



Photo Image Correction on the PhotoShop v7.0+ for MPX-60

Fundamental Version Vol. 1.0

This manual explains how to correct the photo image to be suitable for printing on the MPX-60. It is issued for the service activity purposes. Please use it for supporting the end users.

All the calibrations mentioned in this document is explained based on the fact that all the images will be printed with the default settings on the Dr. METAZA 2 and METAZA Driver.

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Roland DG Corporation

About printing with the MPX-60

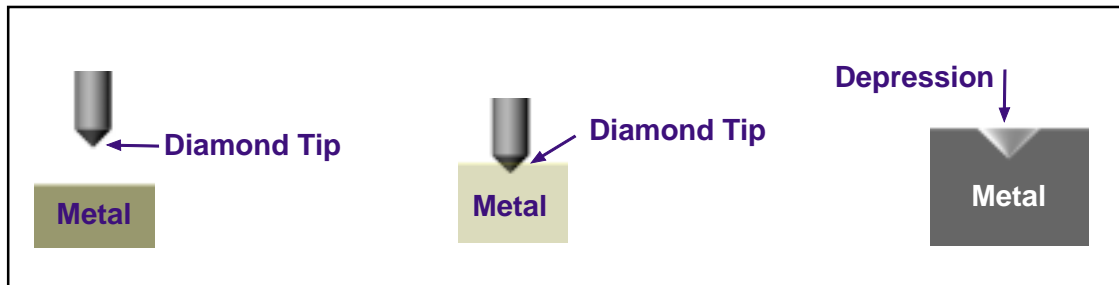
MPX-60 is a Metal Printer which can print text, logos drawings and photographs on the metal, plastic and so on.



1. How MPX-60 Marks Dots on Metal

MPX-60 impacts a conical diamond-tipped stylus onto a metallic surface to make a depression. The area with depression look lighter than where there are none. These difference form an image.

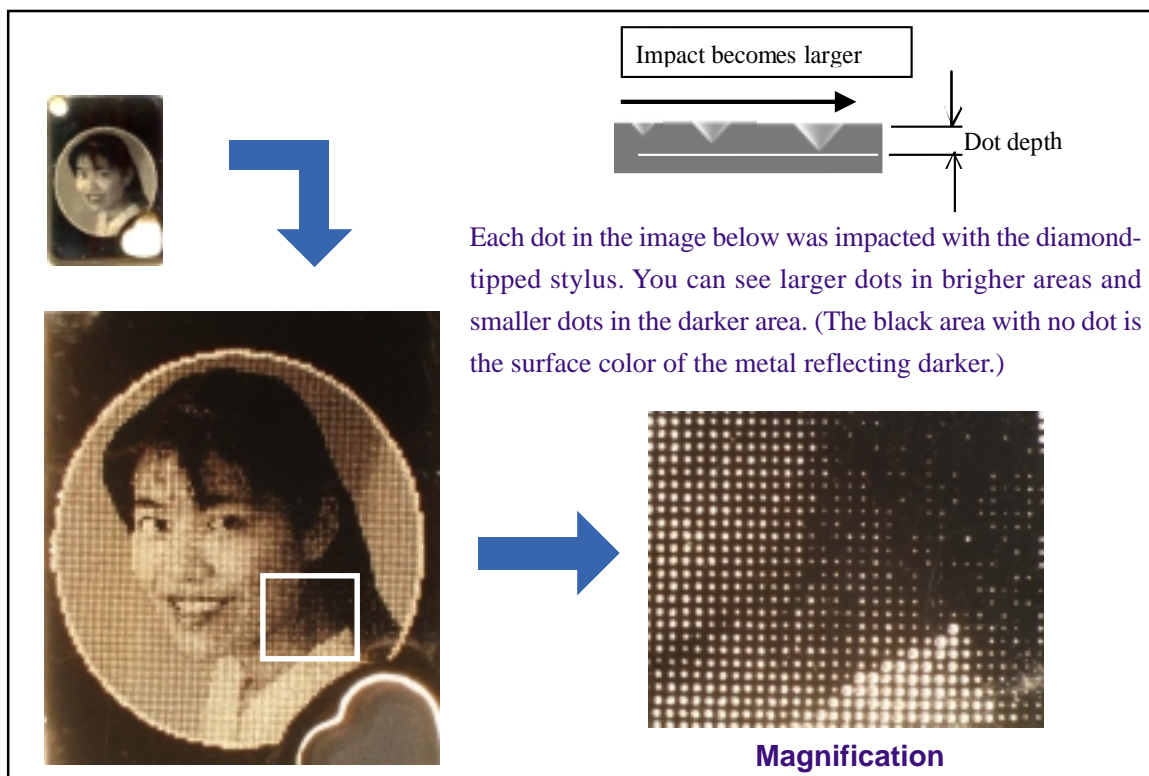
(a depression = a dot)



2. How METAZA Creates Tone

MPX-60 changes the size of a dot to create the tone of an image. (The stronger the impact, the larger and deeper the depression will be.)

MPX-60 varies the impact with a diamond tip so that the image consists of smaller dots for darker areas and larger dots for brighter areas.



1. Printing Text and Logos

Text and logos can be expressed easily without using the fine gradation not like photos.

Even though there are some different cases, text and logos can be expressed with 2 tones, the part that has been hit and the part that has not hit by the stylus.

Therefore, it is much easier for the machine to control the head to print these images compared to with the case printing the photos.

Besides of controlling the head, the printing results will be less affected by the way of setting the material or the material itself.

2. Printing Photographs

Photo images need to be expressed with fine tones (gradation).

When printing with MPX-60, the impact of the head is controlled delicately and the head creates various sizes of dots in micron order to express the fine tones.

The printing results could be affected easier, in comparison with the case printing texts and logos, by the external factors such as flatness or hardness of the materials and the original data itself.

Therefore, it is very important to correct the original data in order to have the better printing results.

This manual explains the way of correcting the photo images using the PhotoShop, though the METAZA Driver has some functions for image correction.

The Functions of Image Correction in PhotoShop

1. The Image Correction in PhotoShop

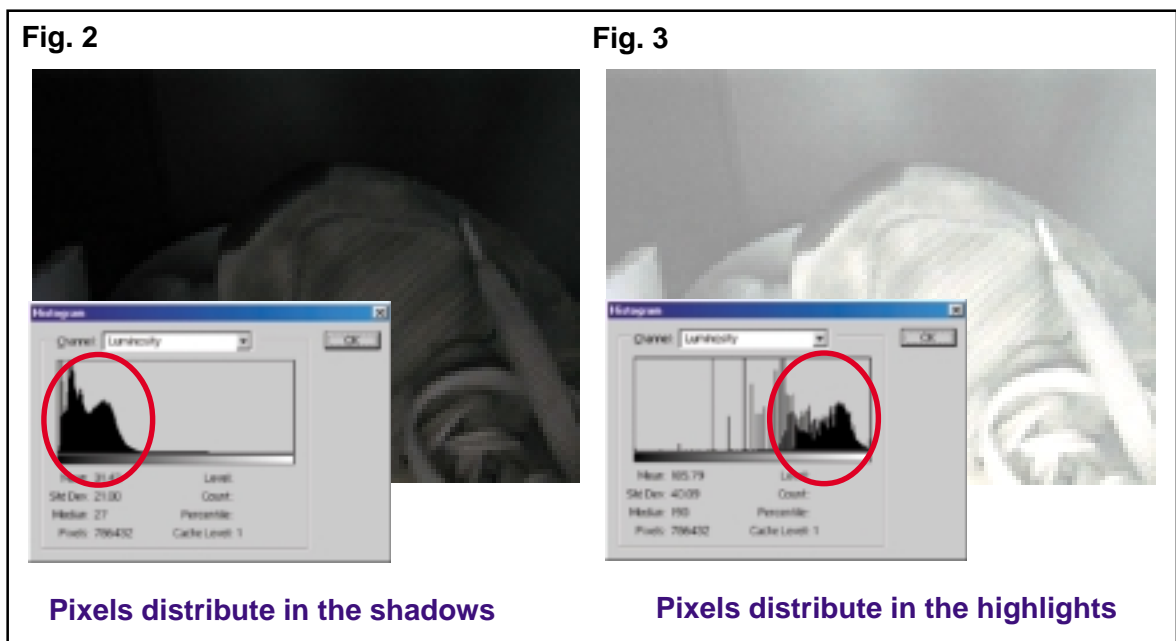
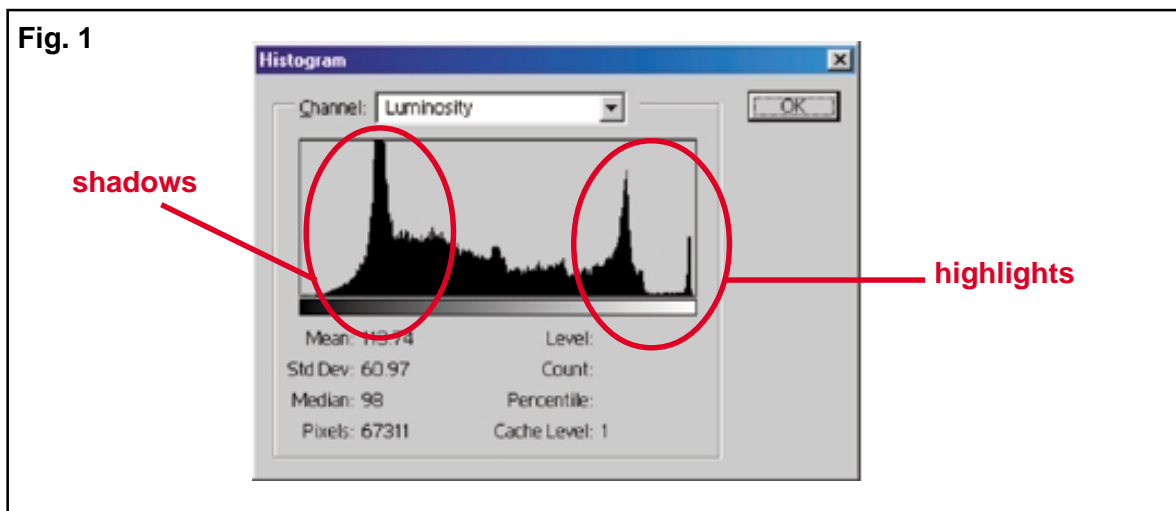
This manual explains how to correct the photo image using [Image] > [Adjust] > [Levels] and [Curves] dialog boxes.

Photo image is normally made of small squares known as pixels to represent images. The brightness of the image is determined by the value of the each pixel. (0 - 255)

Both adjustments in [Levels] and [Curves] make it possible to correct the image suitable for MPX-60 by changing the value of the whole pixels or some part of the pixels in the printing image.

2. Histogram

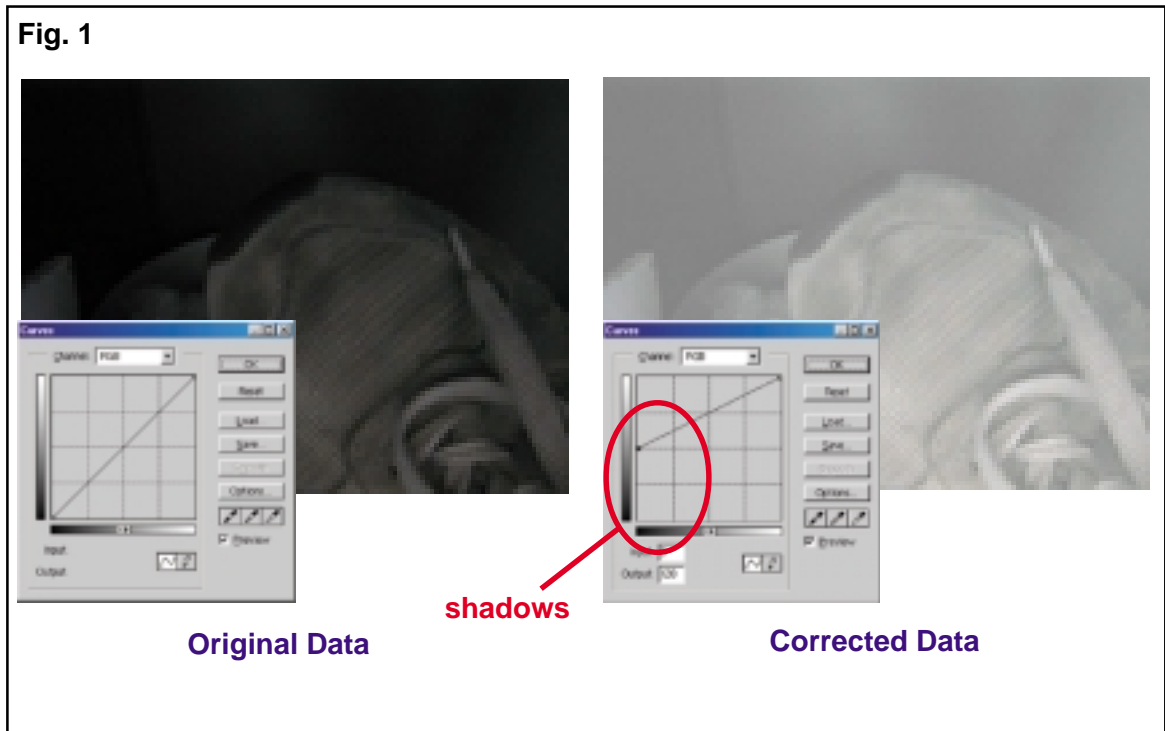
Histogram shows the number of pixels at each brightness level in the image. The left part is the shadows (dark) and the right part is the highlights (bright). When the pixels of the image are distributed in the shadows, the whole image looks dark. (Fig.1) When the pixels of the image are distributed in the highlights, the whole image looks bright. It makes it possible to correct the image more properly by checking the distribution of the pixels in the histogram. (Fig.2)



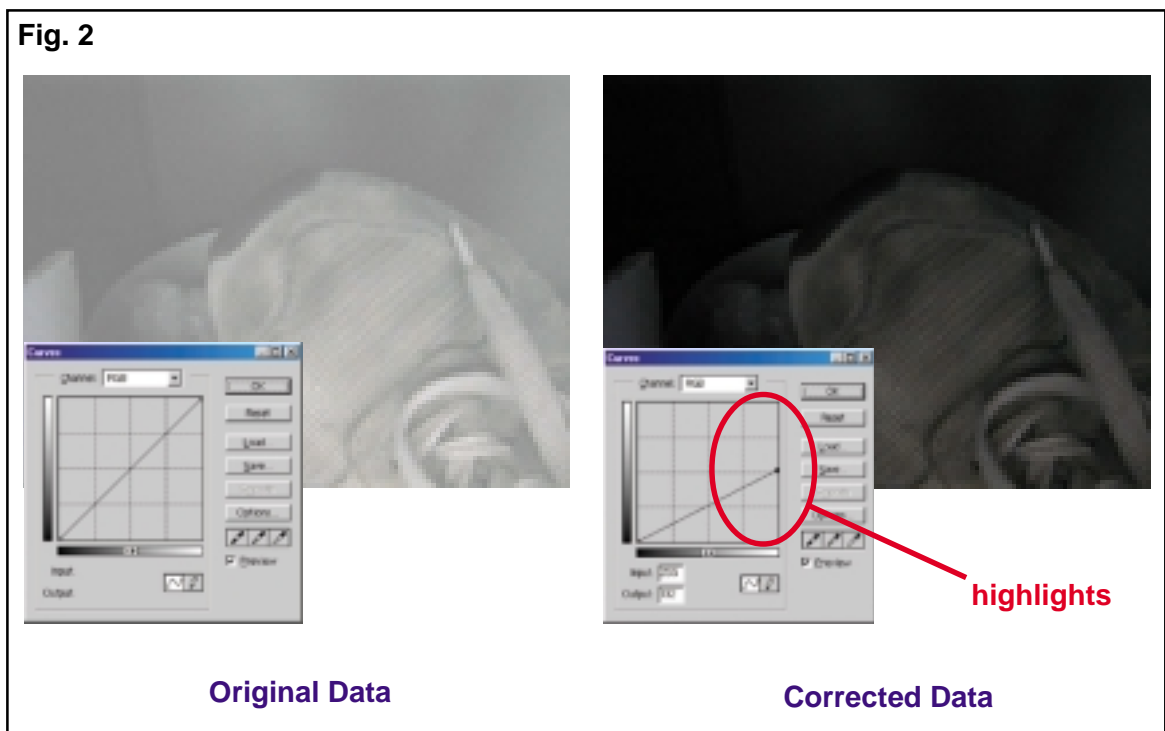
1. Curves

3-1. To use the Curves --- Brightness Correction

In the Curves, the X axis represents the original brightness value of the pixels. The Y axis represents the brightness value of the MPX-60 printing results. The left part is the shadows (dark) and the right part is the highlights (bright). When the shadow part is raised in the Curves, the printing results of MPX-60 become brighter. (Fig.1)



On the other hand, when the highlight part is lowered, the printing results of MPX-60 become darker.

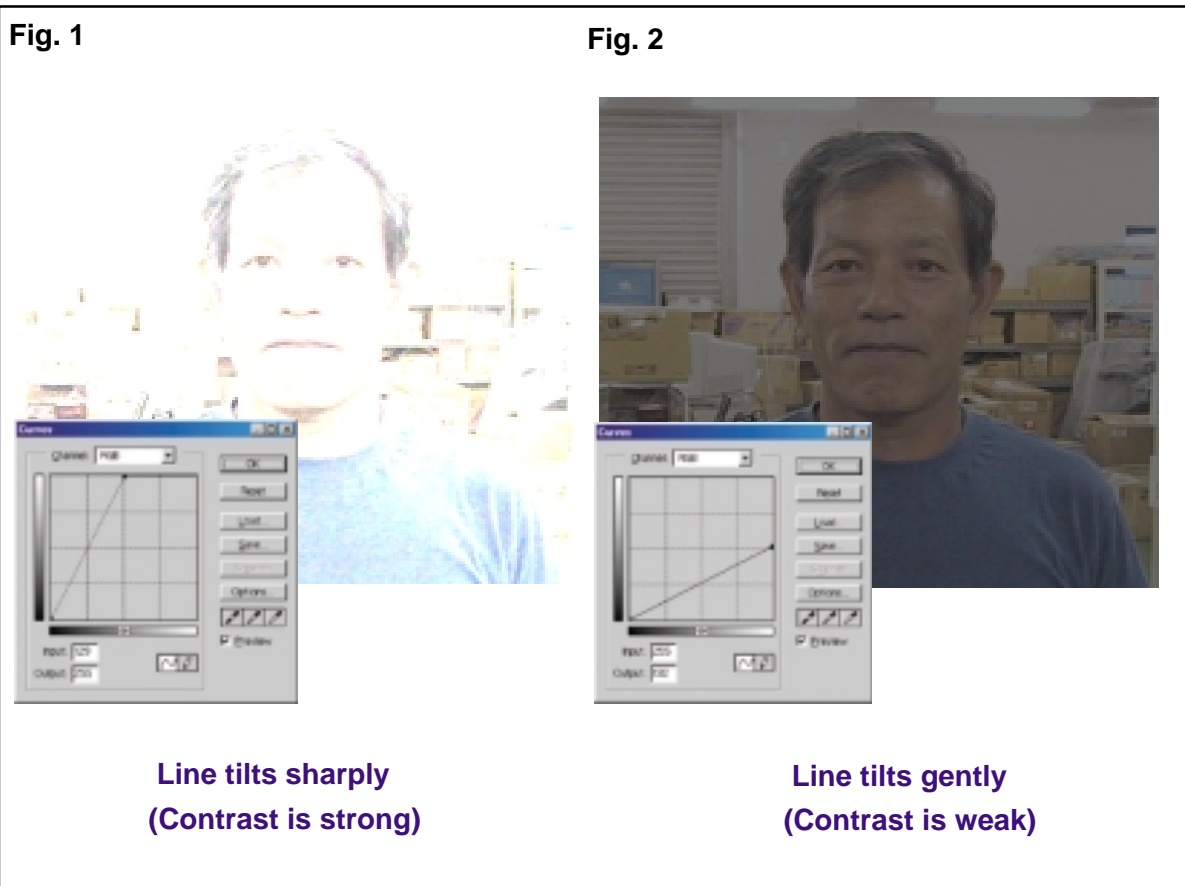


3-2. To use the Curves --- Contrast Correction

The angle of the line in the Curves represents the contrast of the image.

If the line tilts sharply, contrast becomes strong, and vice versa.

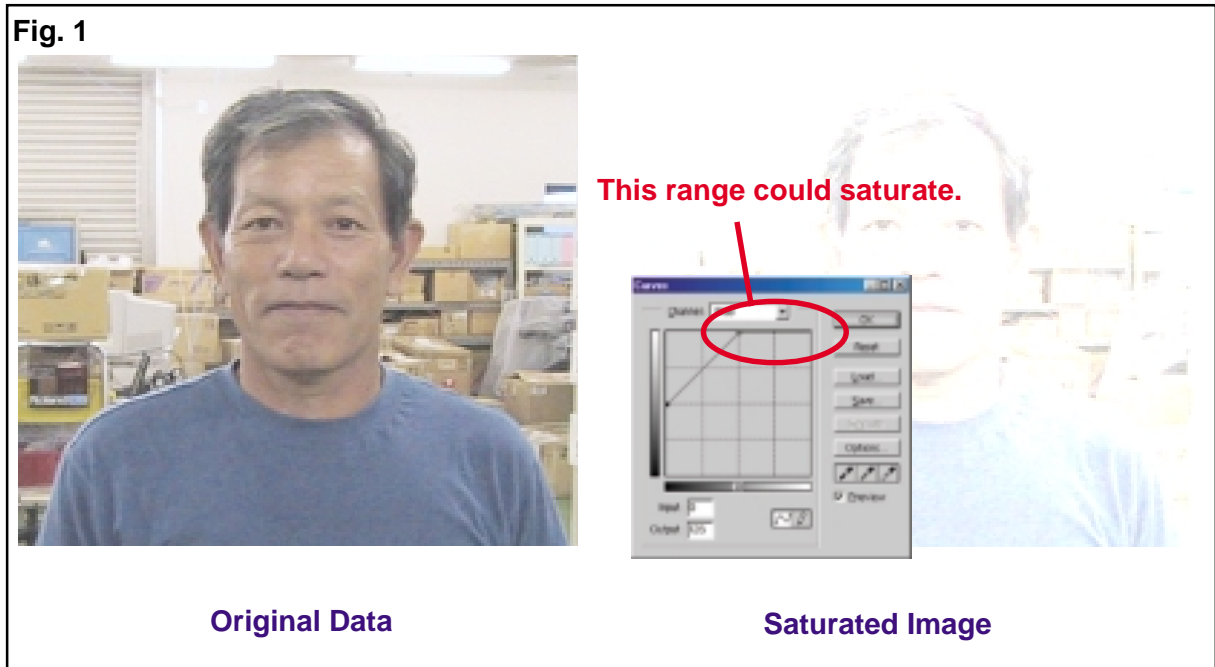
When the contrast is too strong, the printing results of MPX-60 saturate. (Fig1.) On the other hand, when the contrast is too weak, the gradation in the printing result becomes unclear. (Fig.2)



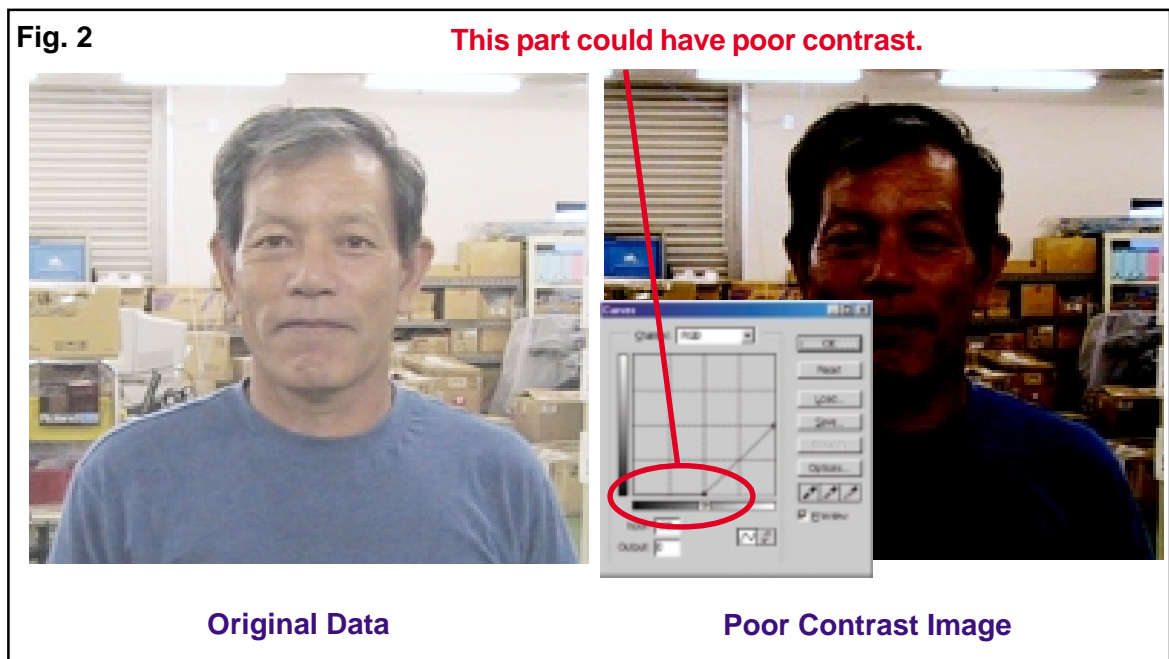
3-3. Notes When Using Curves

You can adjust the brightness and contrast of the image which will be printed on the MPX-60 by changing the Curves.

However, bright part in the image could be saturated when shifting the whole curve upwards because the highlights range shown in Fig.1 will be expressed with the same brightness.



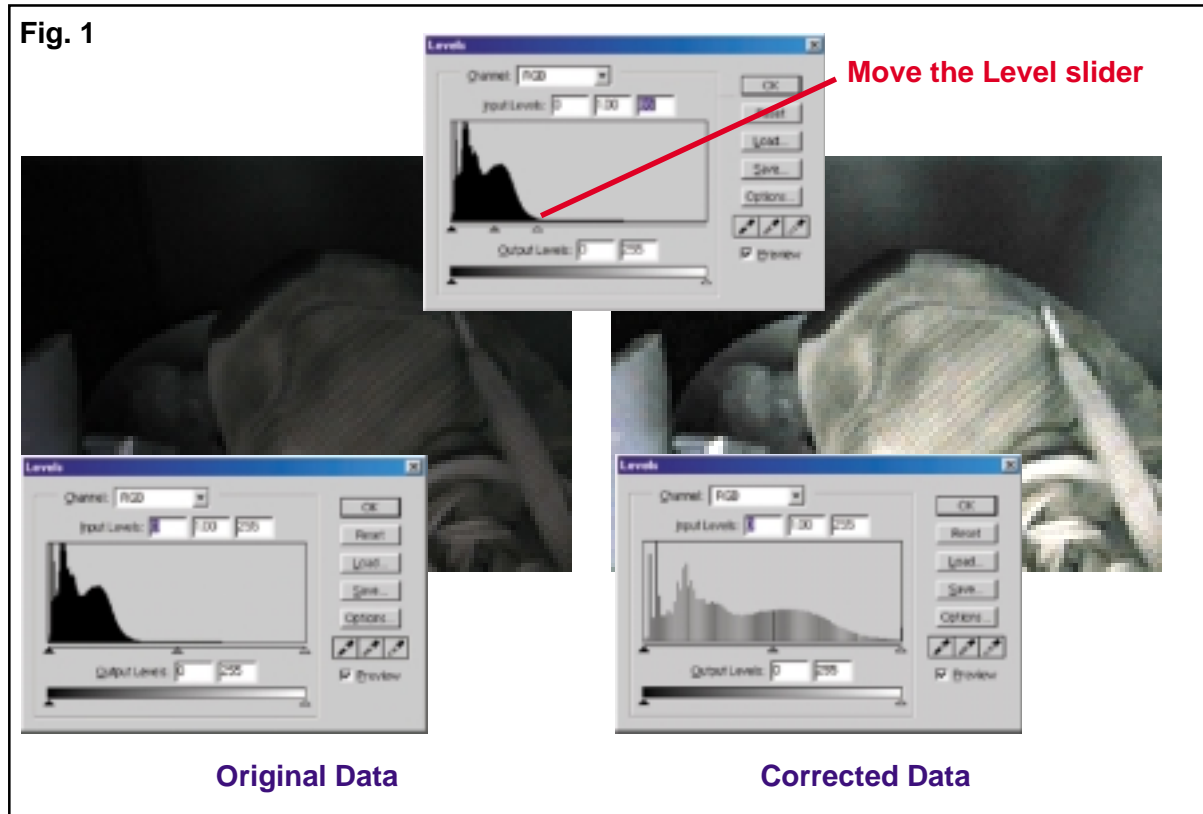
Dark part in the image could be expressed with poor contrast when shifting the whole curve downwards because the shadows range shown in Fig.2 will be expressed with the same brightness.



1. Levels

The histogram is displayed in the Levels dialog box.

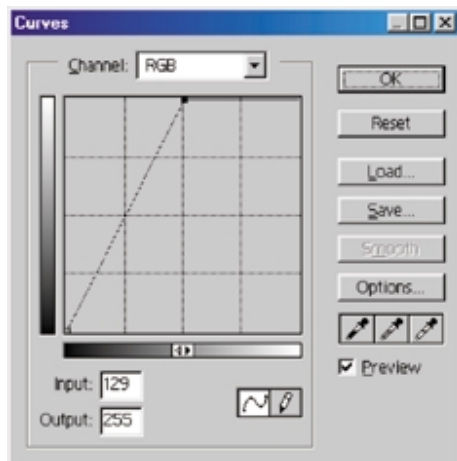
The calibration using the Levels is effective especially on the images that the pixels are distributed in the limited range. You can make the pixels to distribute in the wider range by moving the level sliders at both ends of the pixels. As a result, the tone range of the image becomes wider and you could have the brighter or darker printing results with stronger contrast.



Additional Information

The above calibration is as same as tilting the Curves more sharply without moving the bottom end to have the highlights part to be saturated.

However, there is no big affect on the printing results of MPX-60 because there is no pixels at the highlights in this case.



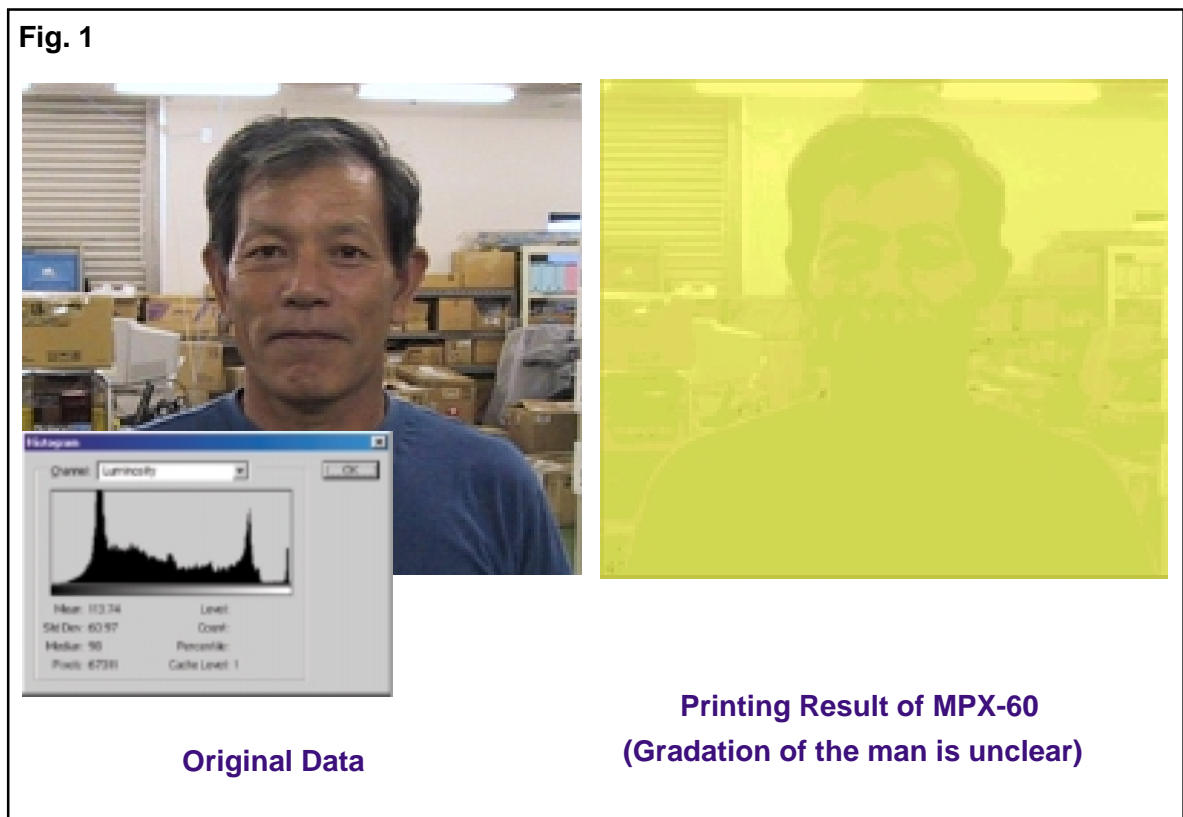
Actual Procedure_Image Correction

This chapter describes the actual procedure for the image correction using a few different kinds of images.

1. Image Correction Using the Curves

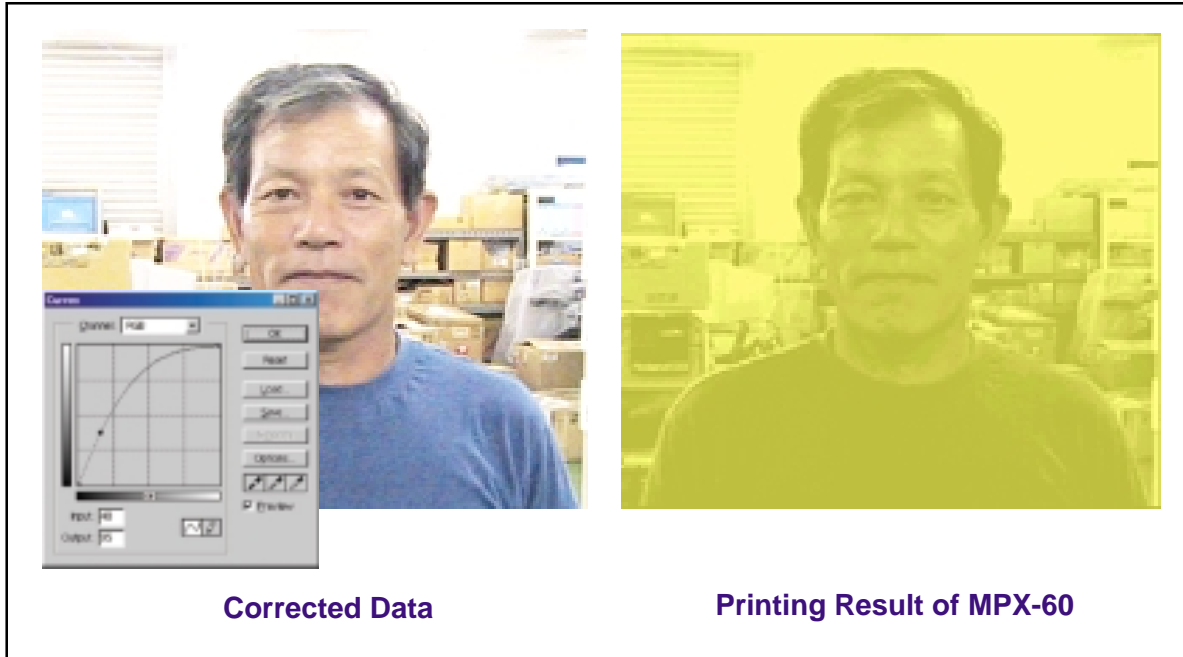
This correction is effective for the images that the pixels are distributed widely in the histogram, and also, the pixels concentrate at shadows, highlights or midtones. (Fig.1) The reason is because this image correction is to extreme the gradation at one area of the image by ignoring the another area.

Take the photograph below for instance, you can estimate that the pixels distributed in the shadows are mainly used for the expressing the man, and the pixels distributed in the highlights are mainly used for the background. When you can acheive the disired printing results by ignoring the backgrund when you like to extreme the man or visa versa. Refer to [1-1. To Exteme the Man] and [1-2. To Exteme the Background] for the procedure.



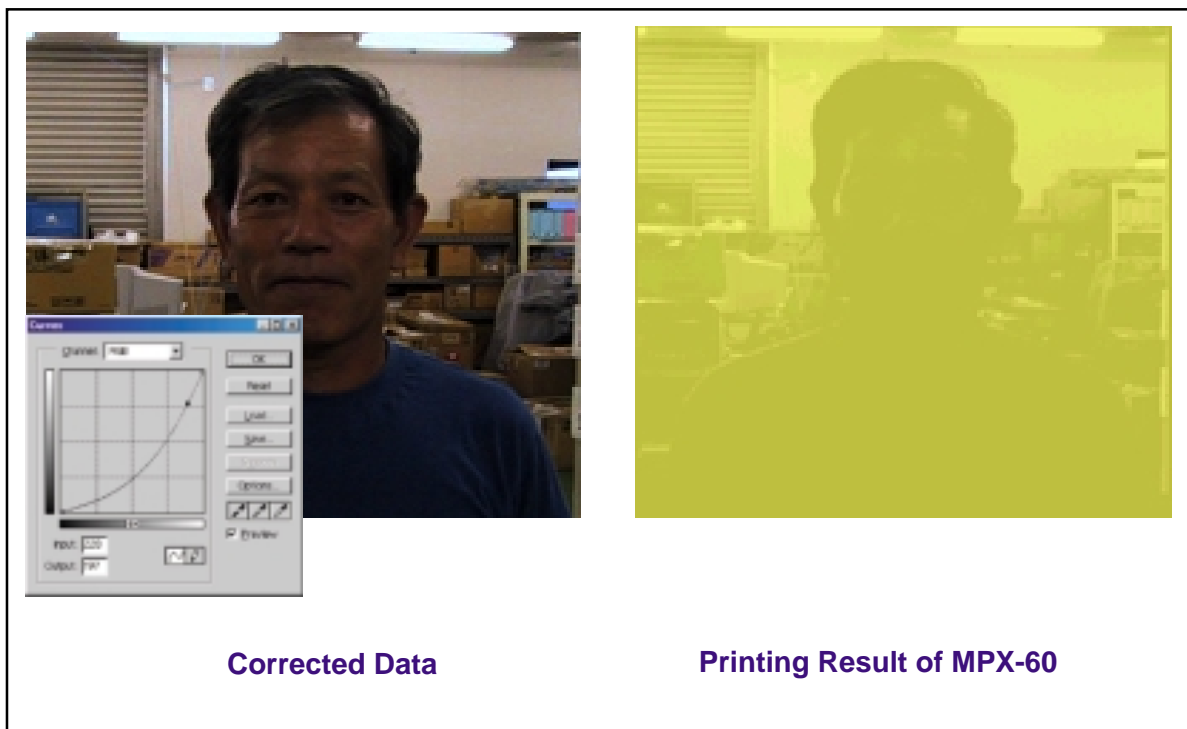
1-1. To Extreme the Man

You can estimate that the pixels used for the man are distributed in the shadows. By adjusting the shadows part of the Curves to be brighter, you can extreme the man. However, on the other hand, the contrast of the highlights is ignored as you can see from the Curves which leads to have blurred printing results for the background of the image.



1-2. To Extreme the Background

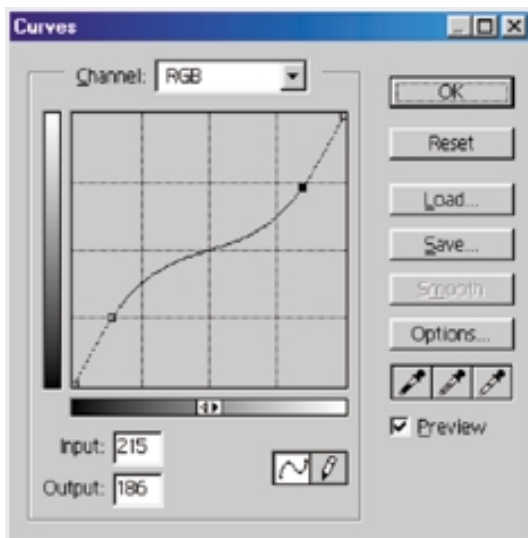
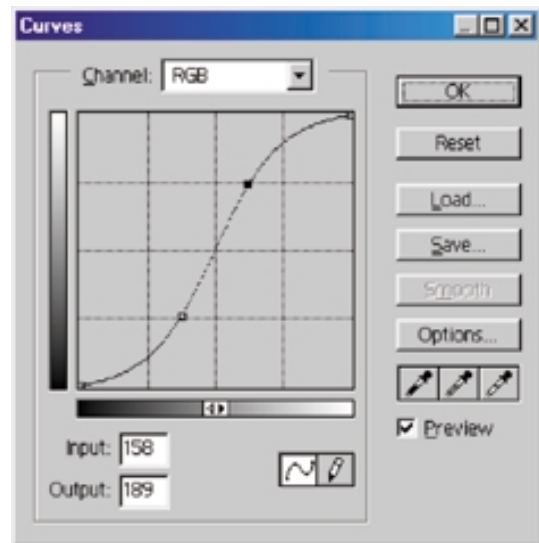
You can estimate that the pixels used for the background are distributed in the highlights. By adjusting the highlights part of the Curves to be darker, you can extreme the background. However, on the other hand, the contrast of the shadows is ignored as you can see from the Curves which leads to have blurred printing results for the man.



1-3. Other Image Correction Using the Curves

By applying the method used at [1-1. To Extreme the Man] and [1-2. Extreme the Background], the following image correction can be done.

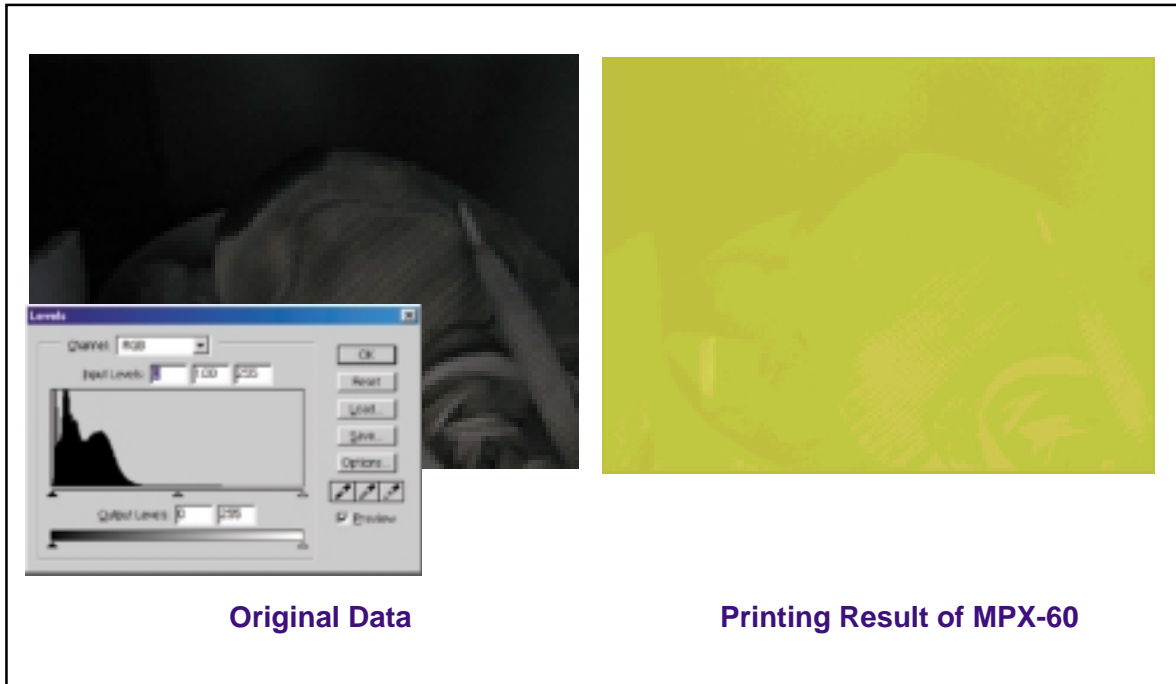
Curves that extremes the tone of the midtones by ignoring the tone at the shadows and highlights



Curves that extremes the tone at both the shadows and highlights by ignoring the tone at the midtones.

2. Image Correction Using the Levels

This correction is effective for the images that the pixels are distributed in the limited range of the histogram, at shadows, highlights or midtones. By distributing the pixels in a wider range of the histogram with this calibration to widen the tone range of the image, you can have brighter or darker printing image with stronger contrast.



2-1. To correct the Levels

Move the level sliders at both ends of the pixels. And click OK.
The dark original data becomes brighter with stronger contrast.

