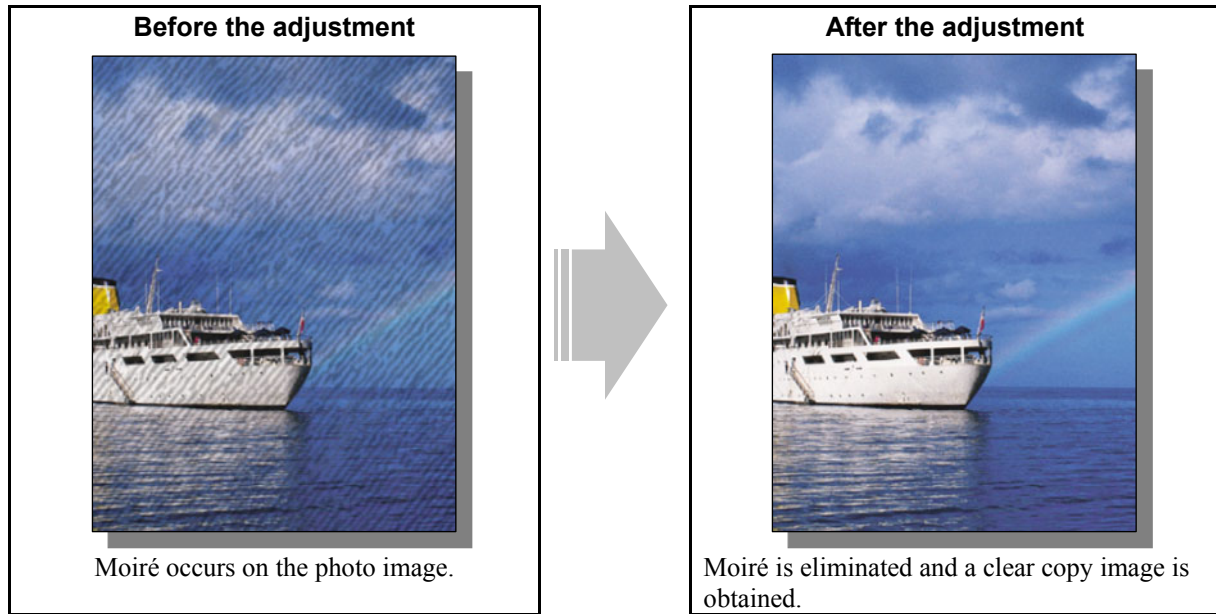
#### **Cautions after the completion of the adjustment**

The adjustment may possibly cause the highlighted area to become less visible on the copy. Therefore, carefully perform the adjustment, while checking the copy image.

#### **Remarks**

Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality.

## 2.8 To Eliminate Moiré




### □ Explanation

When an original containing photo images or gradational images (halftones) is copied, moiré sometimes occurs on the copy. Perform an adjustment regarding the image processing (sharpness intensity), in order to obtain a clear copy image, while eliminating moiré.

### □ Procedures

- \* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.
- \* Procedures (1) and (2) are used by the service technician, and by the user.
- \* Procedure (3) is used by the service technician only.

-  (1) Press the [BASIC] button on the Control Panel and select the original mode option, as follows:
- To copy in Full color mode: Select the Printed image mode option.
  - To copy in Black mode: Select the Photo mode option.

\*To have the above original mode options selected by default, use the following procedures:

### **To change default original mode on the Control Panel**

Use steps (a) to (d) to change default original mode.

- (a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
- (b) Press the [USER] button.
- (c) Press the [COPY] button.
- (d) In the "ORIGINAL MODE FOR COLOR" or "BLACK" option, press the button corresponding to the desired original mode option.

### **To change default original mode in setting mode [08]**

Enter setting mode [08]. Change the value for code [550] or [585] to change the original mode option, which is selected by default at power-on.

- In Black mode


Value for 08-550	Default original mode at power-on
0	Text/Photo (default)
1	Photo
2	Text
3	Image smoothing

- In Full color mode

Value for 08-585	Default original mode at power-on
0	Text/Photo (default)
1	Text
2	Printed image
3	Photo
4	Map


After changing the default original mode option, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

-  (2) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.  
Press the [SOFT] button to soften the copy image.

After softening the copy image, copy and check the copy image quality.

With the sharpness intensity set to the minimum (softest), if further image quality adjustments are still necessary, the service technician must use the next procedure.

-  (3) Enter adjustment mode [05]. Change the values for codes [604 to 606], [1737 to 1741] and [1757] to adjust the sharpness intensity.

\*Decreasing the sharpness intensity will minimize moiré.

Color mode	Original mode	[05] code	Value recommended	Acceptable value range	Default
Black	Text/Photo	05-604	Set a value smaller than 16.	0 to 31	0
	Text	05-605			
	Photo	05-606			
Full color	Text/Photo	05-1737	Set a value smaller than 16.	0 to 31	0
	Text	05-1738			
	Printed image	05-1739			
	Photo	05-1740			
	Map	05-1741			
Auto color	Text/Photo	05-1757	Set a value smaller than 16.	0 to 31	0

\*Setting "1" provides the softest image, while setting "31" provides the sharpest image. The default value ("0") provides an image as sharp as the one provided by setting "16."

Changing the values for these codes will change the sharpness intensity, when the "Sharpness" indicator in the "IMAGE" menu is set to the center. Remember that 1 step of the indicator will increase or decrease the sharpness intensity by 3. If the sharpness intensity of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is increased by 5 (sharper), the value of each step of the indicator will also be increased by 5 (sharper).)

**<Note>** "Minimizing moiré" and "Sharpening the copy image" are mutually contradictory. When the adjustment is performed to minimize moiré, the resolution of the copy image may decrease.

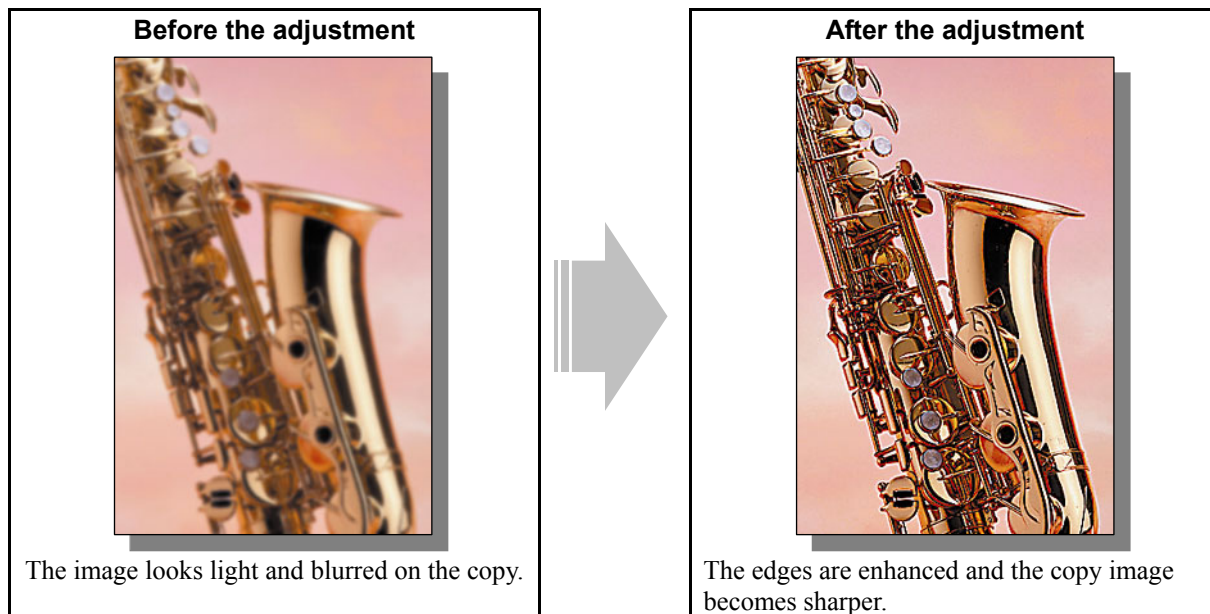
**❑ Cautions after the completion of the adjustment**

Nothing in particular.

**❑ Remarks**

- Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality.
- Procedures (2) and (3) provide the same effect of the adjustment. However, procedure (3) allows more flexible adjustment.

## 2.9 To Copy Sharply (To enhance sharpness)



### □ Explanation


Perform an adjustment regarding the image processing (sharpness intensity), in order to obtain a sharper copy image, when a light or blurred original is copied.

### □ Procedures

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.




\* Procedures (1) and (2) are used by the service technician, and by the user.

\* Procedure (3) is used by the service technician only.

-  (1) Press the [IMAGE] button on the Control Panel. Press the [ONE TOUCH ADJUSTMENT] button. Press the [CLEAR] button.


After selecting the "Clear" option, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

-    (2) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button. Press the [SHARP] button to increase the sharpness intensity.

After increasing the sharpness intensity, copy and check the copy image quality.

With the sharpness intensity set to the maximum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

-  (3) Enter adjustment mode [05]. Change the values for codes [604 to 606], [1737 to 1741] and [1757] to adjust the sharpness intensity.

\* Increasing the sharpness intensity will enhance the edges of the image.

Color mode	Original mode	[05] code	Value recommended	Acceptable value range	Default
Black	Text/Photo	05-604	Set a value larger than 16.	0 to 31	0
	Text	05-605			
	Photo	05-606			
Full color	Text/Photo	05-1737	Set a value larger than 16.	0 to 31	0
	Text	05-1738			
	Printed image	05-1739			
	Photo	05-1740			
	Map	05-1741			
Auto color	Text/Photo	05-1757	Set a value larger than 16.	0 to 31	0

\* Setting "1" provides the softest image, while setting "31" provides the sharpest image. The default value ("0") provides an image as sharp as the one provided by setting "16."

Changing the values for these codes will change the sharpness intensity, when the "Sharpness" indicator in the "IMAGE" menu is set to the center. Remember that 1 step of the indicator will increase or decrease the sharpness intensity by 3. If the sharpness intensity of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is increased by 5 (sharper), the value of each step of the indicator will also be increased by 5 (sharper).)

**<Note>** "Sharpening the copy image" and "Minimizing moiré" are mutually contradictory. When an adjustment is performed to sharpen the copy image, moiré may occur.

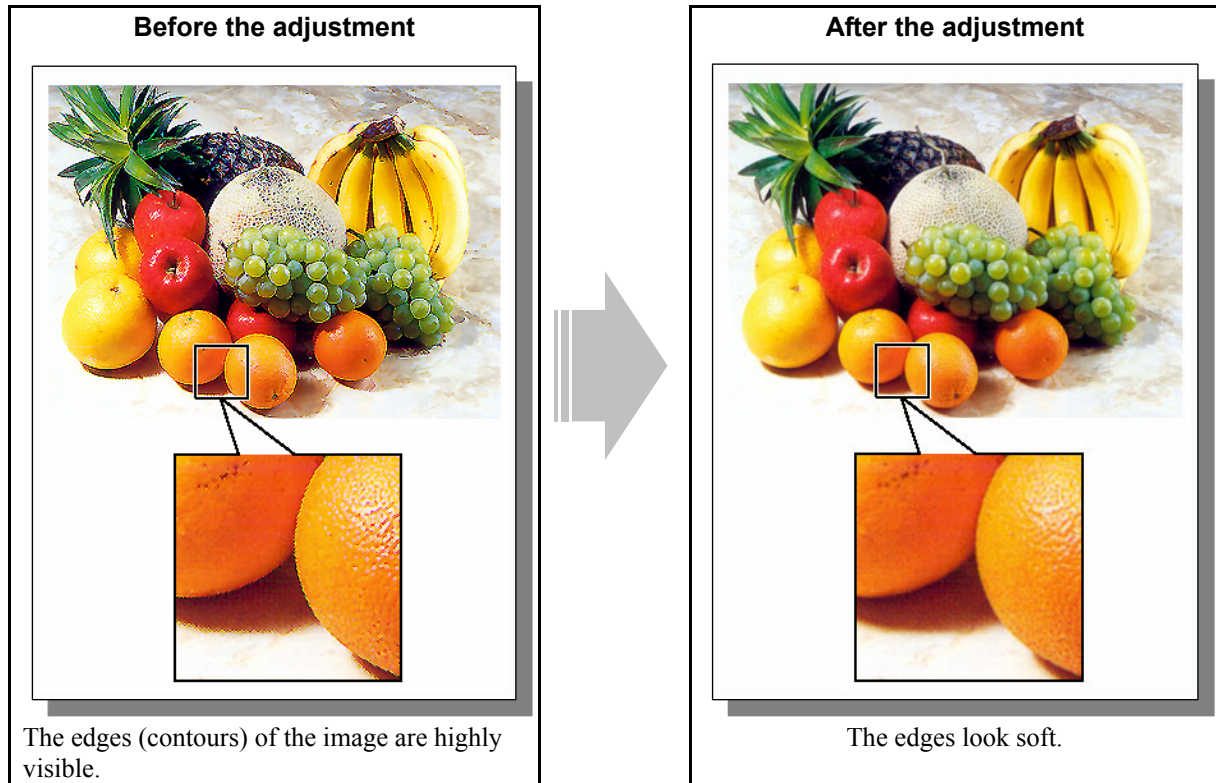
#### Cautions after the completion of the adjustment

Nothing in particular.

#### Remarks

- Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality.
- Procedures (2) and (3) provide the same effect of the adjustment. However, procedure (3) allows more flexible adjustment.

## 2.10 To Make Photo Edges Look Softer



### □ Explanation

When a photo image is copied, the contours or edges of the image sometimes become highly visible on the copy. Perform an adjustment regarding the image processing (sharpness intensity), in order to soften the edges of the image.

### □ Procedures

- \* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.
- \* Procedures (1) and (2) are used by the service technician, and by the user.
- \* Procedures (3) to (5) are used by the service technician only.



 (1) Press the [BASIC] button on the Control Panel and select the original mode option, as follows:


- To copy in Full color mode: Select the Printed image mode option.
- To copy in Black mode: Select the Photo mode option.

\*When copying a photo image in Full color mode, select the Photo mode option from among the original mode options.

\*To have the above original mode options selected by default, refer to procedure (1) in 2.8 To Eliminate Moiré.


After changing the default original mode option, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

 (2) Press the [IMAGE] button on the Control Panel. Press the [SHARPNESS] button.  
Press the [SOFT] button to soften the copy image.

After softening the copy image, copy and check the copy image quality.

With the sharpness intensity set to the minimum (softest), if further image quality adjustments are still necessary, the service technician must use the next procedure.

-  (3) Enter adjustment mode [05]. Change the values for codes [604 to 606], [1737 to 1741] and [1757] to adjust the sharpness intensity.

\*Decreasing the sharpness intensity will minimize the edges of the image.

Color mode	Original mode	[05] code	Value recommended	Acceptable value range	Default
Black	Text/Photo	05-604	Set a value smaller than 16.	0 to 31	0
	Text	05-605			
	Photo	05-606			
Full color	Text/Photo	05-1737	Set a value smaller than 16.	0 to 31	0
	Text	05-1738			
	Printed image	05-1739			
	Photo	05-1740			
	Map	05-1741			
Auto color	Text/Photo	05-1757	Set a value smaller than 16.	0 to 31	0


\*Setting "1" provides the softest image, while setting "31" provides the sharpest image. The default value ("0") provides an image as sharp as the one provided by setting "16."

Changing the values for these codes will change the sharpness intensity, when the "Sharpness" indicator in the "IMAGE" menu is set to the center. Remember that 1 step of the indicator will increase or decrease the sharpness intensity by 3. If the sharpness intensity of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is increased by 5 (sharper), the value of each step of the indicator will also be increased by 5 (sharper).)

**<Note>** "Minimizing the edges of the copy image" and "Sharpening the copy image" are mutually contradictory. When the adjustment is performed to minimize the edges, the resolution of the copy image may decrease.

After decreasing the sharpness intensity, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.


-  (4) Enter adjustment mode [05]. Change the values for codes [1630 to 1633] to adjust the maximum color density of text.

Color to be adjusted	[05] code	Value recommended	Acceptable value range	Default
Y (Yellow)	05-1630	Set a value larger than 5 to increase the density.	0 to 10	5
M (Magenta)	05-1631			
C (Cyan)	05-1632	Set a value smaller than 5 to decrease the density.		
K (Black)	05-1633			

\*Set the value in increment of 1, while checking the copy image until the optimum value is obtained.

After adjusting the maximum color density of text, copy and check the copy image quality.

If further image quality adjustments are still necessary, use the next procedure.

-  (5) Enter adjustment mode [05]. Change the value for code [1725] to adjust the level of reproducibility in Text/Photo mode.

Color mode	[05] code	Value recommended	Acceptable value range	Default
Full color	05-1725	Set a value smaller than 3.	0 to 5	0

\*Set the value in increment of 1, while checking the copy image until the optimum value is obtained.

First, set "3" for this code and check the copy image. If further image quality improvements are still necessary, set "2." If even further improvements are still necessary, set "1" for this code.

\*Remember that if a value larger than "3" is set, the edges of the image are enhanced (attaching importance to the reproducibility of text). The table below shows you the correlation between the value and image quality.

Value	Advantage of image quality	Reproducibility of edges
0	Default	Intermediate
1	Intended to improve the reproducibility of photos more than the one obtained when "2" is set.	Soft
2	Intended to improve the reproducibility of photos more than the one obtained when "3" is set.	↓
3	Equivalent to the one obtained when the default value ("0") is set.	Intermediate
4	Intended to improve the reproducibility of text more than the one obtained when "3" is set.	↓
5	Intended to improve the reproducibility of text more than the one obtained when "4" is set.	Sharp

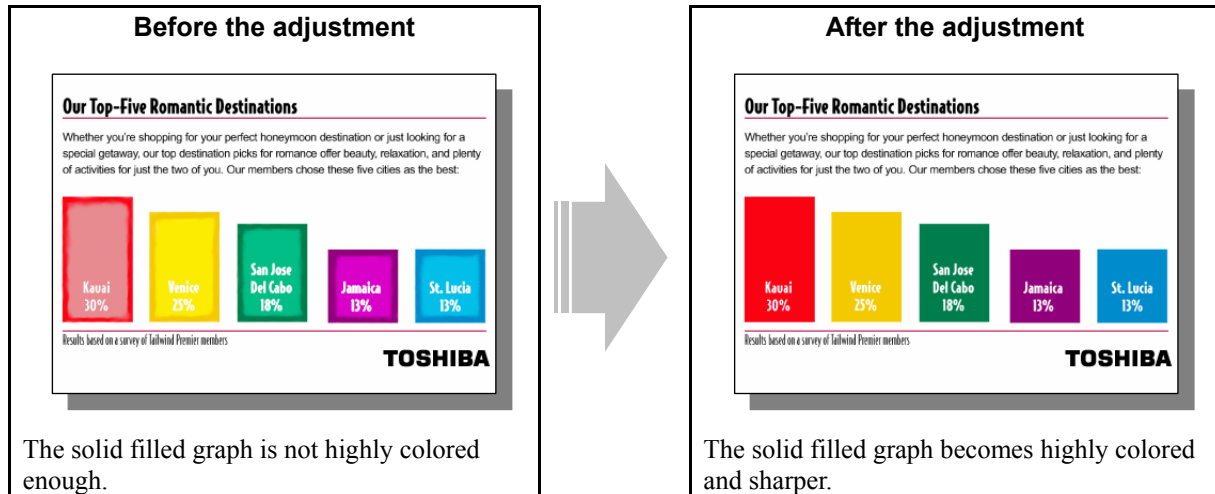
#### ❑ Cautions after the completion of the adjustment

When the original containing text is copied, the adjustment may possibly cause the text to become blurred on the copy. Therefore, carefully perform the adjustment, while checking the copy image.

#### ❑ Remarks

- Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality.
- Procedures (2) and (3) provide the same effect of the adjustment. However, procedure (3) allows more flexible adjustment.

## 2.11 To Make Solid Filled Bold Text (Logo) Highly Colored



### □ Explanation

Solid filled bold text, such as a logo, is not sometimes highly colored on the copy. Change the original mode option and perform the copy density adjustment, in order to make the solid filled image more highly colored.

\* This adjustment will have an effect only on copying in Full color mode.

### □ Procedures


\* The procedure to use varies, depending on whether to adjust the copy image quality of a black or colored logo. Refer to the procedure corresponding to a user's request.

### 2.11.1 To Adjust the Copy Image Quality of a Black Logo

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.

\* Procedures (1) and (4) are used by the service technician only.


\* Procedures (2) and (3) are used by the service technician, and by the user.

-  (1) Make sure that the color of the solid filled logo is not printed out of register. If it is, perform color registration control.

\* For further information regarding the adjustment procedures, refer to 1.5. To Correct Out-of-register Colors or the Service Manual.

After correcting out-of-register colors, copy and check the copy image quality.


If further image quality adjustments are still necessary, use the next procedure.

-  (2) Perform the color balance adjustment to enhance black.

- Use steps (a) through (d) to perform the adjustment.
  - (a) Press the [IMAGE] button on the Control Panel.
  - (b) Press the [COLOR BALANCE] button.
  - (c) Press the [+] button to enhance the tint of [BLACK].
  - (d) Press the [ENTER] button.

After adjusting the tint of black, copy and check the copy image quality.


With the tint of black set to the maximum, if further image quality adjustments are still necessary, use the next procedure.

-  (3) Press the [BASIC] button on the Control Panel. Select "TEXT" from among the original mode options.

\* To have "TEXT" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

After selecting Text mode, copy and check the copy image quality.

If further image quality adjustments are still necessary, the service technician must use the next procedure.

-  (4) Enter adjustment mode [05]. Change the value for code [1795] to adjust the black density.

Color to be adjusted	Original mode	[05] code	Subcode	Value recommended	Acceptable value range	Default
K (Black)	Text	05-1795	0/1/2	Set a value larger than 128.	0 to 255	128

\* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

\* The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area
2	High-density area

#### **Cautions after the completion of the adjustment**

The adjustment may possibly cause the highly or deeply colored area, such as in a photo, to become blurred on the copy. Also, it may also cause offset failure, grained images and degradation in gradation. Therefore, carefully perform the adjustment, while checking the copy image.

## 2.11.2 To Adjust the Copy Image Quality of a Colored Logo

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.


\* Procedures (1) to (3) are used by the service technician, and by the user.

\* Procedure (4) is used by the service technician only.

 (1) Press the [BASIC] button on the Control Panel. Press the [D] button to increase the copy density.

After increasing the copy density, copy and check the copy image quality.

With the copy density set to the maximum, if further image quality adjustments are still necessary, use the next procedure.

 (2) Perform the color balance adjustment or RGB adjustment to adjust the hue in general.

- Use steps (a) through (d) to perform the adjustment.

(a) Press the [IMAGE] button on the Control Panel.


(b) Press the [COLOR BALANCE] button to adjust the color balance by changing the amount of toner (C, M, Y and K) or the [RGB ADJUSTMENT] button to adjust the color balance by changing the intensity of R, G and B.

(c) Press the [+] button to enhance the tint of the color or the [□] button to decrease it.

(d) Press the [ENTER] button.

After adjusting the hue, copy and check the copy image quality.


If further image quality adjustments are still necessary, use the next procedure.

 (3) Press the [BASIC] button on the Control Panel. Select "TEXT" or "MAP" from among the original mode options.

\* To have "TEXT" or "MAP" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

After selecting Text or Map mode, copy and check the copy image quality.

If further image quality adjustments are still necessary, the service technician must use the next procedure.

-  (4) Enter adjustment mode [05]. Change the values for codes [1780/1785/1790/1795] or [1783/1788/1793/1798] to adjust the color density.

Color to be adjusted	Original mode	[05] code	Subcode	Value recommended	Acceptable value range	Default
Y (Yellow)	Text	05-1780	0/1/2	Set a value larger than 128.	0 to 255	128
	Map	05-1783	0/1/2			
M (Magenta)	Text	05-1785	0/1/2			
	Map	05-1788	0/1/2			
C (Cyan)	Text	05-1790	0/1/2			
	Map	05-1793	0/1/2			
K (Black)	Text	05-1795	0/1/2			
	Map	05-1798	0/1/2			

\* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

\*The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

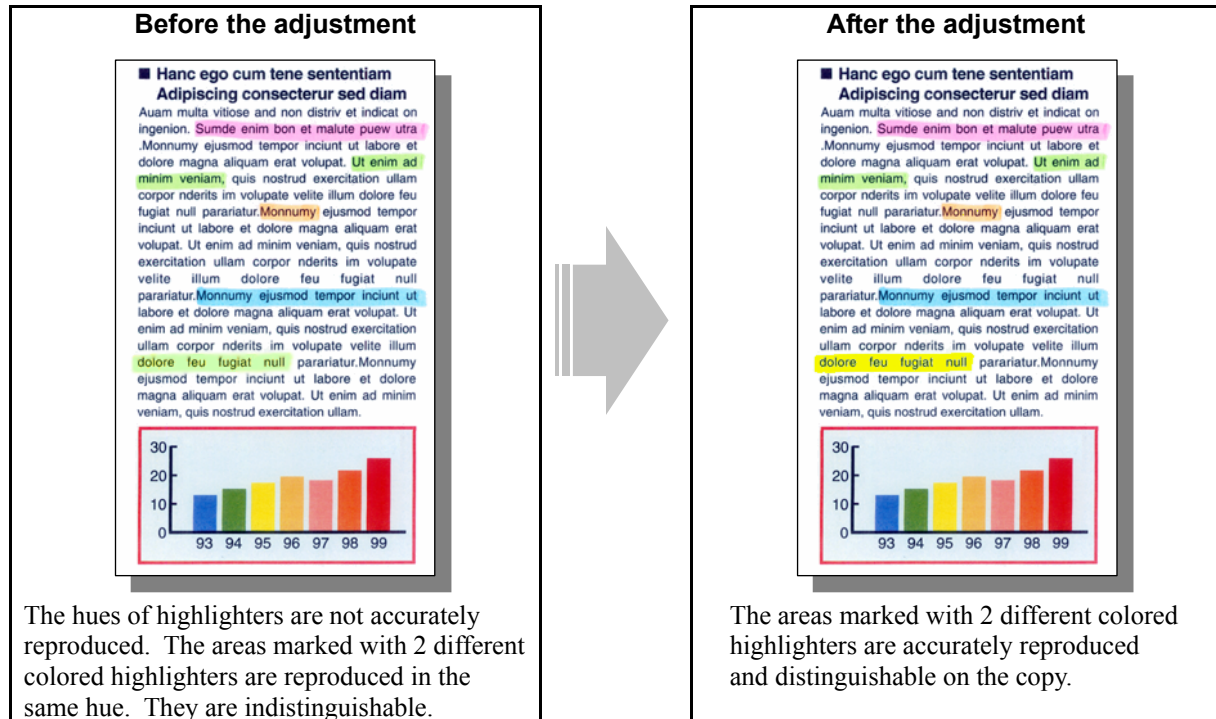
Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area
2	High-density area

#### Cautions after the completion of the adjustment

The adjustment may possibly cause a dark-colored area, such as in a photo, to become blurred on the copy. Also, it may also cause offset failure, grained images and degradation in gradation. Therefore, carefully perform the adjustment, while checking the copy image.



## 2.12 To Sharply Contrast the Hues of Highlighters on the Copy




### □ Explanation

When an original containing text or areas marked with highlighters is copied, their hues may sometimes not be accurately reproduced on the copy. The inks of highlighters are special. Therefore, their hues cannot be accurately reproduced. To reproduce the hues of similar highlighters, such as yellow and green, while producing sharp contrasts on the copy, perform the color adjustment (color balance adjustment or RGB adjustment) and color density adjustment. Also, the e-STUDIO281c/351c/451c allows the setting specifically for reproducing text or areas marked with highlighters. It can be assigned for a button in the "ONE TOUCH ADJUSTMENT" option.

### □ Procedures


- \* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.
- \* Procedure (1) is used by the service technician, and by the user.
- \* Procedures (2) and (3) are used by the service technician only.

 (1) Perform the color balance adjustment or RGB adjustment to adjust the hue in general.

\* For further information regarding the adjustment procedures, refer to procedure (3) in 2.2 To Closely Match with the Color Balance of the Original.

After adjusting the hue, copy and check the copy image quality.

If further image quality adjustments are still necessary, the service technician must use the next procedure.

-  (2) Enter adjustment mode [05]. Change the values for codes [1769 to 1772] to assign the highlighter-specific mode function for a button in the "ONE TOUCH ADJUSTMENT" option.

\*First, request the user to select a button ([VIVID], [CLEAR], [WARM] or [COLD]) to assign the highlighter-specific mode function for.

Button to assign the highlighter-specific mode function for	[05] code	Mode to assign	Acceptable value range	Default
[VIVID]	05-1769	0: Default 1: MARKER 1 2: MARKER 2	0 to 2	0
[CLEAR]	05-1770			
[WARM]	05-1771			
[COLD]	05-1772			

\*Two types of highlighter-specific modes are available. "MARKER 1" is intended to sharply contrast between "yellow and green" or between "pink and purple" in similar hues, because yellow and green are difficult to contrast in default mode. "MARKER 2" is intended to improve the overall vividness, compared to "MARKER 1." Select either of modes at a user's request.


\*Setting "0" for each code allows the adjustment to be performed in accordance with the name of the button. (For instance, setting "0" for code 05-1769 is intended to provide more vivid copy images.) But once any value other than "0" is set for the codes, the output will no longer be obtained in accordance with the name of the button.

\*When "1" or "2" is set for the codes, the buttons in the "ONE TOUCH ADJUSTMENT" option will be renamed. (For instance, provided that "1" is set for code 05-1769 to assign "MARKER 1" for the [VIVID] button, "MARKER 1" will appear in place of [VIVID] in the "ONE TOUCH ADJUSTMENT" option.)

- After assigning the highlighter-specific mode function for the button, use steps (a) to (b) and press the Highlighter-specific mode button in the "ONE TOUCH ADJUSTMENT" option.
  - (a) Press the [IMAGE] button on the Control Panel. Press the [ONE TOUCH ADJUSTMENT] button.
  - (b) Press the button where the highlighter-specific mode function is assigned.

After selecting highlighter-specific mode, copy and check the copy image quality.

If further image quality adjustments are still necessary, the service technician must use the next procedure.

 (3) Enter adjustment mode [05]. Change the values for codes [1779 to 1798] to adjust the color density.

Color to be adjusted	Original mode	[05] code	Subcode	Value recommended	Acceptable value range	Default
Y (Yellow)	Text/Photo	05-1779	0/1/2	Set a value larger than 128 to increase the density.  Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-1780	0/1/2			
	Printed image	05-1781	0/1/2			
	Photo	05-1782	0/1/2			
	Map	05-1783	0/1/2			
M (Magenta)	Text/Photo	05-1784	0/1/2			
	Text	05-1785	0/1/2			
	Printed image	05-1786	0/1/2			
	Photo	05-1787	0/1/2			
	Map	05-1788	0/1/2			
C (Cyan)	Text/Photo	05-1789	0/1/2			
	Text	05-1790	0/1/2			
	Printed image	05-1791	0/1/2			
	Photo	05-1792	0/1/2			
	Map	05-1793	0/1/2			
K (Black)	Text/Photo	05-1794	0/1/2			
	Text	05-1795	0/1/2			
	Printed image	05-1796	0/1/2			
	Photo	05-1797	0/1/2			
	Map	05-1798	0/1/2			

\* Set the value in increments of approximately 10, while checking the copy image until the optimum value is obtained.

\* Changing the values for the codes corresponding to Text/Photo mode will affect the copy image quality in Full color mode and Auto color mode.

\* The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area
2	High-density area

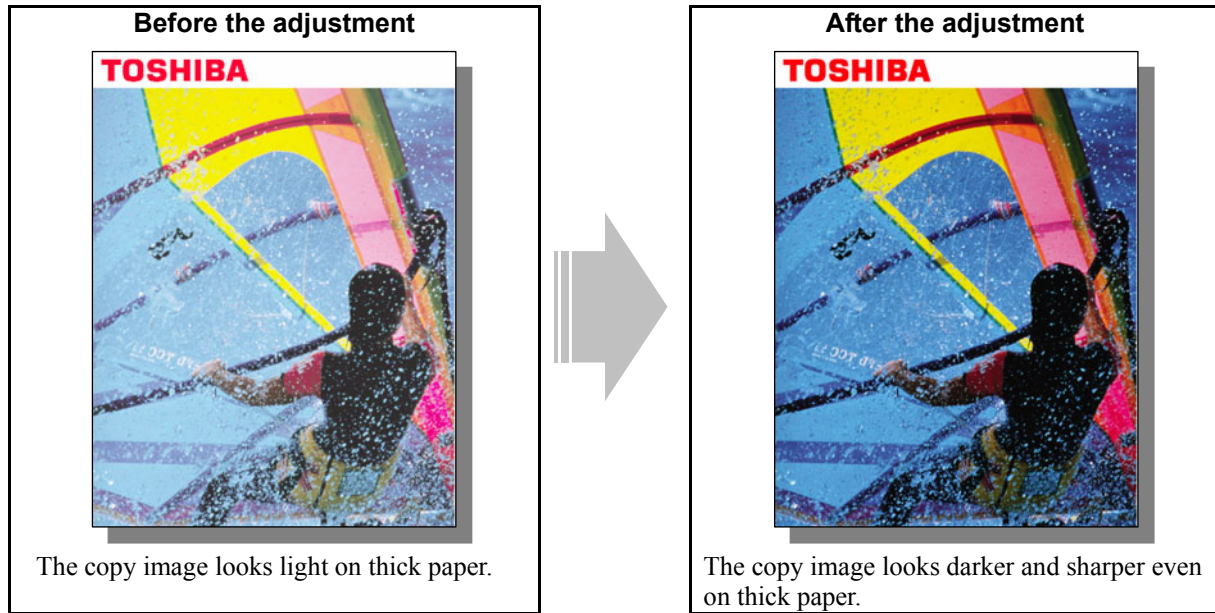
#### ❑ Cautions after the completion of the adjustment

The adjustment may possibly vary the hues of areas (including photo images and text) other than those marked with highlighters. Therefore, carefully perform the adjustment, while checking the copy image.

#### ❑ Remarks

Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality.

## 2.13 To Obtain a Good Color Balance on Thick Paper




### □ Explanation

When a copy is made on thick paper in thick paper mode, the copy image sometimes looks light. In thick paper mode, the amount of toner used is reduced in advance, in order to avoid a toner fixing problem. Adjust the amount of toner used, while checking the toner fixing, in order to obtain a dark and sharp copy image on thick paper.

### □ Procedure

\*The adjustment is performed by the service technician only.

 (1) Enter adjustment mode [05]. Change the values for codes [1613 to 1616] to adjust the amount of toner used.

- The code to use varies, according to paper mode. Adjust the value for the [05] code corresponding to paper mode for which you would like to improve the image quality and increase the value to obtain the copy density that the user desires.

Paper mode	[05] code	Value recommended	Acceptable value range	Default
Thick 1	05-1613	Set a value larger than 249.	0 to 255	249
Thick 2	05-1614	Set a value larger than 237.		237
Thick 3	05-1615	Set a value larger than 237.		237
OHP	05-1616	Set a value larger than 249.		249

\*Set the value in increments of approximately 4, while checking the copy image until the optimum value is obtained.

\*The table below shows you the acceptable paper weight for the paper types.

Paper type	Acceptable paper weight	
Thick 1	81 to 105 g/m <sup>2</sup>	Max. 28 lb. Bond
Thick 2	106 to 163 g/m <sup>2</sup>	Max. 43 lb. Bond / 90 lb. Index
Thick 3	164 to 209 g/m <sup>2</sup>	Max. 55 lb. Bond / 110 lb. Index

\* Use the recommended OHP transparencies.

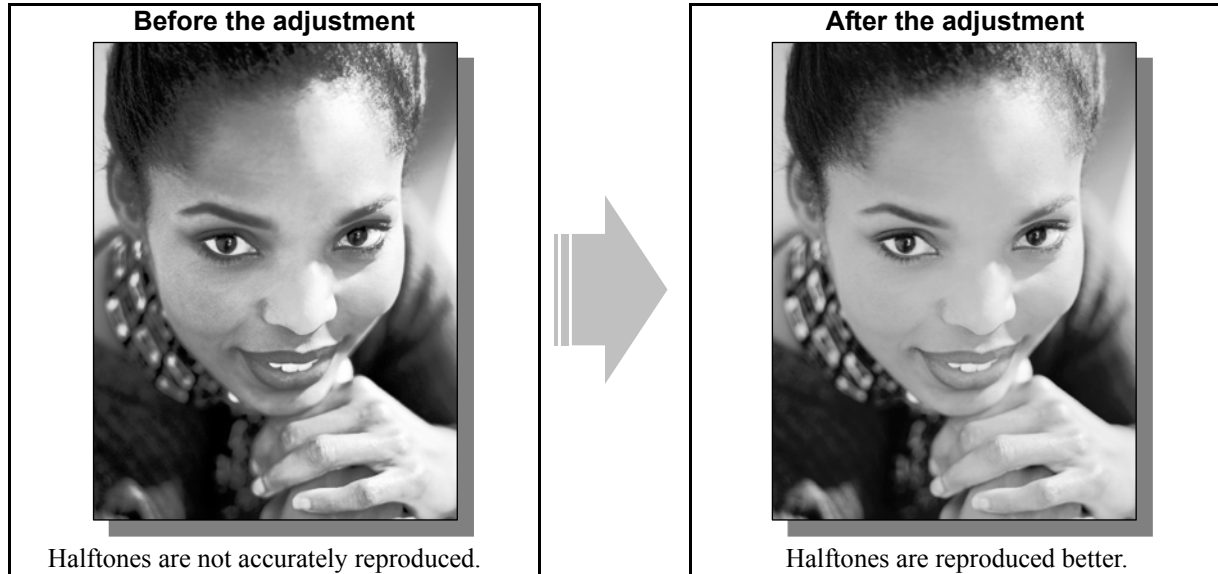
**❑ Cautions after the completion of the adjustment**

Nothing in particular.

**❑ Remarks**

- Enter the value within the recommended value range mentioned in the procedures. Otherwise, it may cause a loss in copier performance, including degradation in the image quality and reduction in the life of the consumables
- If the adjustment causes a toner fixing problem, decrease the values for codes 05-1613 to 1616.

## 2.14 To Obtain Smooth Gray-scale Photo Images



### □ Explanation

When a photo image or gradational image is copied in Black mode with the Text/Photo mode option selected, halftones are not accurately reproduced. Select Image smoothing mode from among the original mode options, in order to reproduce halftones better in Black mode.

\*Remember that the copy image obtained in Image smoothing mode cannot be stored in the e-Filing box.

### □ Procedure

\*The adjustment is performed by the service technician only.

- (1) Press the [BASIC] button on the Control Panel. Select "IMAGE SMOOTHING" from among the original mode options.

\*To have "IMAGE SMOOTHING" selected from among the original mode options by default, refer to procedure (1) in 2.8 To Eliminate Moiré.

### □ Cautions after the completion of the adjustment

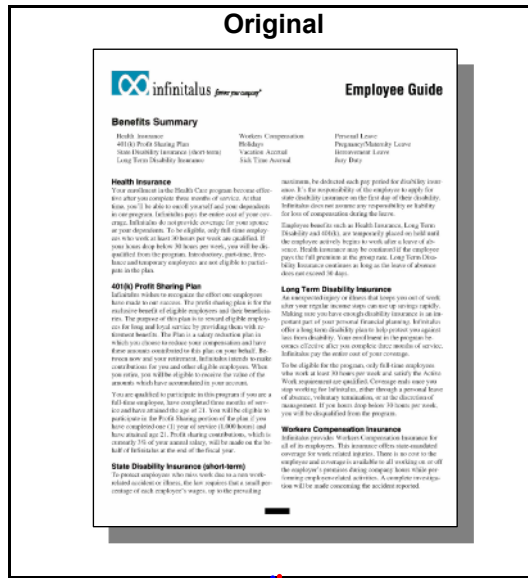
Nothing in particular.

### □ Remarks

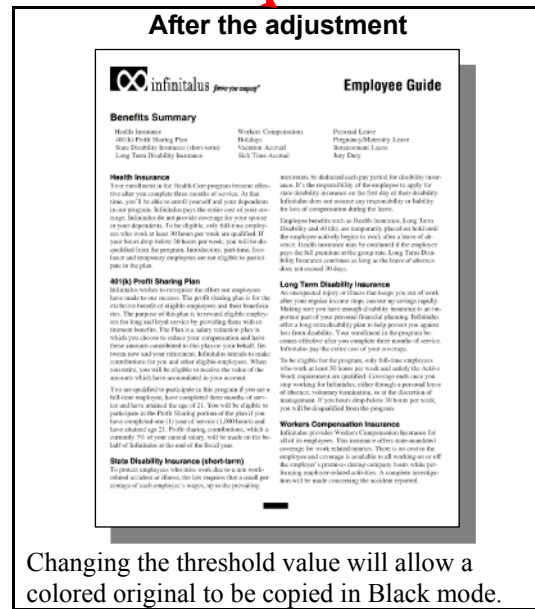
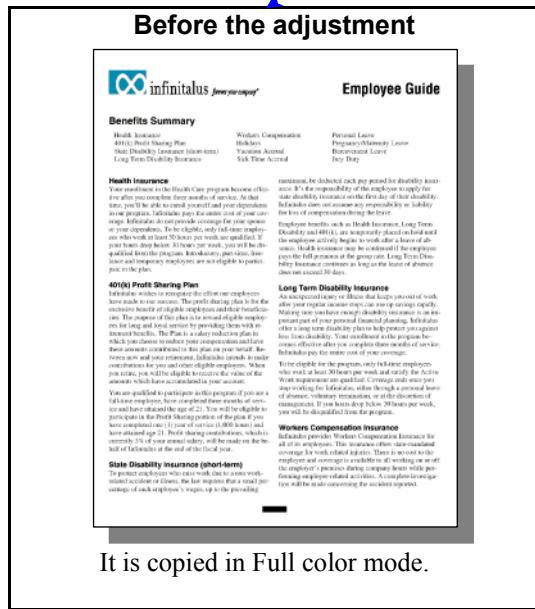
When Image smoothing mode is selected from among the original mode options, the image processing is performed to give a higher priority to accurate reproduction of halftones. As a result, the copying speed will be slowed down, compared to other modes.

# 2.15 To Change the Threshold in Auto Color Mode

(To change the threshold between Full color mode and Black mode to meet the user's needs)



Copied in Auto color mode



### □ Explanation

When Auto color mode is selected, it will be automatically determined whether an original is colored or black-and-white. Then it will be copied in Full color mode or Black mode. But adjust the threshold value, in order to change the threshold between Black mode and Full color mode and suit preferences of the user.




## □ Procedures

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.

\* Procedure (1) is used by the service technician, and by the user.


\* Procedure (2) is used by the service technician only.

 (1) Press the [BASIC] button on the Control Panel. Press the [ZOOM] button. Specify an original size and a copy size.

\* When a non-standard sized original is copied, an area outside the original (or the original cover) may also be scanned. This may prevent the original size from being accurately detected. If the original size is specified in the reduction and enlargement copying function beforehand, the area outside the original will no longer be scanned. As a result, the original size will be accurately detected. Also, clean the original cover, if it is soiled. Otherwise, the type of original cannot be accurately detected.

After specifying the original size and copy size, copy and check the copy image quality.

If further image quality adjustments are still necessary, the service technician must use the next procedure.

 (2) Enter adjustment mode [05]. Change the values for codes [1675/1676] to adjust the threshold value in Auto color mode.

\* As the set value is increased, the original will be more likely to be recognized as black-and-white. On the other hand, if the value is decreased, it will be more likely to be recognized as full color.

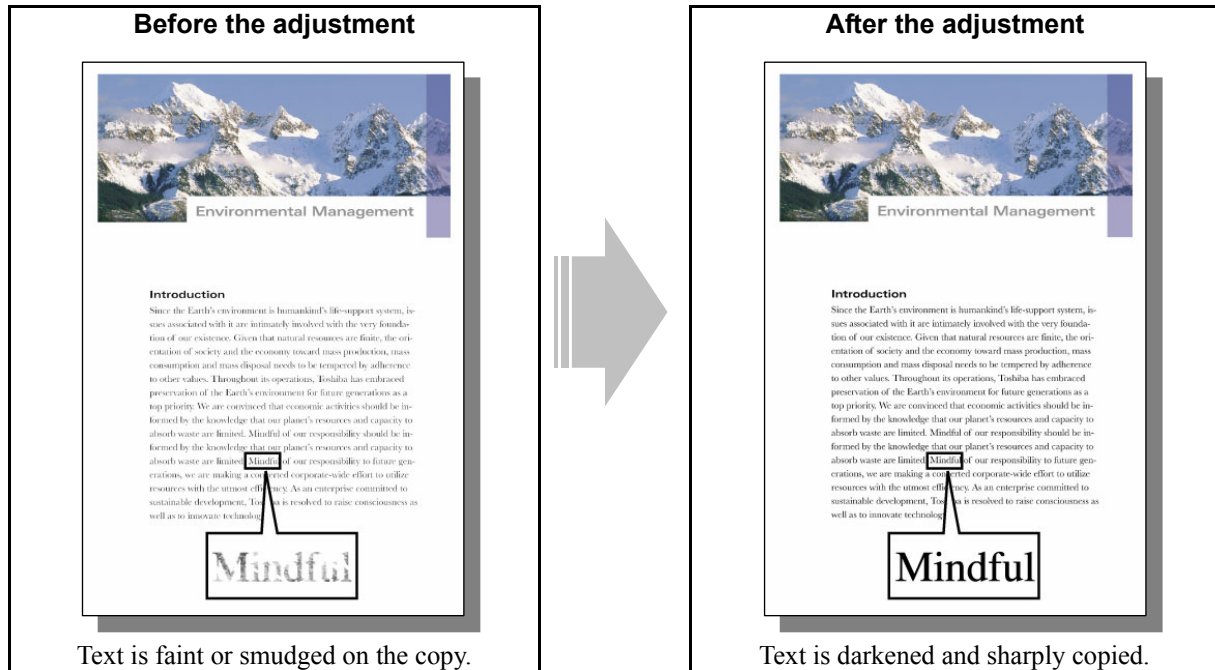
Threshold to be adjusted	[05] code	Acceptable value range	Default
Threshold when an original is manually placed on the original glass	05-1675	0 to 255	70
Threshold when an original is placed on the original glass from the RADF (MR-3018)	05-1676	0 to 255	70

\* Set the value in increments of approximately 30, while checking the copy image until the optimum value is obtained.

## □ Cautions after the completion of the adjustment

- When a non-standard sized original is copied, an area outside the original (or the original cover) may also be scanned. This may prevent the original size from being accurately detected. If the original cover is soiled, the type of original cannot be accurately detected. Therefore, instruct the user to clean the original cover on a routine basis (once a week).
- After the threshold in Auto color mode is adjusted, based on a particular type of original, other types of original may not be correctly detected. Therefore, carefully perform the adjustment, while checking whether any type of original is correctly detected.

## 2.16 To Clearly Copy Text (To adjust the density of text)



### □ Explanation

Adjust the copy density of text, in order to sharply copy light-colored, thin text, or lighten highly colored text.


\* This adjustment will be effective, only when Text/Photo or Text mode is selected from among the original mode options. If Text/Photo mode is selected, the adjustment will affect only text (or an area which is recognized as text).

### □ Procedure

\* The adjustment is performed by the service technician only.

\* The procedure to use varies, depending on whether to adjust the copy image quality in Black mode or Full color mode. Refer to the procedure corresponding to a user's request.

### 2.16.1 To Adjust the Copy Image Quality in Black Mode


-  (1) Enter adjustment mode [05]. Increase the value for code [648] to increase the copy density of text.

(To improve faint, smudged text or thin lines)

- Initially, set a value larger than 180 for code 05-648. Copy and check the copy image quality. Next, finely adjust the value, in accordance with the original density. Up to 255 can be set for this code.

Original mode	[05] code	Value recommended	Acceptable value range	Default
Text/Photo	05-648	Approx. 180	0 to 255	30

### 2.16.2 To Adjust the Copy Image Quality in Full Color Mode

-  (1) Enter adjustment mode [05]. Change the values for codes [1630 to 1633] to adjust the maximum color density of text.

Color to be adjusted	[05] code	Value recommended	Acceptable value range	Default
Y (Yellow)	05-1630	Set a value larger than 5 to increase the density.	0 to 10	5
M (Magenta)	05-1631			
C (Cyan)	05-1632	Set a value smaller than 5 to decrease the density.		
K (Black)	05-1633			

\* Set the value in increment of 1, while checking the copy image until the optimum value is obtained.

#### Cautions after the completion of the adjustment

The adjustment may possibly cause degradation in the image quality. For instance, if the density of text is increased, noise may possibly occur around the text on the copy. If the density is decreased, the text may look faint. Therefore, carefully perform the adjustment, while checking the copy image.

## 2.17 To Adjust the Twin Color Copy Image Quality

(To adjust the image quality in red and black mode)

**Before the adjustment**

**Conglomerate Group's PRTR data**

*Ursa Major Operations, Conglomerate Corp.*

Substance number	Substance name
1	Zinc water-soluble compounds
16	2-aminoethanol
43	Ethylene glycol
63	Xylene
69	Chromium (VI) compounds
227	Toluene
230	Lead and its compounds
243	Barium and its water-soluble compounds
283	Hydrogen fluoride and its water-soluble salts
304	Boron and its compounds
346	Molybdenum and its compounds

When a copy is made in red and black mode for twin color copy, red is blended in a part of the black area.

➔

**After the adjustment**

**Conglomerate Group's PRTR data**

*Ursa Major Operations, Conglomerate Corp.*

Substance number	Substance name
1	Zinc water-soluble compounds
16	2-aminoethanol
43	Ethylene glycol
63	Xylene
69	Chromium (VI) compounds
227	Toluene
230	Lead and its compounds
243	Barium and its water-soluble compounds
283	Hydrogen fluoride and its water-soluble salts
304	Boron and its compounds
346	Molybdenum and its compounds

A blend of undesired colors in the black area is reduced.

### □ Explanation

When a copy is made in red and black mode for twin color copy, red may be blended in the black area or look different from what the user desires. Adjust the reproducibility or tint of black in red and black mode, in order to reduce a blend of undesired colors in the black area or adjust the tint of red.


\* This adjustment will be effective, only if you make a copy in red and black mode for twin color copy. This does not affect twin color selectable mode.

### □ Procedure

\* The procedure to use varies, depending on whether to adjust the reproducibility of black or tint of red in red and black mode. Refer to the procedure corresponding to a user's request.

### 2.17.1 To Adjust the Reproducibility of Black in Red and Black Mode

\*The adjustment is performed by the service technician only.

-  (1) Enter adjustment mode [05]. Set "1" for code [1761] to change the setting, which is intended to improve the reproducibility of black areas.

\*If you are making a copy in red and black mode for twin color copy, red may be blended in the black area.

Change the value for this code. A blend of red in the black area is reduced on the copy.



Value for 05-1761	Reproducibility of black in red and black mode for twin color copy
0	Default
1	Intended to improve the reproducibility of black

#### Cautions after the completion of the adjustment

Setting "1" for code 05-1761 may not provide a clear boundary between red and black. Therefore, carefully perform the adjustment, while checking the copy image.

### 2.17.2 To Adjust the Tint of Red in Red and Black Mode

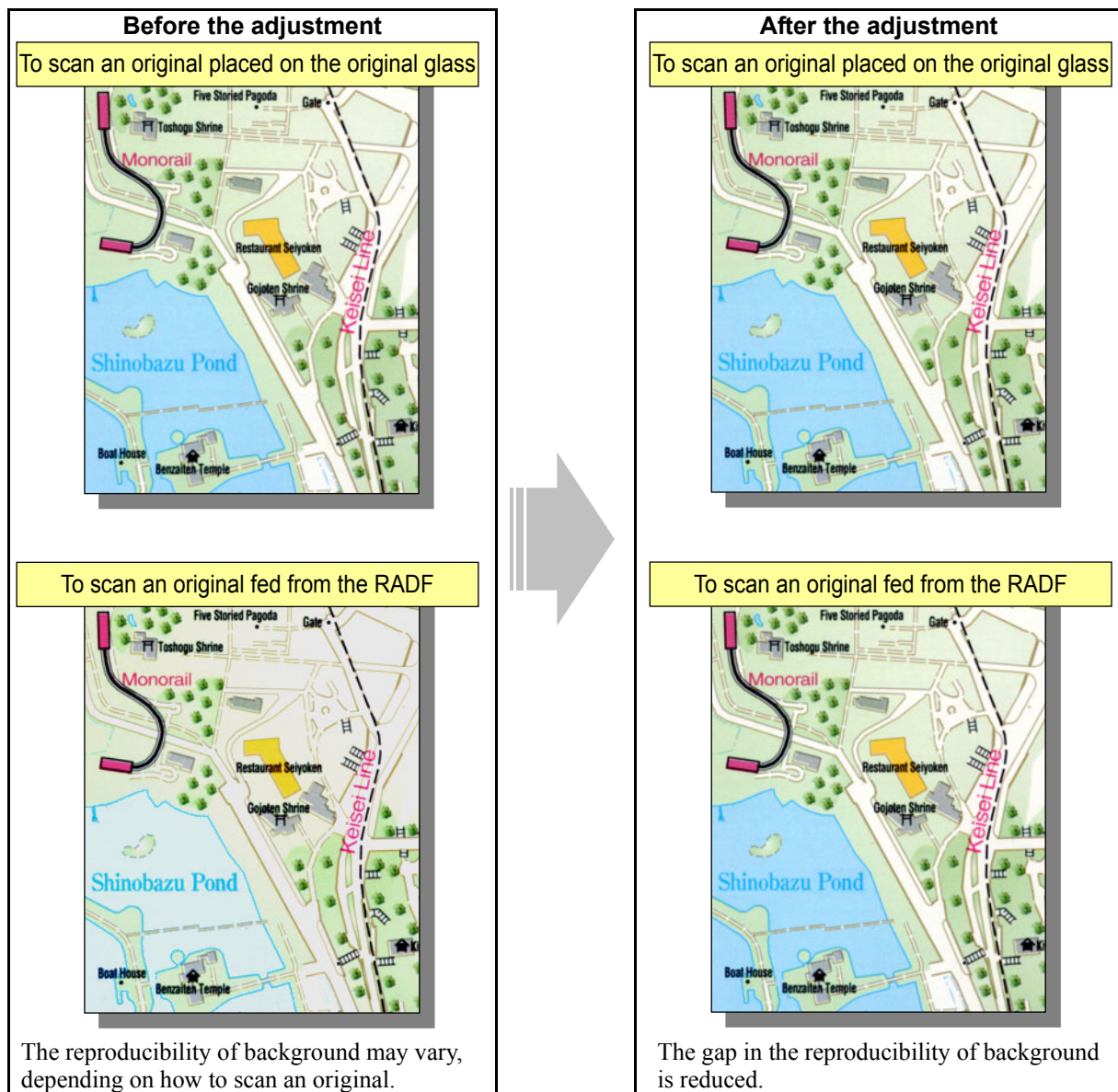
\*The adjustment is performed by the service technician, and by the user.

-  (1) Press the [IMAGE] button on the Control Panel. Press the [TWIN COLOR COPY] button.  
Press the [RED&BLACK] button to enter red and black mode.
-  (2) Press the [ADJUST] button. Press the [+] button or the [-] button for the color to be adjusted, in order to adjust the tint of red.
- Press the [-] button to decrease yellow and the [+] button to enhance magenta, in order to enhance the tint of red.
  - Press the [+] button to enhance yellow and the [-] button to decrease magenta, in order to decrease the tint of red.

#### Cautions after the completion of the adjustment

Nothing in particular.

## 2.18 To Adjust the Image Quality Scanned from the RADF




### □ Explanation

The reproducibility of background may vary, depending on the type of original, or whether to scan an original placed on the original glass or fed from the RADF (MR-3018). Adjust the reproducibility of background, while scanning an original fed from the RADF, in order to minimize the gap in the reproducibility of background, using either of how to scan an original.

\* Before performing this adjustment, make sure that the copier and RADF are correctly adjusted. Therefore, perform all the necessary adjustments. Only if further adjustment is still desired for the reproducibility of background, perform this adjustment.

### □ Procedure

\*The adjustment is performed by the service technician only.

-  (1) Enter adjustment mode [05]. Change the value for code [361] or [362] to adjust the reproducibility of background, while scanning an original fed from the RADF.

Color mode	[05] code	Value recommended	Acceptable value range	Default
Full color	05-361	Set a value larger than 3 to increase the background density.	0 to 4	0
Black	05-362	Set a value smaller than 2 to decrease the background density.		

\*Set the value in increments of approximately 1, while checking the copy image until the optimum value is obtained.

\*The table below shows you the correlation between the value and image quality.

Value	Advantage of image quality	Reproductivity of background
0	Default (equivalent to the one obtained when an original placed on the original glass is scanned)	---
1	Lighter background is reproduced than the one obtained when "2" is set.	Light
2	Lighter background is reproduced than the one obtained when the default value is set.	↓
3	Darker background is reproduced than the one obtained when the default value is set.	↓
4	Darker background is reproduced than the one obtained when "3" is set.	Dark

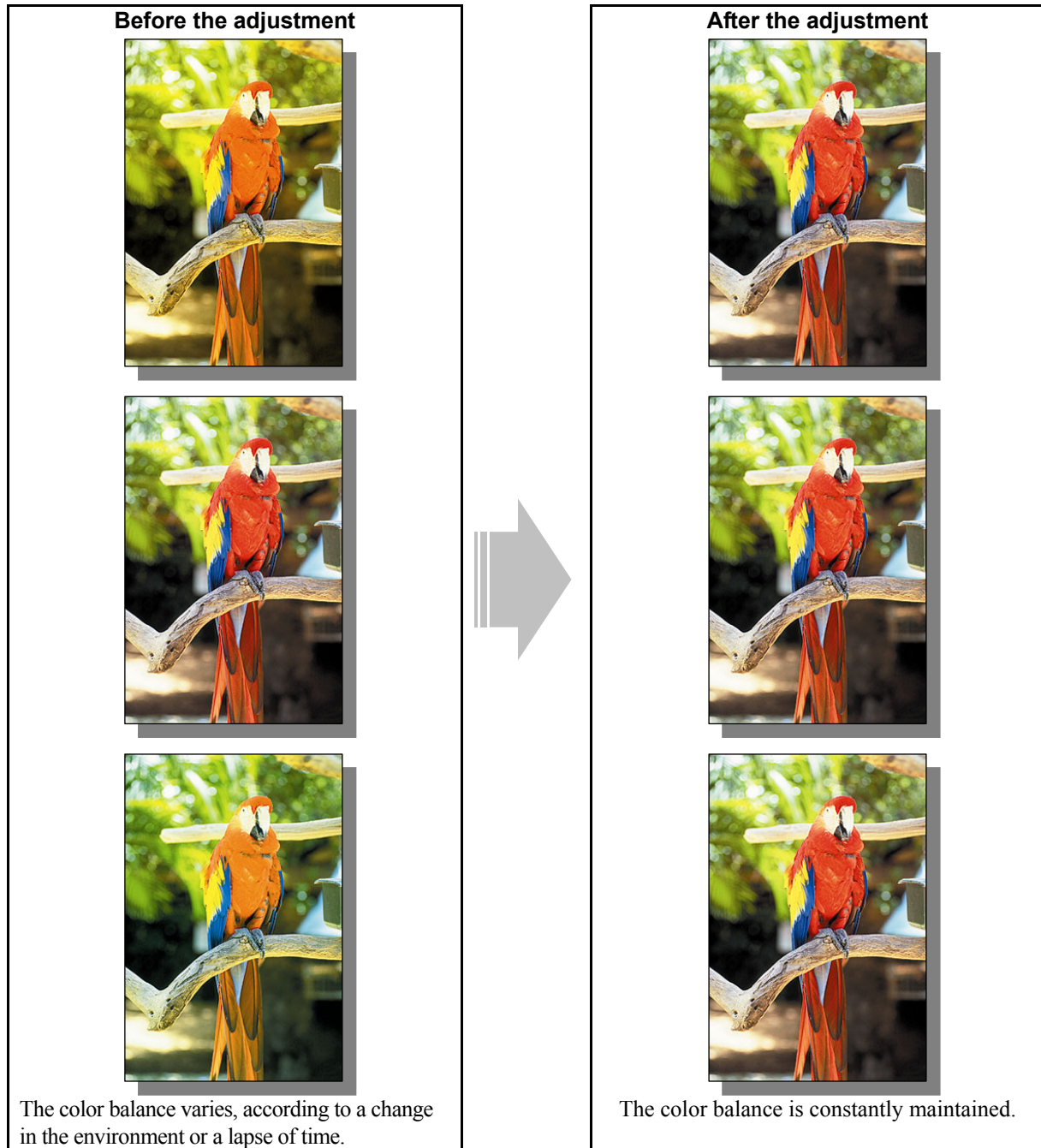
### □ Cautions after the completion of the adjustment

Correctly adjusting the copier and RADF is a prerequisite to perform this adjustment. Therefore, perform all the necessary adjustments. Only if further adjustment is still desired for the reproducibility of background, perform this adjustment.



## 3. Printer-specific Adjustments

### 3.1 To Maintain a Steady Color Balance



#### □ Explanation

The color balance varies, according to a change in the environment, replacement of the consumables and so forth. Periodically adjust the color reproducibility (automatic calibration), in order to constantly maintain a steady color balance on the printout.

The automatic calibration is the basic adjustment to accurately reproduce colors on the printout. When you would like to accurately reproduce the desired hue or when you have replaced the consumables and changed the operating conditions, perform the automatic calibration to ensure the color reproducibility.

#### □ Procedures

\* Perform the adjustment in accordance with the procedures below.

\* Procedure (1) is used by the service technician only.

\* Procedure (2) is used by the service technician, and by the user.



**PCL5c** **PCL6** **PS3** **Mac**

 (1) Enter adjustment mode [05]. Select code [395]. Press the [START] button.


- Image quality control will be forcibly performed to correct variations in image contrast.

After exercising image quality control, print and check the print image quality.

If further image quality adjustments are still necessary, use the next procedure.

**PCL5c** **PS3** \* This adjustment will be effective, only if "Automatic" is selected from among the "Color" options on the printer driver.

**Mac** \* This adjustment will be effective, only if "Color" is selected from among the "Color Resolution Type" options on the printer driver.

 (2) Perform the automatic calibration to correct variations in image density.

\* [ADMIN] is selected from among the [CALIBRATION DISPLAY LEVEL] options by default. In other words, an administrator is authorized to operate the automatic calibration. But the [USER] option can also be selected to allow the user to operate it. Refer to the User Functions Guide for further information regarding how to select the [CALIBRATION DISPLAY LEVEL] option.

\* Use steps (a) through (k) to perform the automatic calibration.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(b) Press the [ADMIN] button.

(c) Enter the 6-digit administrator password. Press the [ENTER] button.

(d) Press the [GENERAL] button.

(e) Press the [CALIBRATION] button.

(f) Press the [PRINT] button.

(g) Press the desired resolution button ([600 x 600] or [1200 x 600]) of the PDL ("PS3" or "PCL" emulation), which will be subjected to the calibration.

(h) Press the [CALIBRATION] button to print out the test chart.

(i) Place the printed test chart on the original glass.

(j) Press the [START] button to perform calibration. When the calibration comes to an end, the message "Scanning and calibrating" will disappear.

(k) The message "Is a result made to reflect?" will appear. Press the [YES] button.

\* Automatic calibration correction will be applied to printing performed under the following conditions:

PC		Printer driver	Printing type	Automatic calibration correction	
Windows	PCL5c	Color: Automatic	Color	Applied	
			Mono	Applied	
		Color: Mono	Mono	Not applied	
	PCL6	---		Mono	Not applied
		PS3	Color: Automatic	Color	Applied
				Mono	Applied
Color: Mono	Mono		Not applied		
Macintosh	Color Resolution Type: Color		Color	Applied	
			Mono	Applied	
			Color Resolution Type: Mono	Mono	Not applied

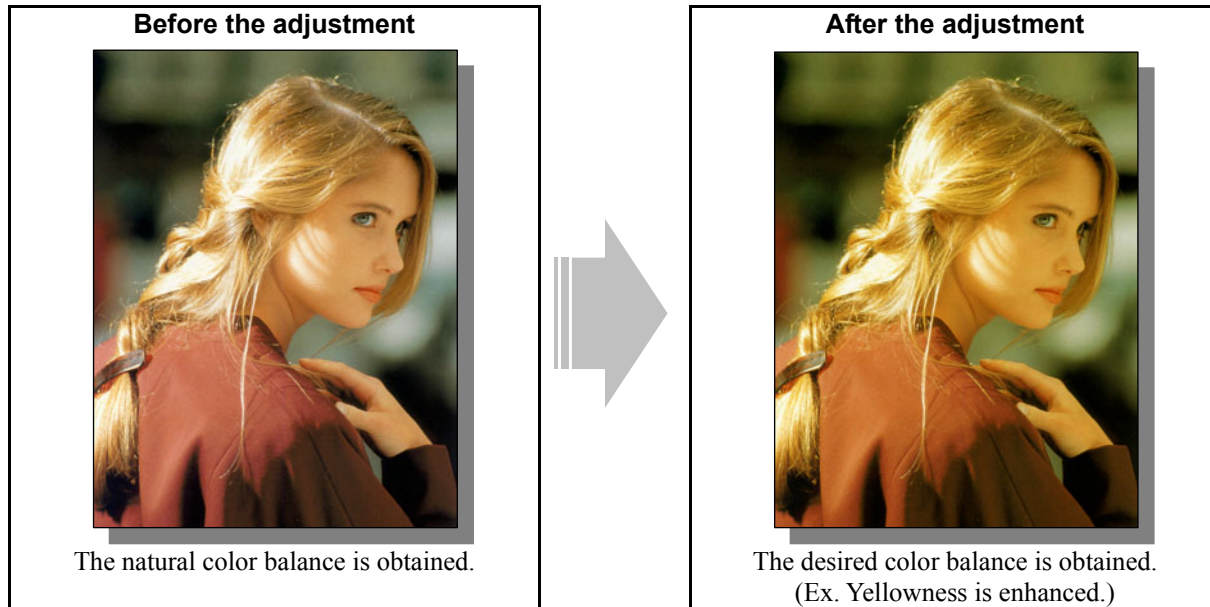
\* The [1200 x 600] button will be displayed, provided that the optional GC-1181 and GC-1230 expansion memories are installed.

\* Repeat the above steps to correct the resolution of the PDL ("PS3" or "PCL" emulation), if necessary.

#### **Cautions after the completion of the adjustment**

Nothing in particular.

## 3.2 To Obtain the Desired Color Balance




### □ Explanation

If you would like to change the color balance or darkness of the printout and reproducibility of halftones in accordance to a type of original or the user's requirement, change the "Image Quality Type" setting on the printer driver or adjust the color balance.

### □ Procedures

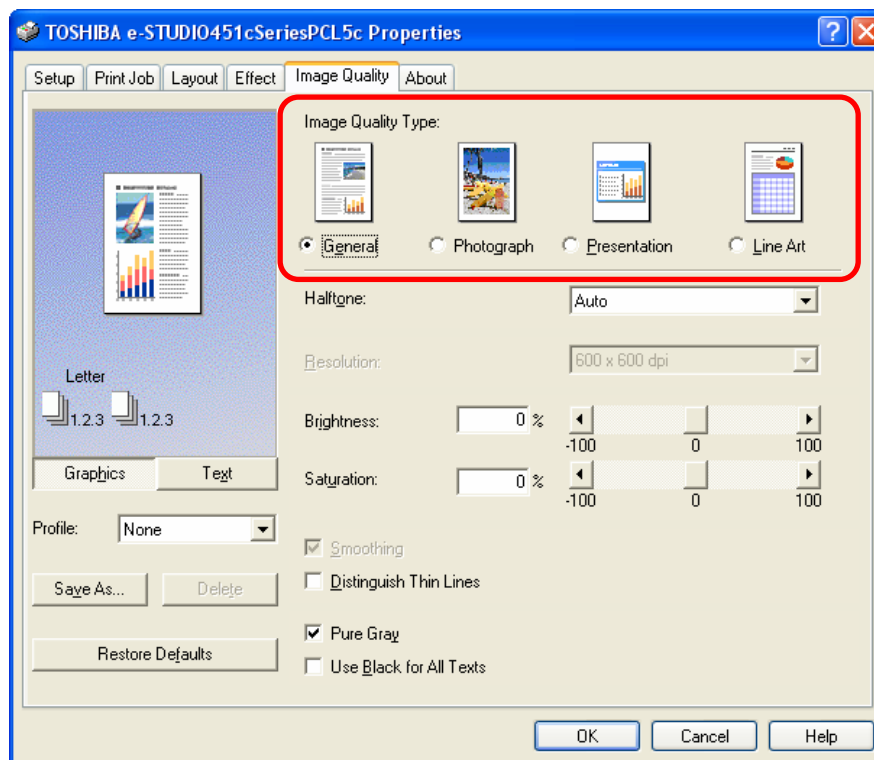
- \* Perform the adjustment in accordance with the procedures below.
- \* Procedures (1) and (3) are used by the service technician, and by the user.
- \* Procedures (2) and (4) are used by the service technician only.

 (1) Change the "Image Quality Type" setting.

\*This adjustment will be effective, only if print out a file created on a general application, such as Microsoft Office, in PostScript (PS3 or Macintosh). Please be careful that it may not be effective, if you print out a file created on a graphic application (e.g. Illustrator) or a DTP application (e.g. QuarkXPress), or PDF file created on these applications using the toner colors (C, M, Y and K). Unmark "Use PostScript Passthrough" in the "PostScript Setting" options in the "Effect" tab. The "Image Quality Type" setting will be effective, if printing on Windows (PS3) is performed (but not on Macintosh) or if you print out a file created on the above applications. However, the color balance may be changed, and also the image quality may be diminished, depending on the type of file.

### For Windows

**PCL5c** **PS3** \* This adjustment will be effective, only if "Automatic" is selected from among the "Color" options on the printer driver. Open the property page of the printer driver. Change the "Image Quality Type" setting in the Image Quality tab.



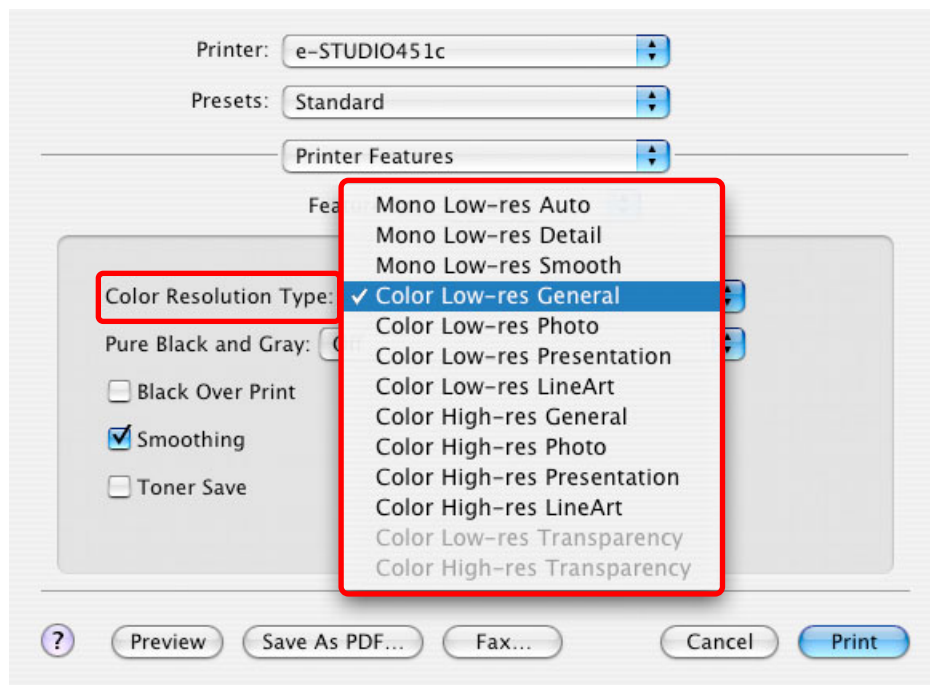
### For Macintosh

**Mac** \* This adjustment will be effective, only if "Color" is selected from among the "Color Resolution Type" options on the printer driver  
Open the print dialog box. Change the "Color Resolution Type" setting.

\*The menu to be selected varies, according to the operating system. Refer to the table below and select the menu.

OS	Menu
OS 9.x	"Quality" ⇒ "Color Resolution Type"
OS X	"Printer Features" ⇒ "Feature Sets: Quality" ⇒ "Color Resolution Type"

- Select the desired combination of color (Color or Mono), resolution, halftone and type from among the "Color Resolution Type" options.



\*The Image Quality Type options feature the following:

- **General:** "General" is the best-rounded option to offer fine printouts of any type of original, including text, photographs and graphics. If "General" is selected, "Smooth" will be selected by default (or automatically) from among the "Halftone" options (how halftones are printed). "Smooth" is intended to improve the reproducibility of gradation. The effects of "Pure Black" and "Pure Gray" will be applied only to text and graphics in this option.
  
- **Photograph:** "Photograph" is intended to improve the reproducibility of halftones, such as photos and gradational images. This provides the color balance closely matching the monitor with sRGB selected as a color space. If "Photograph" is selected, "Smooth" will be selected by default (or automatically) from among the "Halftone" options. "Smooth" is intended to improve the reproducibility of gradation. The effects of "Pure Black" and "Pure Gray" will be applied only to text and graphics in this option.
  
- **Presentation:** "Presentation" is intended to improve to the reproducibility of vivid colors. It is suitable for printing a presentation material, which requires sharp-contrast images. Therefore, the color balance this option provides may be slightly different from the one on the monitor. If "Presentation" is selected, "Smooth" will be selected by default (or automatically) from among the "Halftone" options. "Smooth" is intended to improve the reproducibility of gradation. The effects of "Pure Black" and "Pure Gray" will be applied only to text and graphics in this option.
  
- **Line Art:** "Line Art" is intended to reproduce thin lines without jaggies visible on the printout. It is suitable for printing out line drawings. The color balance this option provides is the same as the one the Presentation option provides. But if "LineArt" is selected, "Detail" will be selected by default (or automatically) from among the "Halftone" options. "Detail" is intended to print halftones in detail (with the high density). The effects of "Pure Black" and "Pure Gray" will be applied to text, graphics and raster data (or image) in this option.

After changing the printer driver settings, print and check the print image quality.

If further image quality adjustments are still necessary, the service technician must use the next procedure.

**PCL5c**

**PCL6**

**PS3**

**Mac**



(2) Enter adjustment mode [05]. Select code [395]. Press the [START] button.

- Image quality control will be forcibly performed to correct variations in image contrast.

After exercising image quality control, print and check the print image quality.

If further image quality adjustments are still necessary, use the next procedure.

**PCL5c**

**PS3**

\* This adjustment will be effective, only if "Automatic" is selected from among the "Color" options on the printer driver.

**Mac**

\* This adjustment will be effective, only if "Color" is selected from among the "Color Resolution Type" options on the printer driver.



(3) Perform the automatic calibration to correct variations in image density.

- \* Refer to procedure (2) described in 3.1 To Maintain a Steady Color Balance.

After exercising the automatic calibration, print and check the print image quality.

If further image quality adjustments are still necessary, use the next procedure.

**PCL5c** **PS3** **Mac** \* This adjustment will have an effect only on full-color printing.

- (4) Enter adjustment mode [05]. Change the values for codes [1010 to 1041] to adjust the color density.
- Adjust the values for the [05] codes corresponding to the print options to be applied (PDL, Resolution and Halftone).

Ex.: • When printing on Windows is performed with the following options selected: PCL5c, 600 x 600, Image Quality Type = General, Halftone = Auto (Smooth)

> Change the values for Y: 05-1026, M: 05-1027, C: 05-1028 and K: 05-1029.

- When printing on Macintosh is performed with the following option selected: Color High-res (= 1200 x 600), Photo (Halftone = Smooth):

> Change the values for Y: 05-1018, M: 05-1019, C: 05-1020 and K: 05-1021.

\* Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

\* The resolution option on the Macintosh printer driver is "Low-res" (= 600 x 600) or "High-res" (= 1200 x 600).

Color to be adjusted	PDL	Resolution	Halftone	[05] code	Subcode	Value recommended	Acceptable value range	Default
Y (Yellow)	PCL5c	600 x 600	Smooth	05-1026	0/1/2	Set a value larger than 128 to increase the density.  Set a value smaller than 128 to decrease the density.	0 to 255	128
			Detail	05-1030	0/1/2			
		1200 x 600	Smooth	05-1034	0/1/2			
			Detail	05-1038	0/1/2			
	PS3	600 x 600	Smooth	05-1010	0/1/2			
			Detail	05-1014	0/1/2			
		1200 x 600	Smooth	05-1018	0/1/2			
			Detail	05-1022	0/1/2			
M (Magenta)	PCL5c	600 x 600	Smooth	05-1027	0/1/2			
			Detail	05-1031	0/1/2			
		1200 x 600	Smooth	05-1035	0/1/2			
			Detail	05-1039	0/1/2			
	PS3	600 x 600	Smooth	05-1011	0/1/2			
			Detail	05-1015	0/1/2			
		1200 x 600	Smooth	05-1019	0/1/2			
			Detail	05-1023	0/1/2			
C (Cyan)	PCL5c	600 x 600	Smooth	05-1028	0/1/2			
			Detail	05-1032	0/1/2			
		1200 x 600	Smooth	05-1036	0/1/2			
			Detail	05-1040	0/1/2			
	PS3	600 x 600	Smooth	05-1012	0/1/2			
			Detail	05-1016	0/1/2			
		1200 x 600	Smooth	05-1020	0/1/2			
			Detail	05-1024	0/1/2			
K (Black)	PCL5c	600 x 600	Smooth	05-1029	0/1/2			
			Detail	05-1033	0/1/2			
		1200 x 600	Smooth	05-1037	0/1/2			
			Detail	05-1041	0/1/2			
	PS3	600 x 600	Smooth	05-1013	0/1/2			
			Detail	05-1017	0/1/2			
		1200 x 600	Smooth	05-1021	0/1/2			
			Detail	05-1025	0/1/2			

\* Set the value in increments of approximately 10, while checking the printout until the optimum value is obtained.

\*"Halftone" refers to how halftones are printed. Two options are available: "Smooth" which is intended to improve the reproducibility of gradation and "Detail" which is intended to print halftones in details (with the high density).

On Windows (PCL5c and PS3), the halftone option to be applied in printing can be selected from among the "Halftone" options in the "Image Quality" tab. "Auto" is selected from among the options by default. It is intended to automatically select "Smooth" or "Detail" in accordance with the selected "Image Quality Type" option, as described by the table below.

On Macintosh, the halftone option in full-color printing is determined, based on the selected image quality type option in the "Quality" menu on the printer driver.

Image Quality Type	Halftone option applied	
	Windows (Halftone = "Auto")	Macintosh
General	Smooth	
Photograph	Smooth	
Presentation	Smooth	
Line Art	Detail	

\*The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area
2	High-density area

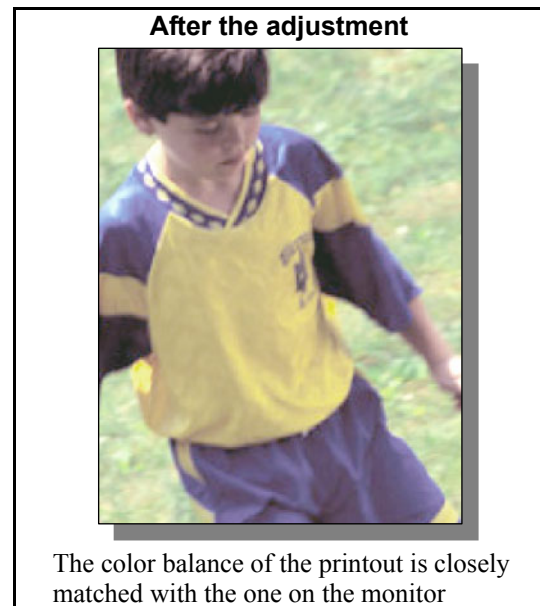
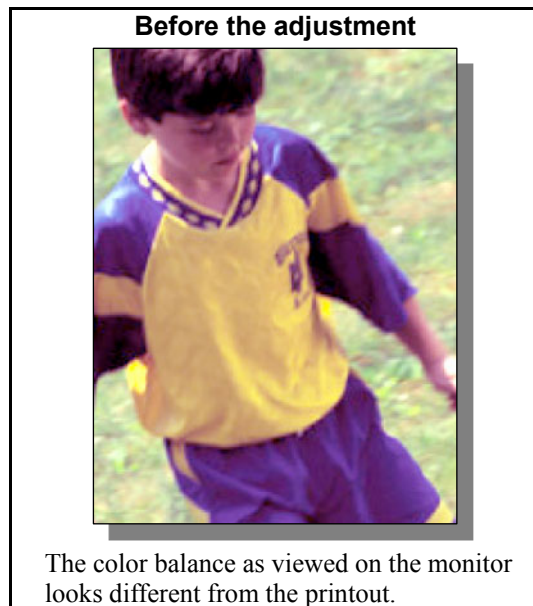
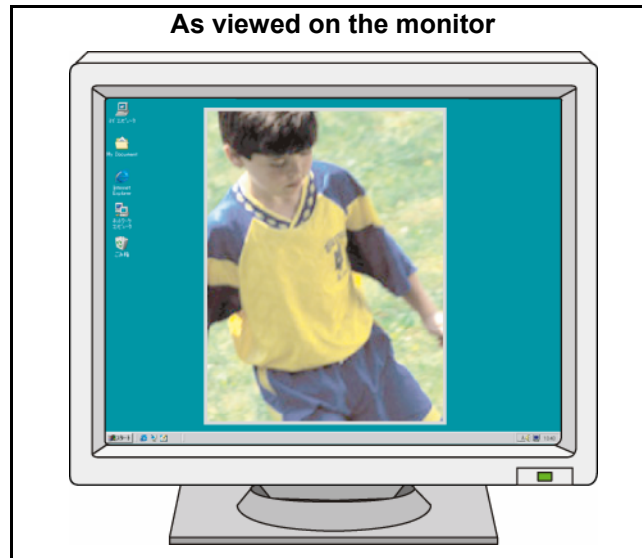
**<Note>** After performing the adjustment, the values changed will be applied to all printouts for the "Image Quality Type" and "Halftone" options. (For instance, if the values for 05 code for PCL, 600 x 600 and Smooth are changed, they will be applied to printing performed with PCL5c, 600 x 600, Halftone = "Smooth" (or "Auto") selected.) Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

#### □ Cautions after the completion of the adjustment

Nothing in particular.



### 3.3 To Closely Match with the Color Balance on the Monitor



#### □ Explanation

The color balance on the printout is initially programmed to provide the maximum color saturation within the range of colors reproducible in printing. In general, colors, which can be reproduced, vary, depending on whether they are reproduced on the printout or on the monitor (or depending on whether they are reproduced in "ink" or with the "light"). Consequently, the color balance on the printout cannot be perfectly matched with the one on the monitor. Change the "Image Quality Type" setting, in order to closely match the color balance on the printout with the one on the monitor, at a user's request.

\*This adjustment will be effective in closely matching the color balance on the printout with the one on the monitor, if the sRGB is selected as a color space. Therefore, remember that it may not be matched with the color balance on the monitor, which does not support sRGB or if a color space other than sRGB is selected.

## □ Procedure

\* The adjustment is performed by the service technician, and by the user.

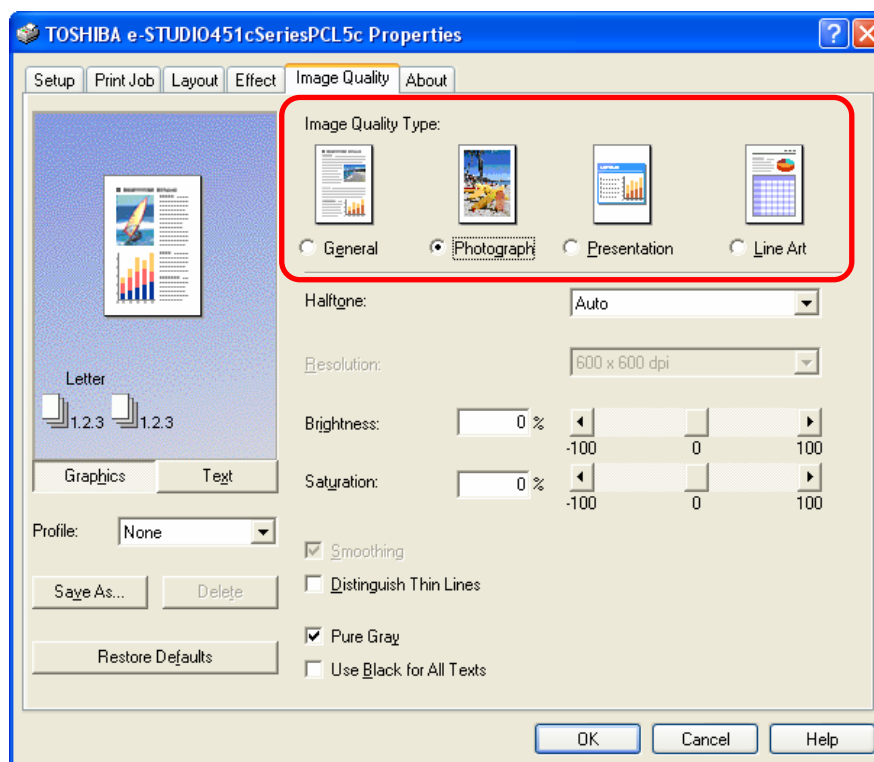
- 🎨 (1) Select "Photograph" from among the "Image Quality Type" options.

\* This adjustment will be effective, only if print out a file created on a general application, such as Microsoft Office, in PostScript (PS3 or Macintosh). Please be careful that it may not be effective, if you print out a file created on a graphic application (e.g. Illustrator) or a DTP application (e.g. QuarkXPress), or PDF file created on these applications using the toner colors (C, M, Y and K). Unmark "Use PostScript Passthrough" in the "PostScript Setting" options in the "Effect" tab. The "Image Quality Type" setting will be effective, if printing on Windows (PS3) is performed (but not on Macintosh) or if you print out a file created on the above applications. However, the color balance may be changed, and also the image quality may be diminished, depending on the type of file.

### For Windows

**PCL5c** **PS3** \* This adjustment will have an effect only on full-color printing.

Open the property page of the printer driver. Select "Photograph" from among the "Image Quality Type" options.



## For Macintosh

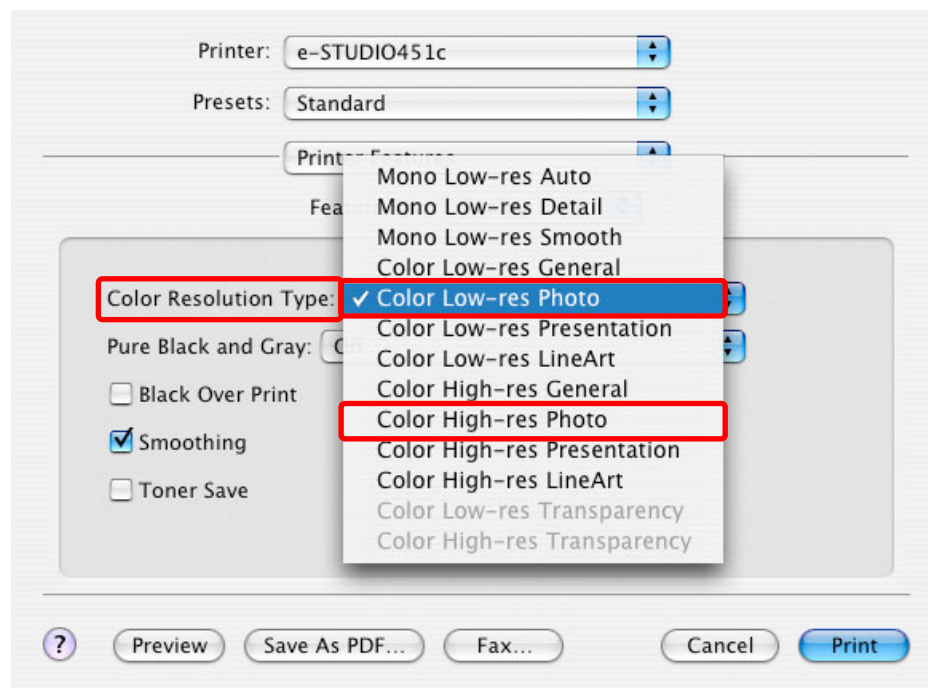
**Mac** \* This adjustment will have an effect only on full-color printing.

Open the print dialog box. Select "Photo" from among the "Color Resolution Type" options.

\* The menu to be selected varies, according to the operating system. Refer to the table below and select the menu.

OS	Menu
OS 9.x	"Quality" ⇒ "Color Resolution Type"
OS X	"Printer Features" ⇒ "Feature Sets: Quality" ⇒ "Color Resolution Type"

- Select the desired combination of color (Color or Mono), resolution, halftone and type from among the "Color Resolution Type" options. In this adjustment, select the combination, which includes the "Photograph" option (Color Low-res Photo or Color High-res Photo).



### ❑ Cautions after the completion of the adjustment

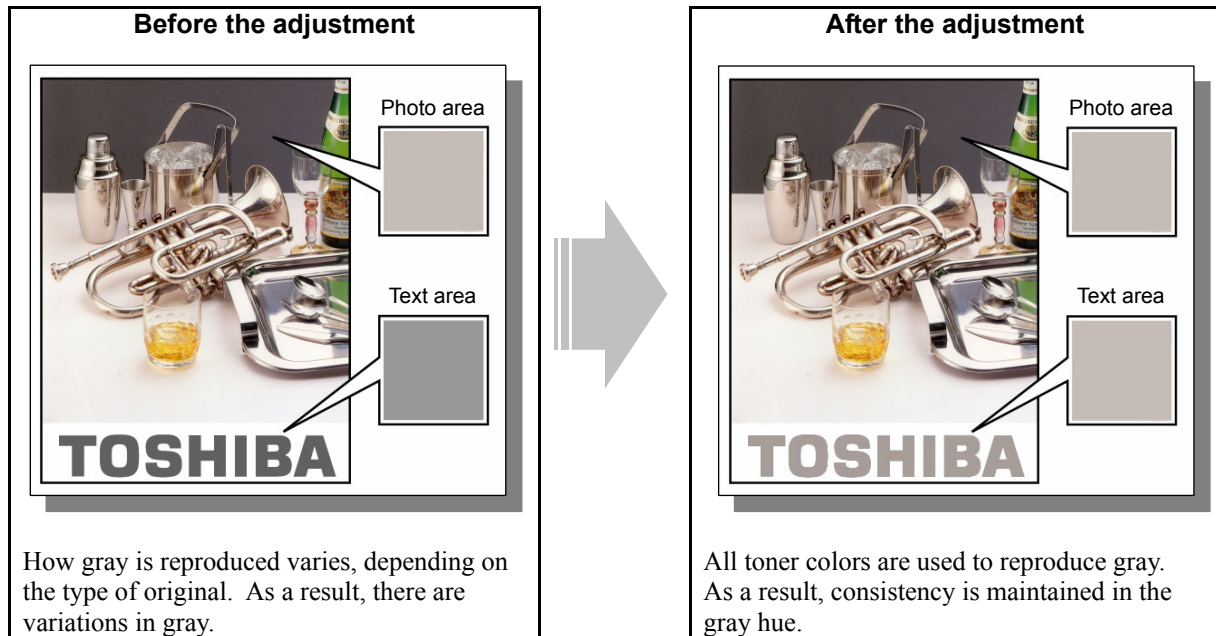
Nothing in particular.

### ❑ Remarks

- Setting a color space to sRGB is a prerequisite to maximize the effectiveness of this adjustment. Therefore, if the monitor does not support sRGB or if color management cannot be performed, the effectiveness of the adjustment may be significantly lost.
- In general, it is impossible to reproduce the color saturation closely matching the true colors, as viewed on the monitor, because the range of colors reproducible in toner colors is narrower than the one on the monitor.

## 3.4 To Maintain a Uniform Gray Hue

(To Maintain consistency in Gray among Text, Photos and Graphics)



### □ Explanation

For printing, only the K toner is usually used to reproduce gray areas of drawing data, lines and text. On the other hand, all toner colors (C, M, Y and K) are used to reproduce gray areas of image data, such as BMP, GIF, JPEG and TIFF. This provides deeper gray on the printout. This provides deeper gray on the printout. Change the printer driver settings, in order to maintain consistency in the gray hue between the drawing data and image data.

## □ Procedure

\*The adjustment is performed by the service technician, and by the user.

- (1) Change the "Pure Gray" setting on the printer driver.

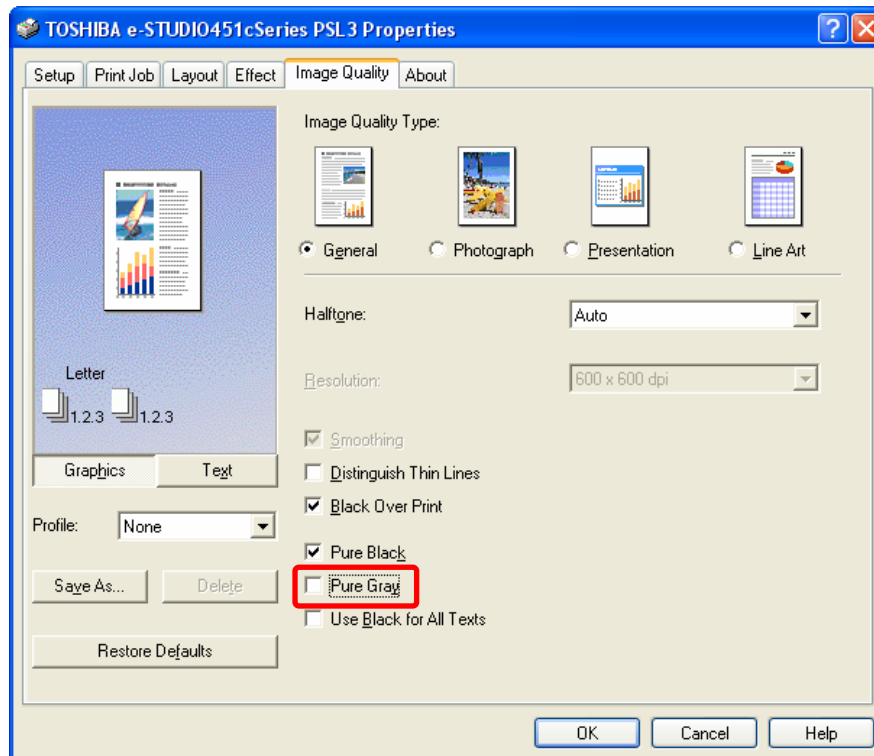
("Pure Gray" allows gray areas to always be reproduced using all toner colors (C, M, Y and K) without changing the hue of color areas.)

\*This adjustment will be effective, only if you print out a file created on a general application, such as Microsoft Office. Please be careful that it may not be effective, if you print out a file or PDF file created on a graphic application (e.g. Illustrator) or a DTP application (e.g. QuarkXPress).

## For Windows

**PCL5c** **PS3** \* This adjustment will have an effect only on full-color printing.

Open the property page of the printer driver. Unmark the "Pure Gray" checkbox in the "Image Quality" Tab.



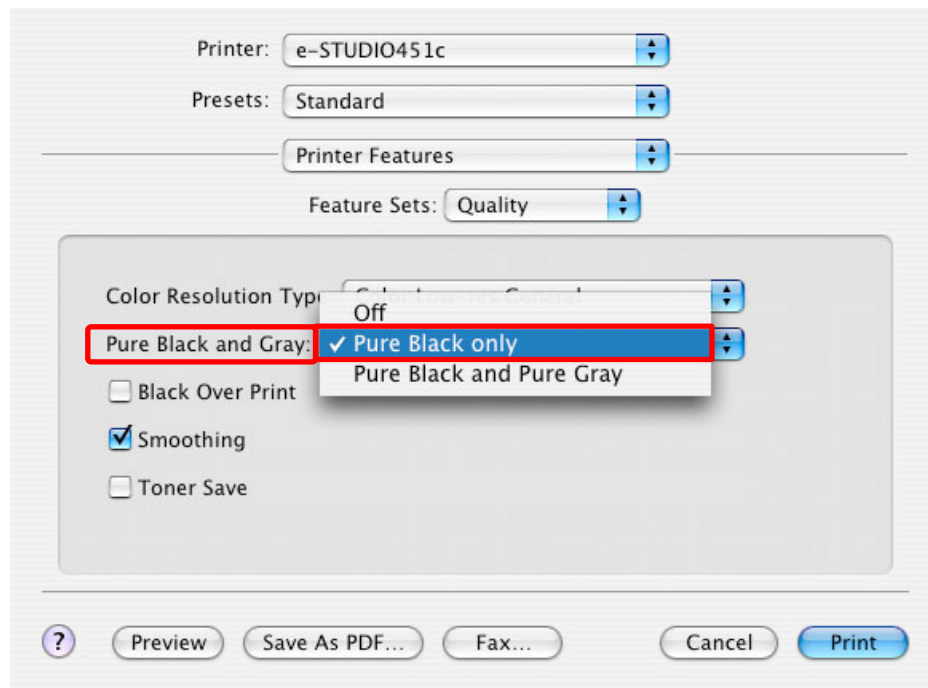
**For Macintosh**

**Mac** \* This adjustment will have an effect only on full-color printing.

Open the print dialog box. Unmark "Pure Black and Pure Gray" in the "Pure Black and Gray" drop-down list. (Select "Pure Black Only" from the drop-down list.)

\*The menu to be selected varies, according to the operating system. Refer to the table below and select the menu.

OS	Menu
OS 9.x	"Quality" ⇒ "Pure Black & Gray"
OS X	"Printer Features" ⇒ "Feature Sets: Quality" ⇒ "Pure Black and Gray"



After changing the printer driver settings, print and check the print image quality.

If further image quality adjustments are still necessary, use the next procedure.

- (2) Select "Line Art" from among the "Image Quality Type" options on the printer driver.

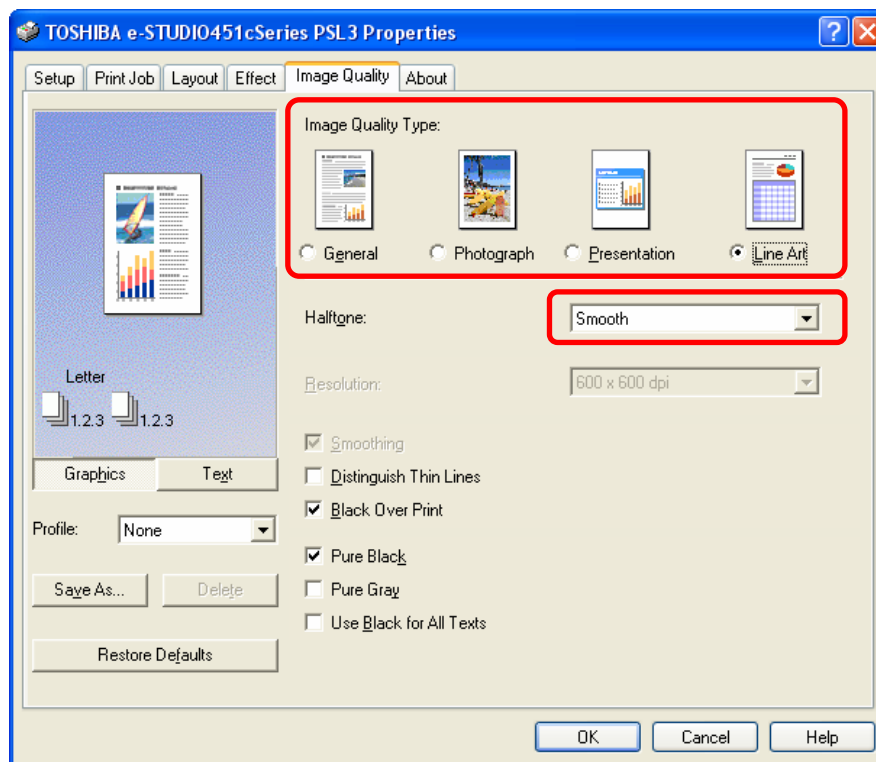
("LineArt" allows gray areas to always be reproduced using only the K toner. The hue of any color other than black this option provides is the same as the one the Presentation option provides.)

\*This adjustment will be effective, only if print out a file created on a general application, such as Microsoft Office, in PostScript (PS3 or Macintosh). Please be careful that it may not be effective, if you print out a file created on a graphic application (e.g. Illustrator) or a DTP application (e.g. QuarkXPress), or PDF file created on these applications using the toner colors (C, M, Y and K). Unmark "Use PostScript Passthrough" in the "PostScript Setting" options in the "Effect" tab. The "Image Quality Type" setting will be effective, if printing on Windows (PS3) is performed (but not on Macintosh) or if you print out a file created on the above applications. However, the color balance may be changed, and also the image quality may be diminished, depending on the type of file.

### For Windows

**PCL5c** **PS3** \* This adjustment will have an effect only on full-color printing.

Open the property page of the printer driver. Select "Line Art" from among the "Image Quality Type" options, and "Smooth" from among the "Halftone" options in the Image Quality tab



**For Macintosh**

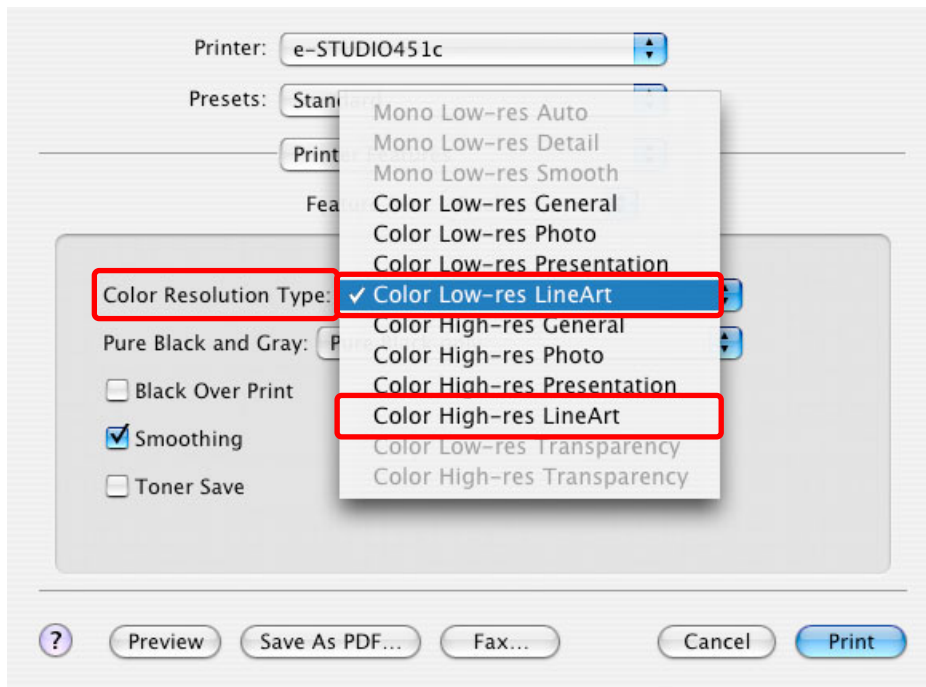
**Mac** \* This adjustment will have an effect only on full-color printing.

Open the print dialog box. Select "LineArt" from among the "Color Resolution Type" options.

\*The menu to be selected varies, according to the operating system. Refer to the table below and select the menu.

OS	Menu
OS 9.x	"Quality" ⇒ "Color Resolution Type"
OS X	"Printer Features" ⇒ "Feature Sets: Quality" ⇒ "Color Resolution Type"

- Select the desired combination of color (Color or Mono), resolution, halftone and type from among the "Color Resolution Type" options. In this adjustment, select the combination, which includes the "LineArt" option (Color Low-res LineArt or Color High-res LineArt).

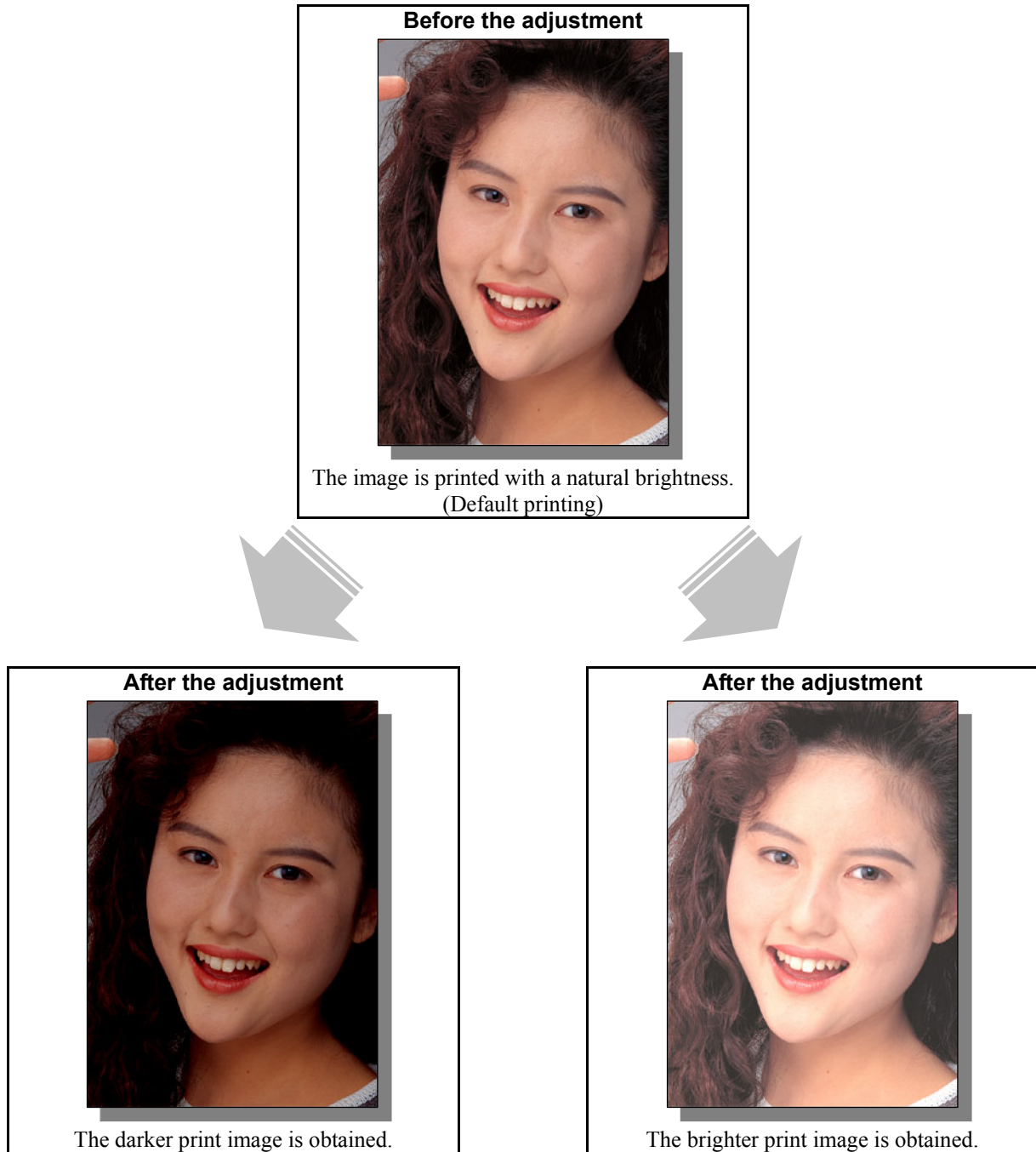




**□ Cautions after the completion of the adjustment**

- The adjustment performed in accordance with procedure (1) will allow gray areas to always be reproduced using all toner colors (C, M, Y and K). As a result, undesired colors may look blended, depending on the image to print out. Therefore, carefully perform the adjustment, while checking the printout.
- The adjustment performed in accordance with procedure (2) will allow gray areas to always be reproduced using only the K toner. As a result, photos may look more grained. The hue of any color other than black is the same as the one when "Presentation" is selected from among the "Color Resolution Type" options. Therefore, carefully perform the adjustment, while checking the printout.  
If "Line Art" is selected from among the Image "Quality Type" options, and "Auto" is selected from among the "Halftone" options, unlike the other "Quality Type" options, "Detail" is selected automatically. Therefore, select "Smooth" manually from among the "Halftone" options.

### 3.5 To Easily Adjust the Overall Brightness



#### □ Explanation

The brightness of the print image can be easily adjusted by changing the "Brightness" setting on the printer driver.

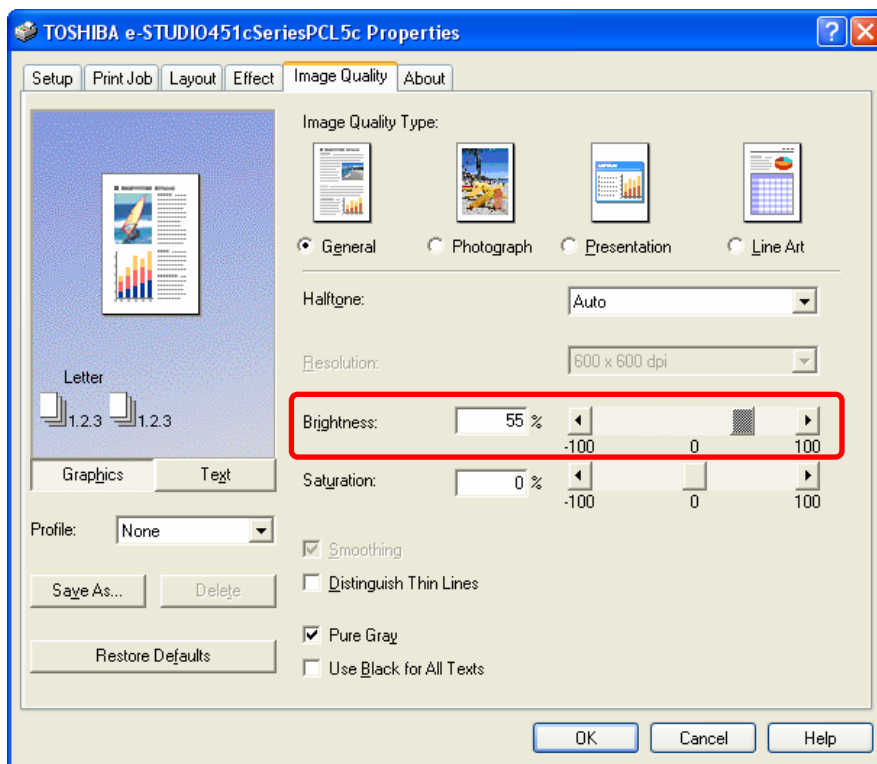
\*This adjustment will have an effect only on printing on the PCL5c emulation printer driver.  
(This adjustment cannot be performed on the Macintosh printer driver.)

## □ Procedure

\*The adjustment is performed by the service technician, and by the user.

### PCL5c

- 1) Open the property page of the printer driver. Adjust "Brightness" in the "Image Quality" tab.
  - Select the desired value for brightness within a range between -100% (Darkest) and 100% (Lightest).



## □ Cautions after the completion of the adjustment

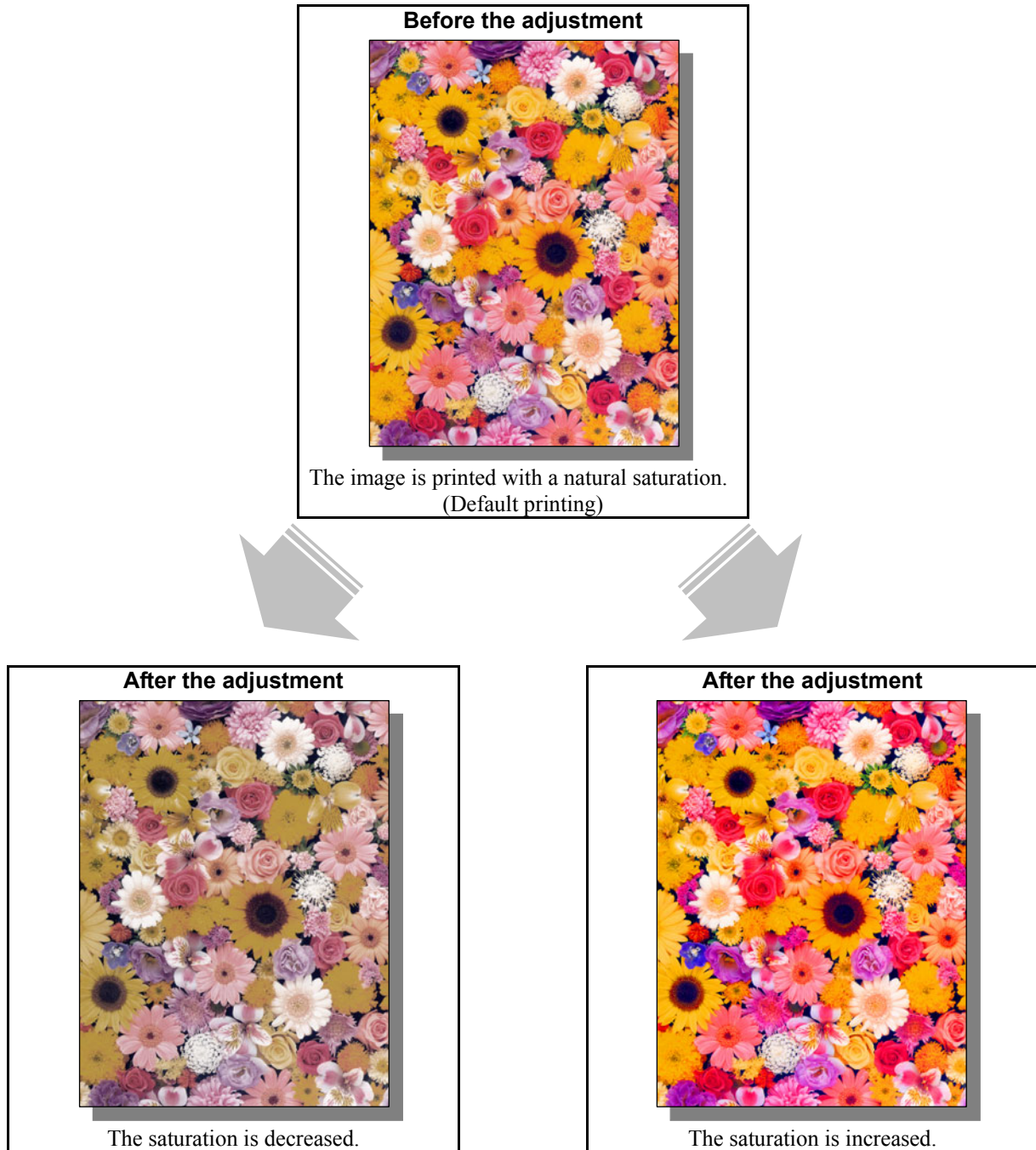
Remember that the brightness change will affect all the "Image Quality Type" options, or black-and-white printing ("Mono" in selected from among the "Color" options in PCL5).

(For instance, if the brightness is changed with "General" selected, it will be maintained, even when it is switched to another "Image Quality Type" option, such as "Photograph," or when "Mono" is selected from among the "Color" options.)

## □ Remarks

The brightness adjustment does not affect black text (CMY = 100%, K = 100% or RGB = 0%).

## 3.6 To Easily Adjust the Overall Saturation



### □ Explanation

The saturation of the print image can be easily adjusted by changing "Saturation" setting on the printer driver.

\*This adjustment will have an effect only on printing on the PCL5c emulation printer driver.

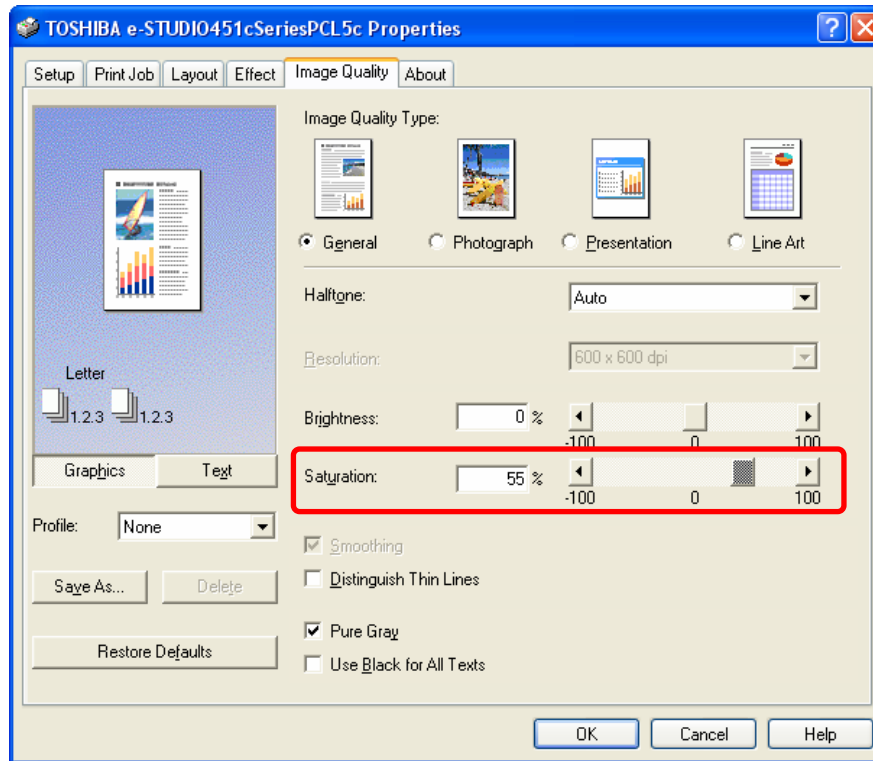
(This adjustment cannot be performed on the Macintosh printer driver.)

### □ Procedure

\* The adjustment is performed by the service technician, and by the user.

**PCL5c** \* This adjustment will have an effect only on full-color printing.

- (1) Open the property page of the printer driver. Adjust "Saturation" in the "Image Quality" tab.
  - Select the desired value for brightness within a range between -100% (Least clear) and 100% (Clearest).



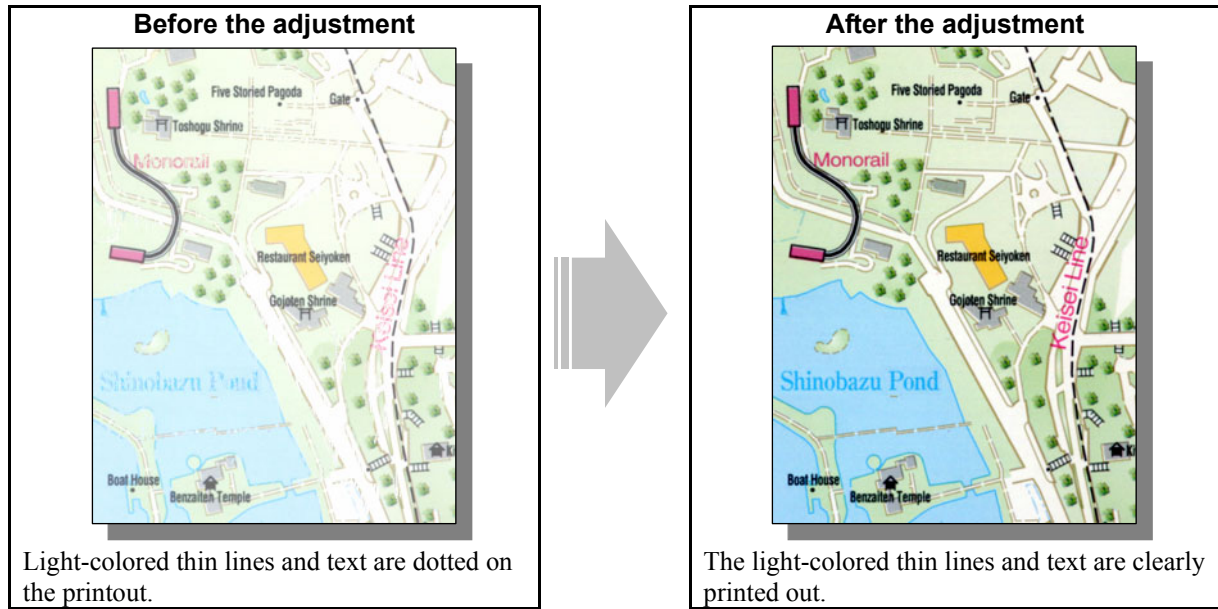
### □ Cautions after the completion of the adjustment

Remember that the saturation change will affect all the "Image Quality Type" options. (For instance, if the saturation is changed with "General" selected, it will be maintained, even when it is switched to another "Image Quality Type" option, such as "Photograph.")

### □ Remarks

The saturation adjustment does not affect black or gray areas on the printout.

## 3.7 To Clearly Print Light-colored Thin Lines or Text



### □ Explanation

When light-colored thin lines and text are printed out, they may sometimes be dotted on the printout. Change the printer driver setting or adjust the color balance or gamma curve balance, in order to clearly print them out.

### □ Procedures

- \* Perform the adjustment in accordance with the procedure below.
- \* Procedure (1) is used by the service technician, and by the user.
- \* Procedure (2) is used by the service technician only.



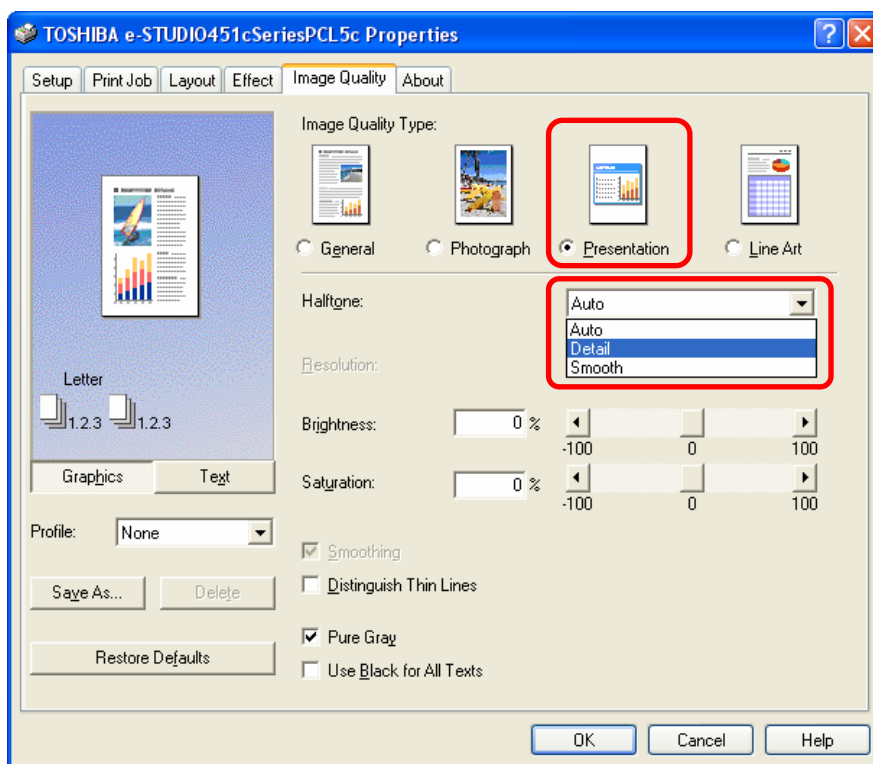
-  (1) Change the "Image Quality Type" setting.

### For Windows

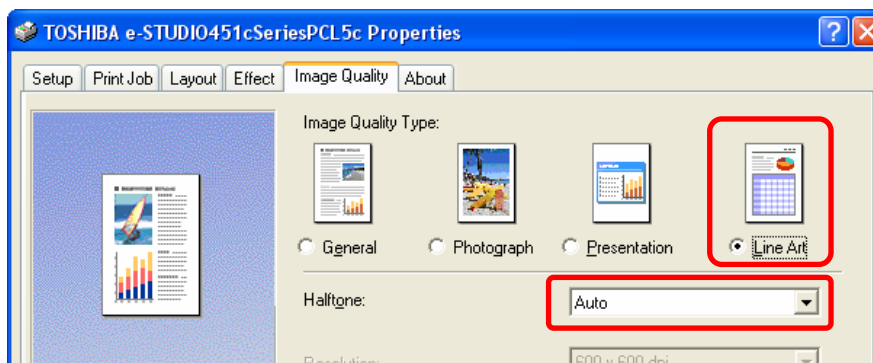
**PCL5c** **PS3**

Open the property page of the printer driver. Change the "Image Quality Type" and "Halftone" settings in the Image Quality tab.

- Change these settings in either of the following, in accordance with a type of original to print:
  - Image Quality Type: "Presentation," Halftone: "Detail"



- Image Quality Type: "Line Art," Halftone: "Auto"



## For Macintosh

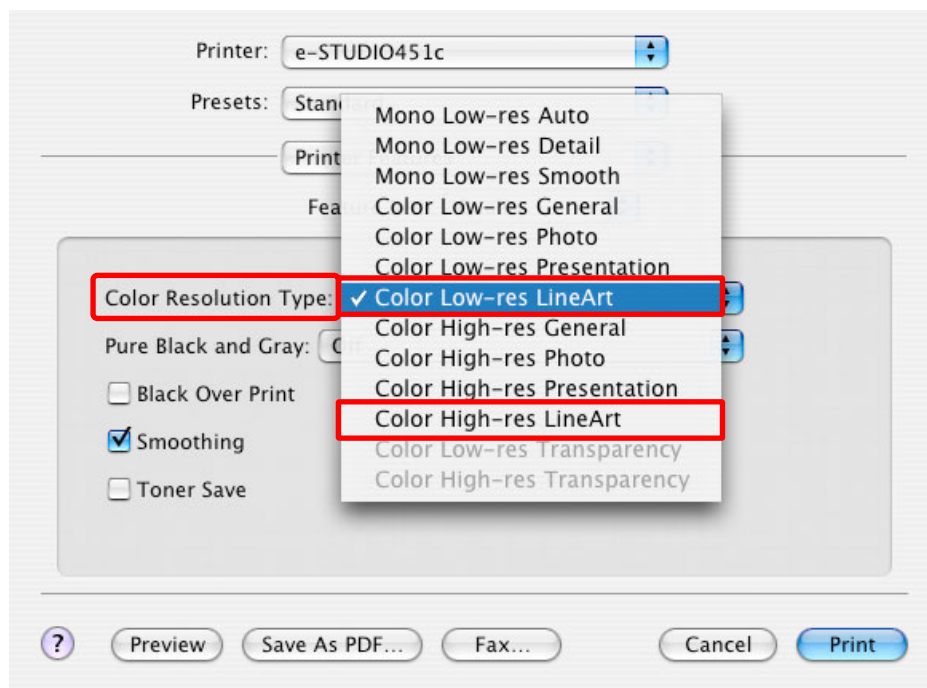
**Mac** \* This adjustment will have an effect only on full-color printing.

Open the print dialog box. Select "LineArt" from among the "Color Resolution Type" options.

\* The menu to be selected varies, according to the operating system. Refer to the table below and select the menu.

OS	Menu
OS 9.x	"Quality" ⇒ "Color Resolution Type"
OS X	"Printer Features" ⇒ "Feature Sets: Quality" ⇒ "Color Resolution Type"

- Select the desired combination of color (Color or Mono), resolution, halftone and type from among the "Color Resolution Type" options. In this adjustment, select the combination, which includes the "Line Art" option (Color Low-res LineArt or Color High-res LineArt).



After changing the printer driver settings, print and check the print image quality.

If further image quality adjustments are still necessary, the service technician must use the next procedure.




PCL5c

PCL6

PS3

Mac

 (2) Change the value for an appropriate code in adjustment mode [05] to adjust the color balance or gamma curve balance.

\*The [05] code to use varies, depending on whether to adjust the image quality in full-color printing or black-and-white printing. Use either of the procedures below appropriate to a type of original to print.

### **To adjust the image quality in full-color printing**

("Automatic" is selected from among the "Color" options on the PCL5c or PS3 printer driver. "Color" is selected from among the "Color Resolution Type" options on the Macintosh printer driver.)

- Use steps (a) to (b) to adjust the color balance.

\*The "Color" options are available in the "Setup" tab on the PCL5c and PS3 printer drivers. The "Color Resolution Type" is available in the "Quality" menu on the Macintosh printer driver.

(a) Enter adjustment mode [05]. Select code [395]. Press the [START] button.

- Image quality control will be forcibly performed to correct variations in image contrast.

(b) Enter adjustment mode [05]. Change the values for codes [1014 to 1017], [1022 to 1025], [1030 to 1033] or [1038 to 1041] to adjust the color balance and increase the color density.

- Adjust the values for the [05] codes corresponding to the print options to be applied (PDL, Resolution and Halftone).

Ex.: • When printing on Windows is performed with the following options selected: PCL5c, 600 x 600, Image Quality Type = Presentation, Halftone = Detail)

> Change the values for Y: 05-1030, M: 05-1031, C: 05-1032 and K: 05-1033.

- When printing on Macintosh is with the following option selected: Color Low-res (= 600 x 600), LineArt (Halftone = Detail):

> Change the values for Y: 05-1014, M: 05-1015, C: 05-1016 and K: 05-1017.

\*Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

\*The resolution option on the Macintosh printer driver is "Low-res" (= 600 x 600) or "High-res" (= 1200 x 600).

Color to be adjusted	PDL	Resolution	Halftone	[05] code	Subcode	Value recommended	Acceptable value range	Default
Y (Yellow)	PCL5c	600 x 600	Detail	05-1030	0/1/2	Set a value larger than 128.	0 to 255	128
		1200 x 600	Detail	05-1038	0/1/2			
	PS3	600 x 600	Detail	05-1014	0/1/2			
		1200 x 600	Detail	05-1022	0/1/2			
M (Magenta)	PCL5c	600 x 600	Detail	05-1031	0/1/2			
		1200 x 600	Detail	05-1039	0/1/2			
	PS3	600 x 600	Detail	05-1015	0/1/2			
		1200 x 600	Detail	05-1023	0/1/2			
C (Cyan)	PCL5c	600 x 600	Detail	05-1032	0/1/2			
		1200 x 600	Detail	05-1040	0/1/2			
	PS3	600 x 600	Detail	05-1016	0/1/2			
		1200 x 600	Detail	05-1024	0/1/2			
K (Black)	PCL5c	600 x 600	Detail	05-1033	0/1/2			
		1200 x 600	Detail	05-1041	0/1/2			
	PS3	600 x 600	Detail	05-1017	0/1/2			
		1200 x 600	Detail	05-1025	0/1/2			

\* Set the value in increments of approximately 10, while checking the printout until the optimum value is obtained.

\* The value for the [05] code for K (black) will affect black-and-white images (including text, lines and photos) on the printout.

\* The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area
2	High-density area

**<Note>** The adjustment results are reflected in "Detail" of the Halftone options and "Line Art" of the Image Quality Type options of the printer driver, and will subsequently apply to all printouts that use the changed setting. (For instance, if the values for [05] code for PCL and Detail are changed, they will be applied to printing performed with PCL5c and Halftone = "Detail" (or "Auto") selected.) Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

Note that this adjustment has no impact when "Smooth" is selected in the "Halftone" options, or when any one of "General," "Photo" and "Presentation" is selected in the "Image Quality Type" options and "Auto" is selected in the "Halftone" options.

**To adjust the image quality in black-and-white printing**

("Mono" is selected from among the "Color" options on the PCL5c or PS3 printer driver. To print using PCL6, "Mono" is selected from among the "Color Resolution Type" options on the Macintosh printer driver.)

\*The "Color" options are available in the "Setup" tab on the PCL5c and PS3 printer drivers. The "Color Resolution Type" is available in the "Quality" menu on the Macintosh printer driver. Note that "Color" options are not present since PCL6 only applies to monochrome printing.

(a) Enter adjustment mode [05]. Increase the value for code [597], [598] or [599]. Adjust the gamma curve balance and increase the density in black-and-white printing.

- Adjust the [05] codes corresponding to the PDL to be applied.

\*Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

PDL	Halftone	[05] code	Subcode	Value recommended	Acceptable value range	Default
PCL5c	Detail	05-599	0/1/2	Set a value larger than 128.	0 to 255	128
PCL5c/PCL6	Smooth	05-598	0/1/2			
PS3	Detail	05-597	0/1/2			

\*Set the value in increments of approximately 10, while checking the printout until the optimum value is obtained.

\*The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area
2	High-density area

- <Note>**
- After performing the adjustment, the values changed will be applied to all printouts for the "Halftone" option. (For instance, if the values for [05] code for PCL and Detail are changed, they will be applied to printing performed with PCL5c and Halftone = "Detail" (or "Auto") selected.) Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.
  - PCL6 and PCL5c use "Smooth" of the "Halftone" options in common. Note that a change to the 05-598 setting has impact on printouts with "Mono" and "Smooth" selected in the "Color" and the "Halftone" options respectively in PCL5c, as well as printouts using PCL6. (When "Mono" is selected in the "Color" options in PCL5c, particular attention should be given since the default setting for the "Halftone" options is "Smooth.")
  - When "Mono" is selected in the "Color" options and "Auto" (default) is selected in the "Halftone" options in PS3, "Detail" of the "Halftone" options is applied to text and graphics (illustrations), and "Smooth" is applied to raster data (images). Therefore, particular attention is required since the adjustment may have different impact according to patterns of the image to be printed.

**❑ Cautions after the completion of the adjustment**

Carefully perform the adjustment while printing out images, since the adjustment may cause graininess or gradation variations.

## 3.8 To Clearly Print Thin Lines/Double Lines

**Before the adjustment**

**Conglomerate Group's PRTR data**

Ursa Major Operations, Conglomerate Corp.

Substance number	Substance name
1	Zinc water-soluble compounds
16	2-aminoethanol
43	Ethylene glycol
63	Xylene
69	Chromium (VI) compounds
227	Toluene
230	Lead and its compounds
243	Barium and its water-soluble compounds
283	Hydrogen fluoride and its water-soluble salts
304	Boron and its compounds
346	Molybdenum and its compounds

Thin lines or double lines are dotted on the print out.

➔

**After the adjustment**

**Conglomerate Group's PRTR data**

Ursa Major Operations, Conglomerate Corp.

Substance number	Substance name
1	Zinc water-soluble compounds
16	2-aminoethanol
43	Ethylene glycol
63	Xylene
69	Chromium (VI) compounds
227	Toluene
230	Lead and its compounds
243	Barium and its water-soluble compounds
283	Hydrogen fluoride and its water-soluble salts
304	Boron and its compounds
346	Molybdenum and its compounds


The thin lines or double lines are clearly printed out.

### □ Explanation

When thin lines or double lines, which are laid out on a solid filled area, are printed out, they may sometimes be dotted on the printout. Change the printer driver setting, in order to clearly print them out.

### □ Procedure

\*The adjustment is performed by the service technician, and by the user.

-  (1) Mark the "Distinguish Thin Line" checkbox on the printer driver.

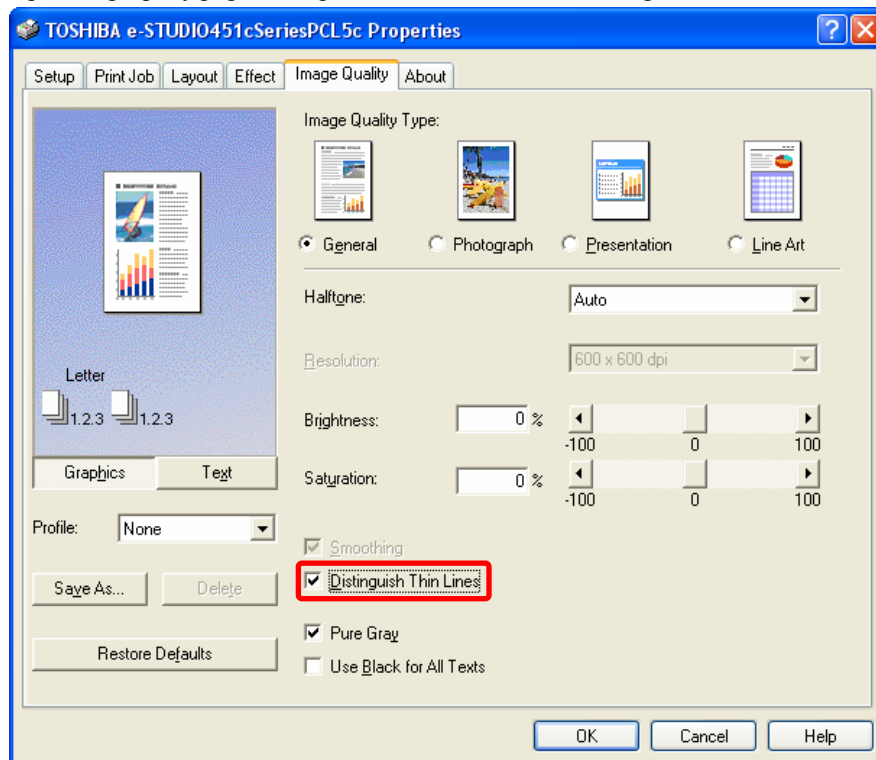
**For Windows**

PCL5c

PCL6

PS3

Open the property page of the printer driver. Mark the "Distinguish Thin Lines" checkbox in the "Image Quality" tab.

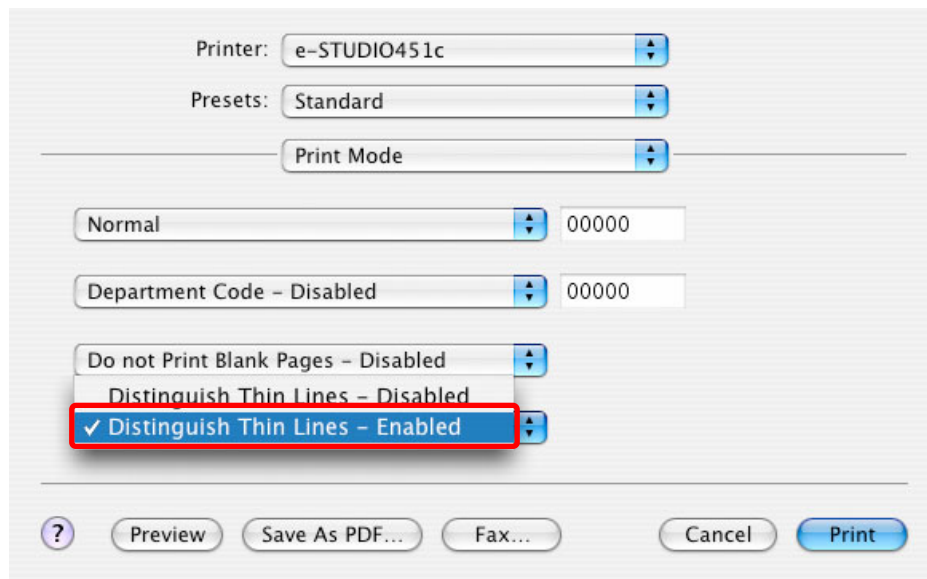


**For Macintosh****Mac**

Open the print dialog box. Mark the "Distinguish Thin Line" checkbox.

\*The menu to be selected varies, according to the operating system. Refer to the table below and select the menu.

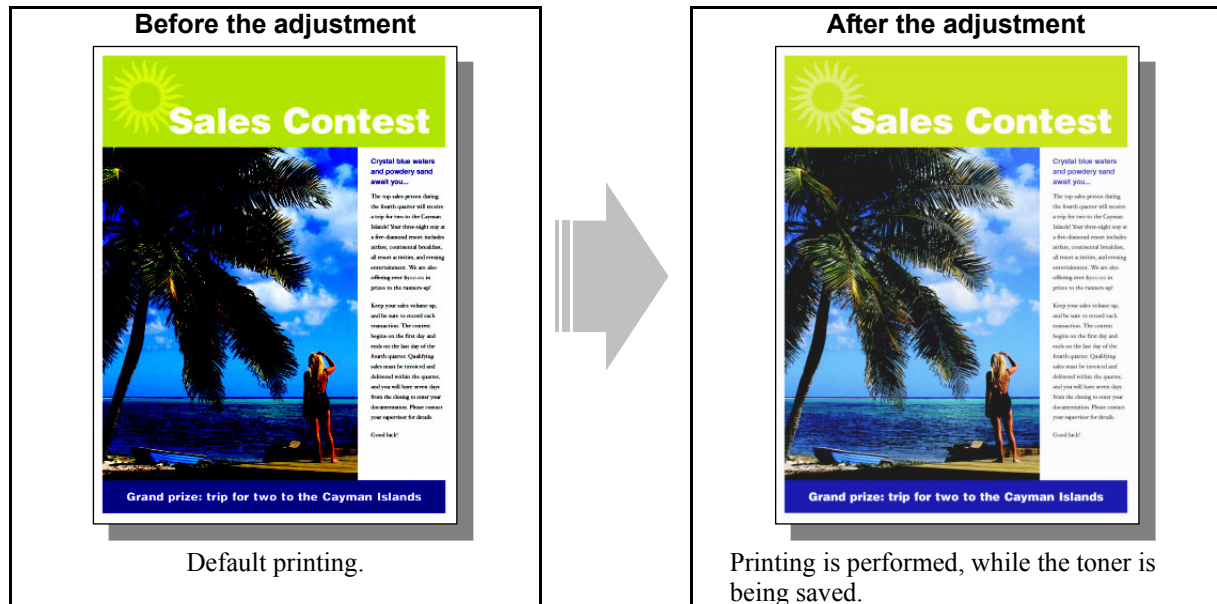
OS	Menu
OS 9.x	"Printing Modes" ⇒ "Distinguish Thin Lines"
OS X	"Print Mode" ⇒ "Distinguish Thin Lines"

**❑ Cautions after the completion of the adjustment**

Satisfactory results cannot be obtained after performing this adjustment on thin lines. In this case, it is recommended that the adjustment described in 3.7 To Clearly Print Light-colored Thin Lines or Text be made at the same time.

## 3.9 To Decrease the Image Density and Save Toner

(To Print in Toner Save Mode)




### □ Explanation

The e-STUDIO281c/351c/451c offers toner save mode. It is intended to automatically decrease the image density and reduce the amount of toner used to print the output. Change the printer driver setting and print in toner save mode, for instance, if a large number of copies have to be printed, or if the image density is too high.

### □ Procedure

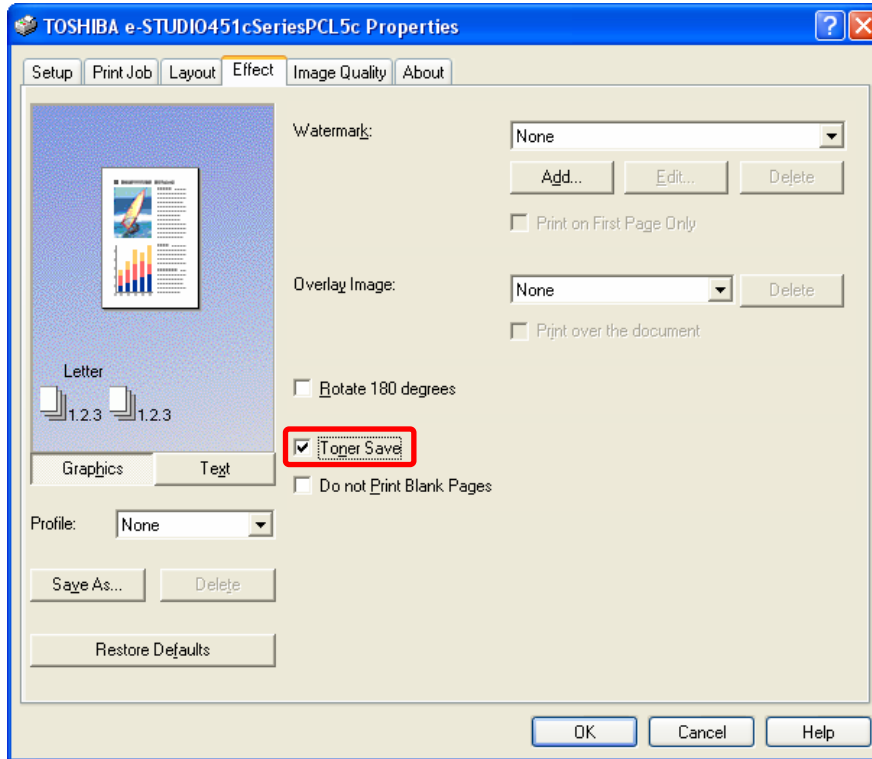
\* The adjustment is performed by the service technician, and by the user.

 (1) Enable toner save mode on the printer driver.

### For Windows

PCL5c PCL6 PS3

Open the property page of the printer driver. Mark the "Toner Save" checkbox in the "Effect" tab.





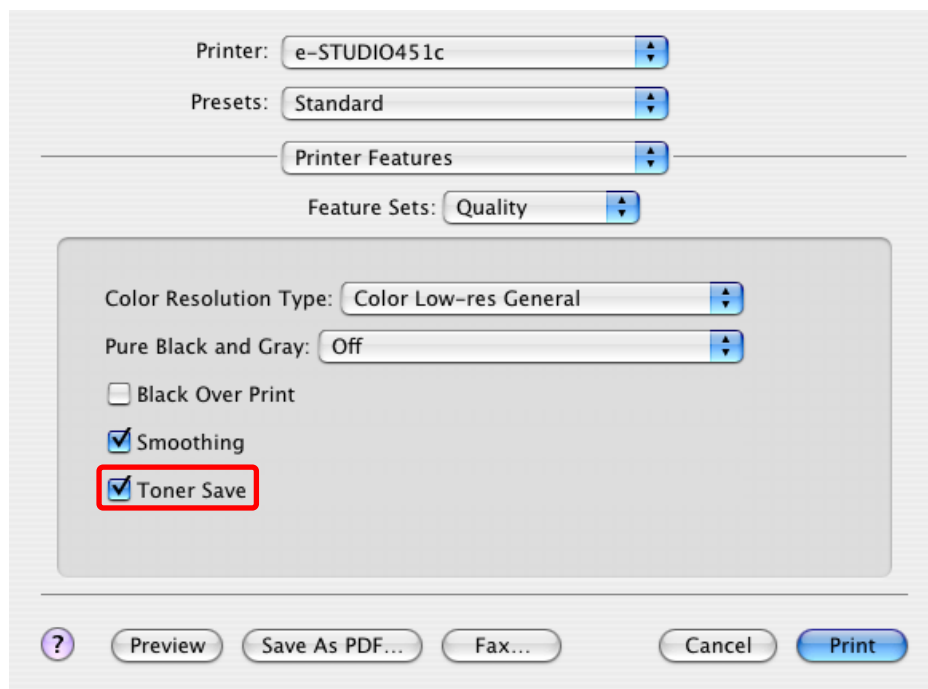
### For Macintosh

**Mac** \* This adjustment will have an effect only on full-color printing.

Open the print dialog box. Mark the "Toner Save" checkbox.

\*The menu to be selected varies, according to the operating system. Refer to the table below and select the menu.

OS	Menu
OS 9.x	"Quality" ⇨ "Toner Save"
OS X	"Printer Features" ⇨ "Feature Sets: Quality" ⇨ "Toner Save"



#### ❑ Cautions after the completion of the adjustment

The adjustment may possibly provide lower image density than the user desires, when printing is performed in toner save mode. Therefore, carefully perform the adjustment, while checking the printout.

#### ❑ Remarks

The print density in toner save mode can also be adjusted. For further information regarding the adjustment procedures, refer to 3.10 To Adjust the Image Density in Toner Save Mode.

## 3.10 To Adjust the Image Density in Toner Save Mode



### □ Explanation

The e-STUDIO281c/351c/451c offers toner save mode. It is intended to automatically decrease the image density and reduce the amount of toner used to print the output. Adjust the upper limit of the image density in toner save mode, in order to obtain the desired print density.

### □ Procedures

\* All the adjustments are performed by the service technician only.

PCL5c

PCL6

PS3

Mac



(1) Change the value for an appropriate code in adjustment mode [05] to adjust the image density in toner save mode.

\*The [05] code to use varies, depending on whether to adjust the image quality in full-color printing or black-and-white printing. Use either of the procedures below corresponding to the type of original to print.

**To adjust the image quality in full-color printing**

("Automatic" is selected from among the "Color" options on the PCL5c or PS3 printer driver. "Color" is selected from among the "Color Resolution Type" options on the Macintosh printer driver.)

\*The "Color" options are available in the "Setup" tab on the PCL5c and PS3 printer drivers. The "Color Resolution Type" is available in the "Quality" menu on the Macintosh printer driver.

(a)Enter adjustment mode [05]. Change the values for codes [1055 to 1058] to adjust the upper limit of the image density in toner save mode.

\* Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

\*The resolution option on the Macintosh printer driver is "Low-res" (= 600 x 600) or "High-res" (= 1200 x 600).

PDL	Resolution	[05] code	Value recommended	Acceptable value range	Default
PCL5c	600 x 600	05-1057	Set a value smaller than 176 to decrease the density.	0 to 255	176
	1200 x 600	05-1058			
PS3	600 x 600	05-1055	Set a value larger than 176 to increase the density.		
	1200 x 600	05-1056			

\*Set the value in increments of approximately 10, while checking the printout until the optimum value is obtained.

**To adjust the image quality in black-and-white printing**

("Mono" is selected from among the "Color" options on the PCL5c or PS3 printer driver. "Mono" is selected from among the "Color Resolution Type" options on the Macintosh printer driver.)

\*The "Color" options are available in the "Setup" tab on the PCL5c and PS3 printer drivers. The "Color Resolution Type" is available in the "Quality" menu on the Macintosh printer driver. The PCL6 printer driver supports only black-and-white printing. Therefore, the "Color" option is not available.

(a)Enter adjustment mode [05]. Increase the value for code [664] or [665]. Increase the upper limit of the image density in toner save mode.

\*Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

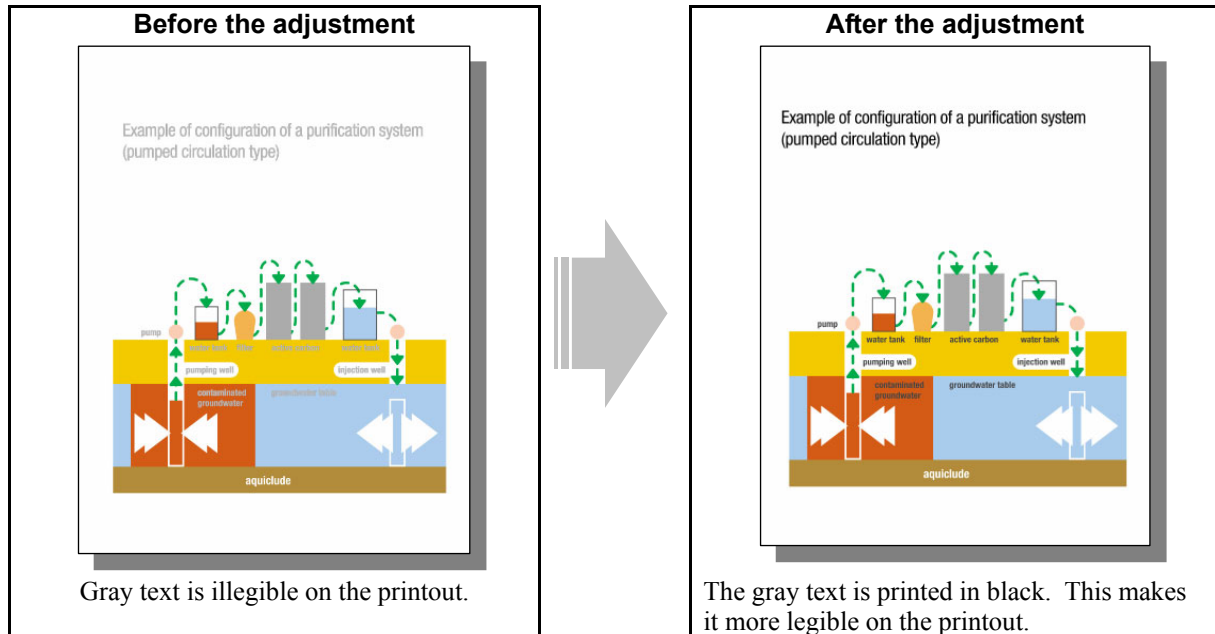
PDL	[05] code	Value recommended	Acceptable value range	Default
PCL5c/PCL6	05-665	Set a value smaller than 176 to decrease the density.	0 to 255	176
PS3	05-664	Set a value larger than 176 to increase the density.		

\*Set the value in increments of approximately 10, while checking the printout until the optimum value is obtained.

**❑ Cautions after the completion of the adjustment**

The adjustment may possibly increase the amount of toner used (if the image density is increased) or cause the faint print image (if the image density is decreased). Therefore, carefully perform the adjustment, while checking the printout.

## 3.11 To Print Illegible Gray or Colored Text in Black



### □ Explanation


Text may look illegible on the printout, depending on the hues of a background and text contained in the original, particularly, when printing the original containing yellow, light blue or gray text in the light-colored background. In addition, when a full-color original is printed in black and white, the colored text may turn gray on the printout and eventually become illegible. In this case, change the printer driver settings, in order to reproduce the colored text (except white text) in black and make it more legible on the printout.

\* This adjustment will have an effect only on printing on the PCL5c, PCL6 or PS3 emulation printer driver.  
(This adjustment cannot be performed on the Macintosh printer driver.)

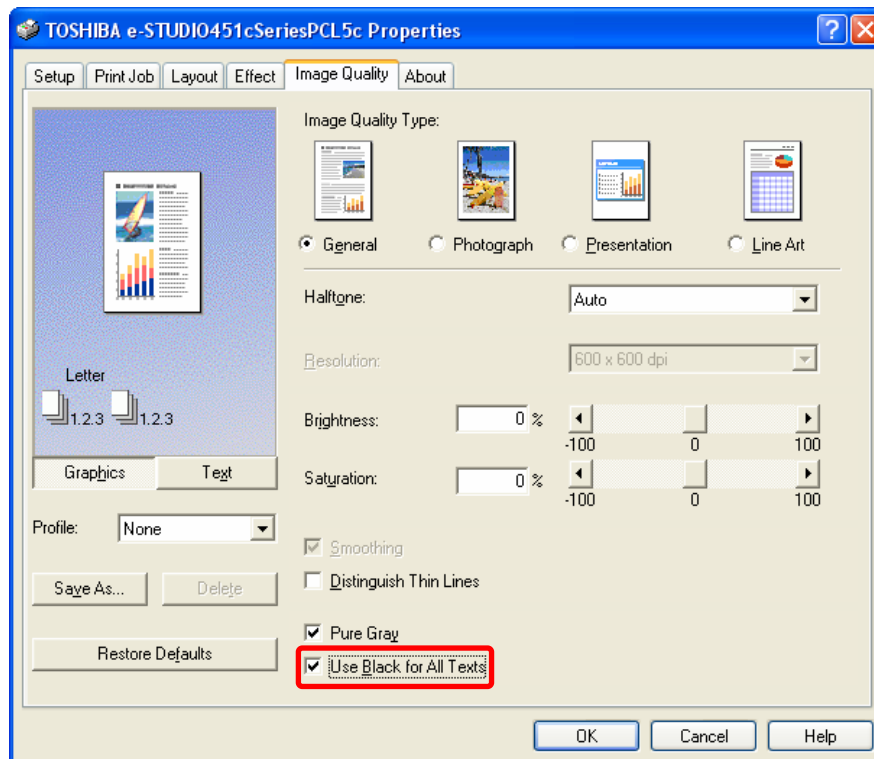
### □ Procedure

\* The adjustment is performed by the service technician, and by the user.

PCL5c PCL6 PS3

-  (1) Open the property page of the printer driver. Mark the "Use Black for All Text" checkbox in the "Image Quality" tab.

\*This adjustment will be effective, only if print out a file created on a general application, such as Microsoft Office, in PostScript (PS3). Please be careful that it may not be effective, if you print out a file or PDF file created on a graphic application (e.g. Illustrator) or a DTP application (e.g. QuarkXPress).



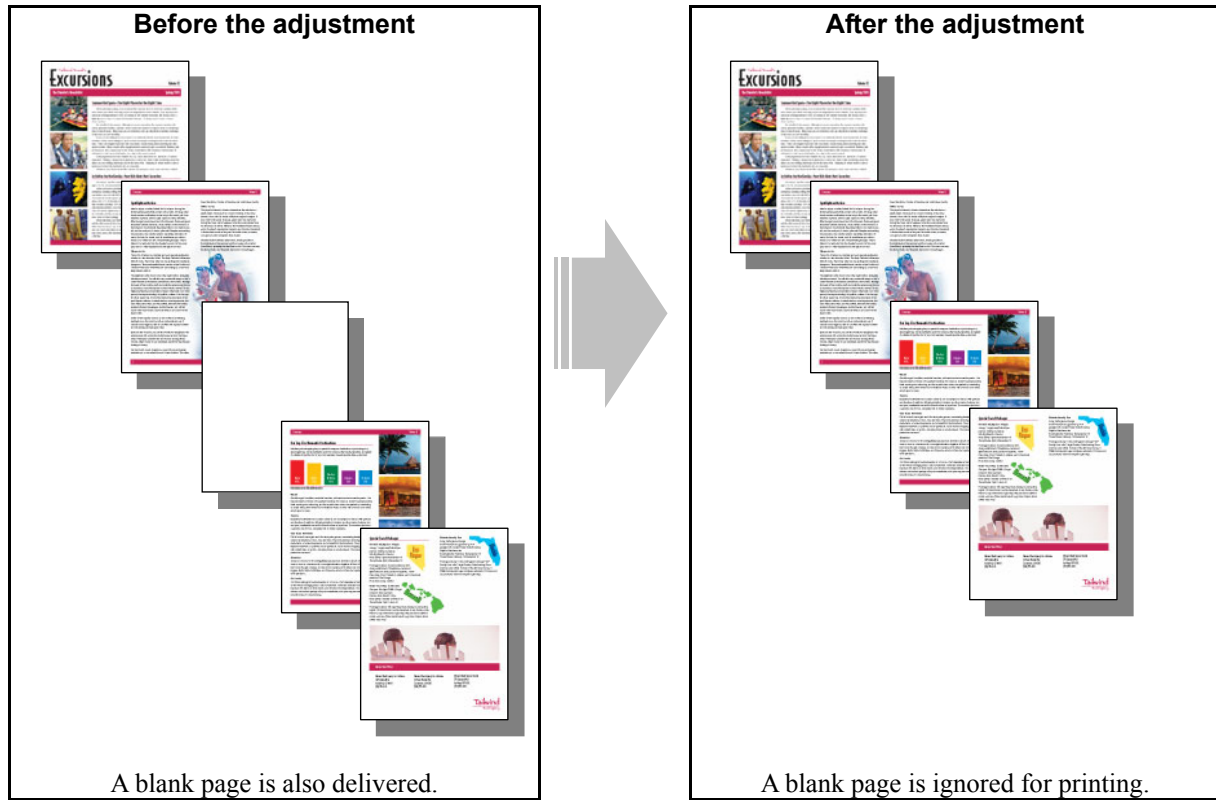
#### Cautions after the completion of the adjustment

Nothing in particular.

#### Remarks

Not all colored text (e.g. extremely large-sized text) may be printed in black.

## 3.12 To Ignore Blank Pages for Printing



### □ Explanation

Some applications may be designed to automatically insert blank pages for laying out the pages of a document. Change the printer driver setting, in order to ignore all blank pages for printing.

### □ Procedure

\* The adjustment is performed by the service technician, and by the user.

- 1) Mark the "Do not Print Blank Pages" checkbox on the printer driver.

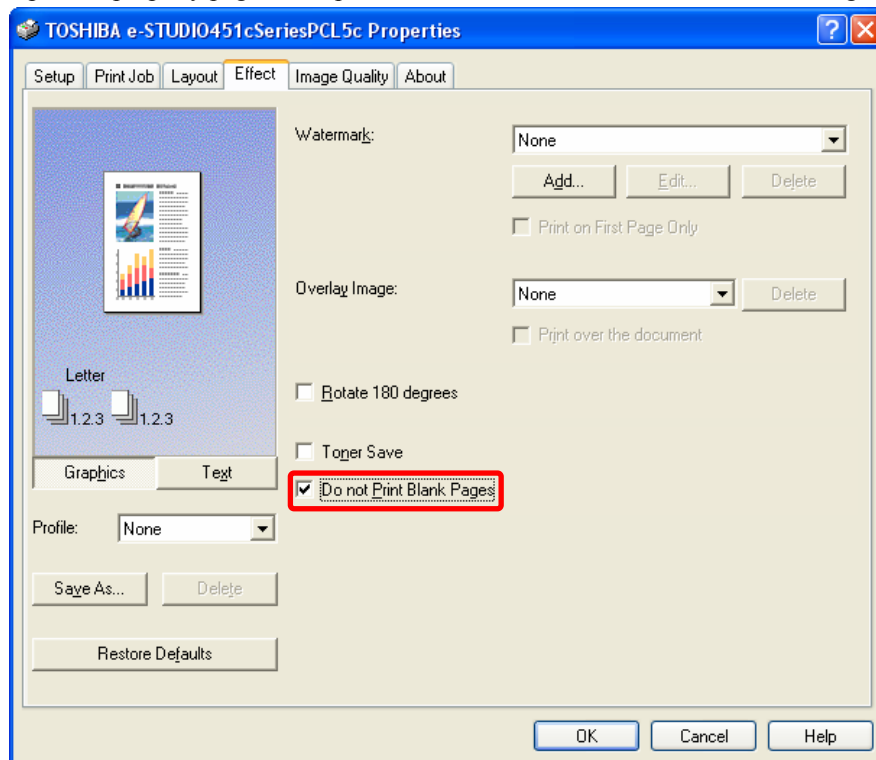
**For Windows**

PCL5c

PCL6

PS3

Open the property page of the printer driver. Mark the "Do not Print Blank Pages" checkbox in the "Effect" tab.

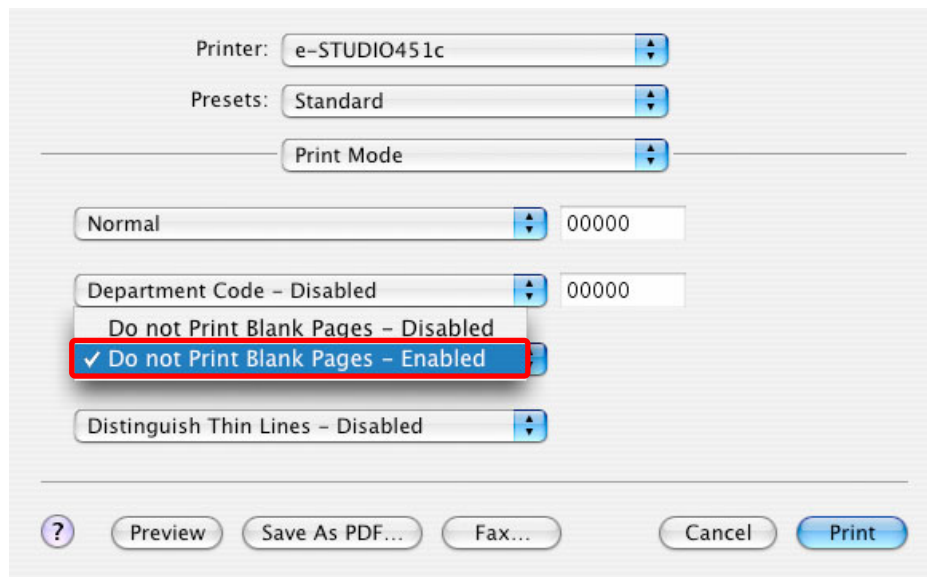


**For Macintosh****Mac**

Open the print dialog box. Mark the "Do not Print Blank Pages" checkbox.

\*The menu to be selected varies, according to the operating system. Refer to the table below and select the menu.

OS	Menu
OS 9.x	"Printing Modes" ⇨ "Do not Print Blank Pages"
OS X	"Print Mode" ⇨ "Do not Print Blank Pages"





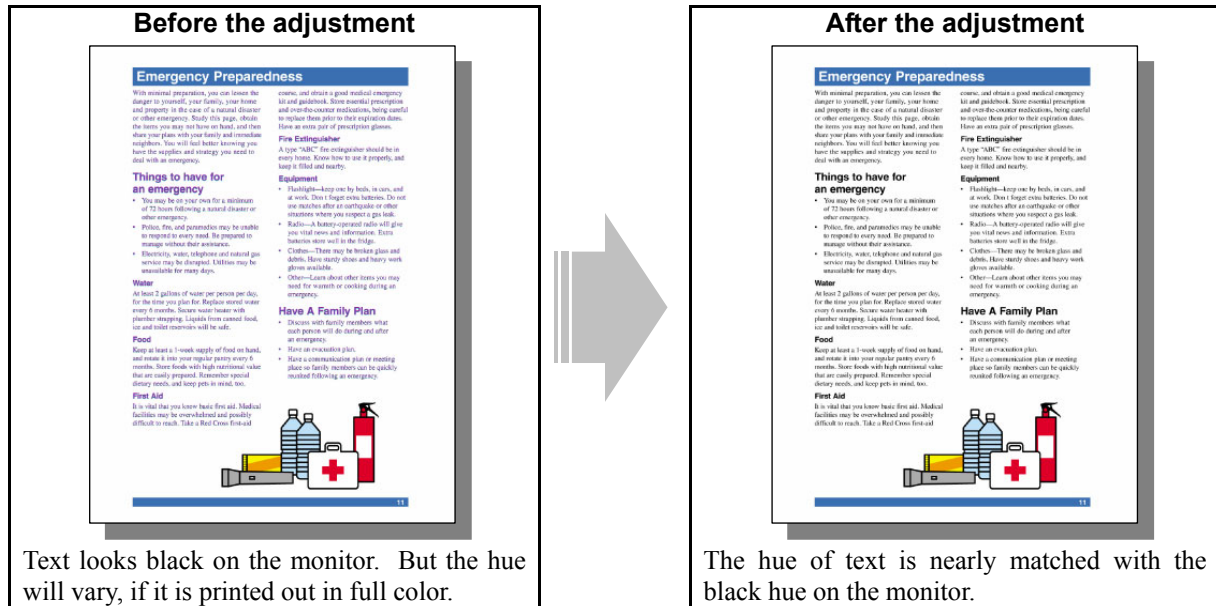
**❑ Cautions after the completion of the adjustment**

The adjustment may possibly cause the functions in the "Layout" tab (Booklet printing, N-up printing, Use Front Cover, Use Back Cover and Interleave Pages) not to work, as programmed. Therefore, pay special attention to a combination of the functions to be used.

**❑ Remarks**

If any data is inserted in the header or footer of a particular page on Excel or Word, even though no data is present in the body, the page will not be recognized as a blank page. The header or footer will be printed out.

## 3.13 To Sharply Print Black Text



### □ Explanation

Text looks black on the monitor. But if it is printed in full color (with "Automatic" selected from among the "Color" options), all toner colors (CMYK) will be used to print it, depending on the application in use. As a result, the black hue on the printout looks different from what the user desires. This problem is caused by the application specifications, not by the printer.

Particularly, the following factors may cause all toner colors (C, M, Y and K) to be used to print black text in the PDF file:

- The file of black text (K = 100%) is printed on the PCL5c printer driver.
- Black text is treated as image data instead of text data on the file.
- Black text is not defined as 100% black (RGB = 0% or CMY = 0%, K = 100%) on the file.

Change the printer driver setting or adjust the color balance, in order to nearly match the hue of black text on the file, in which these factors may be included, with the black hue.

### □ Procedures


- \* Perform the adjustment in accordance with the procedures below.
- \* Procedures (1) to (3) are used by the service technician, and by the user.
- \* Procedures (4) and (5) are used by the service technician only.

-  (1) If printing is performed with PCL5c, select the PS3 printer driver.

**<Hint>** If printing is performed with PCL5c, or if you print out a file or high-definition PDF file created on a DTP application for printing CMYK data, such as Illustrator, QuarkXPress, FreeHand, or CorelDraw, or a graphic application, black text may not be converted into 100% black. But if printing is performed with PS3, the K toner is used to print black text, as shown on the file.

After printing on the PS3 driver, print and check the print image quality.

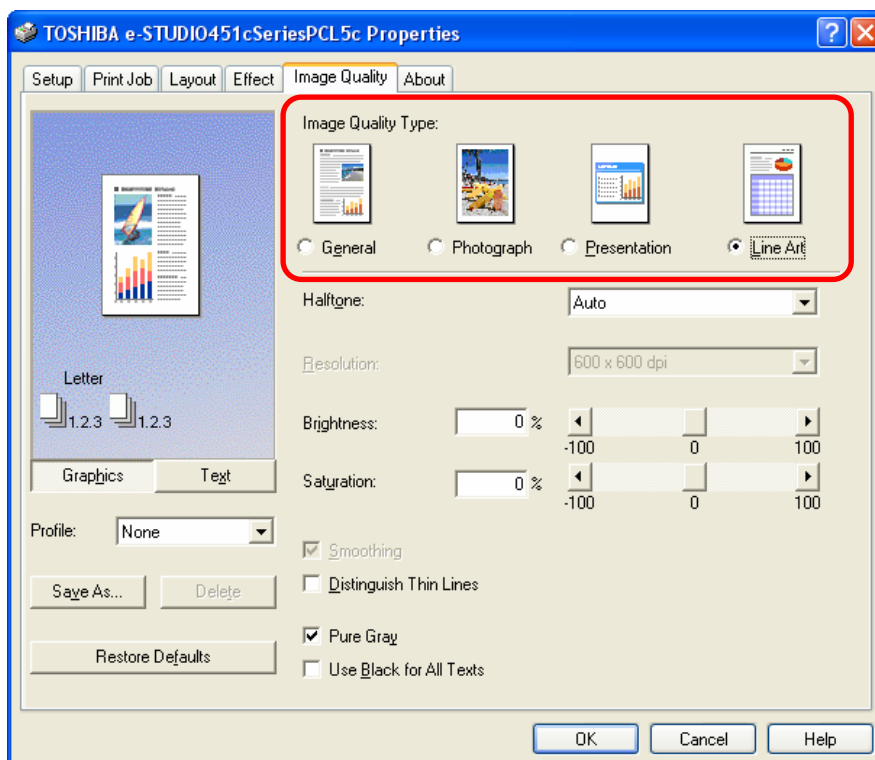
If further image quality adjustments are still necessary, use the next procedure.

-  (2) Select "Line Art" from among the "Image Quality Type" options on the printer driver.  
("Line Art" allows gray areas to always be reproduced using only the K toner. The hue of any color other than black this option provides is the same as the one the Presentation option provides.)

### For Windows

**PCL5c** **PS3** \* This adjustment will have an effect only on full-color printing.

Open the property page of the printer driver. Select "Line Art" from among the "Image Quality Type" options.



**For Macintosh**

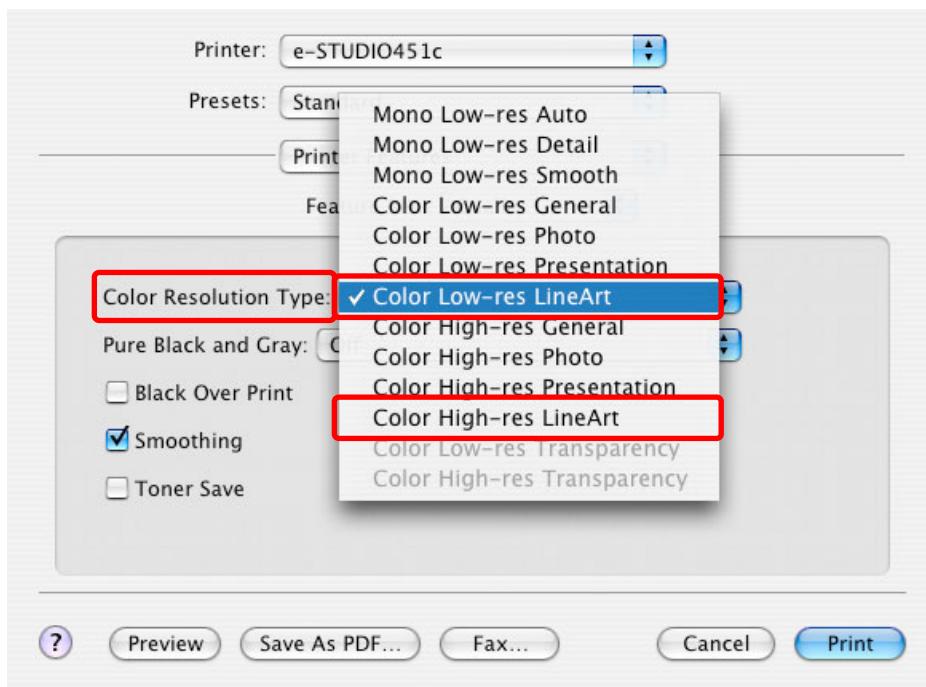
**Mac** \* This adjustment will have an effect only on full-color printing.

Open the print dialog box. Select "LineArt" from among the "Color Resolution Type" options.

\*The menu to be selected varies, according to the operating system. Refer to the table below and select the menu.

OS	Menu
OS 9.x	"Quality" ⇒ "Color Resolution Type"
OS X	"Printer Features" ⇒ "Feature Sets: Quality" ⇒ "Color Resolution Type"

- Select the desired combination of color (Color or Mono), resolution, halftone and type from among the "Color Resolution Type" options. In this adjustment, select the combination, which includes the "LineArt" option (Color Low-res LineArt or Color High-res LineArt).



**<Hint>** A file created on a retouching application for printing image data, such as PhotoShop, is printed out as image data, which is the same as text and photos. If "General," "Photo" and "Presentation" are selected from among the "Image Quality Type" options on the printer driver, all toner colors (CMYK) will be used to print black and gray areas of image data, attaching importance to textures of the data. If "LineArt" is selected, only the K toner will be used to print black and gray areas of all data, including text, graphics and photos.

After changing the printer driver settings, print and check the print image quality.

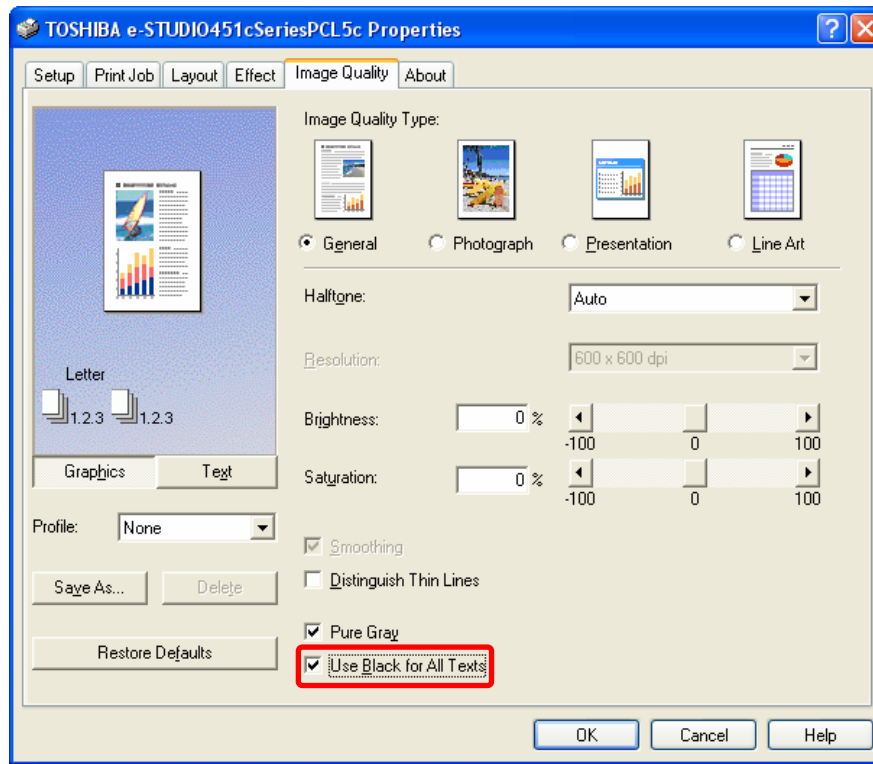
If further image quality adjustments are still necessary, use the next procedure.

PCL5c PCL6 PS3

- (3) Open the property page of the printer driver. Mark the "Use Black for All Text" checkbox in the "Image Quality" tab.

\*This adjustment will have an effect only on printing on the PCL5c, PCL6 or PS3 emulation printer driver. (This adjustment cannot be performed on the Macintosh printer driver.)

\*This adjustment will be effective, only if print out a file created on a general application, such as Microsoft Office, in PostScript (PS3). Please be careful that it may not be effective, if you print out a file or PDF file created on a graphic application (e.g. Illustrator) or a DTP application (e.g. QuarkXPress).



After changing the printer driver settings, print and check the print image quality.

If further image quality adjustments are still necessary, the service technician must use the next procedure, because text may not be defined as 100% black on the file.

PCL5c

PCL6

PS3

Mac



(4) Enter adjustment mode [05]. Select code [395]. Press the [START] button.

- Image quality control will be forcibly performed to correct variations in image contrast.

After exercising image quality control, print and check the print image quality.

If further image quality adjustments are still necessary, use the next procedure.

PCL5c

PS3

Mac

\* This adjustment will have an effect only on full-color printing.



(5) Enter adjustment mode [05]. Change the values for codes [1010 to 1041] to adjust the color density (color balance).

- Adjust the values for the [05] codes corresponding to the print options to be applied (PDL, Resolution and Halftone).

Ex.: • When printing on Windows is performed with the following options selected: PCL5c, 600 x 600,

Image Quality Type = General, Halftone = Detail

> Change the values for Y: 05-1030, M: 05-1031, C: 05-1032 and K: 05-1033.

- When printing on Macintosh is performed with the following option selected: Color High-res (= 1200 x 600), Photo (Halftone = Smooth):

> Change the values for Y: 05-1018, M: 05-1019, C: 05-1020 and K: 05-1021.

\* Printing on Macintosh is performed in PostScript. (See the "PS3" row in the table below.)

\* The resolution option on the Macintosh printer driver is "Low-res" (= 600 x 600) or "High-res" (= 1200 x 600).

\* The black hue of text printed using all toner colors (C, M, Y and K) will look much clearer, if the amount of the C (cyan) toner used is larger than the M (magenta) or Y (yellow) toner. Remember that adjusting the density of K (black) does not affect the black hue, if all toner colors are used to print text.

Color to be adjusted	PDL	Resolution	Halftone	[05] code	Subcode	Value recommended	Acceptable value range	Default
Y (Yellow)	PCL5c	600 x 600	Smooth	05-1026	0/1/2	Set a value larger than 128 to increase the density.  Set a value smaller than 128 to decrease the density.	0 to 255	128
			Detail	05-1030	0/1/2			
		1200 x 600	Smooth	05-1034	0/1/2			
			Detail	05-1038	0/1/2			
	PS3	600 x 600	Smooth	05-1010	0/1/2			
			Detail	05-1014	0/1/2			
		1200 x 600	Smooth	05-1018	0/1/2			
			Detail	05-1022	0/1/2			
M (Magenta)	PCL5c	600 x 600	Smooth	05-1027	0/1/2			
			Detail	05-1031	0/1/2			
		1200 x 600	Smooth	05-1035	0/1/2			
			Detail	05-1039	0/1/2			
	PS3	600 x 600	Smooth	05-1011	0/1/2			
			Detail	05-1015	0/1/2			
		1200 x 600	Smooth	05-1019	0/1/2			
			Detail	05-1023	0/1/2			
C (Cyan)	PCL5c	600 x 600	Smooth	05-1028	0/1/2			
			Detail	05-1032	0/1/2			
		1200 x 600	Smooth	05-1036	0/1/2			
			Detail	05-1040	0/1/2			
	PS3	600 x 600	Smooth	05-1012	0/1/2			
			Detail	05-1016	0/1/2			
		1200 x 600	Smooth	05-1020	0/1/2			
			Detail	05-1024	0/1/2			
K (Black)	PCL5c	600 x 600	Smooth	05-1029	0/1/2			
			Detail	05-1033	0/1/2			
		1200 x 600	Smooth	05-1037	0/1/2			
			Detail	05-1041	0/1/2			
	PS3	600 x 600	Smooth	05-1013	0/1/2			
			Detail	05-1017	0/1/2			
		1200 x 600	Smooth	05-1021	0/1/2			
			Detail	05-1025	0/1/2			

\*Set the value in increments of approximately 10, while checking the printout until the optimum value is obtained.

\*The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area
2	High-density area

**<Note>** After performing the adjustment, the values changed will be applied to all printouts for the "Image Quality Type" and "Halftone" options. (For instance, if the values for 05 code for PCL, 600 x 600 and Smooth are changed, they will be applied to printing performed with PCL5c, 600 x 600, Halftone = "Smooth" (or "Auto") selected.) Carefully perform the adjustment, being aware that the image quality of all future printouts will be changed, when printing out originals other than the one that is used for the adjustment.

### ❑ Cautions after the completion of the adjustment

The adjustment may possibly change the hue of the text and image, such as a photo image, on the printout. Therefore, carefully perform the adjustment, while checking the printout.

### ❑ Remarks

#### **To check the definition of black text**

When creating a PDF file, 100% black may not be defined as follows, depending on the application settings:

"100% black" indicates the following values:

- RGB data: RGB = 0%
- CMYK data: CMY = 0%, K = 100%

As a result, text, which should be defined as 100% black on the application, is not defined as 100% black on the saved PDF file. (A few percent of color data is defined.) Eventually, all toner colors (C, M, Y and K) will be used to print it.

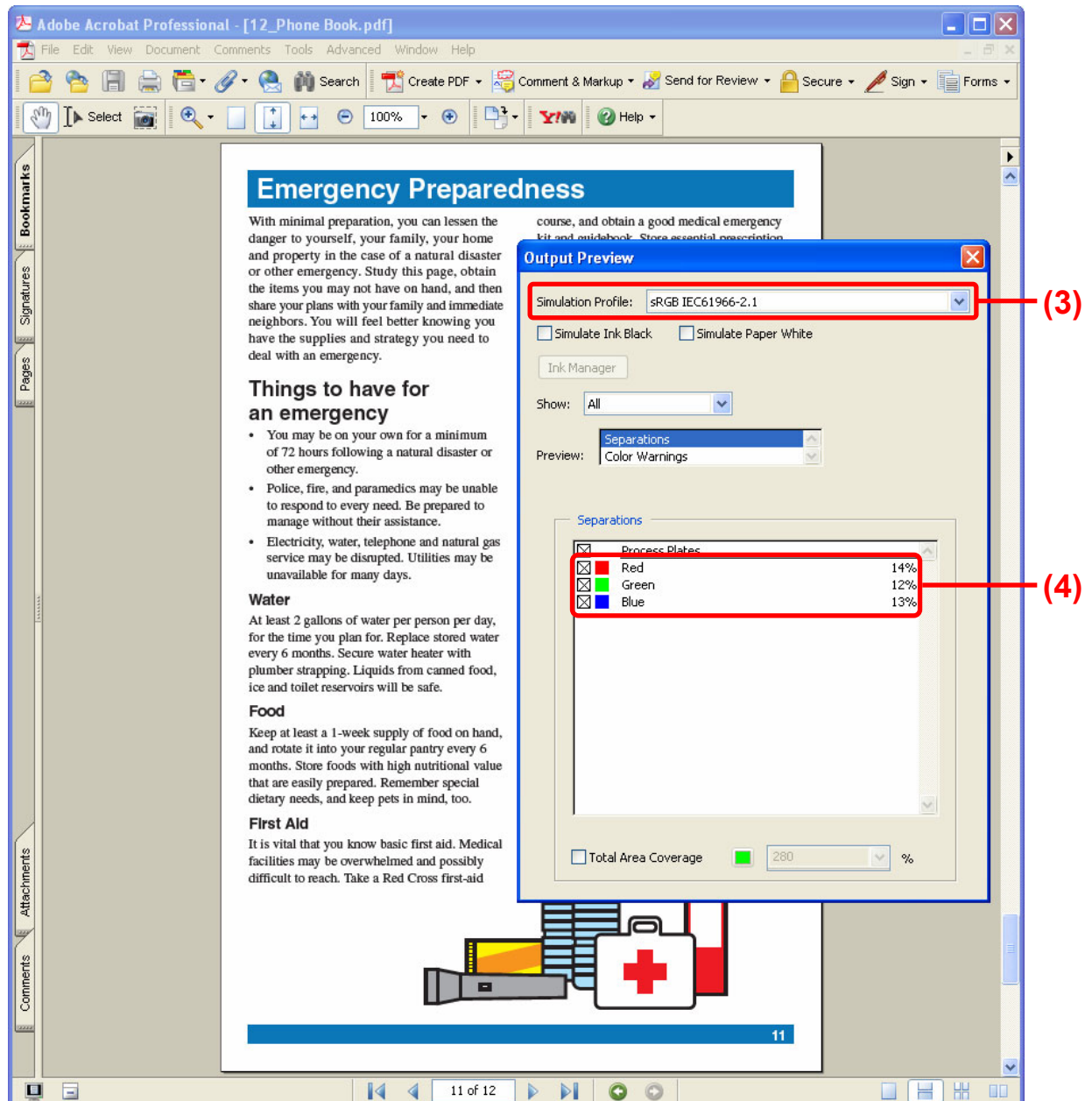
If printing is performed with PCL5c, print data is captured as RGB data. If black text is defined as 100% black (CMY=0□, K = 100□) for CMYK data on a PDF file, it will not be converted into 100% black (RGB = 0%) for RGB data on Acrobat, and it will be printed in colors. (It is recommended to print CMYK data on the PS3 printer driver instead of the PCL5c printer driver.)

Use "Output Preview" on Acrobat 7.0 Professional to examine the color definition on the PDF file.

\*For further information regarding the Output Preview, refer to an appropriate manual or the Help menu of Acrobat 7.0 Professional.

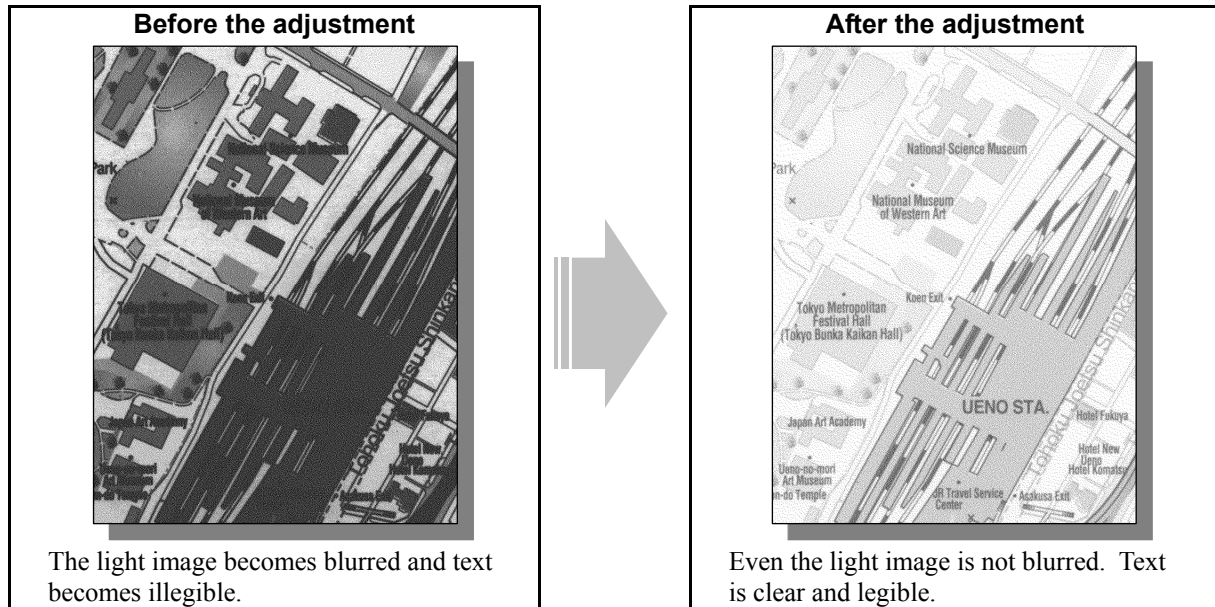


- (1) Open a PDF file on Acrobat 7.0 Professional.
- (2) Select "Output Preview" in the "Advanced" menu.
- (3) Select a profile from among the "Simulation Profile" options.
- \* Select the profile to use for the Monitor Simulation, in order to print RGB data, and the one to use for the Ink Simulation, in order to print CMYK data from among the "Simulation Profile" options.
- (4) Move the cursor over the data to check the color definition. Then the color calibration will be displayed in percentage on "Separations."



## 4. e-Filing-specific Adjustments

### 4.1 To Clearly Store the B/W Image in Auto Color Mode



#### □ Explanation

When a black-and-white original containing black-and-white photo images is scanned in Auto color mode and stored in the e-Filing box (Scan to Box), it is stored with binary data, with reference to a threshold value. This may make a dark area blurred and a light area eliminated. Adjust the threshold value, in order to clearly store the black-and-white original in Auto color mode.

\*Please remember that the e-Filing functions are available only on the Windows platform, but not on the Macintosh or UNIX platform.


\*This adjustment will have an effect on the image stored using Scan to File and Scan to E-mail.

#### □ Procedure

\*The adjustment is performed by the service technician, and by the user.

**Scan to Box**

\* This adjustment will have an effect only on the image stored in Auto color mode.

-  (1) Adjust the threshold value, in order to store the black-and-white original with the appropriate density.
- Use steps (a) to (d) to adjust the threshold value.
    - (a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
    - (b) Press the [USER] button.
    - (c) Press the [SCAN] button.
    - (d) In the "THRESHOLD" option, press [◀] or [▶] to adjust the threshold value.
      - If the threshold value is set to "◀," the original will be stored with the low density.
      - If the threshold value is set to "▶," the original will be stored with the high density.

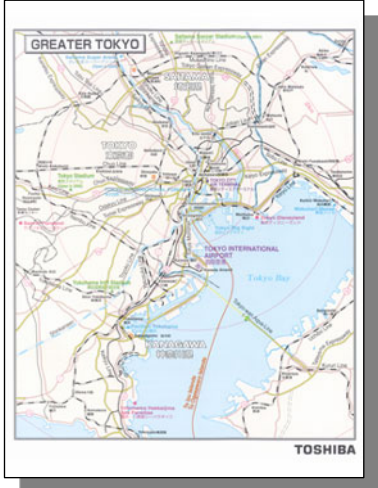
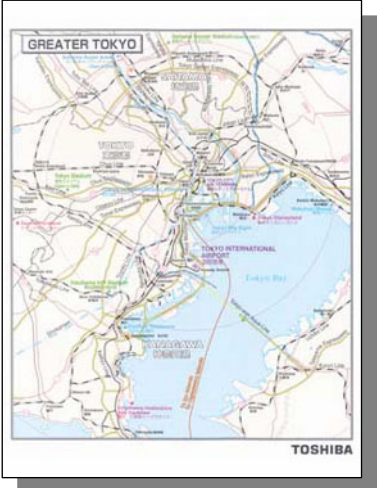
**❑ Cautions after the completion of the adjustment**

All scanning functions are implemented with reference to the threshold changed above. It will affect the quality of images stored in Auto color mode. Therefore, carefully perform the adjustment, being aware that the image quality of all future images will be changed, when storing originals other than the one that is used for the adjustment.

**❑ Remarks**

If the adjustment does not result in the desired image, it is recommended to scan the black-and-white original in Full color mode rather than in Auto color mode, or copy it in Auto color mode and store it in the e-Filing box (Copy to Box) rather than scan it. This allows it to be stored in shades of gray rather than with binary data, and eventually provides better halftones. But remember that the data will increase in size, compared to the one with binary data.

## 4.2 To Store the Original, while Reducing the File Size

Before the adjustment	After the adjustment
Ex.: A4, 200 dpi, LOW = Approx. 1000 KB	Ex.: A4, 200 dpi, HIGH = Approx. 400 KB
	
<p>When "LOW" is selected in the "JPEG COMPRESS" options, the file size will become larger than required.</p>	<p>When "HIGH" is selected in the "JPEG COMPRESS" options, the file size will be reduced.</p>

### □ Explanation

When an original is scanned in Full color or Gray scale mode and stored in the e-Filing box (Scan to Box), it will be compressed in JPEG format. The data compression rate can be selected on a job-by-job basis. The file size significantly varies, depending on the selected data compression rate. (When "LOW" is selected in the "JPEG COMPRESS" option, the file size will be 2 to 4 times larger than the one when "HIGH" is selected.) When storing the original, if a higher priority is given to the file size reduction than the image quality, change the JPEG compression rate.

\* Please remember that the e-Filing functions are available only on the Windows platform, but not on the Macintosh or UNIX platform.

\* This adjustment will have an effect on the image stored using Scan to File and Scan to E-mail.

### □ Procedure

\* The adjustment is performed by the service technician, and by the user.

**Scan to Box**

\* This adjustment will have an effect only on the image stored in Full color mode (including Auto color mode) or Gray scale mode.



- (1) Select [HIGH] from among the "JPEG COMPRESS" options.

\* In the "JPEG COMPRESS" option, [MID] is selected by default.

\* The procedure to use varies, depending on whether to select the JPEG compression rate on a job-by-job basis (without utilizing the template), utilize the template, or change the default JPEG compression rate. Refer to "To select the JPEG compression rate on a job-by-job basis" in order to store an image at a high compression rate for a particular job. Refer to "To utilize the template" in order to select an appropriate JPEG compression rate, corresponding to the type of original to store and the purpose of the image stored. Refer to "To change the default JPEG compression rate" in order to have "HIGH" selected from among the "JPEG COMPRESS" options by default.

### **To select the JPEG compression rate on a job-by-job basis (without utilizing the template)**

When scanning the original, press the [EDIT] button on the Control Panel. Select [HIGH] from among the "JPEG COMPRESS" options.

### **To utilize the template**

Recall the template where "HIGH" is selected from among the JPEG compression rate options and scan the original.

\* The user may want to select a compression rate, depending on the type of original or purpose of the image stored. In this case, it is recommended to utilize the template. Initially, select the desired JPEG compression rate in the template and recall it as necessary. This facilitates changing the compression rate on a job-by-job basis. For further information regarding the template and its use, refer to the Operator's Manual for Basic Function, Network Operator's Guide and Network Administrator's Guide.

### **To change the default JPEG compression rate**

Use steps (a) to (d) to change the default JPEG compression rate.

- (a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
- (b) Press the [USER] button.
- (c) Press the [SCAN] button.
- (d) In the "JPEG COMPRESS" option, select [HIGH] as the default compression rate.

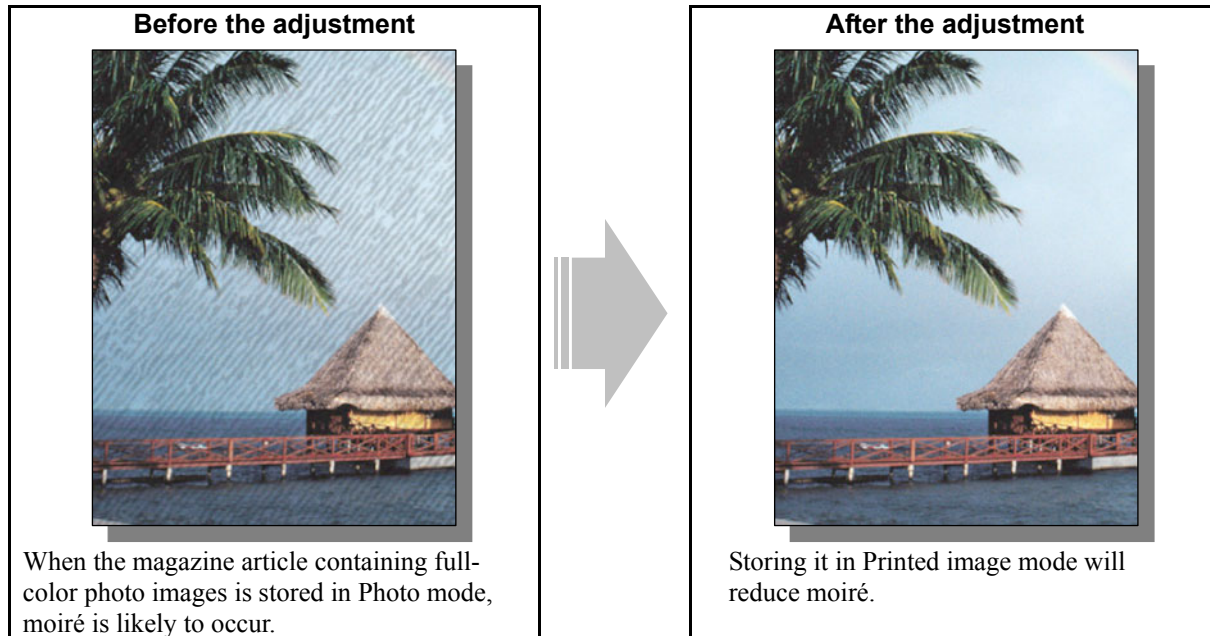
### **❑ Cautions after the completion of the adjustment**

Changing the default JPEG compression rate of the scanning functions will affect the quality of images, which will be stored in Full color (including Auto color) or Gray scale mode. Carefully perform the adjustment, being aware that the image quality of all future images will be changed, when storing originals other than the one that is used for the adjustment.

### **❑ Remarks**

If the image is copied or printed in full color or shades of gray and stored in the e-Filing box (Copy to Box or Print to Box), the user can select a desired JPEG compression rate, when downloading the image using File Downloader on a client PC.

### 4.3 To Store the Color Photo Image, while Minimizing Moiré



#### □ Explanation

When an original, such as a magazine article containing with full-color photo images, is copied in Full color mode, with Photo mode selected, and stored in the e-Filing box (Copy to Box), moiré is likely to occur on the photo images. It may occur, when it is copied on paper. But it will be more enhanced, if it is stored as image data. Select Printed image mode from among the original mode options, in order to store full-color photo images, while minimizing moiré,


\*Please remember that the e-Filing functions are available only on the Windows platform, but not on the Macintosh or UNIX platform.

#### □ Procedure

\* The adjustment is performed by the service technician, and by the user.



**Copy to Box** \* This adjustment will have an effect only on the image stored in Full color mode.

-  (1) Press the [BASIC] button on the Control Panel. Select [PRINTED IMAGE] from among the original mode options.

\*Use either of the following procedures to switch default original mode to Printed image mode:

#### **To change default original mode on the Control Panel**

Use steps (a) to (d) to change default original mode.

- (a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
- (b) Press the [USER] button.
- (c) Press the [COPY] button.
- (d) In the "ORIGINAL MODE FOR COLOR" option, press the [PRINTED IMAGE] button.

#### **To change default original mode in setting mode [08]**

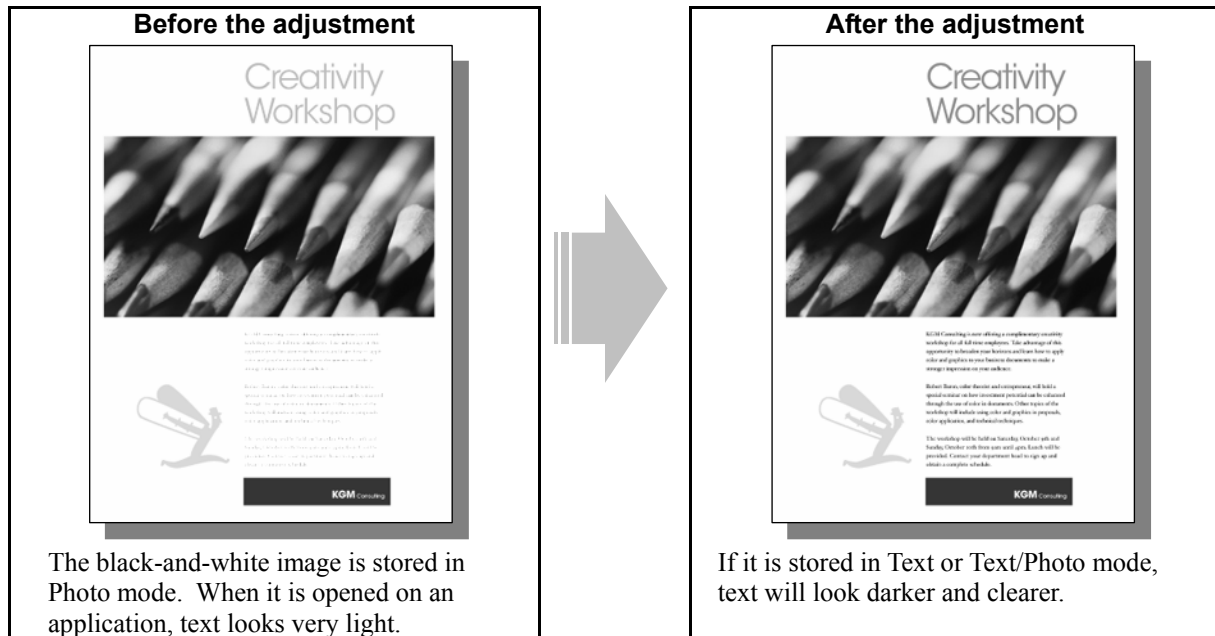
Enter setting mode [08]. Set "2" for code [585]. Printed image mode will be selected by default at power-on.

Value for 08-585	Default original mode at power-on
0	Text/Photo (Default)
1	Text
2	Printed image
3	Photo
4	Map

#### **□ Cautions after the completion of the adjustment**

Nothing in particular.

## 4.4 To Store the B/W Original with Photos and Text with the High Density (To change the density in Copy to Box)



### □ Explanation

When a black-and-white original containing both photo images and text is copied in Black mode, with Photo mode selected, and stored in the e-Filing box (Copy to Box), text may be stored with the low-density, depending on the type of original, because Photo mode is intended to improve the reproducibility of halftones. Change the original mode option and adjust the scan density, in order to obtain a darker and clearer image, when the image stored in the e-Filing box is to be imported into an application on a client PC.

\* Please remember that the e-Filing functions are available only on the Windows platform, but not on the Macintosh or UNIX platform.

### □ Procedures

\* All the adjustments are performed by the service technician, and by the user.



**Copy to Box** \* This adjustment will have an effect only on the image stored in Black mode.

- (1) Press the [BASIC] button on the Control Panel. Select [TEXT] or [TEXT/PHOTO] from among the original mode options.

\* Copying the original in Text mode may diminish the quality of photo images. If there is a problem with the image stored in Text mode, switch to Text/Photo mode.

\* Use either of the following procedures to switch default original mode to Text mode or Text/Photo mode:

#### **To change default original mode on the Control Panel**

Use steps (a) to (d) to change default original mode.

- (a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
- (b) Press the [USER] button.
- (c) Press the [COPY] button.
- (d) In the "ORIGINAL MODE FOR BLACK" option, press the desired button to specify default mode.

#### **To change default original mode in setting mode [08]**

Enter setting mode [08]. Change the value for code [550]. The specified original mode option will be selected by default at power-on.

Value for 08-550	Default original mode at power-on
0	Text/Photo (default)
1	Photo
2	Text
3	Image smoothing

After changing original mode, store the original and check the image quality.

If further image quality adjustments are still necessary, use the next procedure.

**Copy to Box** \* This adjustment will have an effect only on the image stored in Black mode.

- (2) Press the [BASIC] button on the Control Panel. Press the [D] button to increase the copy density.

#### **□ Cautions after the completion of the adjustment**

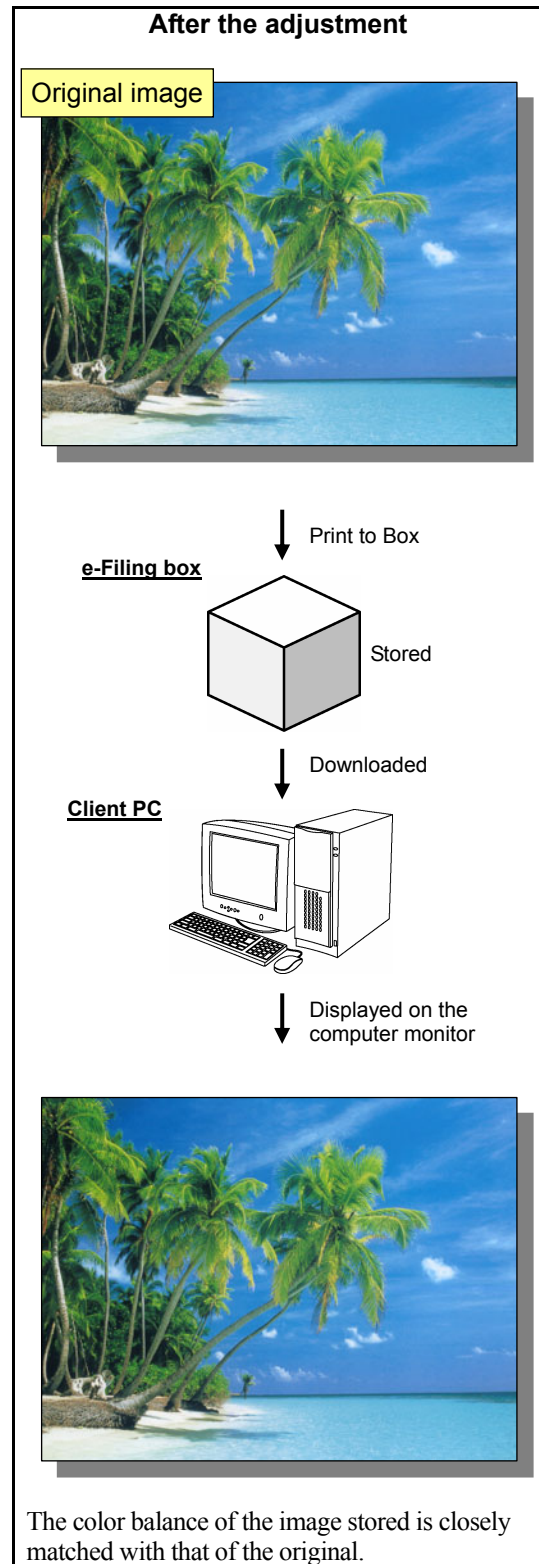
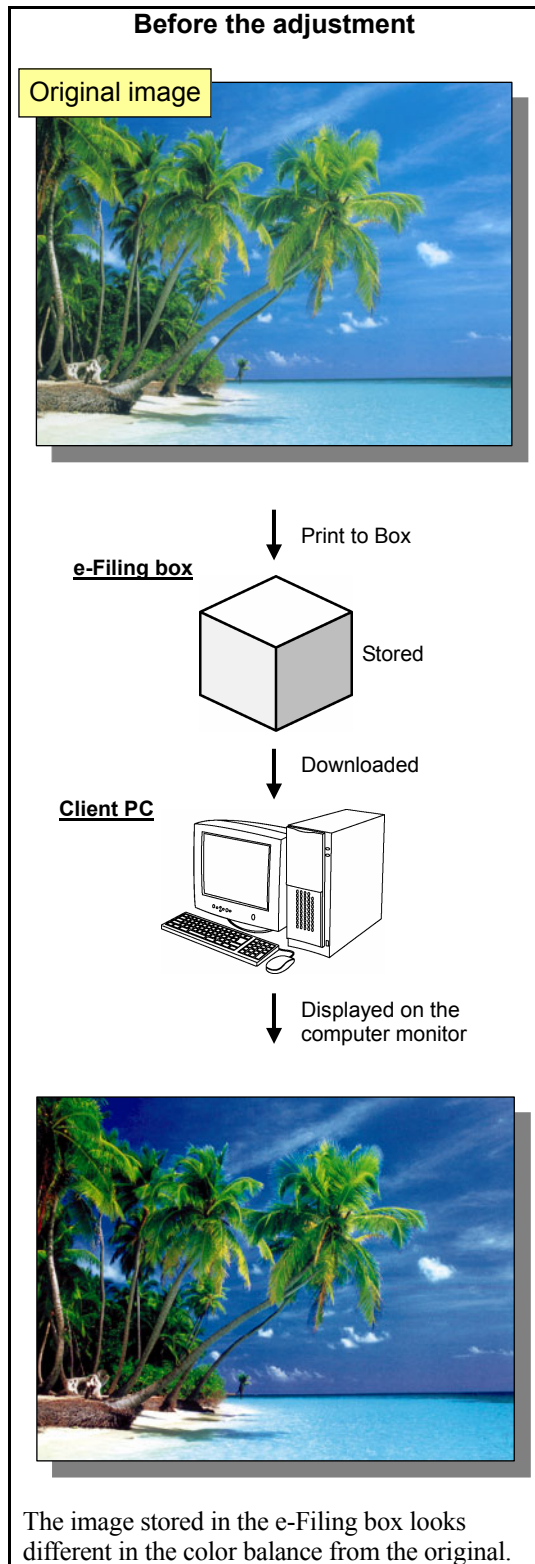
Nothing in particular.

#### **□ Remarks**

If this adjustment does not result in the desired image quality, it is recommended to scan the black-and-white original and store it in the e-Filing box (Scan to Box), rather than copy it. Provided that the image stored is imported into an application on a client PC, Scan to Box will provide the image most suitable for displaying on the computer monitor. Remember that copying and storing in the e-Filing box cannot be performed simultaneously.

## 4.5 To Match with the Color Balance on the Original

(To adjust the color balance in Print to Box)



## □ Explanation

If a full-color image is printed on a client PC and stored in the e-Filing box (Print to Box), it will be optimized for printing on paper. This is the reason why the image stored in the e-Filing box looks slightly different in the color balance from the original displayed on the computer monitor. Change the "Image Quality Type" setting on the printer driver, in order to minimize the difference in the color balance and closely match the color balance of the image stored with that of the original.

\* Please remember that the e-Filing functions are available only on the Windows platform, but not on the Macintosh or UNIX platform.

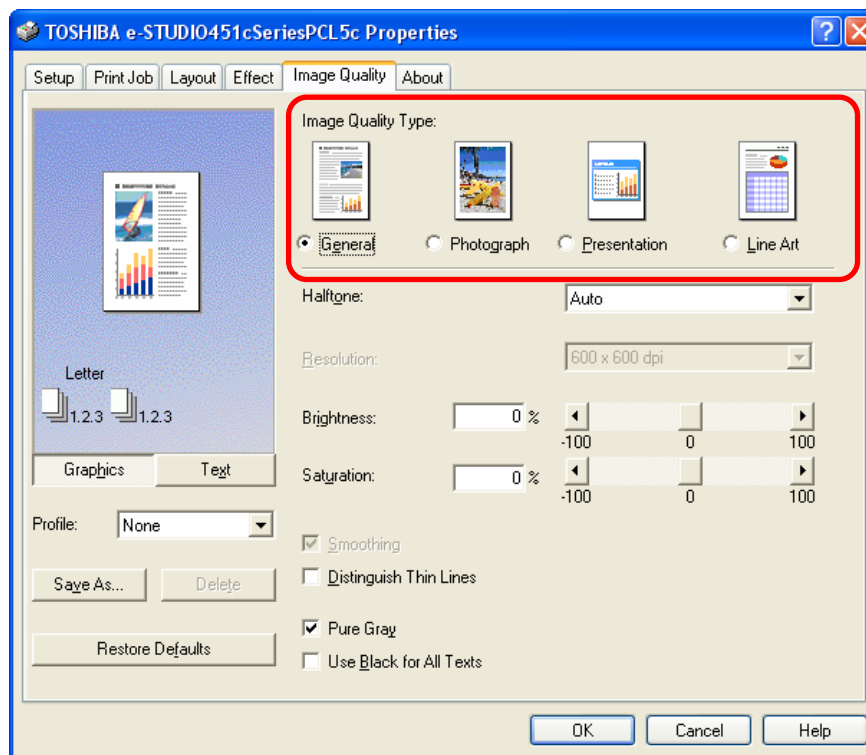
## □ Procedure

\* The adjustment is performed by the service technician, and by the user.

**Print to Box** **PCL5c** **PS3** \* This adjustment will have an effect only on full-color printing.

- 1) Open the property page of the printer driver. Select "General" from among the "Image Quality Type" options in the Image Quality tab.

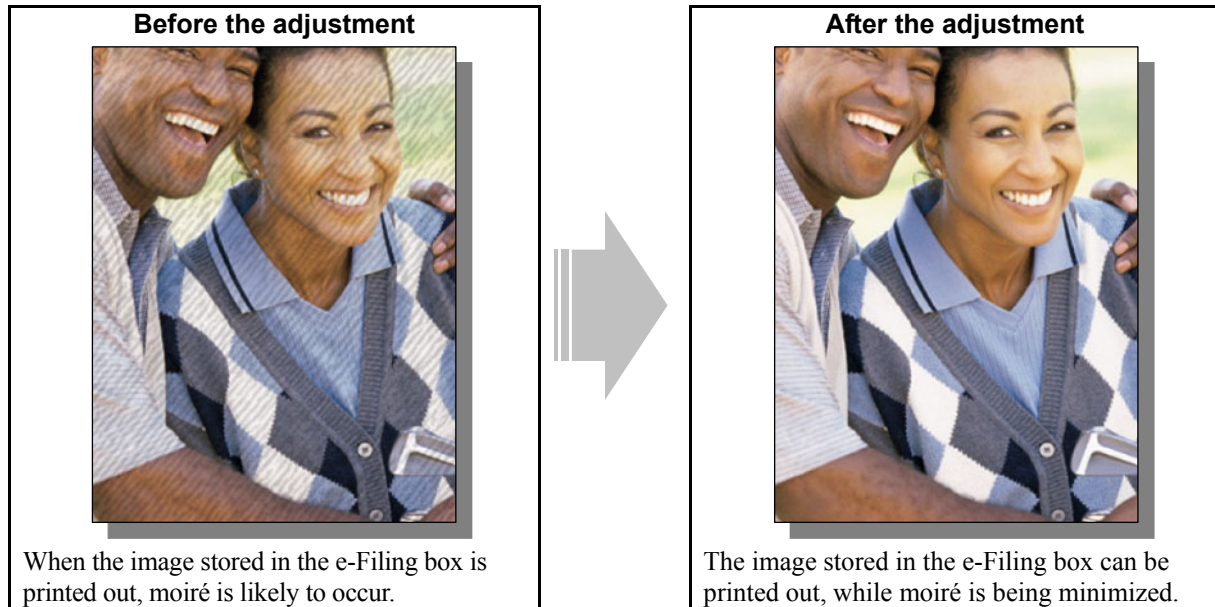
\* "General" allows the image to be stored in colors, which are closely matched with the original, compared to the other Image Quality Type options.



## □ Cautions after the completion of the adjustment

Nothing in particular.

## 4.6 To Scan and Print, while Minimizing Moiré




### □ Explanation

An original is scanned and stored in the e-Filing box (Scan to Box). When the image stored is printed directly from the e-Filing box, moiré may occur, depending on the type of original. Also, it is likely to occur, particularly when the original is scanned in Full color mode or Auto color mode in a high resolution (600 dpi) or even in Gray scale mode. Select an appropriate scan resolution or adjust the sharpness intensity in the scanning functions, in order to store the original and print it from the e-Filing box, while minimizing moiré.

### □ Procedures

- \* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.
- \* Procedures (1) and (2) are used by the service technician, and by the user.
- \* Procedure (3) is used by the service technician only.

**Scan to Box**


-  (1) When scanning the original, press the [EDIT] button on the Control Panel. Select [PRINTED IMAGE] from among the original mode options.

\* This adjustment will be effective, only if "TEXT" or "PHOTO" is initially selected from among the original mode options.

\* This adjustment will have an effect only on the image stored in Full color mode.

After changing original mode, scan and store the original. Then print and check the print image quality. If further image quality adjustments are still necessary, use the next procedure.

**Scan to Box**


-  (2) When scanning the original, press the [EDIT] button on the Control Panel. In the "RESOLUTION" option, select a lower resolution option.

\* In the "RESOLUTION" option, "200 (dpi)" is selected by default. If moiré occurs in a resolution of 200 dpi, select a lower resolution option (100 dpi or 150 dpi).

\* This adjustment will have an effect only on the image stored in Full color mode or Gray scale mode.

After changing the resolution, scan and store the original. Then print and check the print image quality. If you do not prefer to decrease a resolution, or if moiré still occurs even in a lower resolution, use the next procedure.

**Scan to Box**

-  (3) Enter adjustment mode [05]. Change the values for codes [1086 to 1088] and for [843] to adjust the sharpness intensity in the scanning functions.

\* This adjustment will have an effect only on the image stored in Full color mode or Gray scale mode.

Color mode	Original mode	[05] code	Value recommended	Acceptable value range	Default
Full color	Text	05-1086	Set a value smaller than 16.	0 to 31	0
	Printed image	05-1087			
	Photo	05-1088			
Gray scale	---	05-843			

\* Setting "1" provides the softest image, while setting "31" provides the sharpest image. The default value ("0") provides an image as sharp as the one provided by setting "16."

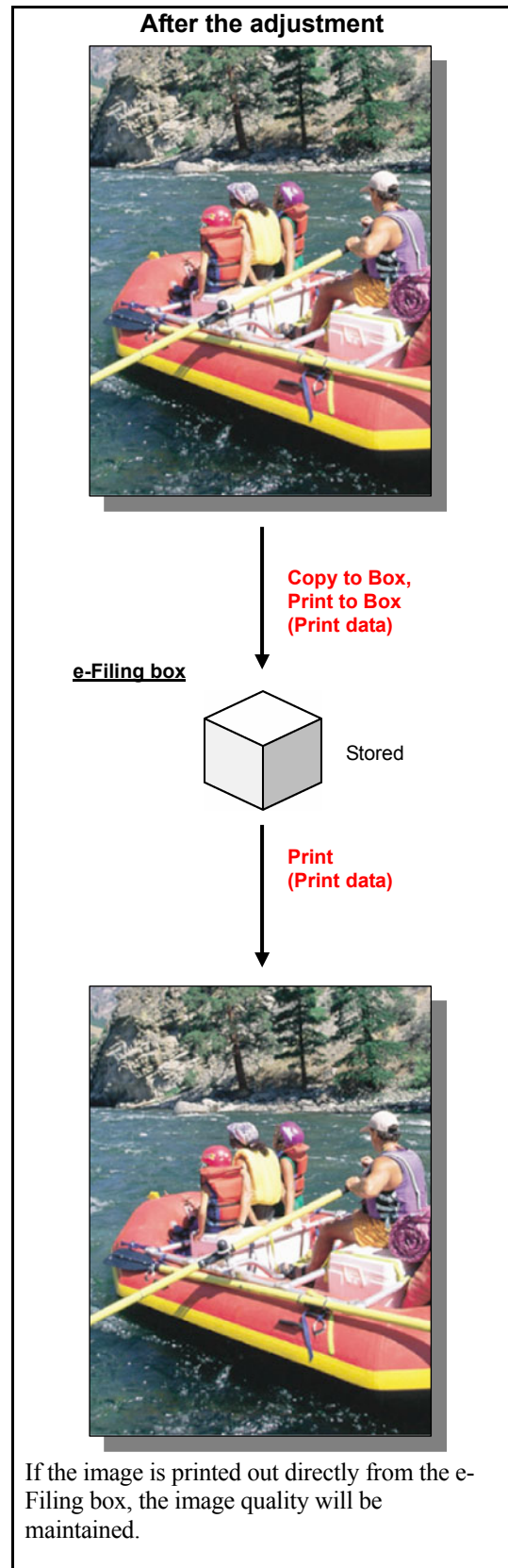
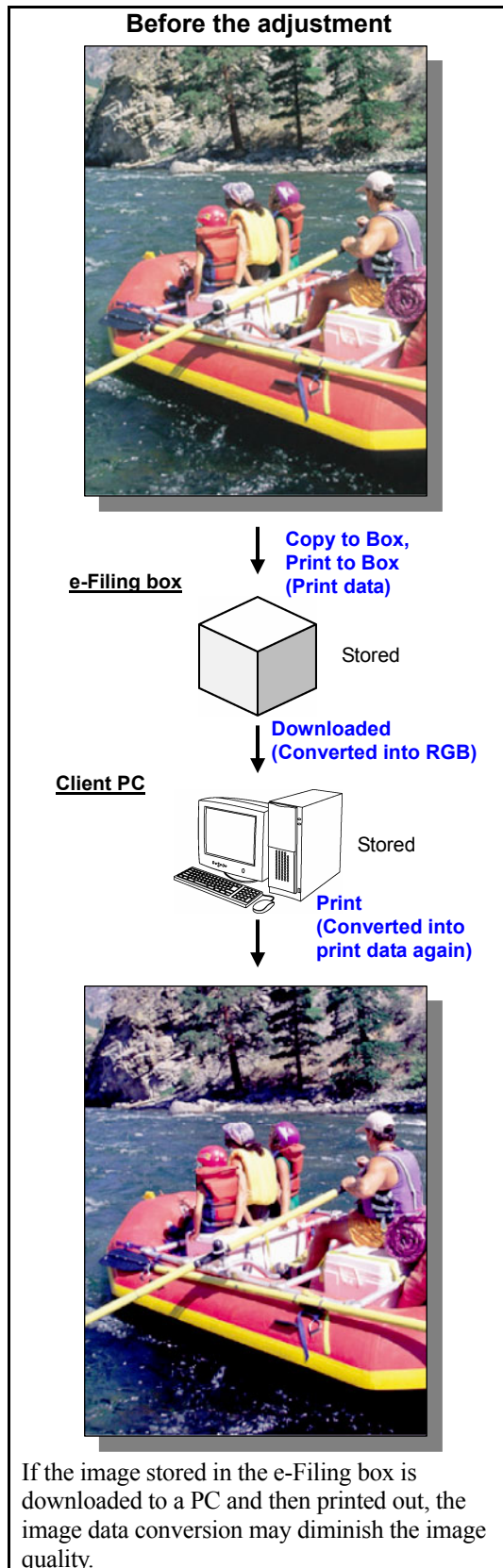
**❑ Cautions after the completion of the adjustment**

When the original containing text and lines is scanned and printed, the adjustment may possibly cause them to look faint or a blend of undesired colors. Therefore, carefully perform the adjustment, while checking the scanned-in image or printout.



## 4.7 To Finely Print the Image Stored in the e-Filing box

(To Print Images Stored through Copy to Box or Print to Box)



**□ Explanation**

Initially, the original is copied or printed and stored in the e-Filing box (Copy to Box or Print to Box) as CMYK data or optimized for printing on paper. While it is being downloaded to a client PC using File Downloader or the TWAIN driver, it is converted into RGB data or optimized for displaying on the computer monitor. The RGB data is not suitable for printing on paper. Therefore, if it is printed out, the image quality may be diminished. Therefore, it should be printed out directly from the e-Filing box, rather than downloaded to the PC, in order to obtain the fine printout.

\* Please remember that the e-Filing functions are available only on the Windows platform, but not on the Macintosh or UNIX platform.

**□ Procedure**

\* The adjustment is performed by the service technician, and by the user.

**Copy to Box**

**Print to Box**



(1) Print out the image stored in the e-Filing box on the Control Panel or using the e-Filing Web utility.

\* For further information regarding how to print it out, refer to the following documents:

- To print it out on the Control Panel: Operator's Manual for Basic Function
- To print it out using the e-Filing Web utility: e-Filing Guide

**<Note>**

**Scan to Box**

**Fax to Box**

To finely print out the original scanned or faxed and stored in the e-Filing box (Scan to Box or Fax to Box), download it to the client PC, first, select the desired Image Quality Type option on the printer driver and print it out, rather than print it out directly from the e-Filing box.

For further information regarding how to print color images stored using the scanning function, refer to 4.9 To Finely Print Color Images Stored through the Scanning Function.

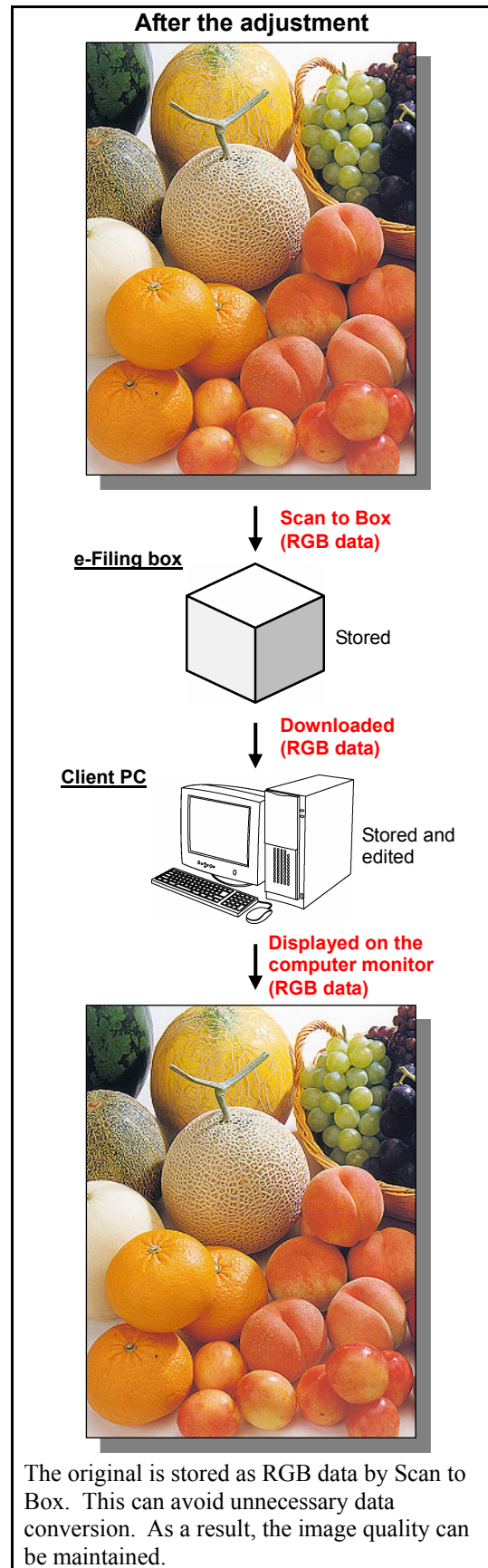
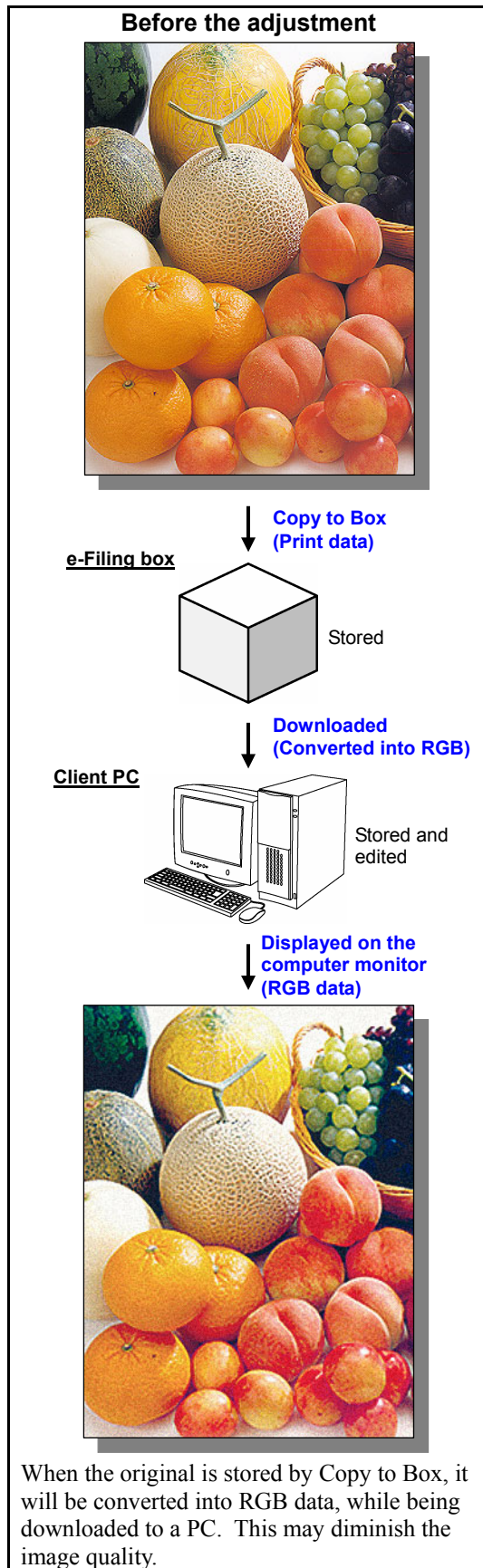
**□ Cautions after the completion of the adjustment**

Nothing in particular.

**□ Remarks**

When "Archive Document" of the e-Filing Web utility or "Backup" of the e-Filing Backup/Restore Utility is used, image data stored in the e-Filing box can be converted to a file maintaining the image quality optimized for printing. For example, you may want to temporarily move stored data to make some space in the box and saved it again in the box. When the data is converted to a PDF or TIFF file and then moved using the File Downloader, image quality may be diminished. However, you can use Archive Document or Backup to move the data while maintaining image quality. The Backup feature can also collectively backs up all data in the e-Filing box. Note that files created through the Archive Document or Backup feature cannot be directly opened on the PC or printed out. For further information regarding Archive Document and Backup, refer to the e-Filing Guide.

## 4.8 To Store an Image Suitable for Displaying on the Monitor or Image Editing





**□ Explanation**

Initially, the full-color original is copied and stored in the e-Filing box (Copy to Box) as CMYK data or optimized for printing on paper. But while it is being downloaded to a client PC using File Downloader or the TWAIN driver, it is converted into RGB data or optimized for displaying on the computer monitor. Depending on the type of original, this CMYK-to-RGB conversion may cause out-of-register colors or graininess on the printout. If the image is displayed on the monitor and further edited on the PC, the image quality may be diminished.

To store the full-color original and display it on the computer monitor, while minimizing image degradation, scan and store it in the e-Filing box (Scan to Box). This allows it to be stored as RGB data.


\* Please remember that the e-Filing functions are available only on the Windows platform, but not on the Macintosh or UNIX platform.

**□ Procedure**

\* The adjustment is performed by the service technician, and by the user.

**Scan to Box**

\* This adjustment will have an effect only on the image stored in Full color mode.

 (1) Scan the full-color image and store it in the e-Filing box.

\* For further information regarding how to store the image using the scanning functions, refer to the Operator's Manual for Basic Function.

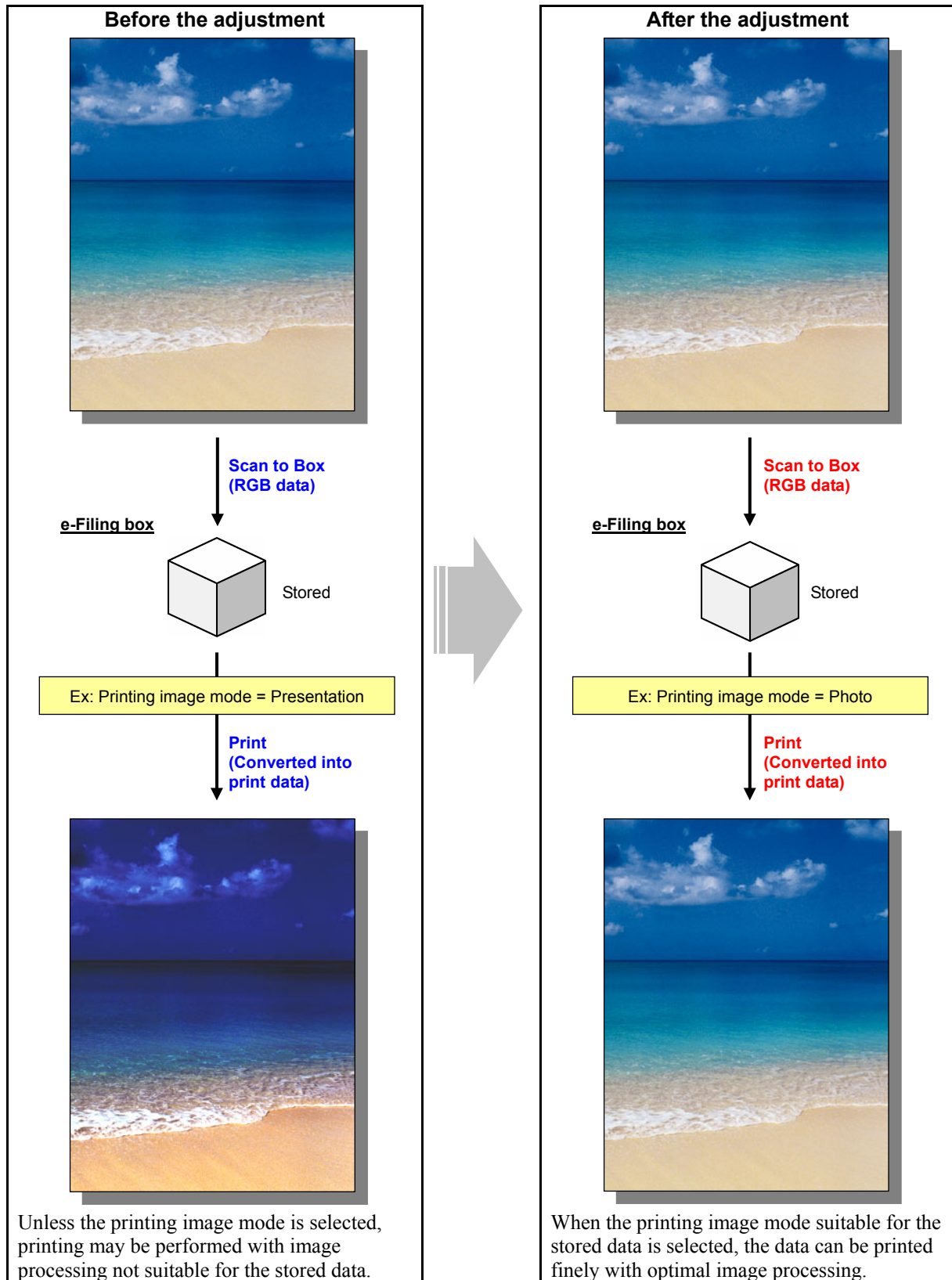
**□ Cautions after the completion of the adjustment**

Nothing in particular.

**□ Remarks**

When storing the black-and-white original in Auto color mode, copy and store it in the e-Filing box (Copy to Box) rather than scan it, in order to obtain the better image, depending on the type of original. For further information, refer to 4.1 To Clearly Store the B/W Image in Auto Color Mode.

## 4.9 To Finely Print Color Images Stored through the Scanning Function (To Print Images Stored through Scan to Box)



## □ Explanation


When an image is stored in the e-Filing box in the full color or auto color mode of the scanning function (Scan to Box) and printed as it is (without setting the printing image mode), printing may be performed with image processing not suitable for the image, causing image quality that the user requires not to be obtained. To finely print a color image stored with the scanning function, image processing optimal for the image can be used for printing, by selecting the suitable printing image mode (General/Photo/Presentation/Line Art), as you do for printing with the printer driver.

## □ Procedure

\*Perform the adjustment in accordance with the procedures below.


\*The adjustment is performed by the service technician, and by the user.

**Scan to Box** \* This adjustment will have an effect only on the image stored in Full color mode.

 (1) Scan the full-color image and store it in the e-Filing box.

\*For further information regarding how to store the image using the scanning functions, refer to the Operator's Manual for Basic Function.

**Scan to Box**

 (2) Select a printing image mode suitable for the stored image.

• Use steps (a) to (d) to change the printing image mode.

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(b) Press the [USER] button.


(c) Press the [E-FILING] button.

(d) Press the button for the mode suitable for the image in the [PRINTING IMAGE MODE] option.

\*For further information regarding the features of each printing image mode, refer to the explanation of the "Image Quality Type" options in Procedure (1) of 3.2 To Obtain the Desired Color Balance.

**<Note>** A change to the printing image quality mode will apply to all future printouts using the e-Filing box. Carefully perform the adjustment while printing out images other than the one that is used for the adjustment.

**Scan to Box**

 (3) Print out the image stored in the e-Filing box on the Control Panel or using the e-Filing Web utility.

\*For further information regarding how to print it out, refer to the following documents:

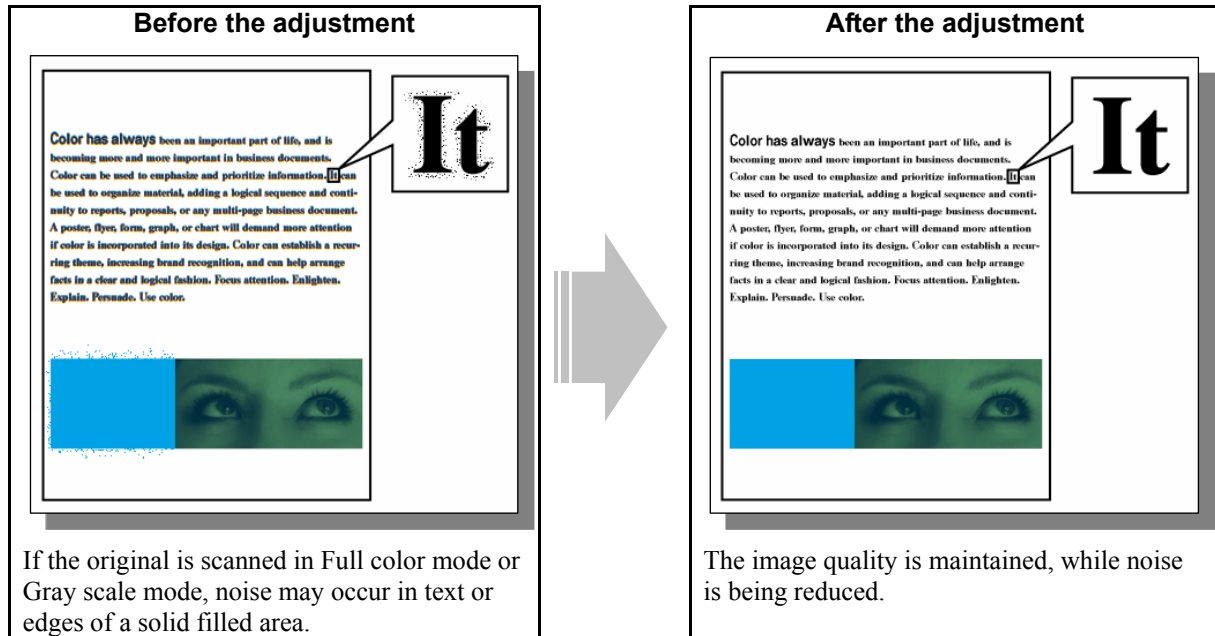
- To print it out on the Control Panel: Operator's Manual for Basic Function
- To print it out using the e-Filing Web utility: e-Filing Guide

## □ Cautions after the completion of the adjustment

Nothing in particular.

## 5. Scanning-specific Adjustments

### 5.1 To Clearly Scan Text (To reduce noise around text)



#### □ Explanation


When an original is scanned in Full color or Gray scale mode, the data compression may cause noise (splattering of the toner colors) around text or the edges of a solid filled area. Adjust the JPEG compression rate or change the scan resolution, in order to obtain better scanned-in image, while reducing noise.

\* This adjustment will have an effect on the image scanned in Full color mode (including Auto color mode) or Gray scale mode.

#### □ Procedures

\* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.


\* All the adjustments are performed by the service technician, and by the user.

 (1) When scanning the original, press the [EDIT] button on the Control Panel. Select [LOW] from among the "JPEG COMPRESS" options.

\* In the "JPEG COMPRESS" option, [MID] is selected by default.

After changing the compression rate, scan the original and check the scanned-in image quality.

If further adjustment is required, use procedure (2).

-  (2) When scanning the original, press the [EDIT] button on the Control Panel. In the "RESOLUTION" option, select a higher resolution.

\* In the "RESOLUTION" option, "200 (dpi)" is selected by default. If noise occurs in a resolution of 200 dpi, select a higher resolution (300 dpi, 400 dpi or 600 dpi).

After changing the resolution, scan the original and check the scanned-in image quality.

If further adjustments are required, use procedure (1).

#### □ Cautions after the completion of the adjustment

- The adjustment of the JPEG compression rate or resolution may possibly increase the size of the file to be stored. Therefore, carefully perform the adjustment, while checking the scanned-in image quality. The table below shows you the correlation between a resolution and file size. (The ratio of the file size may vary, depending on the type of original. Therefore, use the table below just for your reference.)

\* The file size in a resolution of 200 dpi is 1.

Resolution	File size ratio
200 dpi	1
300 dpi	Approx. × 2
400 dpi	Approx. × 4
600 dpi	Approx. × 10

- If the resolution selected in procedure (2) is too high, moiré may possibly occur in the scanned-in image. Therefore, carefully adjust the resolution, while checking the scanned-in image.

#### □ Remarks

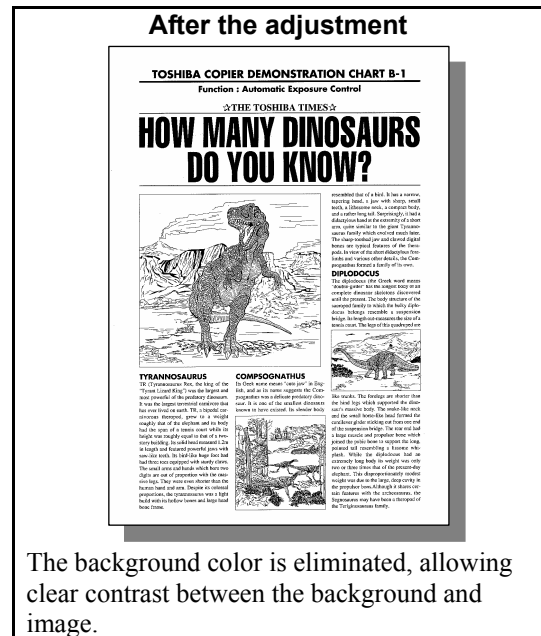
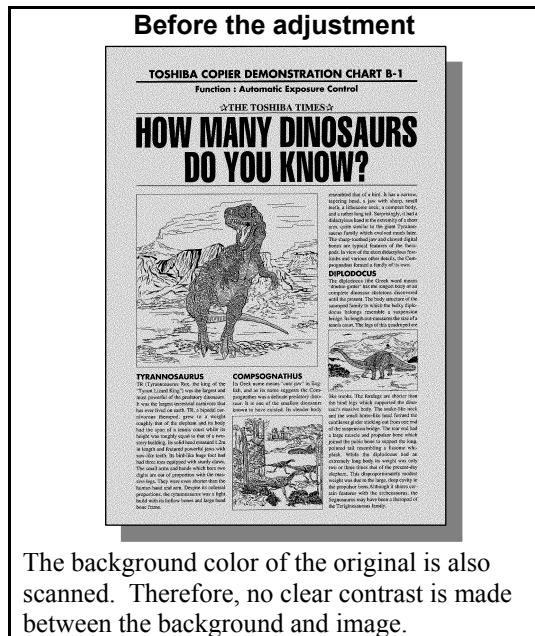
Use the following steps to change the default "JPEG COMPRESS" and "RESOLUTION" options:

- Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
- Press the [USER] button.
- Press the [SCAN] button.
- In the "JPEG COMPRESS" or "RESOLUTION" option, press the desired button to change the default setting.

\* The default resolution can be selected on a color mode basis: Full color mode (including Auto color mode), Gray scale mode and Black mode. But, remember that some of the resolution options cannot be selected as the default. (The resolution options available vary, depending on whether the optional GC-1181 and GC-1230 expansion memories are installed or not.)

- The following resolution options are available as the default:
  - Full color mode (including Auto color mode): 300 / 200 / 150 / 100 (dpi)
  - Gray scale mode: 400 / 300 / 200 / 150 / 100 (dpi)
  - Black mode: 600 / 400 / 300 / 200 / 150 (dpi)

## 5.2 To Scan the Original, while Eliminating the Background Color (To eliminate the background density)



### □ Explanation

When an original with a background color is scanned, such as a newspaper and color paper, the background color is also scanned. Therefore, no clear contrast is made between the background and image. Perform the background adjustment, in order to clearly scan this type of original.

\* This adjustment will have an effect only on the image scanned in Full color mode (including Auto color mode) or Gray scale mode.


### □ Procedures

- \* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.
- \* Procedure (1) is used by the service technician, and by the user.
- \* Procedure (2) is used by the service technician only.



(1) When scanning the original, press the [EDIT] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [0] button to decrease the background density.

After decreasing the background density, scan the original and check the scanned-in image quality. With the background density set to the minimum, if further image quality adjustments are still necessary, the service technician must use the next procedure.

 (2) Enter adjustment mode [05]. Change the values for codes [1070 to 1072] or [848] to decrease the background density.

- The code to use varies, according to color mode (Full color mode or Gray scale mode). Adjust the value for the [05] code corresponding to color mode for which you would like to improve the image quality.

Color mode	Original mode	[05] code	Value recommended	Acceptable value range	Default
Full color	Text	05-1070	Set a value larger than 0.	0 to 50	0
	Printed image	05-1071			
	Photo	05-1072			
Gray scale	---	05-848	Set a value smaller than 128.	0 to 255	128

\* Set the value, as follows, while checking the scanned-in image until the optimum value is obtained.

- Adjustment in Full color mode: Set the value in increments of approximately 10.
- Adjustment in Gray scale mode: Set the value in increments of approximately 20.

\* The background density in Full color mode (code 05-1070, 1071 or 1072) will become the highest, if "0" is set. On the other hand, it will become the lowest, if "50" is set. Changing the value will also change the background density in Full color mode, when the "Background Adjustment" indicator is set to the center. Then, if the background density of the center value is changed, each step of the indicator will be changed accordingly. (For instance, if the center value is increased by 5 (lighter), the value of each step of the indicator will also be increased by 5 (lighter)).

\* The background density in Gray scale mode (05-848) will become the lowest, if "0" is set. On the other hand, it will become the highest, if "255" is set. Changing the value will also change the background density in Gray scale mode, when the "Background Adjustment" indicator is set to the center. Each step of the background density indicator will be changed, based on the values for codes 05-853 and 858. They are intended to adjust the amount of change in the output background density per step defined in manual density mode.

#### ❑ Cautions after the completion of the adjustment

The adjustment may possibly diminish the quality of the light-colored image. Therefore, carefully perform the adjustment, while checking the scanned-in image.

#### ❑ Remarks

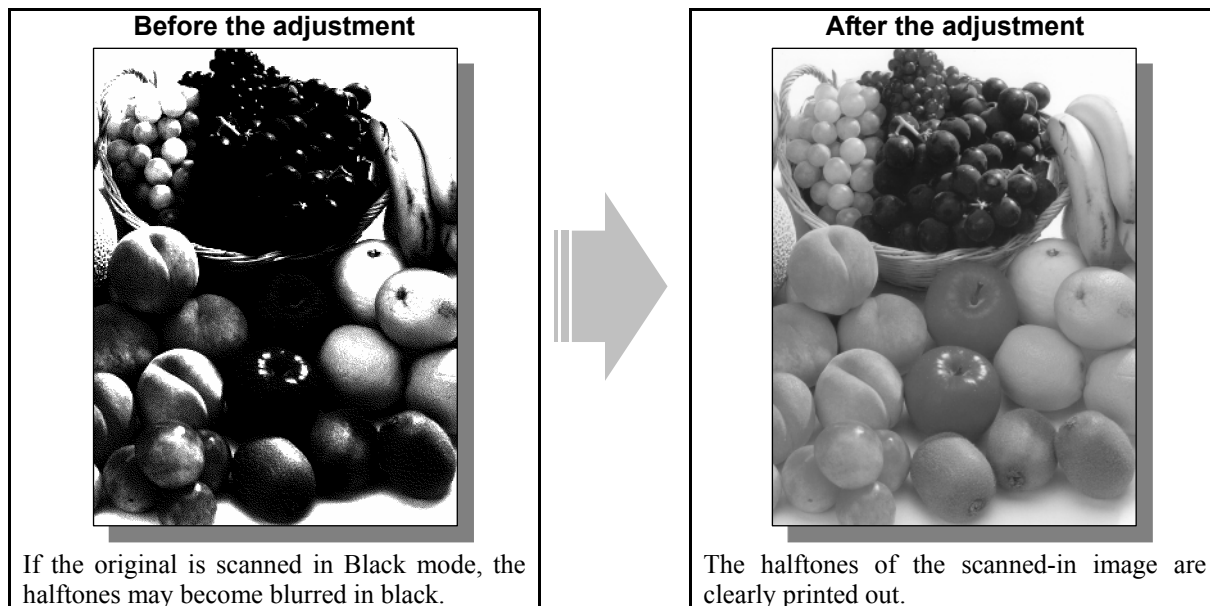
When scanning the original, use the following steps to change the default indicator position in the background adjustment option, which is displayed on the Control Panel:

- Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.
- Press the [USER] button.
- Press the [SCAN] button.
- In the "BACKGROUND ADJUSTMENT" option in Full color mode or Gray scale mode, specify the default background density.



## 5.3 To Clearly Scan and Print the Original in Black and White

(To improve gradation and reduce graininess)



### □ Explanation

If an original is scanned in Black mode, a difference in the density level of the halftones cannot be accurately scanned. As a result, it may become blurred in black or grained. Scan the black-and-white original in Gray scale mode, in order to scan and print it out in black and white more clearly.

### □ Procedure

\*The adjustment is performed by the service technician, and by the user.

- (1) When scanning the original, press the [EDIT] button on the Control Panel. Select [GRAY SCALE] from among the color mode options.



**□ Cautions after the completion of the adjustment**

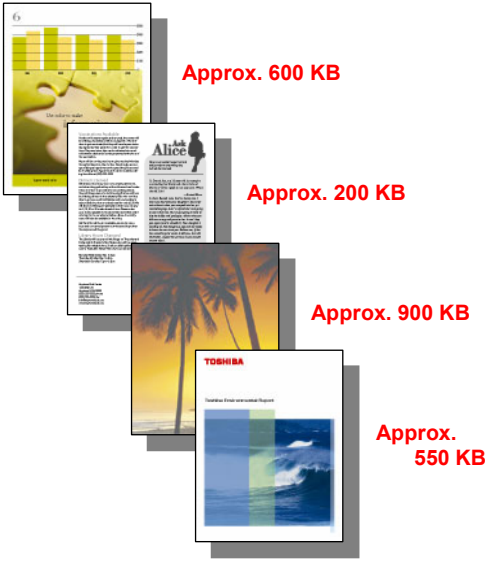
The adjustment may possibly increase the size of the file to be stored. Therefore, carefully perform the adjustment, while checking the scanned-in image quality. The correlation between color mode and file size is as described below. (The ratio of the file size may vary, depending on the type of original. Therefore, use the description below just for your reference.)

\*Ratio of the file size in Black mode to Gray scale mode

- If the file size in Black mode/Text mode is 1, it will be increased to approximately 7 times in Gray scale mode.
- If the file size in Black mode/Photo mode is 1, it will be approximately doubled in Gray scale mode.

## 5.4 To Scan the Original, while Reducing the File Size

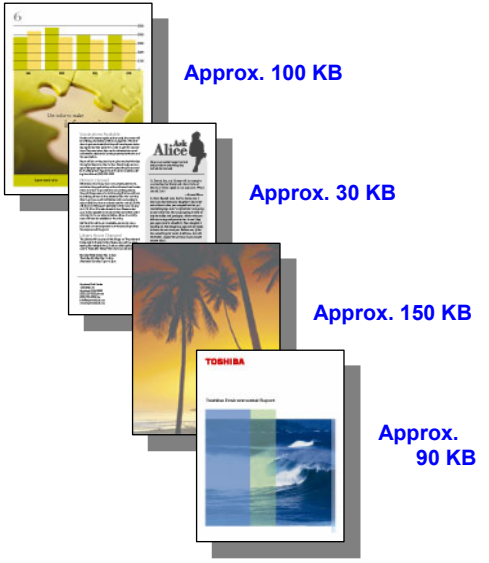
**Before the adjustment**



\* The above file sizes are just for your reference.  
If the original is constantly scanned at the default compression rate, the file size will become larger than required.

➔

**After the adjustment**




\* The above file sizes are just for your reference.  
If the original is scanned at a reasonable compression rate, depending on the purpose of the scanned-in image, the file size will be successfully reduced.

### □ Explanation

If an original is scanned at the default settings, a proper image will be obtained for general purposes. But the file size may become larger than required. The file size of the scanned-in image significantly varies, depending on the selected resolution or JPEG compression rate. If an appropriate resolution and a compression rate are selected in accordance with the purpose of the original, the image quality will be maintained, while the file size is being reduced. Change the resolution, original mode, or JPEG compression rate or perform the background adjustment, in order to minimize the file size of the scanned-in image.

### □ Procedures


- \* You can start with any of the procedures. But it is recommended to perform the procedures in order, as listed below. You can use one procedure in conjunction with another. But if this changes the image quality more than required or loses effectiveness of the adjustment, restore the settings made in the previously used procedure to the original. Then perform the next procedure.
- \* All the adjustments are performed by the service technician, and by the user.

-  (1) When scanning the original, press the [EDIT] button on the Control Panel. Select a lower resolution option in the "RESOLUTION" option.
- \*In the "RESOLUTION" option, "200 (dpi)" is selected by default. Select a lower resolution option (100 dpi or 150 dpi) to reduce the file size.

\*This adjustment will have an effect on the image scanned in all color modes (Full color, Gray scale, Black and Auto color).

After changing the resolution, scan the original and check the scanned-in image quality.

If further image quality adjustments are still necessary, use the next procedure.


-  (2) When scanning the original, press the [EDIT] button on the Control Panel. In the "ORIGINAL MODE" option, select [TEXT].
- \*Perform this adjustment, only if the black-and-white original containing no photo images is scanned or if degradation in the photo image quality is acceptable.

\*This adjustment will be effective, only if [TEXT/PHOTO] or [PHOTO] is initially selected from among the original mode options.

\*This adjustment will have an effect only on the image scanned in Black mode.

After changing original mode, scan the original and check the scanned-in image quality.

If further image quality adjustments are still necessary, use the next procedure.


-  (3) When scanning the original, press the [EDIT] button on the Control Panel. In the "JPEG COMPRESS" option, select [HIGH].

\*In the "JPEG COMPRESS" option, [MID] is selected by default.

\*This adjustment will have an effect only on the image scanned in Full color mode (including Auto color mode) or Gray scale mode.

After changing the compression rate, scan the original and check the scanned-in image quality.

If further image quality adjustments are still necessary, use the next procedure.

-  (4) When scanning the original, press the [EDIT] button on the Control Panel. Press the [BACKGROUND ADJUSTMENT] button. Press the [Q] button to decrease the background density. Then select [HIGH] from among the "JPEG COMPRESS" options.

\*This adjustment will be effective, only when the original with a color background, such as a newspaper and color paper, is scanned.

\*This adjustment will have an effect only on the image scanned in Full color mode (including Auto color mode) or Gray scale mode.

After decreasing the background density and changing the compression rate, scan the original and check the scanned-in image quality.

With the background density set to the minimum, if further image quality adjustments are still necessary, the service technician must use another procedure.

### ❑ Cautions after the completion of the adjustment

• The table below shows you the correlation between the adjustment and file size. (The ratio of the file size may vary, depending on the type of original. Therefore, use the table below just for your reference.)

- Correlation between a resolution and file size (procedure (1))

\*The file size in a resolution of 200 dpi is 100%.

Resolution	File size ratio
200 dpi	100%
150 dpi	Approx. 60%
100 dpi	Approx. 40%

- Correlation between original mode and file size (procedure (2))

\*The file size in Photo mode is 100%.

Original mode	File size ratio
Photo	100%
Text	Approx. 30%

- Correlation between JPEG compression rate and file size (procedure (3))

\*The file size is 100%, with [MID] selected.

JPEG compression rate	File size ratio
MID	100%
HIGH	Approx. 80%

• The adjustment may possibly diminish the image quality, as shown by the table below. Therefore, carefully perform the adjustment, while checking the scanned-in image.

Procedures used	Possible image degradation
Any of procedures from (1) to (4)	A photo image area may be blurred.
(1) or (3)	Noise may be increase around text.
(1) or (3)	Small-sized text may become illegible.
(4)	Light-colored images may not be clearly scanned.

## □ Remarks

- Use the following steps to change the default resolution, original mode, JPEG compression rate and/or background adjustment options:

(a) Press the [USER FUNCTIONS] button on the Control Panel to enter the "User Functions" menu.

(b) Press the [USER] button.

(c) Press the [SCAN] button.

(d) In the "RESOLUTION," "ORIGINAL MODE," "JPEG COMPRESS" and/or "BACKGROUND ADJUSTMENT" option, press the desired button to change the default.

\*The default resolution can be selected on a color mode basis: Full color mode (including Auto color mode), Gray scale mode and Black mode. But remember that some of the resolution options cannot be selected as the default. (The resolution options available vary, depending on whether the optional GC-1181 and GC-1230 expansion memories are installed or not.)

- The following resolution options are available as the default:

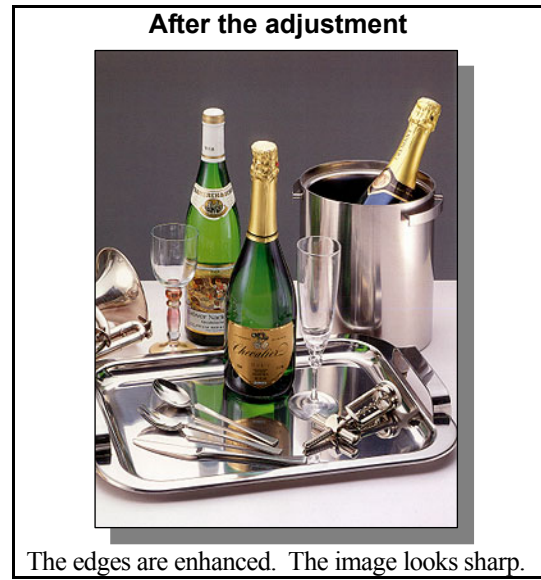
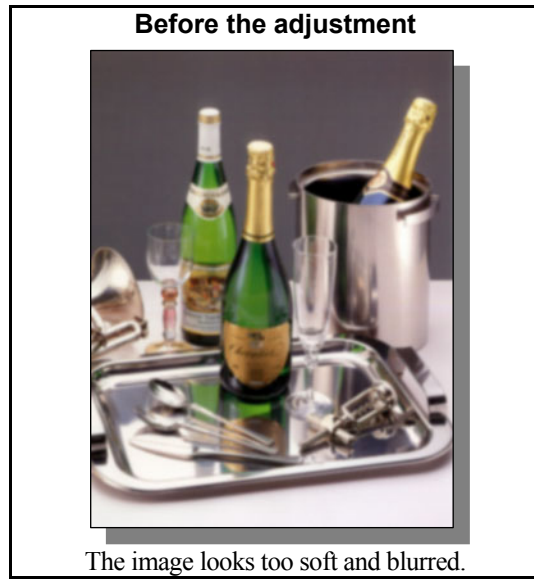
- Full color mode (including Auto color mode): 300 / 200 / 150 / 100 (dpi)

- Gray scale mode: 400 / 300 / 200 / 150 / 100 (dpi)

- Black mode: 600 / 400 / 300 / 200 / 150 (dpi)

- Remember that when scanning in Full color mode, if the original mode option is switched from Photo mode or Printed image to Text mode, the file size may become larger.

## 5.5 To Sharply Scan the Original (To increase the sharpness intensity)




### □ Explanation

Adjust the sharpness intensity, in order to sharply scan the soft and blurred original.

\*This adjustment will have an effect on the image scanned in all color modes (Full color, Gray scale, Black and Auto color).

### □ Procedure

\*The adjustment is performed by the service technician only.

-  (1) Enter adjustment mode [05]. Change the values for codes [1086 to 1088] and [840 to 843] to adjust the sharpness intensity.

Color mode	Original mode	[05] code	Value recommended	Acceptable value range	Default
Black	Text/Photo	05-840	Set a value larger than 16.	0 to 31	0
	Text	05-841			
	Photo	05-842			
Full color	Text	05-1086			
	Printed image	05-1087			
	Photo	05-1088			
Gray scale	---	05-843			

\* Setting "1" provides the softest image, while setting "31" provides the sharpest image. The default value ("0") provides an image as sharp as the one provided by setting "16."

### □ Cautions after the completion of the adjustment

The adjustment may possibly cause moiré. In addition, when text and thin lines in a light-colored background are scanned, the background around the text or line may be eliminated. Therefore, carefully perform the adjustment, while checking the scanned-in image.

## 5.6 To Scan the Original, while Enhancing Black



### □ Explanation


When a full-color original is scanned, black is not dark enough, compared to the original. (In general, the scanned-in image is likely to become less dark.) Finely adjust the black density of the scanned-in image, in order to darken black and closely match it with the original hue.

\*This adjustment will have an effect only on the image scanned in Full color mode (including Auto color mode).



### □ Procedure

\*The adjustment is performed by the service technician only.

-  (1) Enter adjustment mode [05]. Change the values for codes [1075 to 1077] to adjust the black density of a scanned-in image.

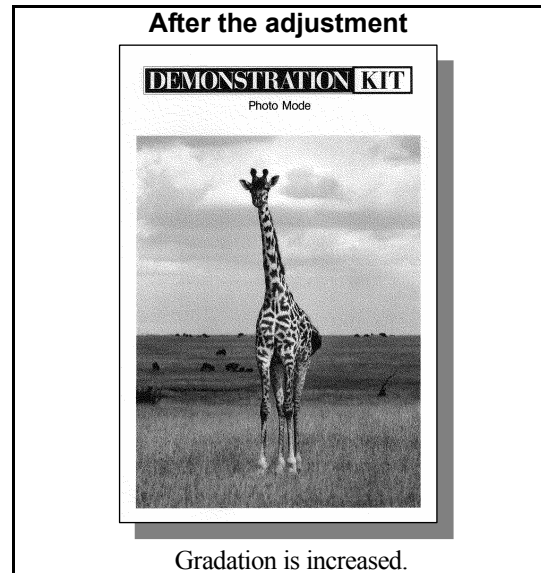
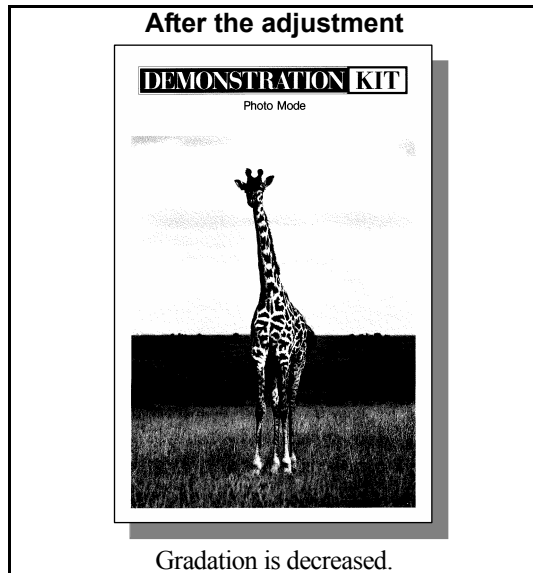
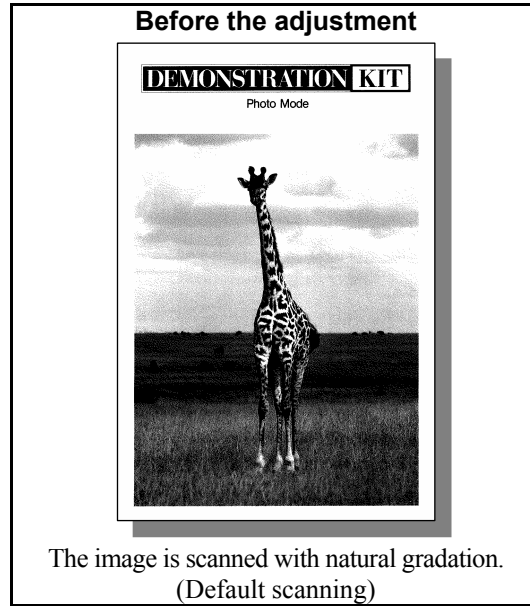
Color mode	Original mode	[05] code	Value recommended	Acceptable value range	Default
Full color	Text	05-1075	Set a value larger than 0.	0 to 4	0
	Printed image	05-1076			
	Photo	05-1077			

\* Setting "0" provides the lightest black, while setting "4" the darkest.

### □ Cautions after the completion of the adjustment

The adjustment may possibly cause the background color to become too dark. Therefore, carefully perform the adjustment, while checking the scanned-in image.

## 5.7 To Scan the Original with the Desired Gradation



### □ Explanation

When an original is scanned in Black mode or Gray scale mode, the reproducibility of halftones (gradation) can be adjusted by changing the scan density on an area basis (low-, medium- and high-density areas). Adjust the gamma curve balance, in order to change the gradation, in accordance with the type of original or at a user's request.

\* This adjustment will have an effect only on the image scanned in Black mode or Gray scale mode.

## □ Procedure

\*The adjustment is performed by the service technician only.

- ■ (1) Enter adjustment mode [05]. Change the values for codes [880 to 883] to adjust the gamma curve balance of the low-, medium- and high-density areas.

Color mode	Original mode	[05] code	Subcode	Value recommended	Acceptable value range	Default
Black	Text/Photo	05-880	0/1/2	Set a value smaller than 128 to decrease the density.	0 to 255	128
	Text	05-881	0/1/2			
	Photo	05-882	0/1/2	Set a value larger than 128 to increase the density.		
Gray scale	---	05-883	0/1/2			

\*Set the value in increments of approximately 20, while checking the scanned-in image until the optimum value is obtained.

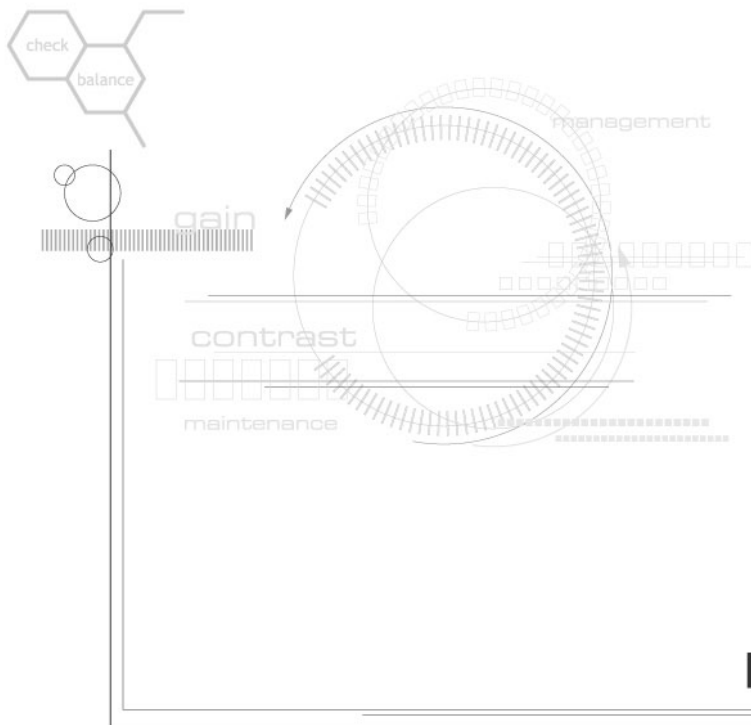
\*The subcode varies, according to the area for which the density is adjusted. Refer to the table below and set the subcode for the area to be adjusted.

Subcode	Area for the density to be adjusted
0	Low-density area
1	Medium-density area
2	High-density area

\*Gradation in Black mode will significantly vary, if the medium-density area is mainly adjusted. But remember that adjusting the low- or high-density area will rarely affect the gradation in Black mode.

## □ Cautions after the completion of the adjustment

Nothing in particular.



**e-STUDIO281c/351c/451c**

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