# COLOR IMAGE SCANNER

## CS610 SERIES

## SERVICE MANUAL

CS610-UM251-02-9370

# HISTORY OF REVISIONS

| No. | Date issued | Description of revision | Page | Edition |
|---|---|---|---|---|
| 1 | 08.05.15 | First Printing. | All | 01 |
| 2 | 08.05.28 | Cord number of the calibration sheet was corrected. | 12-1 | 02 |
| 3 | 08.05.28 | Cord number of the calibration sheet was corrected. | 13-12 | 02 |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# CONTENTS

# 1. OVERVIEW

## 1.1 Features

- **600-dpi optical resolution for high-precision image scanning**
  Scanning with an optical resolution of 600 dpi allows even complex and difficult-to-scan documents, such as CAD drawings, electronic files, and mapping data to be scanned rapidly and with high precision. Scanning Master 21+ (scanner software included as a standard accessory) can be used to adjust the resolution in five levels (50 dpi to 800 dpi/50 dpi to 9600 (PRO) dpi, in 1-dpi increments) to suit the scanned document.
- **Compatible document widths range from 210 mm to 1066 mm**
  **Compatible with document sizes from ISO A4 up to ANSI E (42 inches)**
- **Capable of color and grayscale scanning**
  Capable of scanning in color (24-bit color, 8-bit color) or grayscale (256 shades)
- **Support of automatic thickness detection**
  ITA (Intelligent Thickness Adjustment) supports automatic document-thickness detection.
- **Capable of reading long-axis data**
  Scanning of long-axis images is supported.
- **Compact and lightweight design**
  A compact design was achieved by using a document travel system that employs contact image sensors in the sensor unit (five rows arranged in a zigzag pattern).
- **Image-processing functions**
  Use of the scanning software provided lets you set image-processing functions for the scanning of a document.
- **Interface**
  USB 2.0, Ethernet

## 1.2 Standard Specifications

| Item | | CS610-11eN | CS610-11eN-PRO |
|---|---|---|---|
| Document size | | ANSI E to ISO A4<br>Maximum width: 1092 mm; minimum width: 210 mm | |
| Effective scanning area | | 1092 mm | |
| Guaranteed scanning precision range*3 | | Width: 1,066.8 mm (centered)<br>Length: 16 m *1<br>If the thickness exceeds 1.5 mm, 762 mm (30 inches) maximum | |
| Document thickness | | 841 mm x 1189 mm, maximum thickness 1.5 mm | |
| Optical resolution | | 600 dpi | |
| Interpolated resolution | | From 50 to a maximum of 800 dpi, in 1-dpi increments | From 50 to a maximum of 9600 dpi, in 1-dpi increments |
| Main scanning system | | Contact image sensor system<br>Five A4 sensors in staggered arrangement | |
| Sub scanning system | | Document travel (sheet through) system | |
| Scanning speed*2 | | When the document thickness is 1.5 mm or less (400 dpi, A0)<br>Normal scan / High-speed scan<br>Monochrome: 13 s / Monochrome: 8 s<br>Gray scale: 25 s / Gray scale: 22 s<br>8-bit color: 47 s / 8-bit color: 33 s<br>24-bit color: 47 s / 24-bit color: 33 s<br>When the document thickness is 1.5 mm to 20.32 mm (400 dpi, A0)<br>Normal scan / High-speed scan<br>Monochrome: 34 s / Monochrome: 34 s<br>Gray scale: 41 s / Gray scale: 41 s<br>8-bit color: 45 s / 8-bit color: 40 s<br>24-bit color: 45 s / 24-bit color: 40 s | |
| Scanning precision*3 | | ±0.1%, ±5 pixels | |
| Gradation | | Monochrome: Bilevel, intermediate tones (dither, error diffusion) | |
| | | Gray : 256 shades | |
| | | Color: 8-bit, 24-bit | |
| Threshold value | | Automatic threshold setting by DSP in monochrome mode | |
| Color space | | sRGB compatible | |
| Sensor | Total number of pixels | 25,200 pixels | |
| | Output | Color: 42 bits/pixel<br>Grayscale: 14 bits/pixel | |
| | Light source | LED (RGB) | |
| Interface*4 | | USB 2.0, Ethernet | |
| Output | | Image data | |
| Rated power supply | | 100 to 120 VAC / 200 to 240 VAC ±10%, 50/60 Hz | |
| Operating environment | | Temperature: 10˚C to 35˚C;Humidity: 35% to 80% RH (no condensation) | |
| Power consumption | | 135 VA or less (60 W or less) (6.3W or less in power-saving mode) | |
| External dimensions (approx.) | | 1205 mm (W) X 957 mm (H) X 650 mm (D) (including stand) | |
| Weight (approx.) | | 47 kg (including stand) | |

*1 If the document is a long-length document, the actual length that can be scanned is limited by the available memory (hard disk or other data storage device) of the computer to which the scanner is connected, and also by the grade of the medium being scanned.

*2 Including data-transfer time

The following system was used to measure the scanning speeds.

CPU: Pentium 3.2 GHz or better Memory: 1 GB or more Interface: USB 2.0

The scanning speeds may be slower depending on the PC system used.

*3 Notes on scanning precision

Scanning precision may vary slightly depending on the grade and thickness of the medium being scanned, and on the operating conditions. The precision figures above were measured under the operating conditions described below.

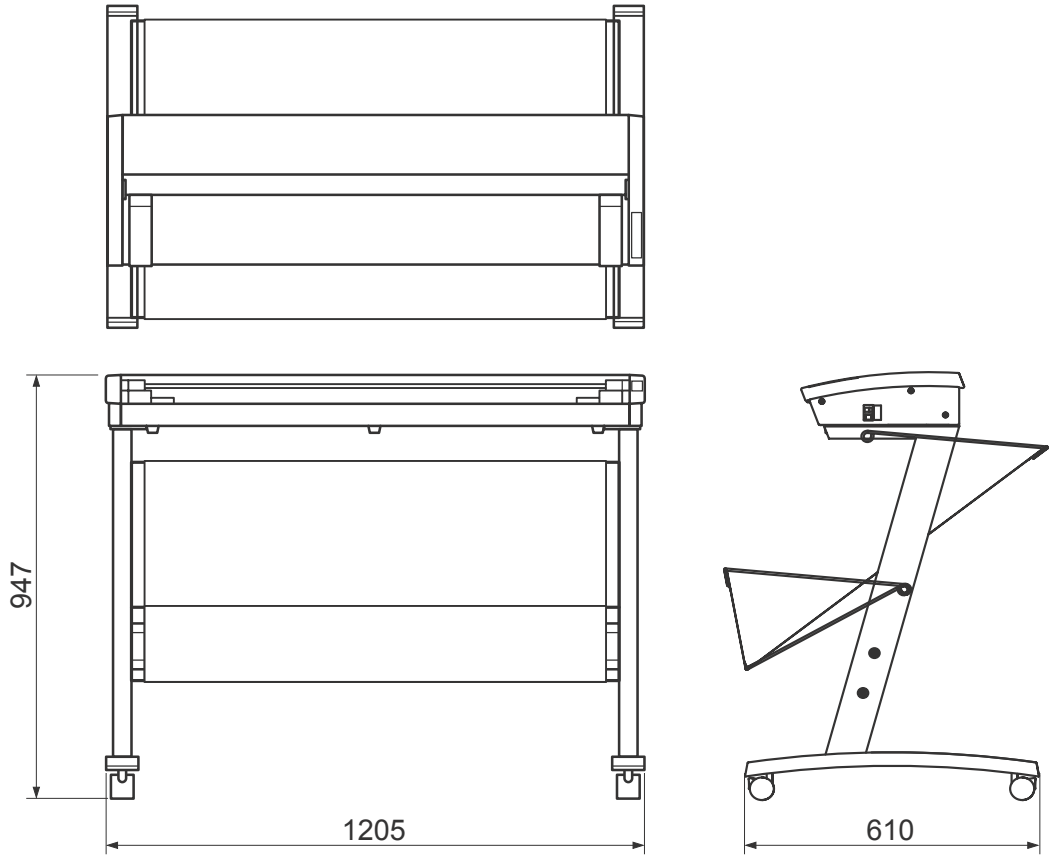
- Test chart used : Mylar sheet #200
- Guaranteed precision conditions : Temperature 20 ±3˚C; humidity: 60% ±10% RH

*4 The USB 2.0 and Ethernet interface cannot be used at the same time.

# 1.3 External View

### External Dimensions

CS610

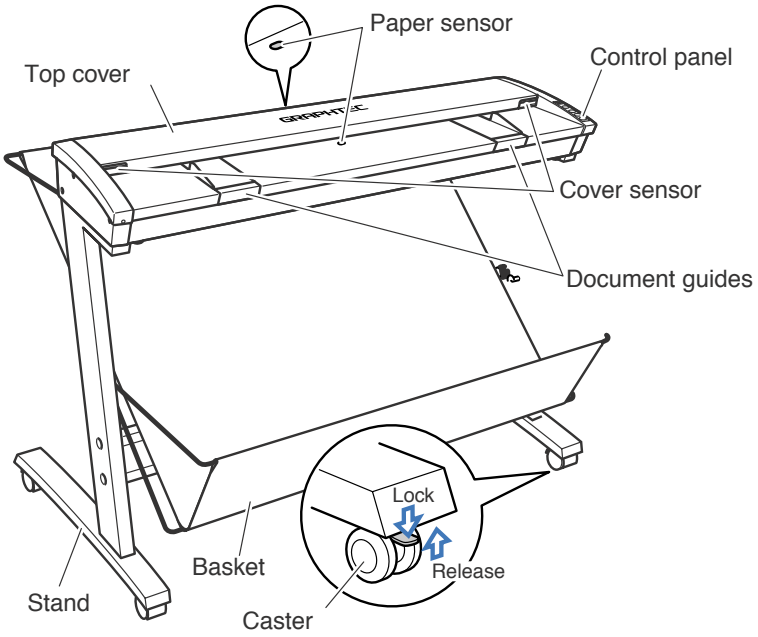



Unit : mm
Dimensional precision error : ±5 mm

# 2. PART NAMES AND FUNCTIONS

## 2.1 Part Names and Functions

### Front View




### Top cover

Open the top cover to clean the document hold-down unit and transparent contact plates.

### Paper sensors

These sense whether a document is present in the scanner.

### Cover sensor

This senses whether the top cover is open or closed, and interrupts scanner operation if the top cover is opened during operation.

### Document guides

Use these guides to determine the position of a document when you load the document.

### Control panel

Use the keys to operate the scanner and the LEDs to monitor the operating status.

### Stand

The stand unit is assembled for mounting of the scanner unit.

### Basket

Receives the document that has been scanned.

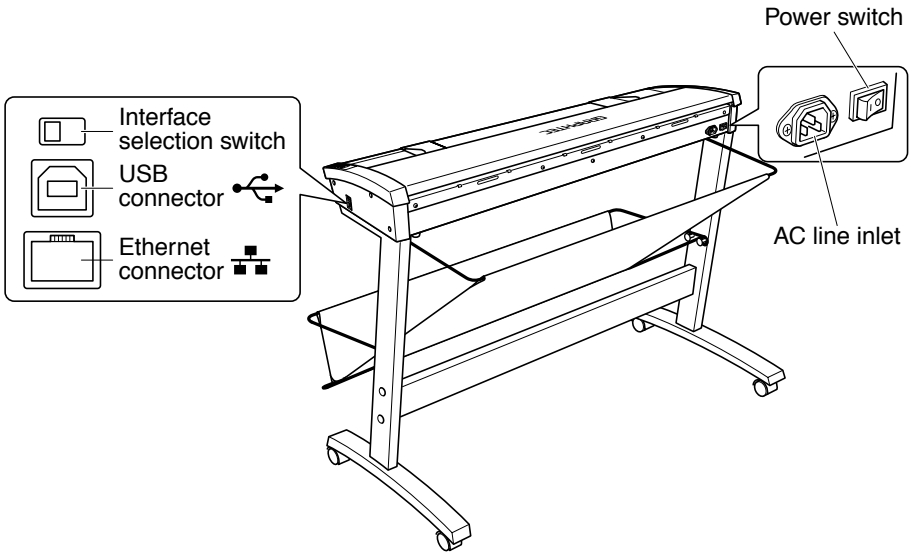
### Casters

Release the lock on the casters to allow the unit to be moved.

**⚠CAUTION**

Do not touch the cover sensors or paper sensors.

### Rear View




### Power switch

Controls the on/off status of the power supply to the scanner.

### AC line inlet

Connect the power cord's female plug here.

### USB connector

Used to connect the USB interface cable.

### Ethernet connector*

Used to connect the Ethernet cable.

*Please do not connect with an Ethernet connector other than an Ethernet cable.

### Interface selection switch

Used to switch between USB and Ethernet (LAN) connection.

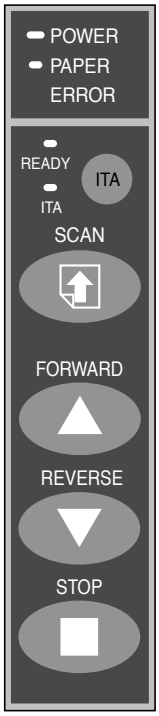
This switch is set to USB connection at the time of shipment.

**⚠CAUTION**

Make sure that the scanner's power supply is turned off before using the interface selection switch to select an interface.

The USB 2.0 interface cannot be used at the same time as the Ethernet interface. Do not connect both the USB and Ethernet cables to a computer, or to two separate computers, at the same time.

## Control panel




### POWER LED

Not lit : Power is turned off.
Lit green : The power is on and the scanner is operating in normal mode.
Flashing orange : The scanner is in power-saving mode.

### PAPER LED

Not lit : Normal mode.
Lit green : The scanner is ready to scan.
Flashing green : The scanner is currently scanning a document (reading image data) or an abnormality in raising/lowering the top cover is detected.

### ERROR LED

Not lit : Normal mode (no errors)
Lit red : Hardware error.
Flashing red : The LED flashes red when a document is detected in the scanner during the power-on selftest, when the STOP button is pressed during scanning, when a paper jam is detected, when the document length is shorter than the scan length,*1 or when an abnormality in raising/lowering the top cover is detected.

*1 If the driver software has been set to check end-of-paper processing.

### ITA button

Switch between ITA (thickness-detection) and READY (normal) modes.

### READY LED

Lit green : READY mode.
Not lit : ITA mode.

### ITA LED

Not lit : READY mode.
Lit green : ITA mode.
Flashing green : The scanner is operating in ITA mode.

| LED / Mode | READY LED | ITA LED |
|---|---|---|
| READY mode | Lit green | Not lit |
| ITA mode | Not lit | Lit green |
| Safety mode* | Not lit | Not lit |

*When something is blocking the scanner.

### SCAN button

If the scanner is connected to a computer, it scans the current document in accordance with the parameters set by the Scanning Master 21+ software. If the software is not active, it is started in order to receive the data from the scanner. *2

*2 This button works during READY mode, but has no effect during ITA mode.

### FORWARD button

• During READY mode
Moves a document into position. If this button is pressed while the scanner is in READY mode, READY mode is cleared and the document is ejected to the rear of the scanner.
• During ITA mode
If a thick document has been placed in the front paper sensor section of the scanner at the time this button is pressed, the thickness-detection process will begin automatically.

### REVERSE button

• During READY mode

Moves the document in the scanner backward. If this button is pressed while the scanner is in READY mode, READY mode is cleared and the document is ejected to rear of the scanner.

• During ITA mode

If a thick document is inserted into the scanner during ITA mode, this button allows you to lower the top cover.

### STOP button

Stops scanning/the automatic thickness-detection process.

# 3. PREPARING TO OPERATE THE SCANNER

## 3.1 System Requirements

The minimum system requirements for running the scanner's hardware and software are listed below.

- ◆ Operating system: Windows 2000 Professional/XP Professional/9XP Home Edition, Vista
- ◆ CPU: Pentium III/4
- ◆ Memory:  32 MB or more
- ◆ Monitor: 1024 × 768 pixels, 256 colors or more
- ◆ Enough disk space to store data
- ◆ Mouse
- ◆ Interface: USB interface*1 that comes standard with your computer or Ethernet interface (10BASE-T/100-BASE-TX).

*1 If your scanner does not operate with the USB interface that comes with your computer, or if your computer does not have a USB 2.0 interface, please contact your sales representative or nearest Graphtec vendor for information on supported add-on cards.

### Recommended environment

#### For binary monochrome data

- ◆ CPU: Pentium 4 or higher
- ◆ Memory: 64 MB or more
- ◆ USB 2.0 interface (that comes standard with your computer)

#### For grayscale data

- ◆ CPU: Pentium 4 or higher
- ◆ Memory: 256 MB or more
- ◆ Monitor: 1024 × 768 pixels, High Color or higher resolution
- ◆ USB 2.0 interface (that comes standard with your computer)

#### For 8-bit/24-bit color data)

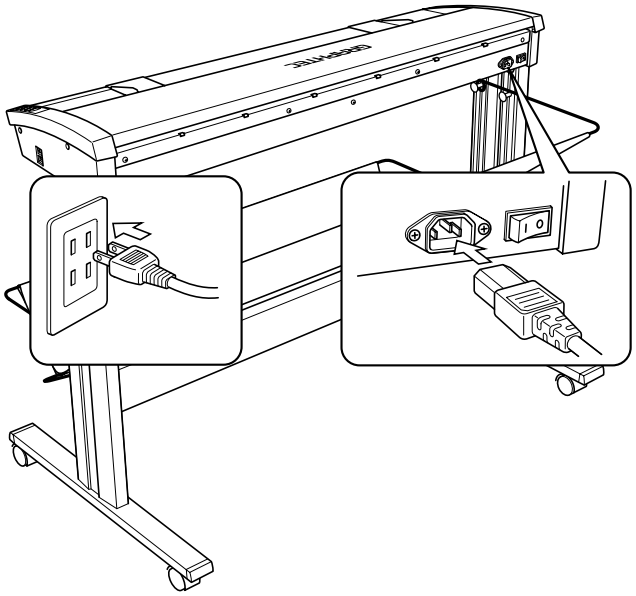
- ◆ CPU: Pentium 4 or higher
- ◆ Memory: 512 MB or more
- ◆ Monitor: 1024 × 768 pixels, True Color or higher
- ◆ USB 2.0 interface (that comes standard with your computer)

**CHECKPOINT**

The system configuration should correspond to the recommended specifications listed here, in order to ensure the optimum capabilities of the scanner.
Use with a system configuration below the recommended specifications will affect the scanning speed and prevent the scanner from operating to its specified capabilities.
To edit an A1-size or larger grayscale document with a resolution of 400 dpi or higher, or color document, you may need more than the recommended memory sizes above. Depending on the type of document, you may not be able to scan in the document even if you increase the memory size.

## 3.2 Connecting the Scanner to a Power Supply

Insert the female plug of the power cord provided into the scanner's AC line inlet and insert its male plug into an electrical socket supplying AC voltage.
Check that the scanner's Power switch remains in the Off position until the connection of the power cord has been completed.



**CHECKPOINT**

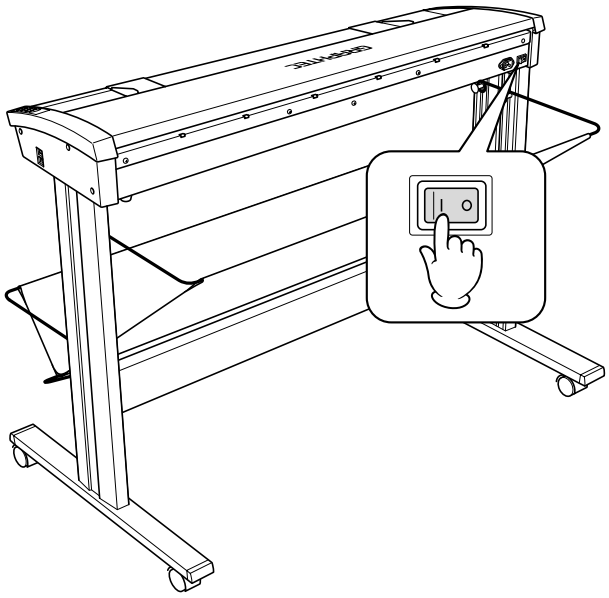
Ensure that the scanner's Power switch is in the Off position.

**⚠CAUTION**

Make sure that your scanner is properly grounded. If it is not grounded, there is a possibility that noise will cause incorrect operation, or that the scanned image may be distorted.

### Turning the Scanner On or Off

Whenever the scanner's Power switch is turned on, the POWER, PAPER, and ERROR lamps on the control panel light up. When the scanner has been initialized, the POWER lamp lights up.



**CHECKPOINT**

When resetting the scanner by turning it off then back on again, wait at least five seconds before turning it back on.

## 3.3 Connecting the Scanner to a Computer

The scanner can be connected to a computer using the USB interface or the Ethernet interface.

**⚠CAUTION**

The operation of the scanner cannot be guaranteed in the following cases:

- When the cable is connected to a USB hub or an add-on USB board.
- When you are using a custom-built computer or one that you have modified.

The following should never be attempted:

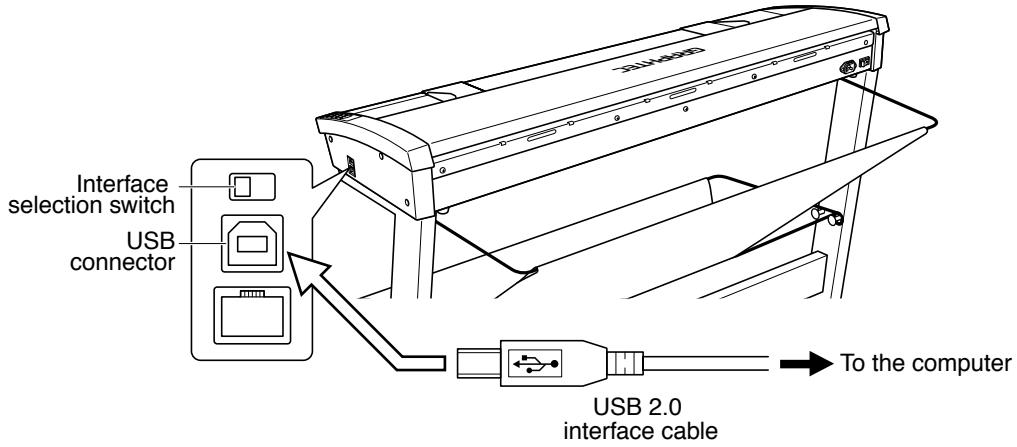
- Remove or reinsert the cable while you are installing the driver.
- Remove or reinsert the cable while starting up the computer or the scanner.
- Remove or reinsert the cable within a period of 5 seconds.
- Remove or reinsert the cable while transferring data.
- Connect two or more scanners to a single computer.

The USB and Ethernet interface connectors cannot be used at the same time. Do not connect both the USB and Ethernet interface cables to a computer, or to two separate computers, at the same time.

### Connecting the scanner via a USB 2.0 interface

(1) Move the interface selection switch to the USB position.

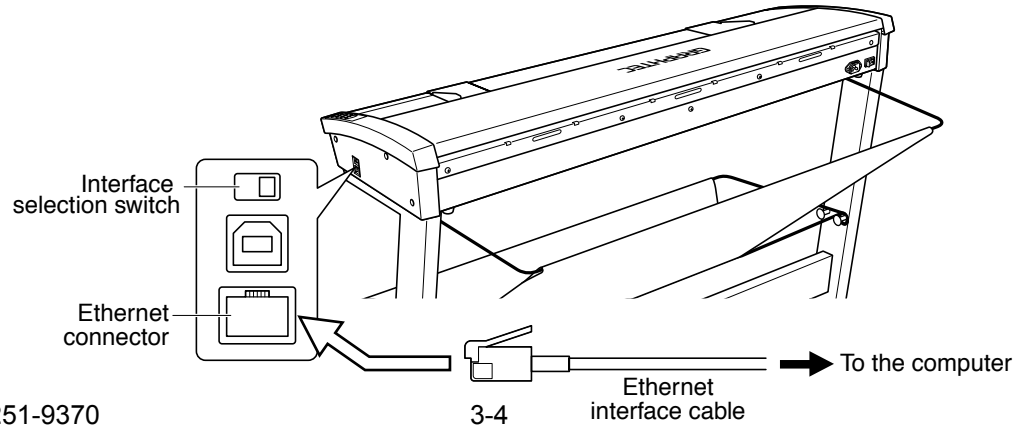
(2) Ensure that you have a USB 2.0 interface cable that works with your computer. Plug the USB 2.0 interface cable into the USB connector socket situated on the right-hand side of the scanner unit.




### Connecting the scanner via an Ethernet interface

(1) Move the interface selection switch to the Ethernet (LAN) position.

(2) Ensure that you have an Ethernet cable that works with your computer.
Plug the Ethernet cable into the Ethernet connector located on the right-hand side of the scanner unit.



# 4. INSTALLING THE SOFTWARE

**CHECKPOINT**

The procedure outlined below is based on the requirement that you are logged on to Windows with administrator rights. Consult your Windows 2000, Windows XP or Windows Vista manual or Windows Help for more information.

## 4.1 Installing the Driver Software

### 4.1.1 Installing the Driver Software for Windows 2000

The following procedure assumes that you are using the CS610-11eN as part of your system, and that you are using the USB interface. The scanner name displayed in the windows is the name of the scanner connected to the computer (CS610-11eN is used in this section).

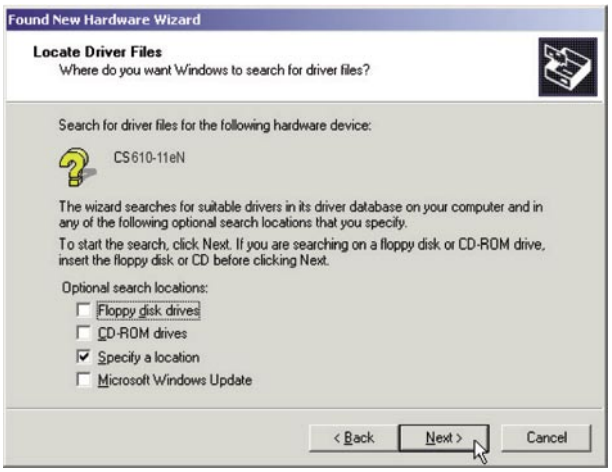
(1) Connect the scanner to the computer, and turn on the computer's power. Insert the CD-ROM disk (included with your computer) into the CD-ROM drive of the computer after Windows has started up, and then turn on the scanner's power.

(2) The message below appears.

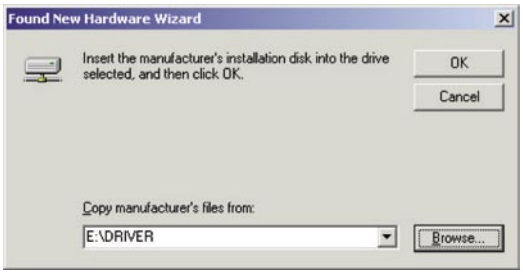

(3) Next, the Found New Hardware Wizard appears.


(4) Click the Next button to proceed to the menu for installing the driver.

(5) Select the option “Search for a suitable driver for my device (recommended)” and click Next.




(6) Select the check box entitled “Specify a location” and click Next.

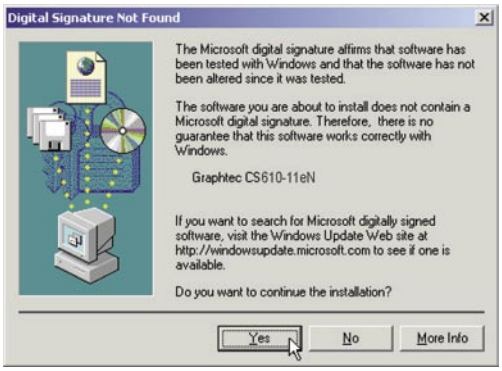



Click Browse and select the DRIVER folder in the CD-ROM drive or enter a CD-ROM drive name and \DRIVER using the keyboard.

**Example**: For drive E, enter “E:\DRIVER.”

(7) When you click OK the wizard will start searching for the driver. The screen shown below is displayed when the wizard has finished searching.

(8) The screen shown below is displayed when you click Next.




Click Yes to continue the installation.

(9) The screen shown below is displayed when the wizard has finished installing the driver.


Click the Finish button.

(10) The Windows 2000 Desktop appears and the Scanner is acknowledged by the computer.

### 4.1.2 Installing the Driver Software for Windows XP

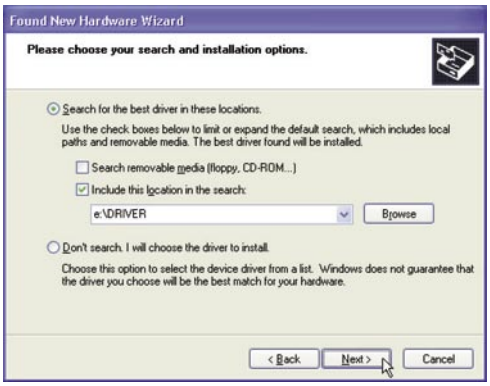
The following procedure assumes that you are using the CS510-11eN as part of your system, and that you are using the USB interface. The scanner name displayed in the windows is the name of the scanner connected to the computer (CS610-11eN is used in this section).

(1) Connect the scanner to the computer, turn on the scanner first, and then turn on the computer. When Windows starts up, insert the CD-ROM supplied with the scanner in the CD-ROM drive. Turn on the power to the scanner.

(2) Next, the Found New Hardware Wizard window appears.


Select the option “Install from a list or specific location (Advanced)”.

(3) The screen shown below is displayed when you click Next.

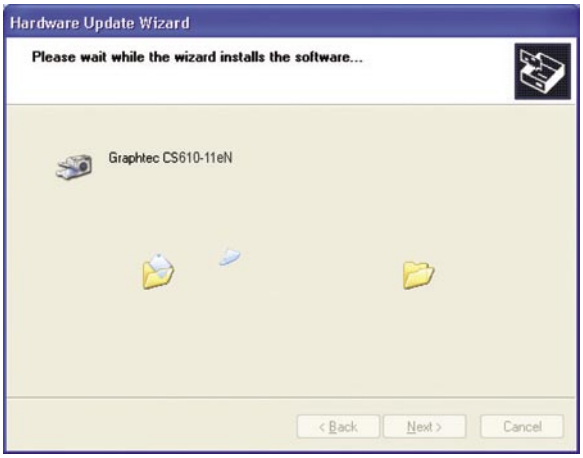



Select the option “Search for the best driver in these locations” and select the check box entitled “Include this location in the search”.

Click Browse and select the DRIVER folder in the CD-ROM drive or enter a CD-ROM drive name and \DRIVER using the keyboard.

**Example**: For drive E, enter “E:\DRIVER.”

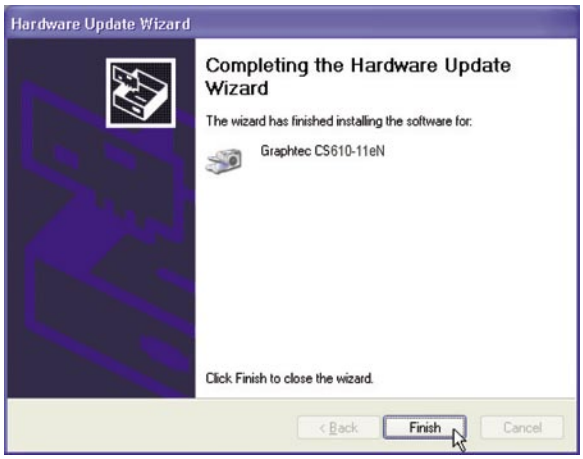
(4) When you click Next the wizard will start searching for the driver.



(5) The screen shown below is displayed.


Click Continue Anyway to continue the installation.

(6) The screen shown below is displayed when the wizard has finished installing the driver.




Click the Finish button to close the “Welcome to the Found New Hardware” wizard.

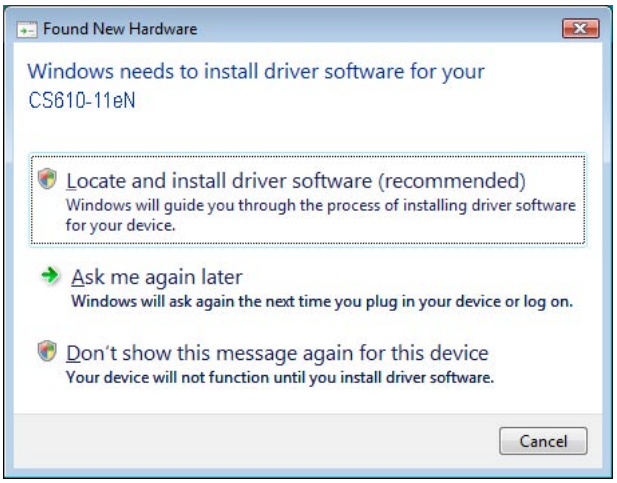
(7) The Windows XP desktop appears, and the scanner is recognized by the computer.

### 4.1.3 Installing the Driver Software for Windows Vista

The following procedure assumes that you are using the CS610-11eN as part of your system, and that you are using the USB interface. The scanner name displayed in the windows is the name of the scanner connected to the computer (CS610-11eN is used in this section).

(1) Connect the scanner to the computer, turn on the scanner first, and then turn on the computer. When Windows starts up, insert the CD-ROM supplied with the scanner in the CD-ROM drive. Turn on the power to the scanner.

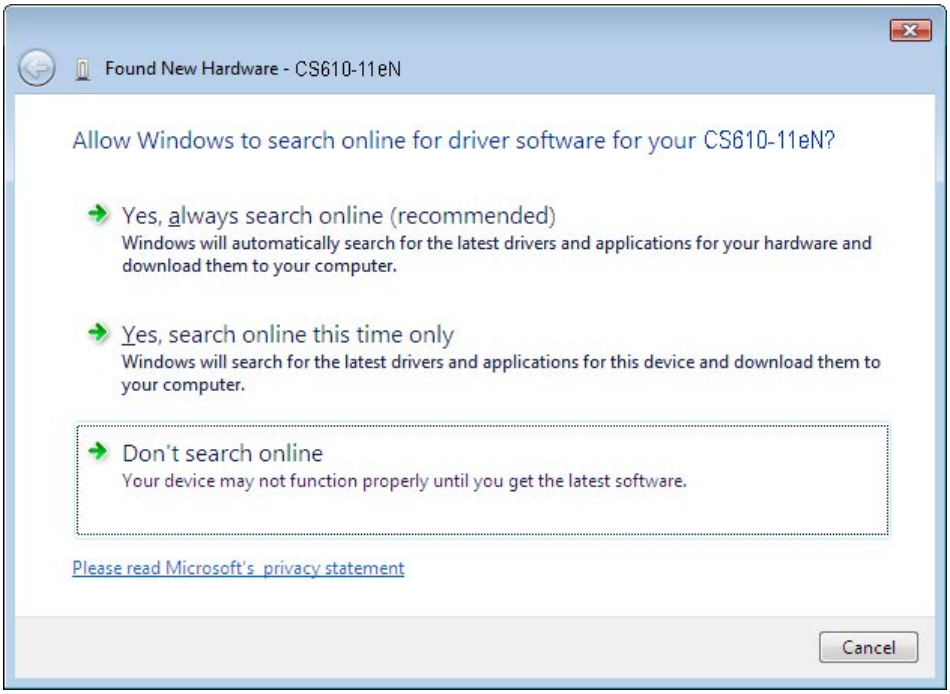
(2) The following window appears.



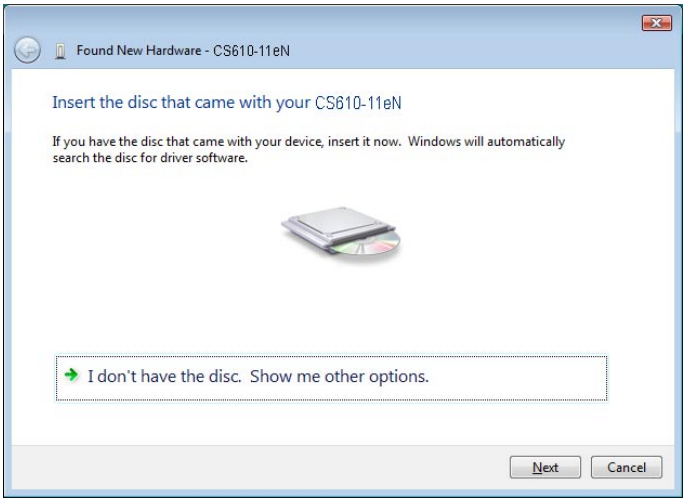

Select the option “Locate and install driver software (recommended)”.

(3) The screen shown below is displayed when you click “Scanners and Cameras”. Click [Continue] to continue the installation.

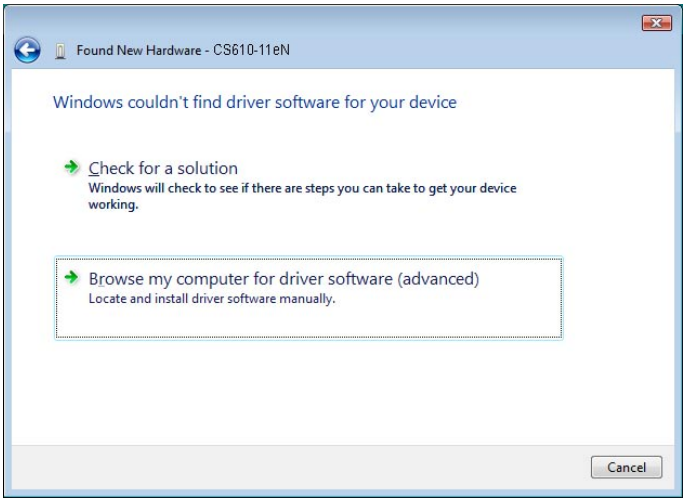
(4) The following window appears.



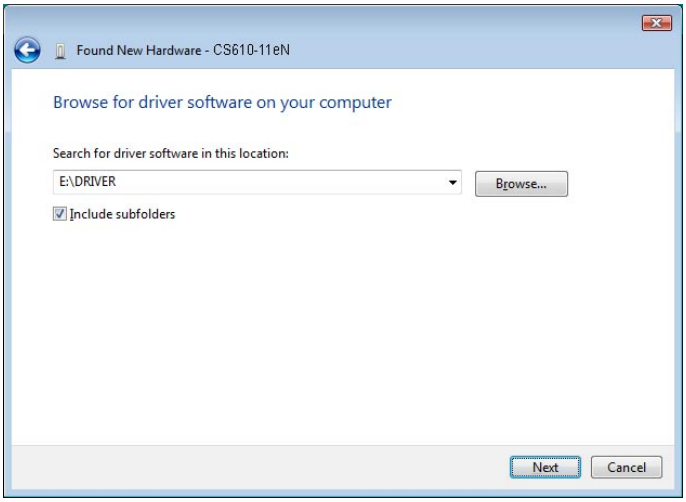
(5) Click “Don’t search online”. The following window appears.




(6) Click “I don’t have the disc. Show me other options.” The following window appears.

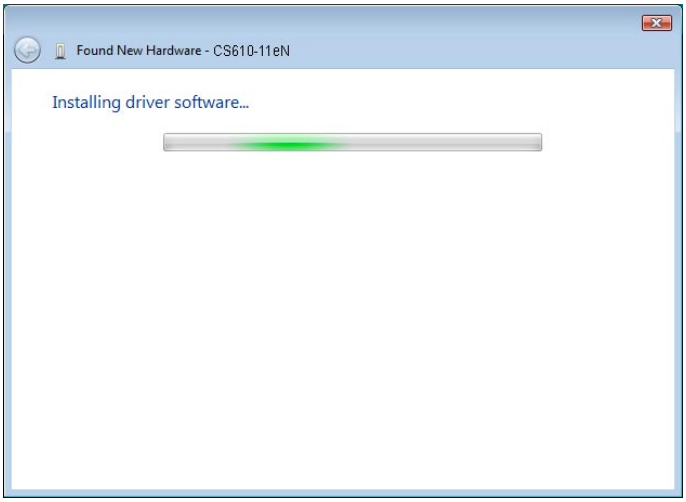



(7) Click “Browse my computer for driver software (advanced)”. The following window appears.




Click [Browse] and select the DRIVER folder in the CD-ROM drive or enter the CDROM drive name and \DRIVER using the keyboard.
Example: For drive E, enter “E:\DRIVER.”

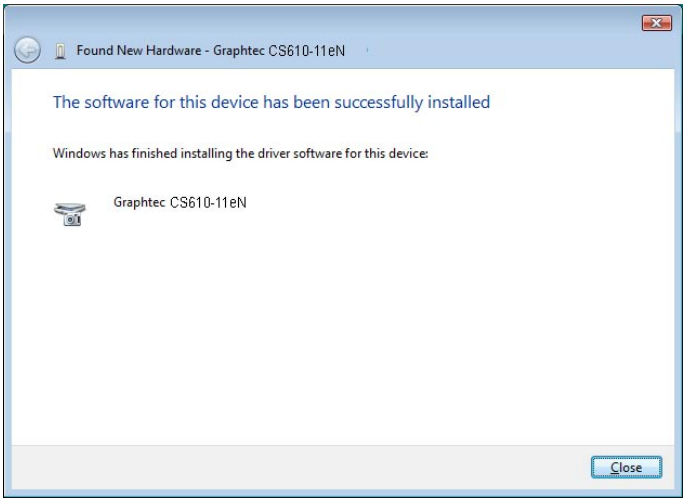
(8) When you click [Next] the wizard will start searching for the driver.




(9) The following window appears.


Click [Install] to continue the installation.

(10) The screen shown below is displayed when the wizard has finished installing the driver.




Click [Close] to close the “Found New Hardware” wizard.

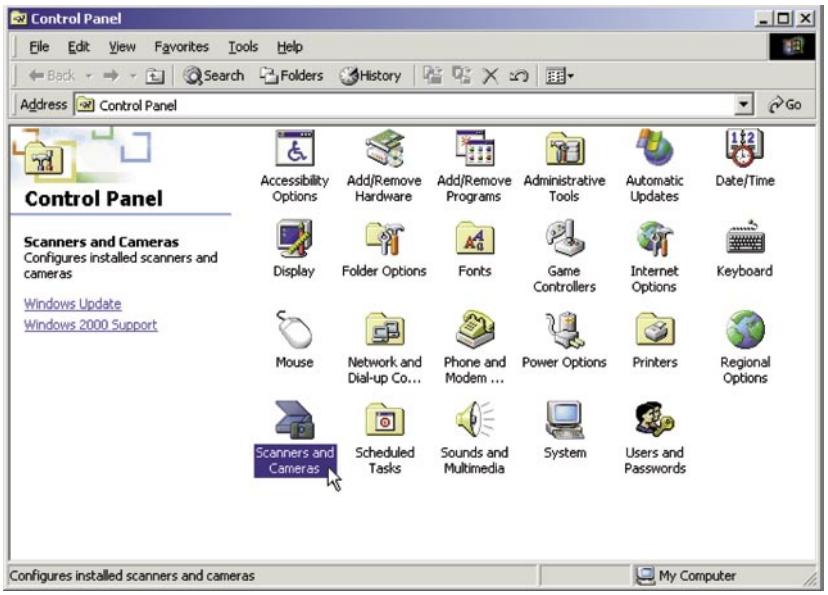
(11) The Windows Vista desktop appears, and the scanner is recognized by the computer.

# 4.2 Checking the Interface Connection

## 4.2.1 Checking the Interface Connection for Windows 2000

The procedure outlined below assumes that the CS610-11eN is connected in your system.
The scanner name displayed in the windows is the name of the scanner connected to the computer (CS610-11eN is used in this section).

(1) Launch the Control Panel using the Start menu.




(2) The screen shown below is displayed when you click on the **"Scanners and Cameras"** icon.

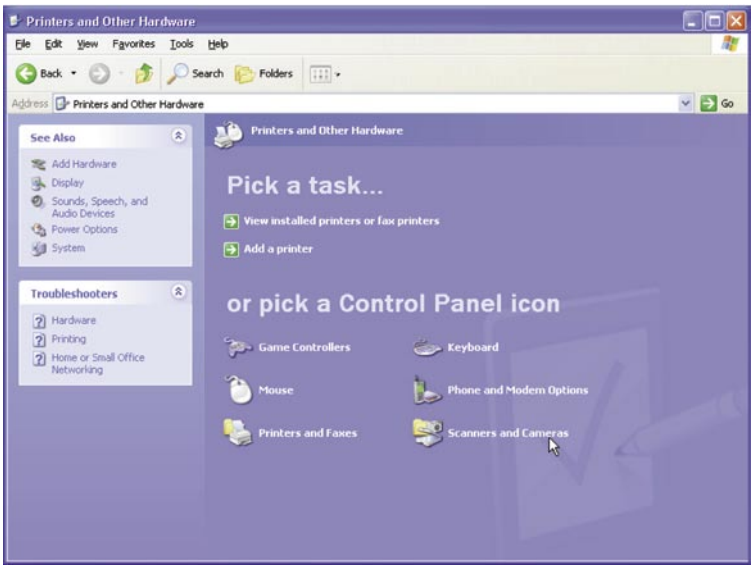

Ensure that **"Graphtec CS610-11eN"** is indicated here.

### 4.2.2 Checking the Interface Connection for Windows XP

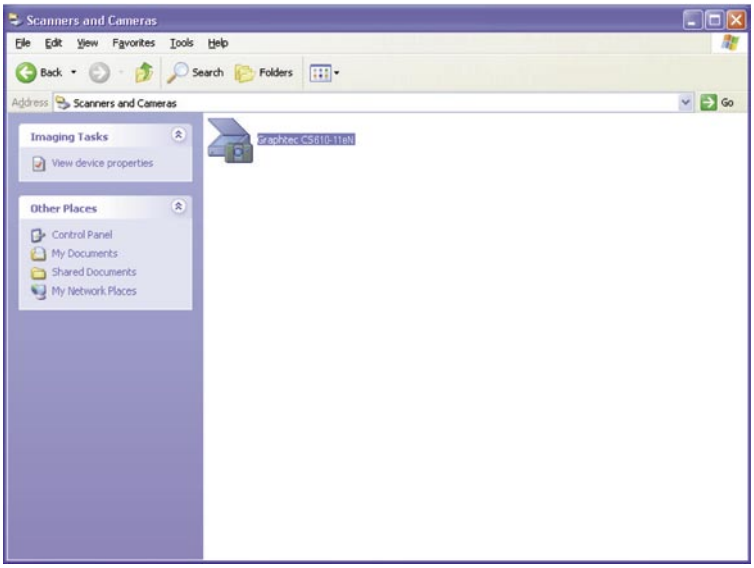
The procedure outlined below assumes that the CS610-11eN is connected in your system.
The scanner name displayed in the windows is the name of the scanner connected to the computer (CS610-11eN is used in this section).

(1) Launch the Control Panel using the Start menu.

(2) The screen shown below is displayed when you click on the **"Printers and Other Hardware"** icon.




(3) The screen shown below is displayed when you click on the **"Scanners and Cameras"** icon.
Ensure that **"Graphtec CS610-11eN"** is indicated here.

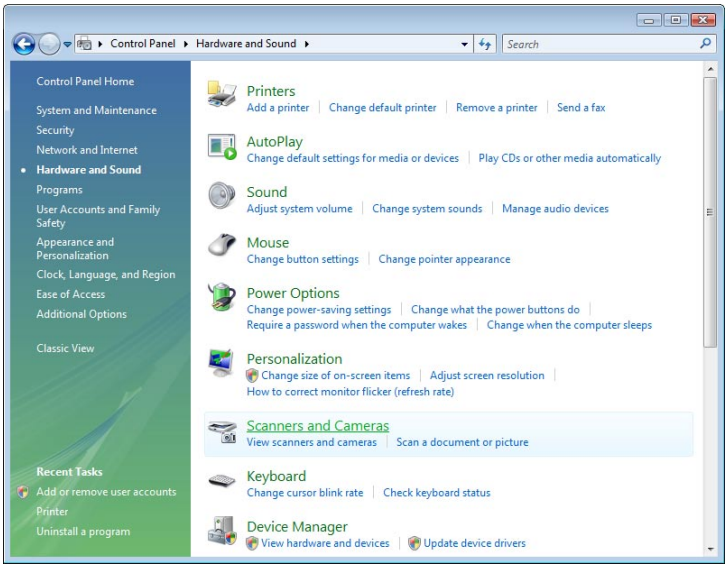


### 4.2.3 Checking the Interface Connection for Windows Vista

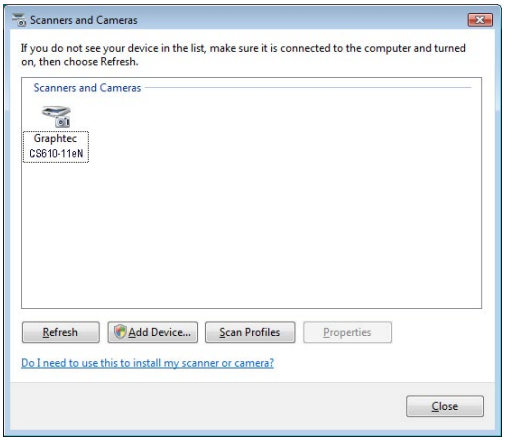
The procedure outlined below assumes that the CS610-11eN is connected in your system.
The scanner name displayed in the windows is the name of the scanner connected to the computer (CS610-11eN is used in this section).

(1) Launch the Control Panel using the Start menu.

(2) The screen shown below is displayed when you click on the "Hardware and Sound".




(3) The screen shown below is displayed when you click on the **“Scanners and Cameras”** icon.
Ensure that **“Graphtec CS610-11eN”** is indicated here.



## 4.3 Installing the Scanning Master 21+ Application

The Scanning Master 21+ “OPS112” is a software application for using a Graphtec scanner to scan image data.

### Operating Environment

Windows 2000 Professional/XP Professional/XP Home Edition/Vista

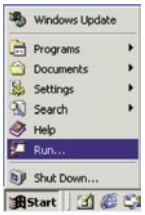
### Installation Procedure

(The following steps are explained using the Windows 2000 windows.)

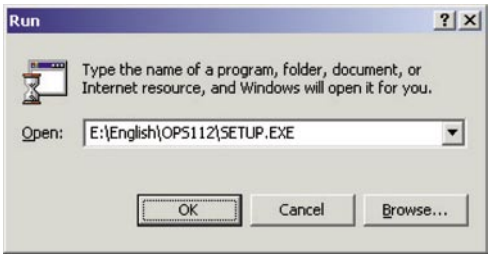
(1) Boot Windows 2000.

(2) Insert the User Guide CD-ROM containing the OPS112 program files into the computer’s CD-ROM drive.

(3) Click the Taskbar’s Start button, then click the Run... icon.




(4) Enter the CD-ROM drive name and English\OPS112\SETUP.EXE as the name of the file you wish to open.
If the disk is in drive E, for example, enter **“E:\English\OPS112\SETUP.EXE”** in the box.




(5) Click the OK button to run the OPS112 setup program. From this point on, follow the setup program’s instructions to install the OPS112 application.

• If the application has been properly installed, **“Scanning Master 21+”** will be newly listed in the Programs menu accessed from the Start button.

---

**TIP**

For more details, open the README.TXT file provided in the “Scanning Master 21+” folder.

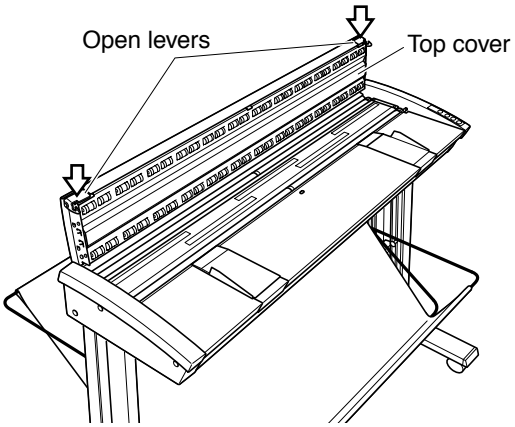
---

# 5. DAILY MAINTENANCE

## 5.1 Opening and Closing the Top Cover

(1) Turn off the scanner's power.

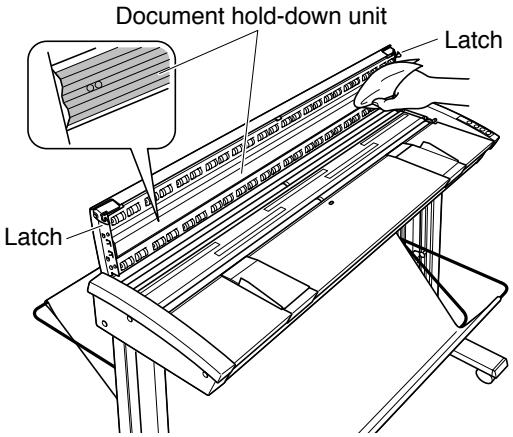
(2) Push the left and right open levers on the top cover to unlock them, and hold the middle part of the top cover while you open the top cover by about 90 degrees.




(3) Close the top cover until the left and right latches on the top cover lock into position, making sure that you don't get your fingers caught.

## 5.2 Cleaning the Document Hold-Down Unit

(1) Turn off the scanner.
(2) Open the top cover as described in Section 5.1 “Opening and Closing the Top Cover”.
(3) Wipe clean the underside of the document hold-down unit (see below) using a soft cloth that has been soaked in water or diluted neutral detergent and thoroughly wrung out.




(4) Wipe the document hold-down unit once again using a soft, dry cloth (remove all moisture).
(5) Close the top cover as described in Section 5.1 “Opening and Closing the Top Cover”.
Take care not to get your fingers caught in the cover.

**⚠CAUTION**

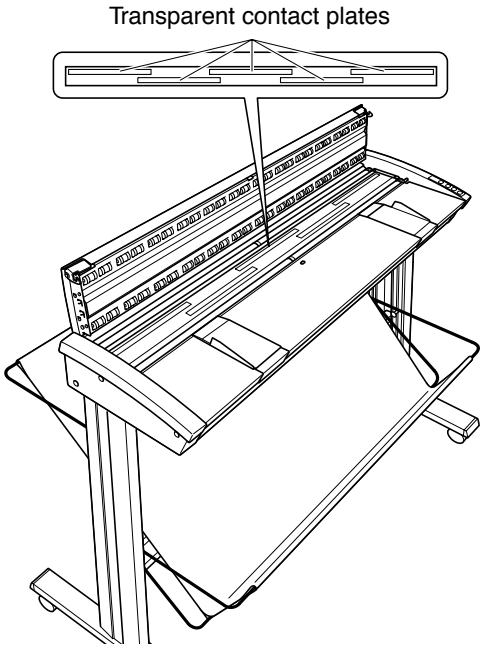
Scanning may be affected if the underside of the document hold-down unit becomes scratched or dirty. It must be cleaned when necessary.

## 5.3 Cleaning the Image Sensors

The scanner's image quality drops when the transparent contact plates over the image sensors become dirty, so clean the image sensors whenever necessary.

### Procedure

(1) Turn off the scanner.
(2) Open the top cover as described in Section 5.1 "Opening and Closing the Top Cover".
(3) As shown below, wipe off any soiled areas on the transparent contact plates using a soft cloth that has been moistened with water or a neutral detergent (diluted with water) and firmly wrung out.




(4) Completely remove any moisture on the transparent contact plates by wiping them off again using a soft, dry cloth.
(5) Close the top cover as described in Section 5.1 "Opening and Closing the Top Cover".
Take care not to get your fingers caught in the cover.

**CHECKPOINT**

Do not use a commercial cleaner for office equipment, a glass cleaner, or chemical solvents such as solutions containing alcohol.

**⚠CAUTION**

Although the glass scanning table is not a maintenance part that requires periodic replacement, it is a consumable part because its surface may receive slight scratches due to minute particles of dust and other foreign matter. If document scanning produces unsatisfactory results (unexpected white or black streaks in the data) due to scratches on the glass table or other reasons, please perform the calibration procedure (see Section 4.6, "Calibration"). If the scanning results do not improve after calibration, the glass table will need to be replaced.

## 5.4 Cleaning the Paper Sensors

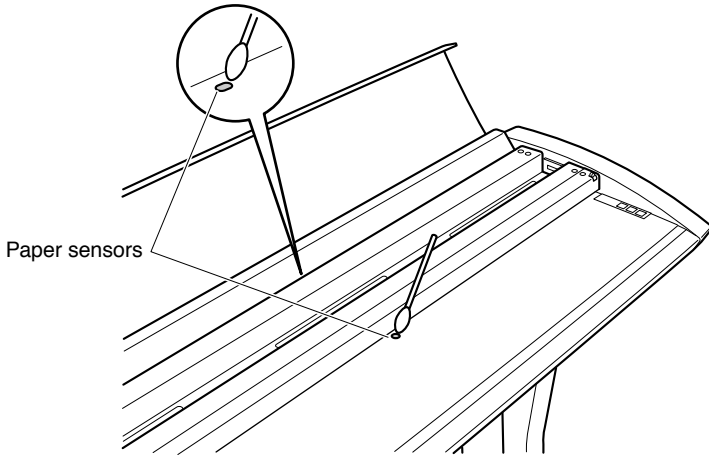
**⚠CAUTION**

Accumulated dust on the paper sensors may prevent the document from being detected. The sensors must be cleaned when necessary.

(1) Turn off the scanner.

(2) Open the top cover as described in Section 4.1 “Opening and Closing the Top Cover”.

(3) Wipe the two paper sensors using a cotton swab.




(4) Close the top cover as described in Section 4.1 “Opening and Closing the Top Cover”.
Take care not to get your fingers caught in the cover.

**⚠CAUTION**

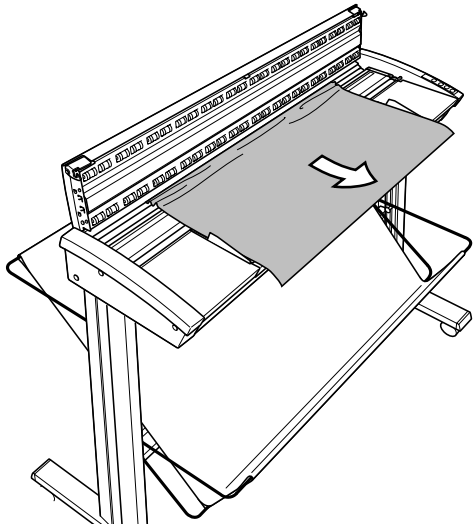
Use a cotton swab or something equally soft to gently wipe the paper sensors. Do not use any chemicals to clean the sensors.

## 5.5 Removing a Jammed Document

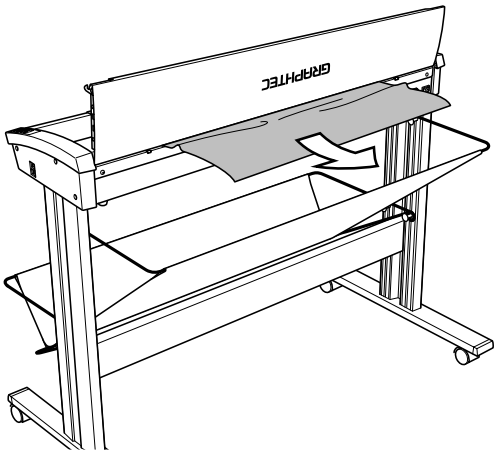
If a document becomes jammed in the scanner during scanning or another operation, immediately turn off the scanner, and then remove the jammed document.

**Procedure**

(1) Turn off the scanner.
(2) Open the top cover as described in Section 4.1 “Opening and Closing the Top Cover”.
(3) If the document is jammed at the front, remove the document from the inside by pulling it forward.



(4) If the document is jammed at the rear, remove the document from the inside by pulling it toward the rear.




(5) Close the top cover as described in Section 4.1 “Opening and Closing the Top Cover”.
Take care not to get your fingers caught in the cover.

## 5.6 Calibration

Calibrate the scanner if scanning quality is observed to deteriorate, with scanned results such as those described below:

- The scanned image is distorted
- Areas of uneven color appear in the scanned image
- Other unsatisfactory results (but not including problems related to media quality, such as folds, wrinkling, or paper curling)

**⚠CAUTION**

- Handle the calibration sheet with care so that it does not get bent. To prevent soiling, store it in its special storage box. The calibration sheet cannot be used if it is bent or soiled.
- The calibration sheet is a paper product. Do not attempt to clean it with any type of liquid cleaner.
- The calibration sheet is a consumable item. Replacement sheets can be purchased from your sales representative or nearest Graphtec vendor.

### Preparation and checks

Recommended usage environment

- Monitor: 1024 x 768 pixels, High Color or better resolution

**TIP**

A low-resolution monitor will make it difficult to discern any problem areas.

### Launching the Scanner Adjustment Program

(1) Connect the scanner to the PC and switch on the scanner. Switch on the PC.
(2) Install Scanning Master 21+ (OPS112) if it is not already installed.
(3) Click the **Start** button, then select **Programs** > **Scanning Master 21+** > **Scanner Adjustment**.
(4) Click **Scanner Adjustment** to launch the **Scanner Adjustment** program.

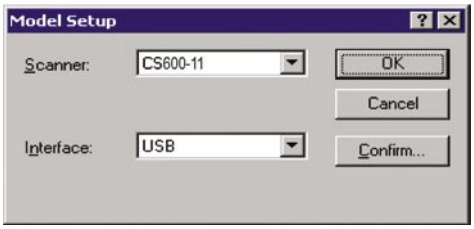
## Scanner Calibration

Before beginning calibration, clean the transparent contact plates and scanner table surface.
Any dust or dirt on this surface may affect calibration results and resulting image quality.
Check that the calibration sheet is free of any dust or dirt.

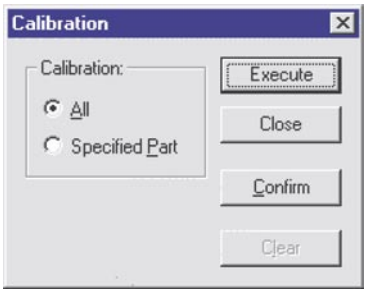
**⚠CAUTION**

The calibration procedure will take some time. Do not switch off the scanner while calibration is underway. Accidentally switching off the scanner may result in damage that requires servicing.

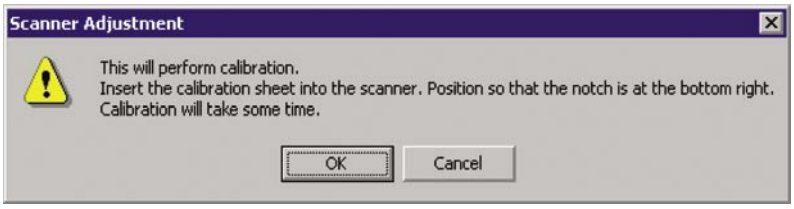
(1) Connect the scanner to the computer. Switch on the scanner, then switch on the PC.
(2) Launch the **Scanner Adjustment** program (as described earlier).
(3) Select **Model Setup** on the **Scanner** menu.



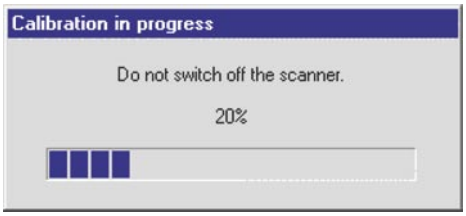

(4) Select the connected scanner and click the **OK** button.
(5) Select **Calibration** on the **Scanner** menu.



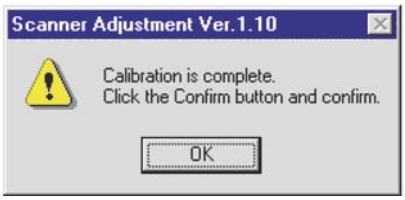

(6) Select **All** in Calibration and click the **Execute** button.
(7) The following message is displayed. Insert the calibration sheet into the scanner as instructed.




(8) Clicking the **OK** button begins calibration.



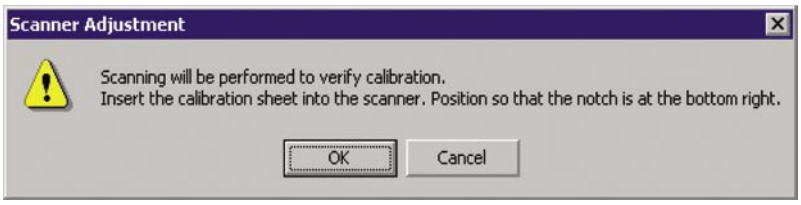

(9) Calibration ends after approximately 10 minutes.




Click the **OK** button to complete calibration.

(10) To check the calibration results, click the **Confirm** button in the **Calibration** menu (shown in step (5) above).

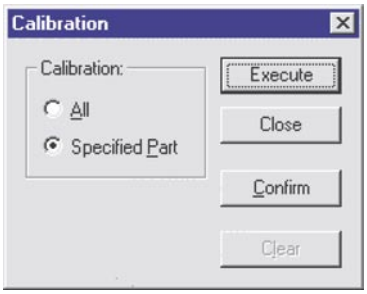
(11) The following message is displayed. Insert the calibration sheet into the scanner as instructed.




(12) Click the **OK** button to start scanning.
The scanned data is displayed when scanning is complete. Colors may differ slightly for individual sensors to make it easier to identify problem areas in calibration. This does not indicate a defect.
Check that there are no vertical streaks, such as white patches, in the scanned data.
(Streaks occur when calibration is not performed correctly due to contamination by dust or dirt.)

(13) If the data is normal, calibration is complete.
Click the **Close** button and exit the **Scanner Adjustment Program**.

(14) If any abnormal data is observed, specify the problem areas as follows:
Select Specified Part in Calibration.




(15) The mouse arrow cursor changes to a cross cursor when moved over the data. Click the left mouse button with the mouse positioned over the streak data. The selected area is shown in blue. Repeat this procedure for any additional streaks.
Areas that have been selected (shown in blue) can be deselected by clicking the left mouse button again. To deselect all selected areas, click the Clear button.

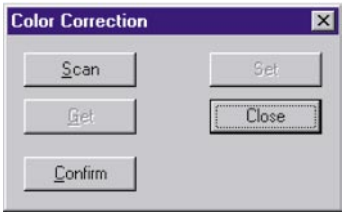
(16) Once all required areas have been specified, remove the calibration sheet and clean the glass and table surfaces. Check the calibration sheet for dust and dirt, then click the Execute button.

(17) Return to step (10) and verify the calibration results.

## Color Correction

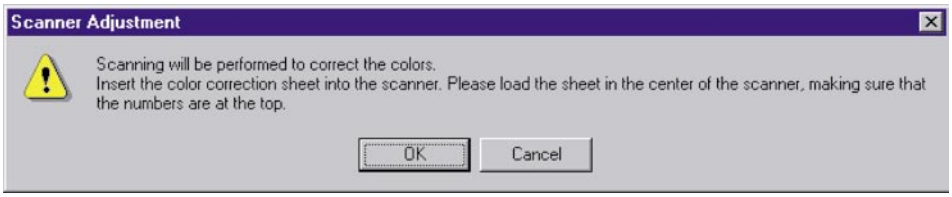
Perform color correction if there is any discrepancy in color in parts of the scanned image even after you have calibrated the scanner.

(1) Select Color Correction on the Scanner menu.




(2) Click the Scan button.

(3) The following message is displayed. Insert the color correction sheet in the scanner.



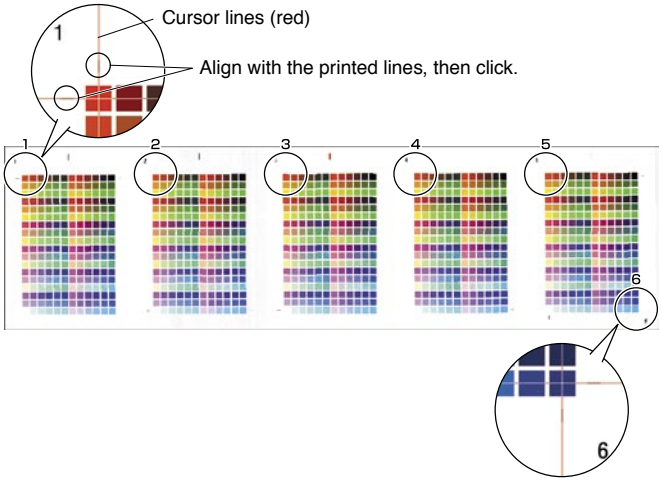

**CHECKPOINT**

Position the color correction sheet so that the red bar in the center of the sheet is centered in the scanner (but with the printed side down).

(4) Click the OK button to start scanning.
The scanned data is displayed when scanning is complete. Colors may differ slightly for individual sensors, but this does not indicate a defect.

(5) When the data is displayed, click the Get button.

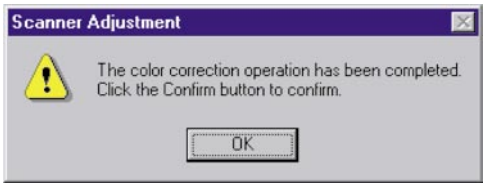
(6) Click in the center of the color tile indicated by the numbers 1 to 6, in ascending order.
For numbers 1 to 5, click the center of the upper left tile; for number 6, click in the center of the bottom right tile. Align the cursor crosshairs with the printed lines at the sides of the tile.




**CHECKPOINT**

- The next reference point to be checked is displayed on the Status bar.
- If you click in error, click the Esc. key to cancel the operation and return to the immediately previous step.
- If you click on the wrong tile, color correction will not be performed correctly and the colors of the image displayed after color correction will be incorrect.

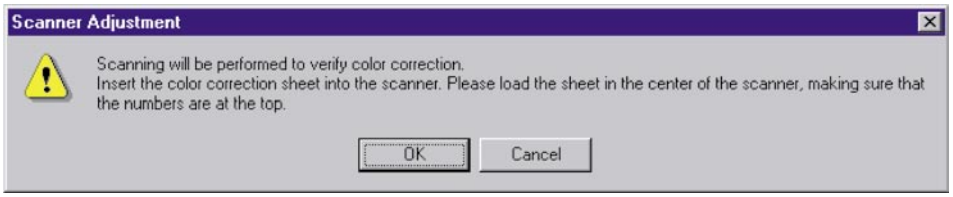
(7) After you have clicked tile number 6, click the Set button.




Click the OK button.

(8) To check the color correction results, click the Confirm button.

(9) The following message is displayed. Insert the color correction sheet in the scanner as instructed.




**CHECKPOINT**

Position the color correction sheet so that the red bar in the center of the sheet is centered in the scanner (but with the printed side down).

(10) Click the OK button to start scanning.
After scanning has been completed, an enlarged view of the color-corrected data is displayed.

(11) Click the Fit icon to display the entire image, and check whether there is any discrepancy in color. If there is no discrepancy, color correction is complete. Click the Close button.

**CHECKPOINT**

If there is still some color discrepancy after performing Color Correction, repeat steps (6) through (11).

# 6. RECOMMENDED PARTS LIST

| No. | Part No. | Part Name | Description | Q'ty | Remarks |
|---|---|---|---|---|---|
| 1 | 444105030 | Data Controller Board CS610PRO | | 1 | CS610PRO |
| | 444105040 | Data Controller Board CS610 | | 1 | CS610 |
| 2 | 794050003 | CIS Controller Board | | 5 | Same as CS600A |
| 3 | 794050004 | CIS Power Board) | | 1 | Same as CS600A |
| 4 | 774019980 | CIS Sensor Assembly, Rank A | Select the same rank of sensor that is used in your scanner. | 5 | |
| | 774019981 | CIS Sensor Assembly, Rank B | | | |
| | 774019982 | CIS Sensor Assembly, Rank C | | | |
| | 774019983 | CIS Sensor Assembly, Rank D | | | |
| | 774019984 | CIS Sensor Assembly, Rank E | | | |
| | 774019985 | CIS Sensor Assembly, Rank F | | | |
| | 774019986 | CIS Sensor Assembly, Rank G | | | |
| | 774019987 | CIS Sensor Assembly, Rank H | | | |
| 5 | 500051794 | Motor | KT60KM06-551 | 1 | |
| 6 | 500052381 | Control Panel | 52610-10 | 1 | |
| 7 | 500051793 | Inlet | FN-9222R-3-06 | 1 | |
| 8 | 502112009 | Power Switch | AJ7201B | 1 | |
| 9 | 502210002 | Paper Sensor | PS-R50L-A | 2 | |
| 10 | 502211000 | Cover Sensor | GP1A05A | 1 | |
| 11 | 500051630 | Switching Power Supply Board | ZWS75AF-24/J | 1 | |
| 12 | 314690020 | Bearing | 6900ZZNXR | 4 | |
| 13 | 341511001 | O Ring | 1AP12 | 208 | |
| 14 | 378020021 | Drive Belt | BELT 60S2M400 | 1 | |
| 15 | 774017027 | Contact Glass Assembly | | 1 | Same as CS500/IS200 |
| 16 | 641300130 | Drive Roller | DRIVE ROLLER | 2 | |
| 17 | 641301502 | Paper Hold-down Roller | | 5 | Same as CS500/IS200 |
| 18 | 641300102 | Pinch Roller | PINCH ROLLER G | 52 | |
| 19 | 641300112 | Pinch Roller Shaft | SHAFT | 26 | |
| 20 | 774018010 | Front Guide Assembly | ASSY-CS5-11 | 1 | |
| 21 | 774017139 | Elevator Gear Box Assembly | | 1 | |
| 22 | 794060002 | Elevator Control Board | | 1 | Same as CS600A |
| 23 | 794050005 | IF Board (Power Cont Block) | | 1 | |
| 24 | 684504150 | Ethernet Board (NIC Board) | | 1 | |

# 7. LIST OF JIGS AND TOOLS

## 7.1 Jigs

| Jigs | Adjustments | Remarks |
|---|---|---|
| sc_csis4vxxx.x | •Downloading system program | Firmware |
| OPS112 (Ver. 6.60or later) | •Downloading system program<br>•Shading (white correction)<br>•Adjusting feed distance<br>•Aligning sensor images<br>•Adjusting offset<br>•Color correction | Software supplied with the scanner<br>(Scanning Master 21+) |
| Calibration sheet | •Shading (white correction)<br>•Replacing main board | Standard accessory<br>1050 mm x 200 mm |
| Color correction sheet | •Color correction | Standard accessory |
| 42-inch adjustment test chart | •Adjusting feed distance<br>•Adjusting offset<br>•Aligning sensor images | Record measured values between c10 and c90. |
| Thick paper test chart | •Adjusting for thickness mode | |

## 7.2 Tools

| Tools | Usage | Remarks |
|---|---|---|
| Screwdriver<br>Allen wrench<br>Needle-nose pliers | Disassembly, reassembly, and other operations | Large, medium, and small flat blade screwdrivers and Phillips screwdrivers |
| Colex gauge | Adjusting belt tension | 200g / 4 mm displacement |
| Multimeter | Checking voltage level | |

## 7.3 Other

| Item | Usage | Remarks |
|---|---|---|
| Water-diluted neutral detergent or absolute ethanol wiper (cloth) | Cleaning | |
| PC<br>USB cable | Used to determine whether the problem is caused by the scanner or any other equipment. | |

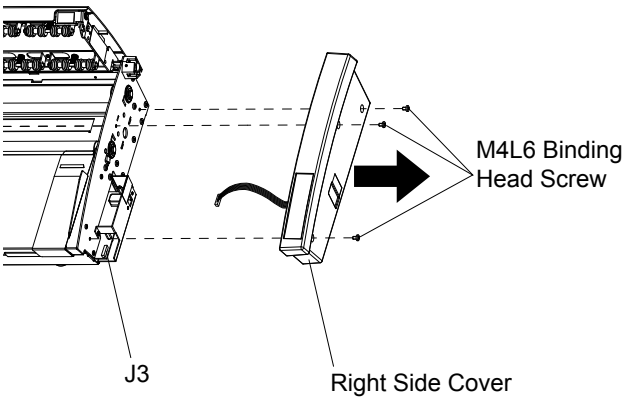
# 8. DISASSEMBLING AND ADJUSTING THE MECHANICAL PARTS

## 8.1 Right Side Cover

### Detaching the right side cover

(1) Remove the three M4L6 binding head screws on the right side of the scanner unit.

(2) Detach the right side cover as shown below.




(3) Disconnect the connectors from the control panel relay board.

### Reattaching the right side cover

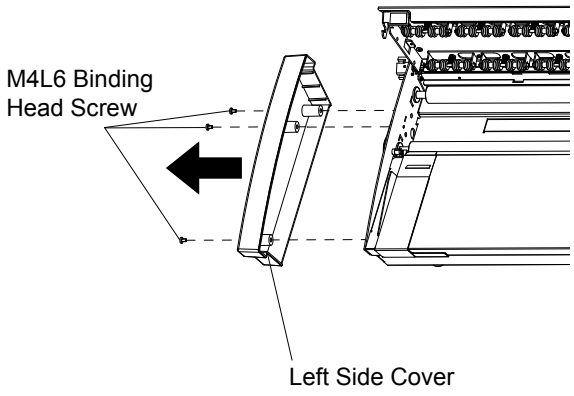
(1) Reattach the right side cover in the reverse order in which it was detached.

## 8.2 Left Side Cover

### Detaching the left side cover

(1) Remove the three M4L6 binding head screws on the left side of the scanner unit.

(2) Detach the left side cover as shown below.



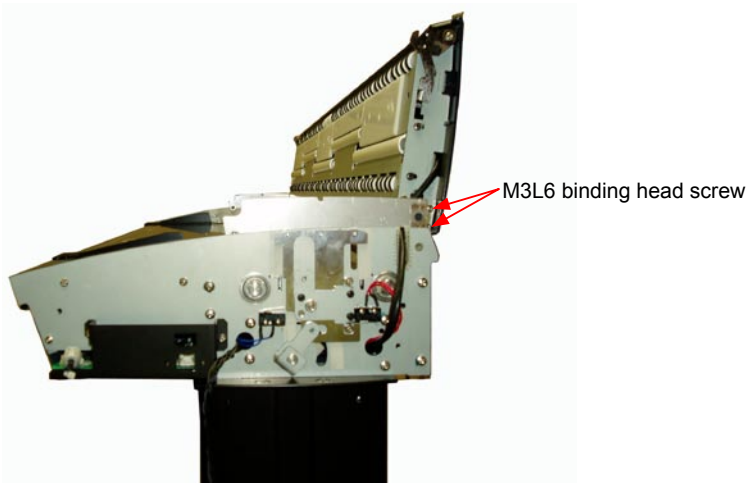

### Reattaching the left side cover

(1) Reattach the left side cover in the reverse order in which it was detached.

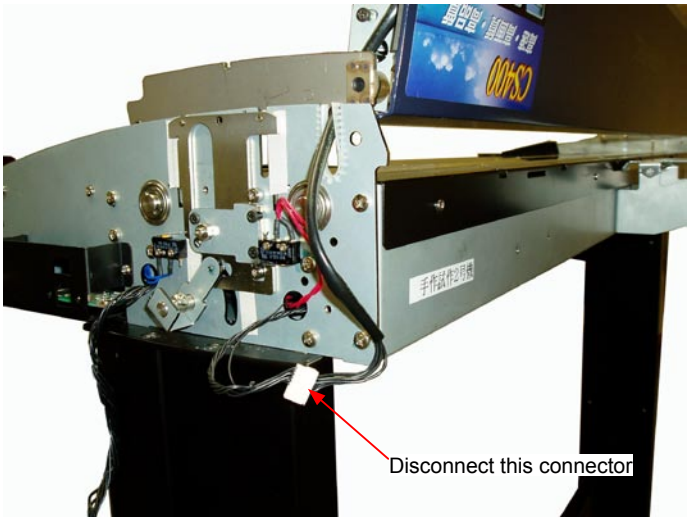
## 8.3 Top Cover Assembly

### Detaching the top cover assembly

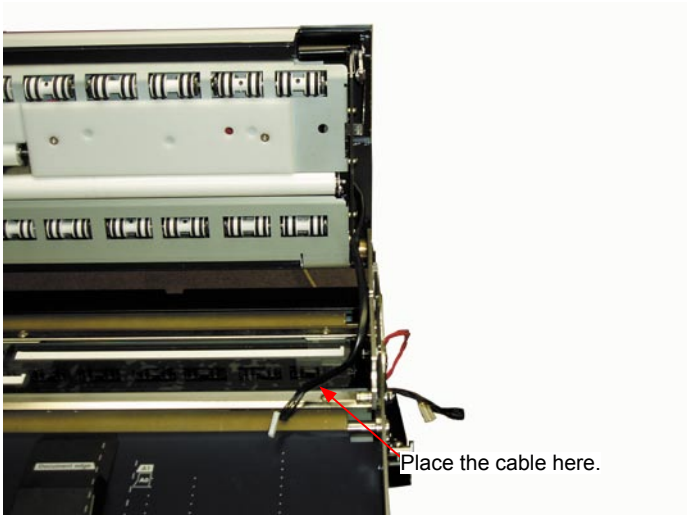
(1) Detach the right and left side covers (see Sections 8.1 and 8.2).
(2) Verify that the POWER LED and READY LED are lit.
(3) Press the ITA button and then verify that the READY LED goes out, and that the ITA LED lights instead.
(4) Press the FORWARD button to raise the top cover to the upper limit position.
(5) Open the top cover.
(6) Loosen the two M3L6 binding head screws holding the right top cover plate.




(7) Disconnect the connector from the top cover assembly as shown below.

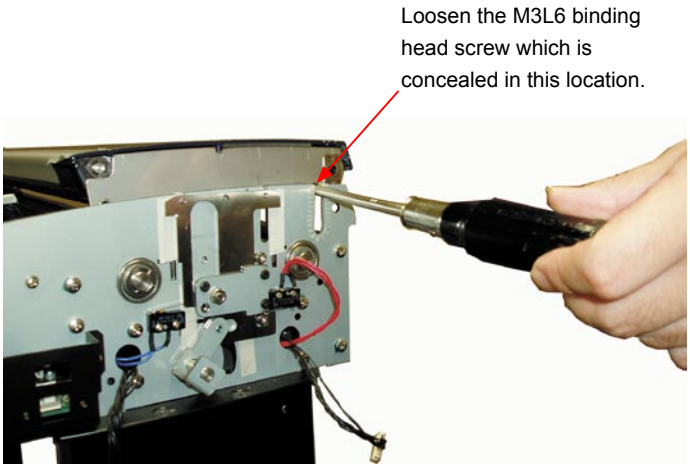


(8) Place the disconnected connector as shown below.

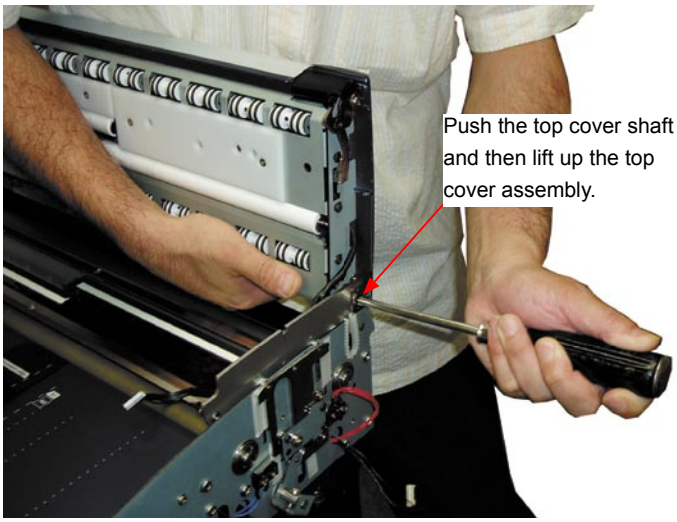



(9) Close the top cover.

(10) Loosen the M3L6 binding head screw holding the right top cover plate as shown below.




(11) Hold the top cover assembly and then release the top cover shaft as shown below.



(12) Detach the top cover assembly from the right side of the scanner unit as shown below.

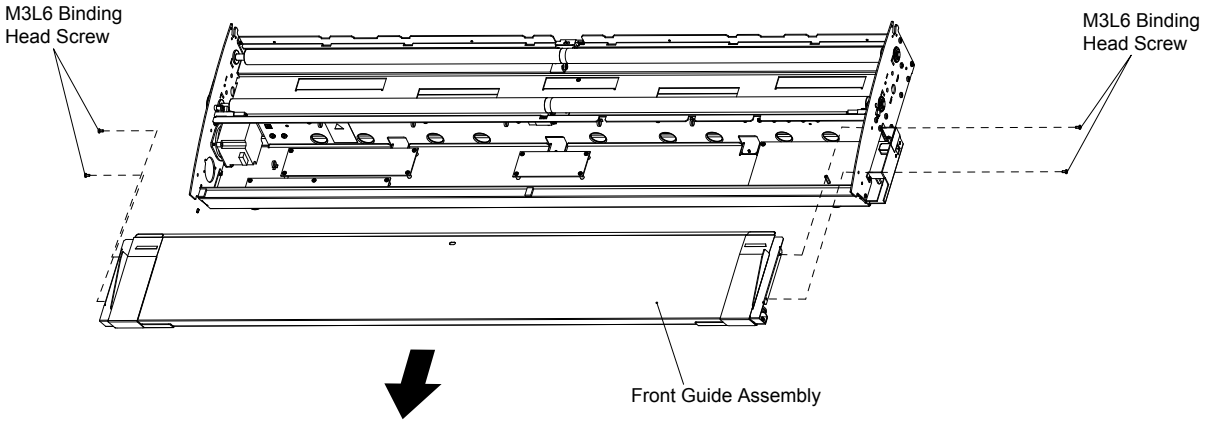
### Reattaching the top cover assembly

(1) Reattach the top cover assembly in the reverse order in which it was detached.

# 8.4 Front Guide Assembly

### Detaching the front guide assembly

(1) Detach the right and left side covers (see Sections 8.1 and 8.2).
(2) Remove the four M3L6 binding head screws holding the front guide assembly from each side.
(3) Detach the front guide assembly as shown below.




### Reattaching the front guide assembly

(1) Reattach the front guide assembly in the reverse order in which it was detached.

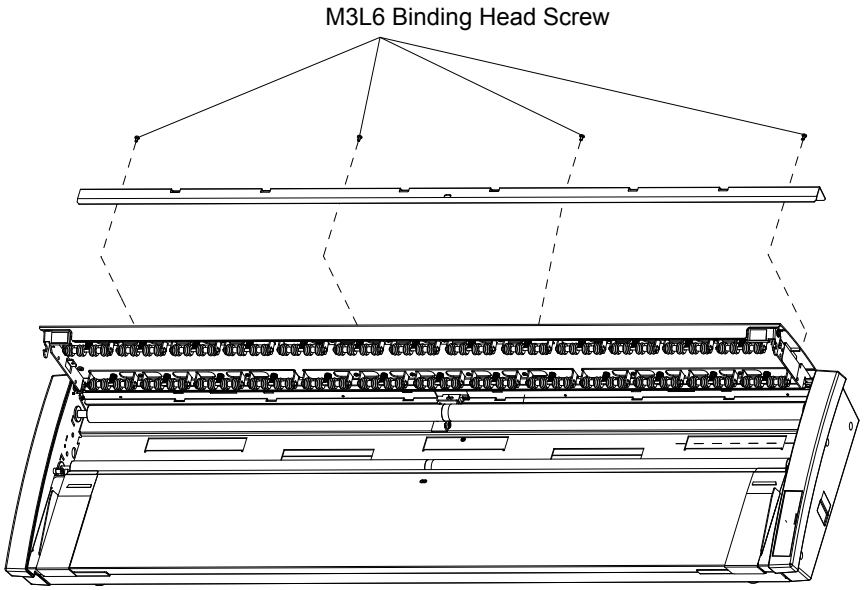
**⚠CAUTION**

When reattaching the front guide assembly, make sure that the front guide assembly does not touch the front drive roller.

## 8.5 Rear Cover

### Detaching the rear cover

(1) Remove the four M3L6 binding head screws at the back of the scanner unit.




(2) Detach the rear cover.

### Reattaching the rear cover

(1) Reattach the rear cover in the reverse order in which it was detached.

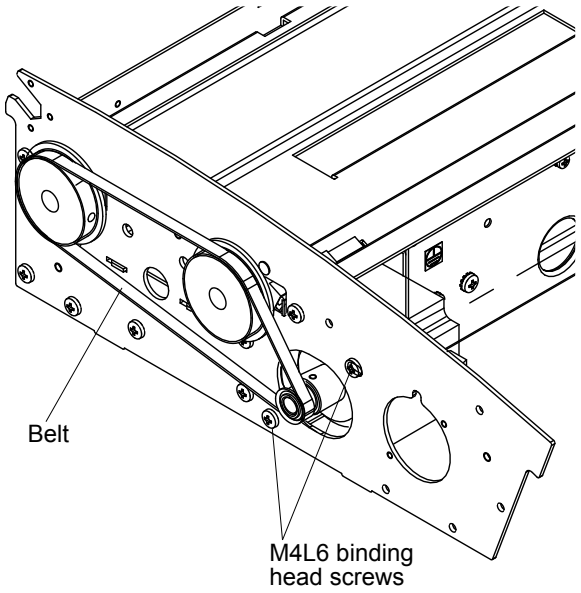
**⚠CAUTION**

When reattaching the rear cover, make sure that the rear cover does not touch the rear drive roller.

## 8.6 Motor

### Detaching the motor

(1) Detach the left side cover (see Section 8.2).
(2) Detach the front guide assembly (see Section 8.4).
(3) Disconnect the J4 connector from the data power board.
(4) Remove the two M4L6 binding head screws holding the motor.
(5) Detach the drive belt from the pulleys.

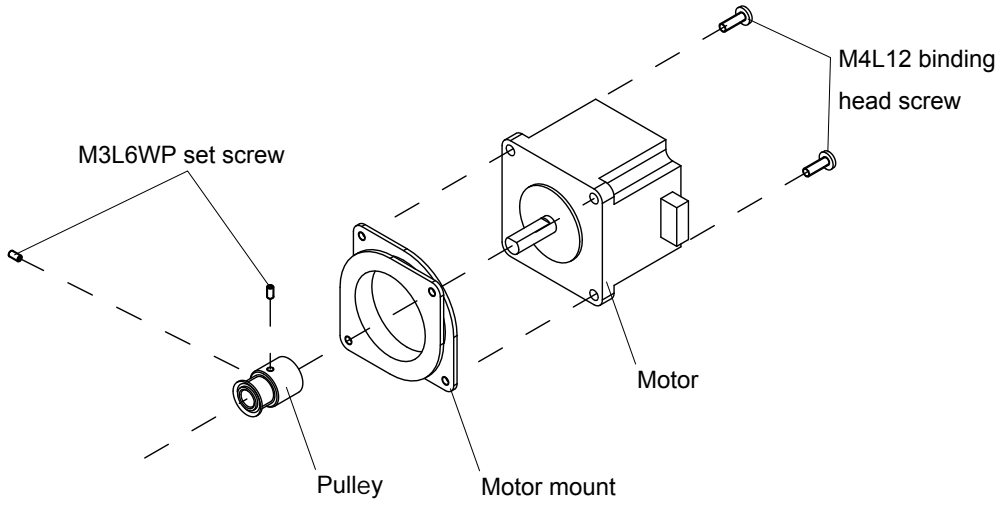



### Reattaching the motor

(1) Reattach the motor by reversing the sequence of steps in which it was detached.
(2) Adjust the drive belt tension (see Section 8.9).

### Disassembling the motor

(1) Loosen the M3L6WP set screws to detach the motor pulley.
Remove the two silver M4L12 binding head screws holding together the motor and motor mount.




### Reassembling the motor

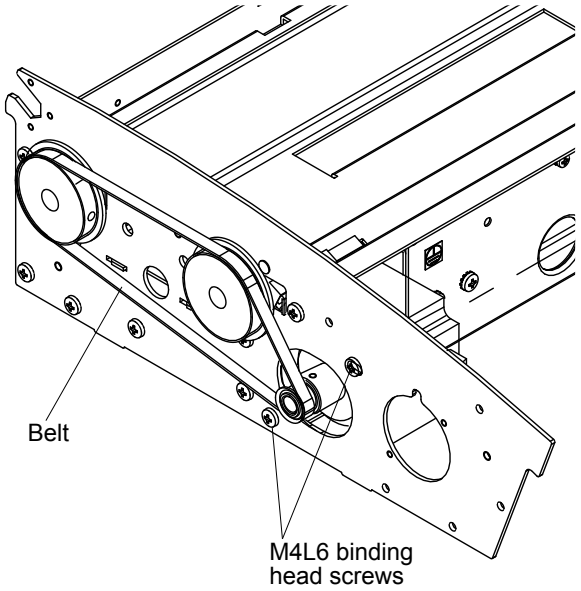
(1) Reassemble the motor by reversing the sequence of steps in which it was disassembled.

# 8.7 Drive Roller Pulley

### Detaching the drive roller pulleys

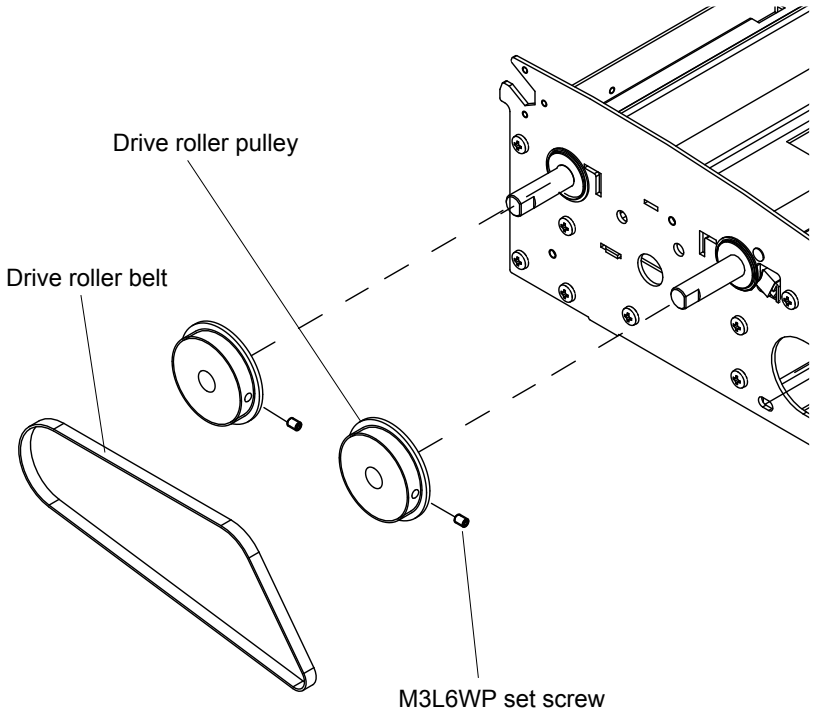
(1) Detach the left side cover (see Section 8.2).

(2) Loosen the two M4L6 binding head screws holding the motor.




(3) Detach the drive belt from the pulleys.

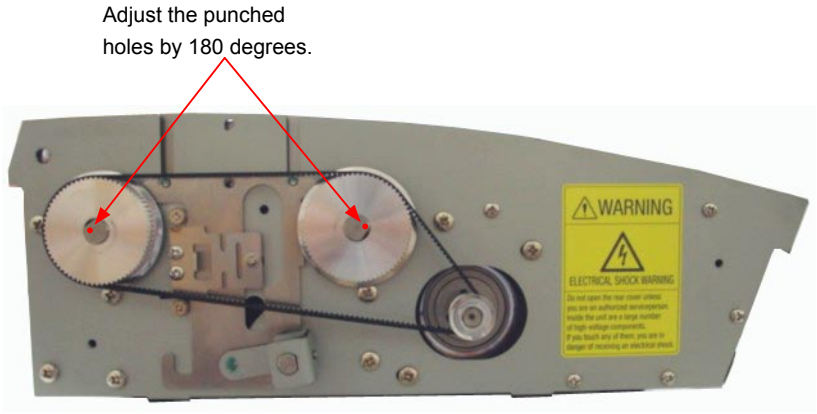
(4) Loosen the M3L6WP set screw to detach the drive roller pulleys.



### Reattaching the drive roller pulleys

(1) Reattach the drive roller pulleys by reversing the sequence of steps in which they were detached.

(2) Install the belt to the 180-degree punched markings of the drive roller shaft as shown below.

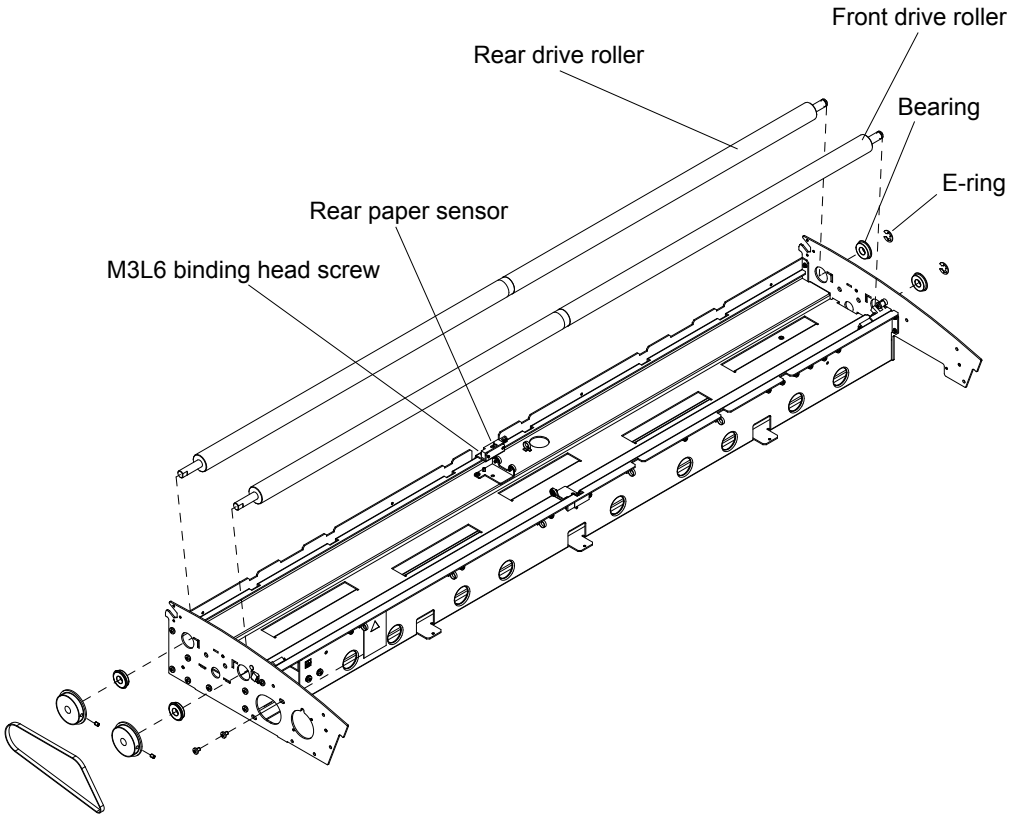



(3) Adjust the belt tension (see Section 8.9).

## 8.8 Drive Rollers

### Detaching the front drive roller

(1) Detach the right and left side covers (see Sections 8.1 and 8.2).
(2) Detach the front guide assembly (see Section 8.4).
(3) Detach the top cover assembly (see Section 8.3).
(4) Detach the drive roller belt and the pulley from the drive roller (see Section 8.7).
(5) Detach the E-ring holding the drive roller.
(6) Detach the two bearings holding both ends of the drive roller.
(7) Slide the drive roller to the left, lift up the drive roller from the right side, and then detach it.



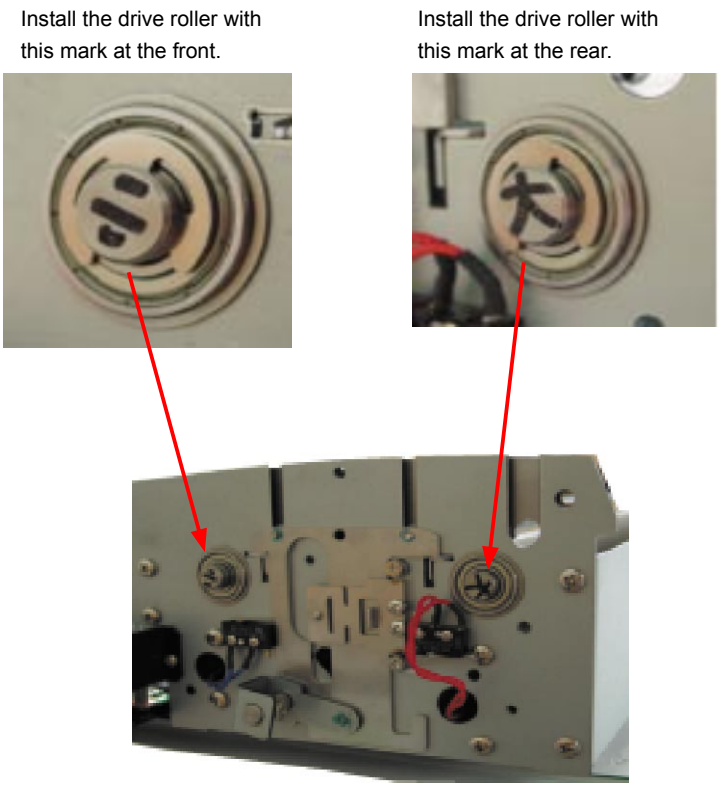

### Detaching the rear drive roller

(1) Detach the right and left side covers (see Sections 8.1 and 8.2).
(2) Detach the rear cover (see Section 8.5).
(3) Loosen the M3L6 binding head screw holding the rear paper sensor bracket.
(4) Detach the drive roller belt and the pulley from the drive roller (see Section 8.7).
(5) Detach the E-ring holding the drive roller.
(6) Detach the two bearings holding both ends of the drive roller.
(7) Slide the drive roller to the left, lift up the drive roller from the right side, and then detach it.

### Reattaching the drive rollers

(1) Reattach the drive rollers by reversing the sequence of steps in which they were detached.

(2) The front drive roller and the rear drive roller are different.
When installing a drive roller, check the mark on it to make sure that you have the correct one.

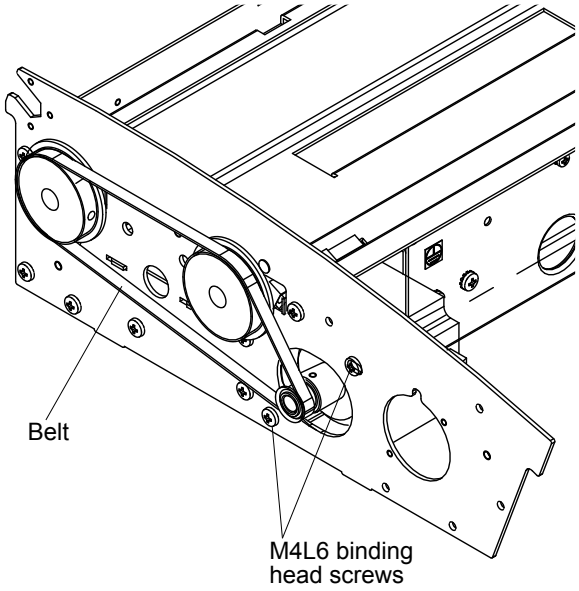



(3) Adjust the drive belt tension (see Section 8.9).

## 8.9 Drive Belt

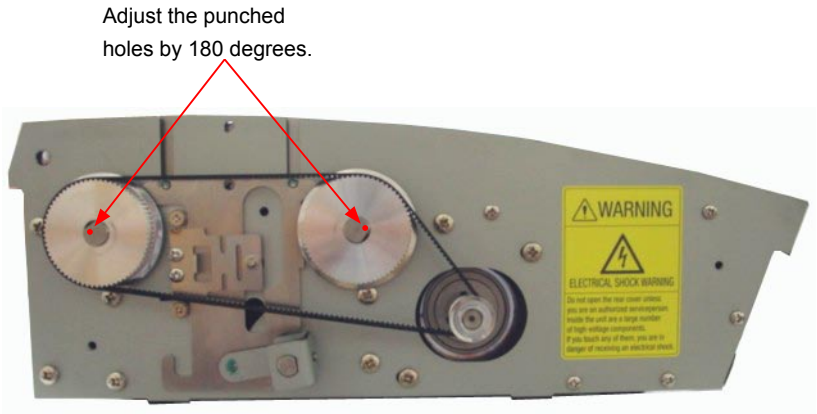
### Detaching the drive belt

(1) Detach the left side cover (see Section 8.2).
(2) Loosen the two M4L6 binding head screws holding the motor.
(3) Detach the drive belt from the pulleys.




### Reattaching the drive belt

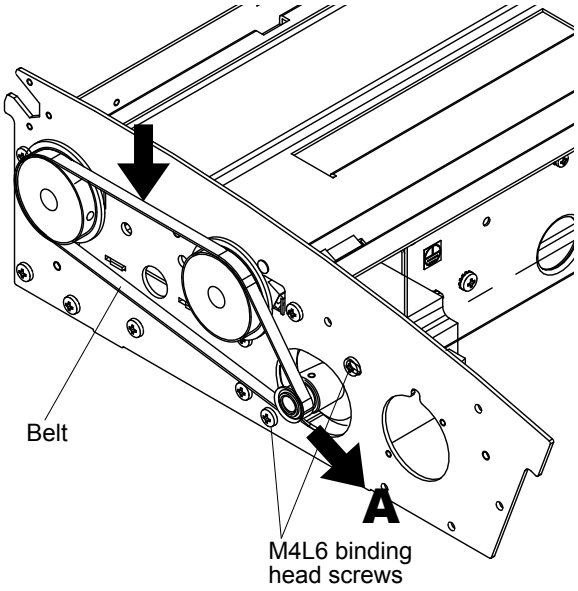
(1) Reattach the drive belt by reversing the sequence of steps in which it was detached.
(2) Install the belt to the 180-degree punched markings of the drive roller shaft as shown below.

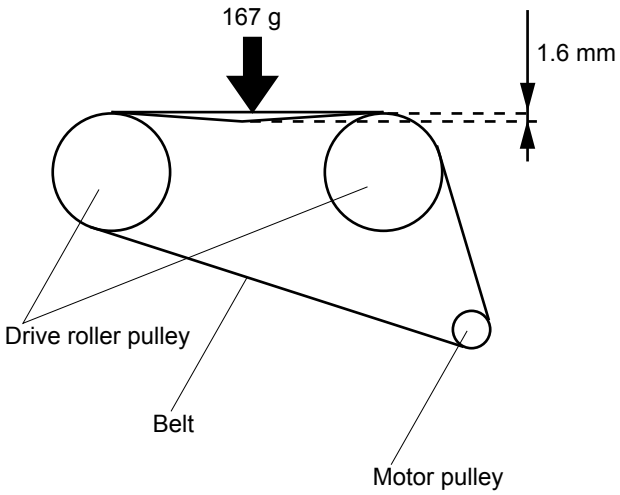



(3) Adjust the drive belt tension.

### Adjusting the drive belt tension

(1) Loosen the two M4L6 binding head screws holding the motor.
(2) Pull the motor in the "A" direction as shown below.
(3) Use the Colex gauge to adjust the belt tension so that the belt displacement is approximately 1.6 mm when pressed with a force of 167 gf.



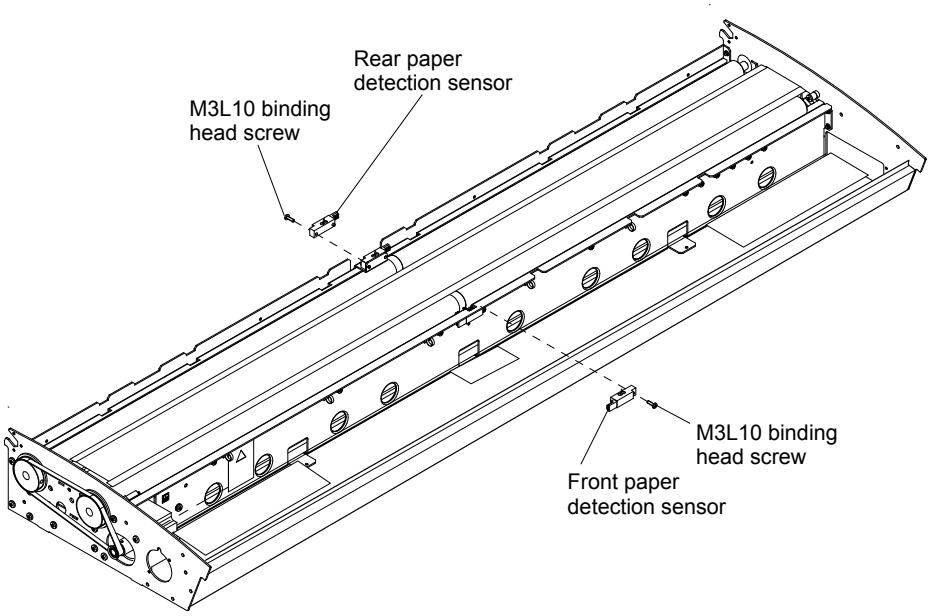




(4) Tighten the two M4L6 binding head screws holding the motor.

## 8.10 Front and Rear Paper Detection Sensors

### Detaching the front paper detection sensor

(1) Detach the right and left side covers (see Sections 8.1 and 8.2).
(2) Detach the front guide assembly (see Section 8.4).
(3) Remove the M3L10 binding head screws holding the front paper detection sensor.
(4) Disconnect the front paper detection sensor cable from the connector and then detach the front paper detection sensor.




### Detaching the rear paper detection sensor

(1) Detach the rear cover (see Section 8.5).
(2) Remove the M3L10 binding head screws holding the rear paper detection sensor.
(3) Disconnect the rear paper detection sensor cable from the connector and then detach the rear paper detection sensor.

### Reattaching the paper detection sensors

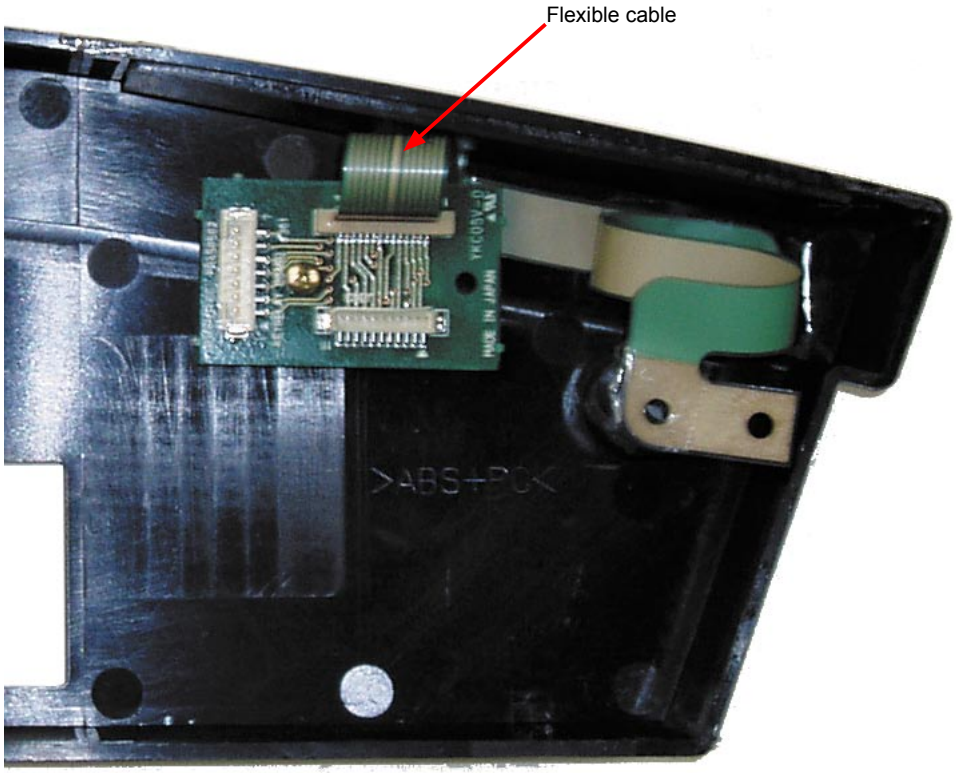
(1) Reattach the paper detection sensors by reversing the sequence of steps in which they were detached.

## 8.11 Control Panel Sheet Switch

### Detaching the control panel sheet switch

(1) Detach the right cover (see Section 8.1).

(2) Disconnect the flexible cable from the control panel relay board and then pull off the control panel sheet switch from the right side cover.



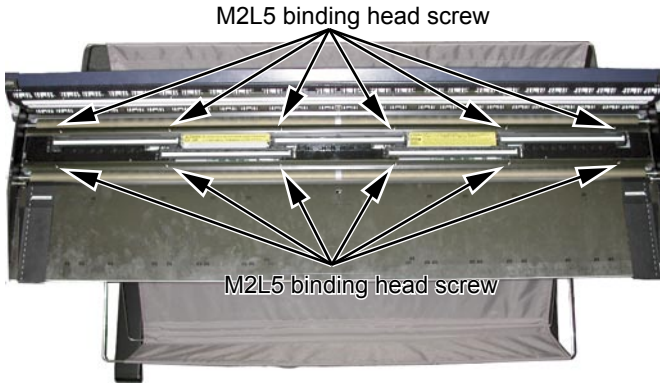

### Reattaching the control panel sheet switch

(1) Reattach the new control panel sheet switch in the reverse order in which it was detached.

## 8.12 Contact Glass Assembly

### Detaching the contact glass assembly

(1) Open the center cover.
(2) Remove the six M2L5 binding head screws holding the front contact glass stopper plate.




(3) Detach the front contact glass stopper plate from the unit.
(4) Remove the six M2L5 binding head screws holding the rear contact glass stopper plate.
(5) Detach the rear contact glass stopper plate from the unit.
(6) Slide the contact glass assembly to the right side, lift up the contact glass from the left side, and then detach the contact glass assembly from the unit.

### Reattaching the contact glass assembly

(1) Reattach the contact glass in the reverse order in which it was detached.
(2) Make sure that each of the CIS assembly surfaces lies flat against the inside of the contact glass assembly when you reattach the contact glass assembly.
(3) Perform the software adjustment.

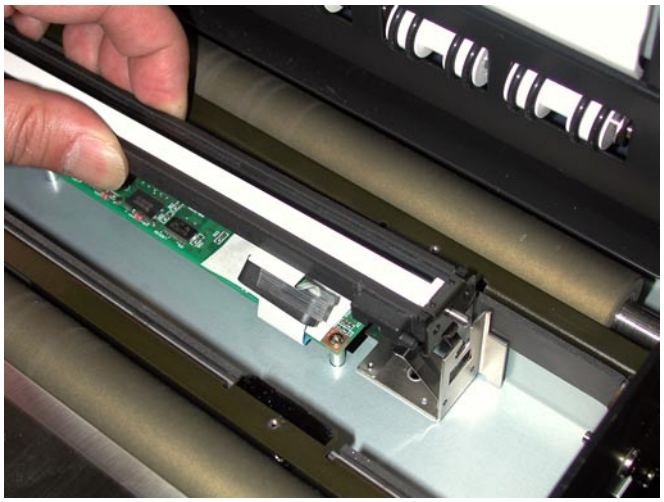
**⚠CAUTION**

When replacing the contact glass assembly, be sure to clean the interior of the image sensor unit and the inside of the contact glass assembly. A soiled or dusty unit can affect scanning performance.

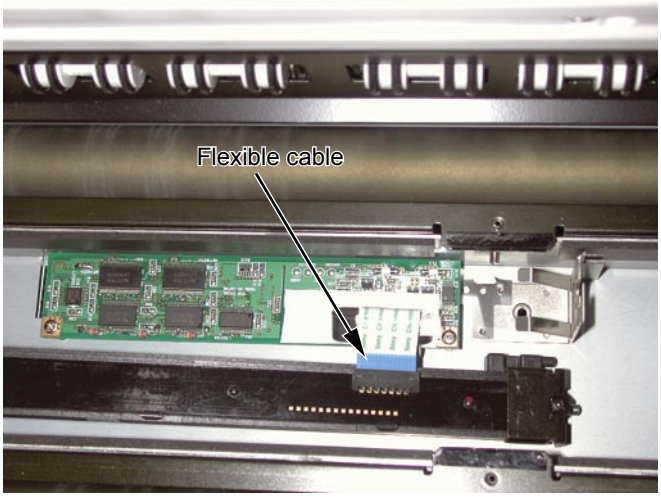
## 8.13 CIS (Charge Coupled Device Imaging Sensor) Assembly

### Detaching the CIS assembly

(1) Detach the contact glass assembly (see Section 8.12).
(2) Slide each CIS assembly to the left side, lift it up from the right side, and then detach each CIS assembly.



(3) Disconnect the flexible cable from each CIS assembly and then detach each CIS assembly.




### Reattaching the CIS assembly

(1) Reattach each CIS assembly in the reverse order in which it was detached.
(2) Perform the software adjustment.

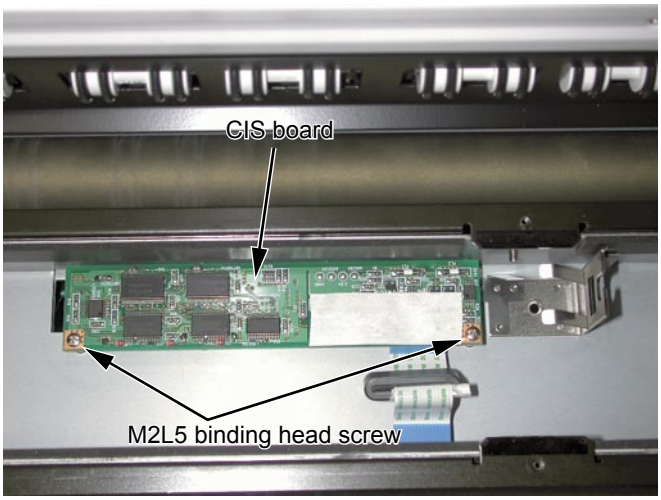
**⚠CAUTION**

When replacing the CIS assembly, be sure to clean the interior of the image sensor unit and the inside of the contact glass assembly. A soiled or dusty unit can affect scanning performance.

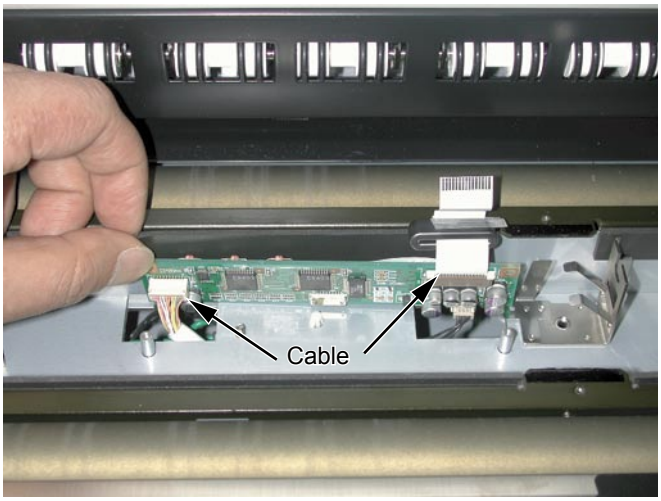
## 7.14 CIS (Charge Coupled Device Imaging Sensor) Board

### Detaching the CIS boards

(1) Detach the contact glass assembly (see Section 7.12).
(2) Detach each CIS assembly (see Section 7.13).
(3) Remove the two M2L5 binding head screws supporting each CIS board.




(4) Disconnect the cables from each CIS board and then detach each CIS board.




### Reattaching the CIS boards

(1) Reattach each CIS board in the reverse order in which it was detached.
(2) When you have replaced the CIS boards, perform calibration using the software adjustment.

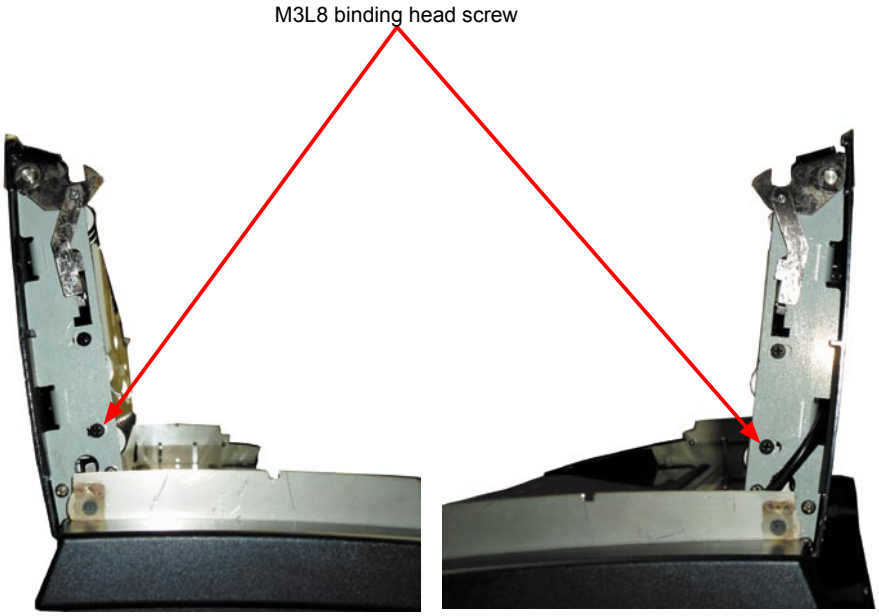
**⚠CAUTION**

When replacing the CIS boards, be sure to clean the interior of the image sensor unit and the inside of the contact glass assembly. A soiled or dusty unit can affect scanning performance.

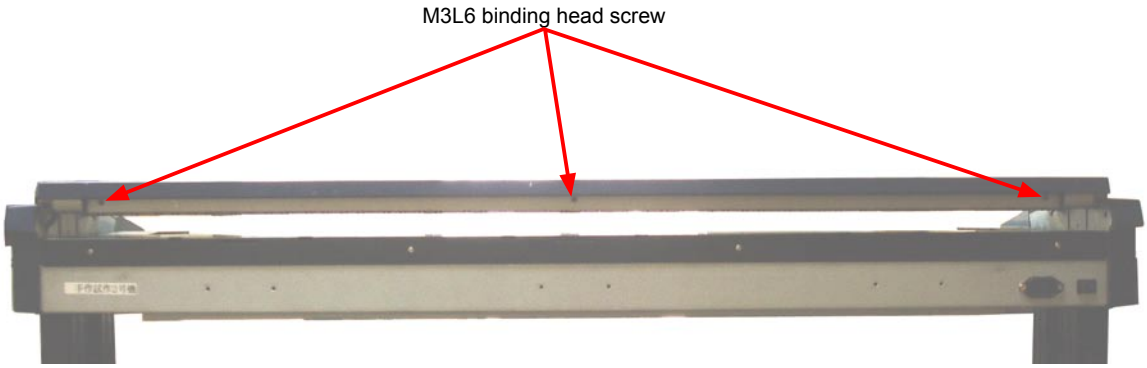
## 8.15 Pinch Roller Covers

### Detaching the rear pinch roller cover

(1) Remove the two M3L8 binding head screws and the bushes holding the rear pinch roller cover.



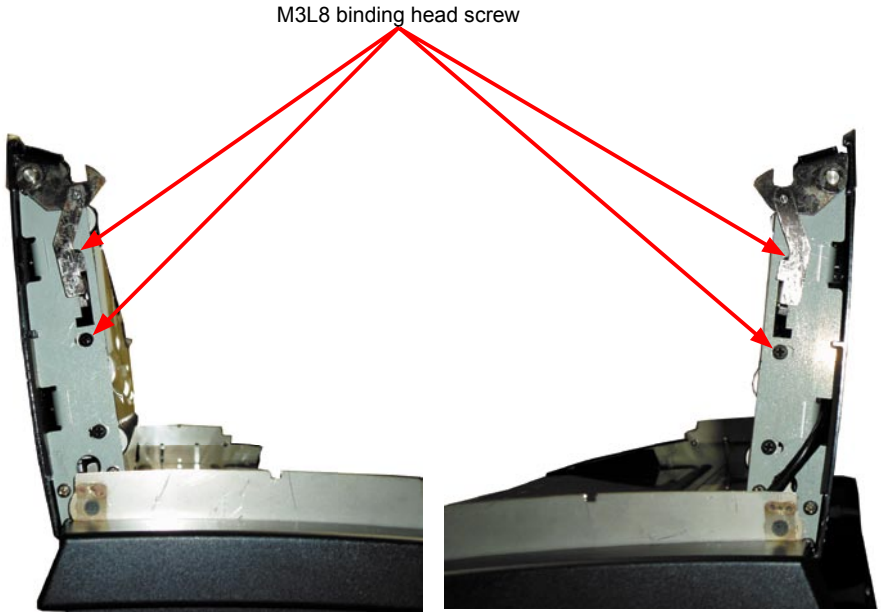

(2) Remove the three M3L6 binding head screws holding the rear pinch roller cover from the rear of the scanner.




(3) Detach the rear pinch roller cover from the top cover assembly.

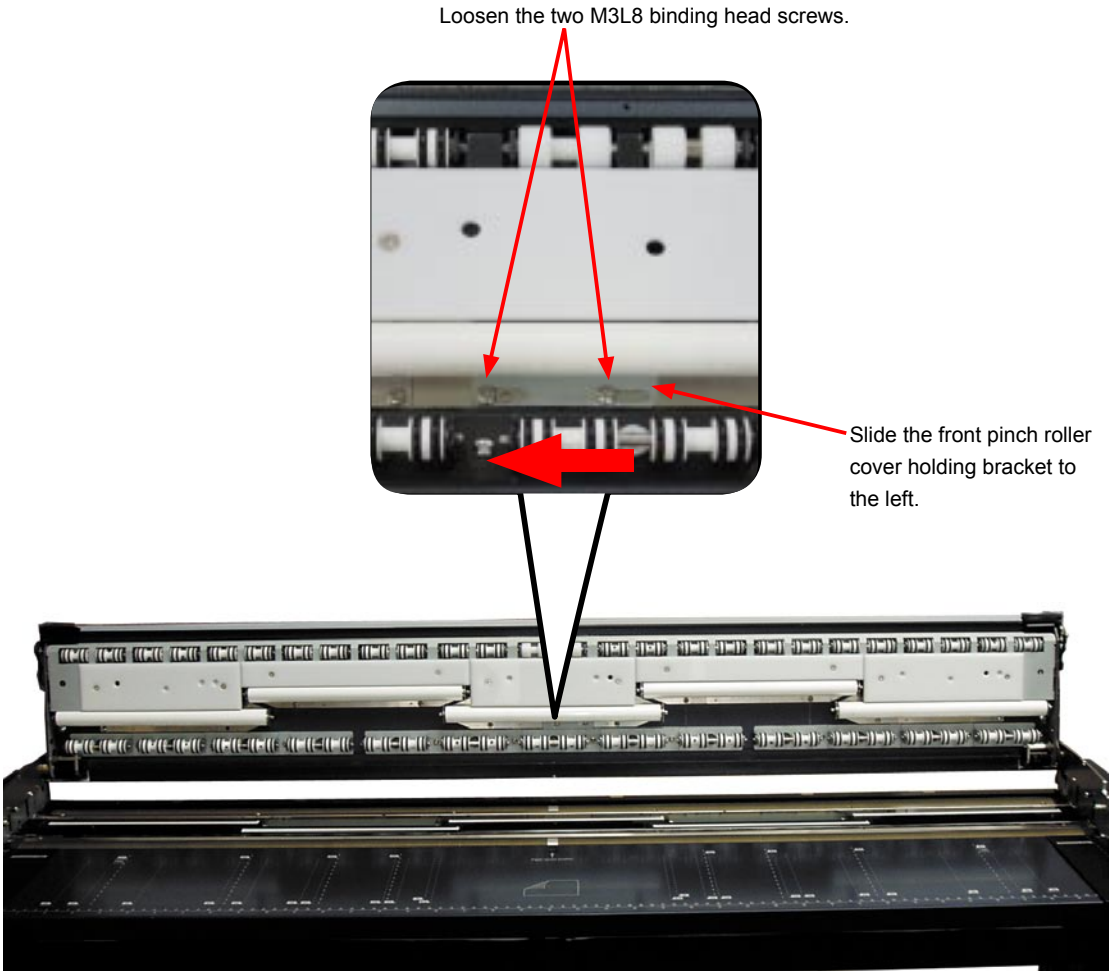
### Detaching the front pinch roller cover

(1) Remove the four M3L8 binding head screws and the bushes holding the front pinch roller cover.




(2) Loosen the two M3L6 binding head screws holding the front pinch roller cover holding bracket.

(3) Slide the front pinch roller cover holding bracket to the left and then detach the front pinch roller cover.



### Reattaching the pinch roller covers

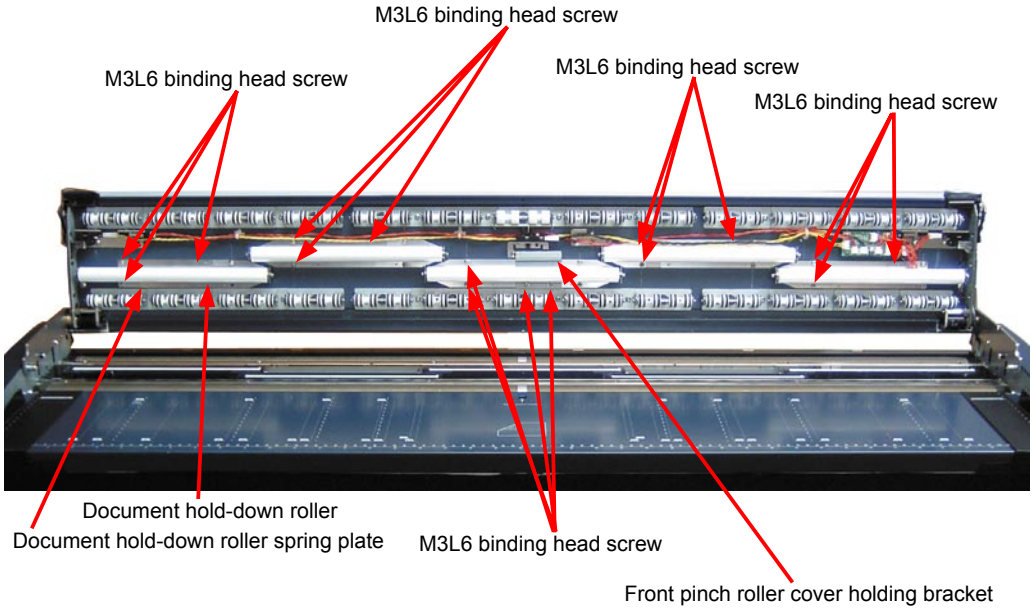
(1) Reattach the pinch roller covers in the reverse order in which they were detached.

## 8.16 Document Hold-down Rollers

### Detaching the document hold-down rollers

(1) Detach the pinch roller covers (see Section 8.15).

(2) Remove the three M3L6 binding head screws holding each document hold-down roller spring plate.




(3) Detach the document hold-down rollers from the top cover assembly.

(4) For the center document hold-down roller, remove the two M3L6 binding head screws holding the front pinch roller cover holding bracket and then detach the front pinch roller cover holding bracket. Remove the three M3L6 binding head screws holding the center document hold-down roller spring plate. Detach the center document hold-down roller from the top cover assembly.

### Reattaching the document hold-down rollers

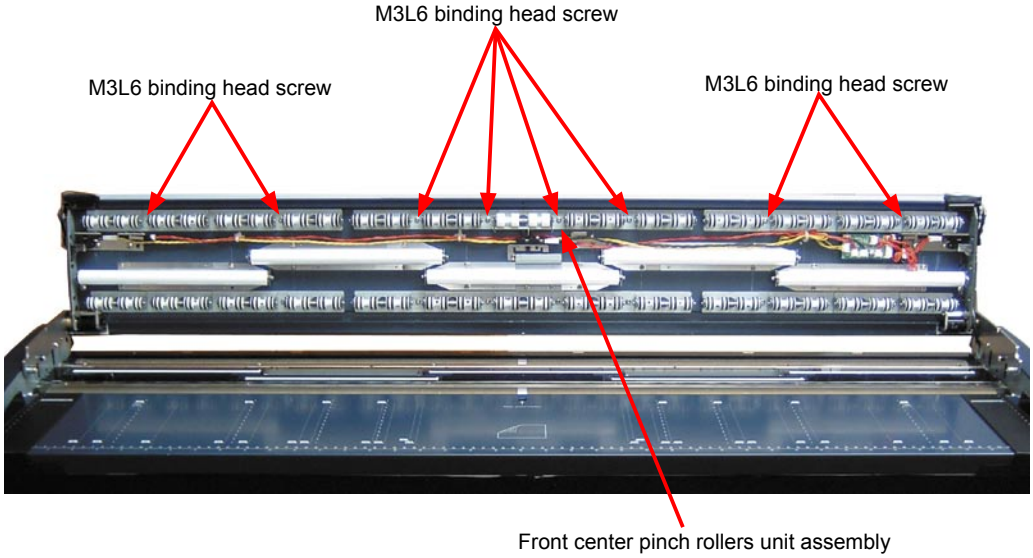
(1) Reattach the document hold-down rollers in the reverse order in which they were detached.

## 8.17 Pinch Roller Units

### Detaching the front pinch roller units

(1) Detach the pinch roller covers (see Section 8.15).

(2) Remove the two M3L6 binding head screws holding the four pinch rollers unit assembly. Detach the four pinch rollers unit assembly from the top cover assembly.

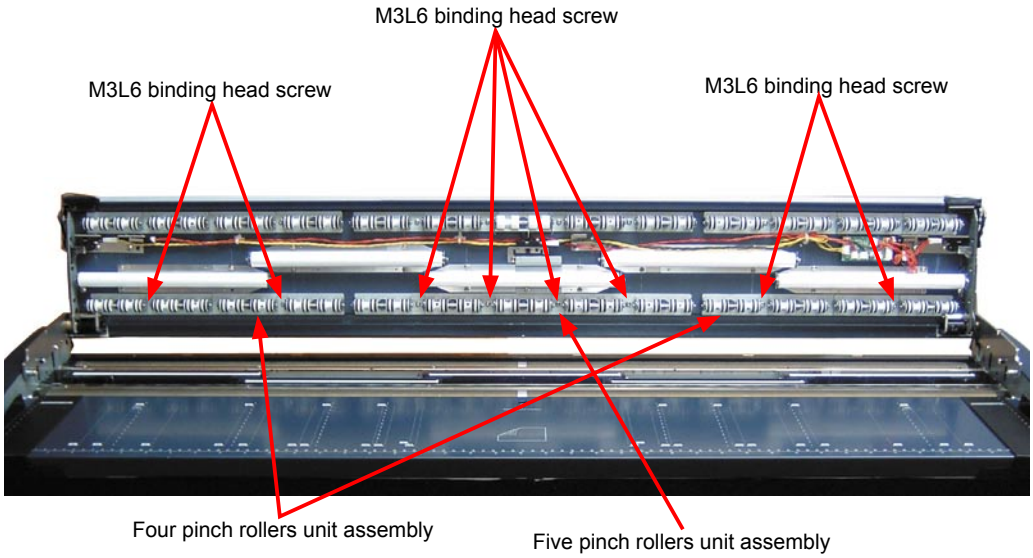



(3) Remove the four M3L6 binding head screws holding the center pinch rollers unit assembly. Detach the center pinch rollers unit assembly from the top cover assembly.

### Detaching the rear pinch roller units

(1) Detach the pinch roller covers (see Section 8.15).

(2) Remove the two M3L6 binding head screws holding the four pinch rollers unit assembly. Detach the four pinch rollers unit assembly from the top cover assembly.




(3) Remove the four M3L6 binding head screws holding the five pinch rollers unit assembly. Detach the five pinch rollers unit assembly from the top cover assembly.

### Reattaching the pinch roller units

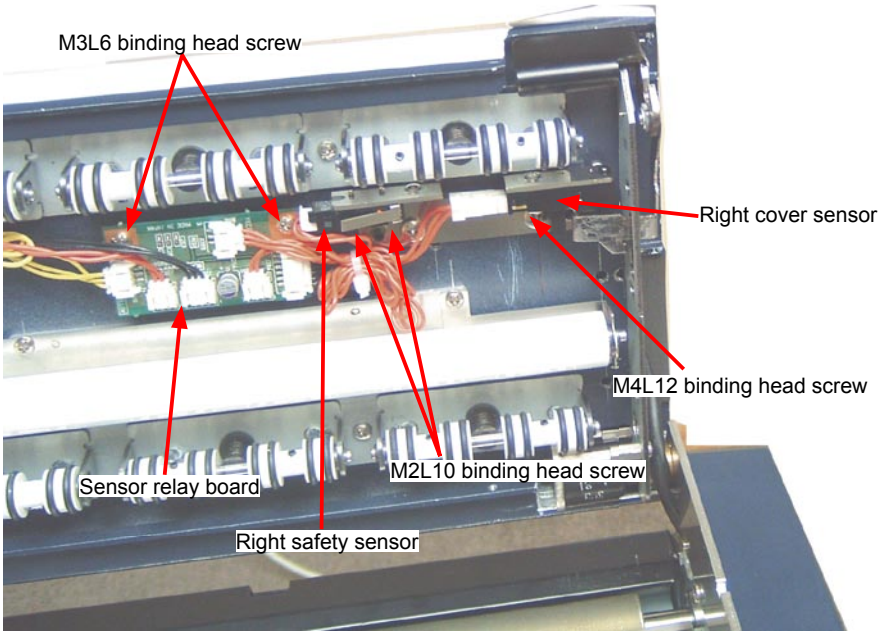
(1) Reattach the pinch roller units in the reverse order in which they were detached.

## 8.18 Cover Sensors

### Detaching the right cover sensor

(1) Detach the pinch roller covers (see Section 8.15).

(2) Remove the M4L12 binding head screws holding the right cover sensor.

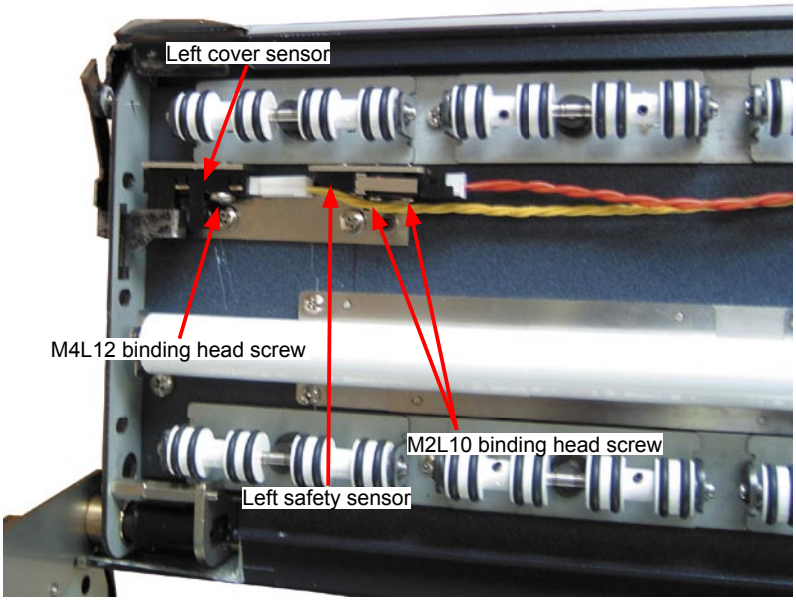



(3) Disconnect the cable from the right cover sensor and then detach the right cover sensor.

### Detaching the left cover sensor

(1) Detach the pinch roller covers (see Section 8.15).

(2) Remove the M4L12 binding head screws holding the left cover sensor.




(3) Disconnect the cable from the left cover sensor and then detach the left cover sensor.

### Reattaching the cover sensors

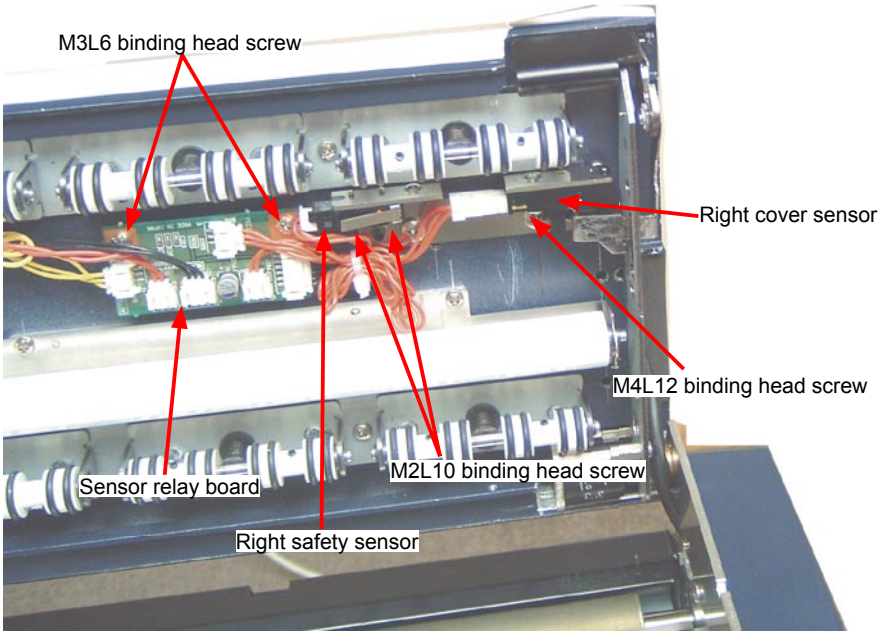
(1) Reattach the cover sensors in the reverse order in which they were detached.

## 8.19 Safety Sensors

### Detaching the right safety sensor

(1) Detach the pinch roller covers (see Section 8.15).

(2) Remove the two M2L10 binding head screws holding the right safety sensor.

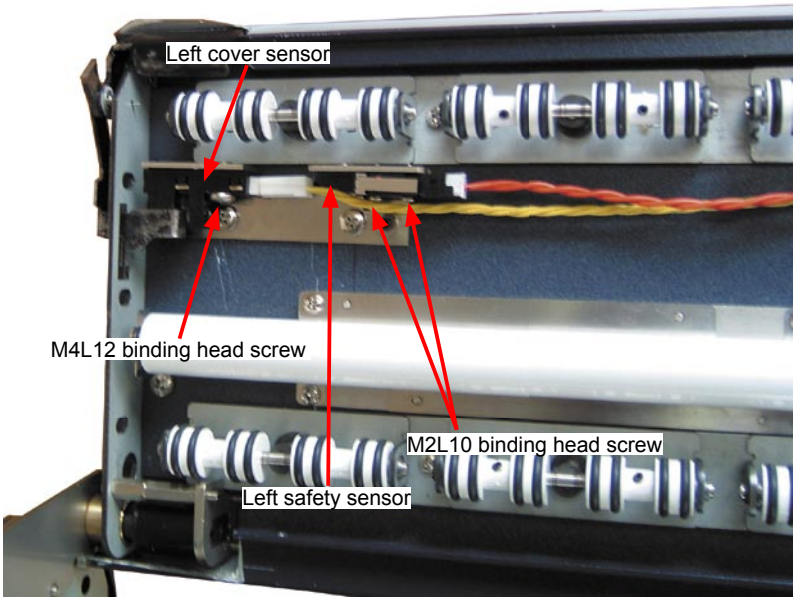



(3) Disconnect the cable from the right safety sensor and then detach the right safety sensor.

### Detaching the left safety sensor

(1) Detach the pinch roller covers (see Section 8.15).

(2) Remove the two M2L10 binding head screws holding the left safety sensor.

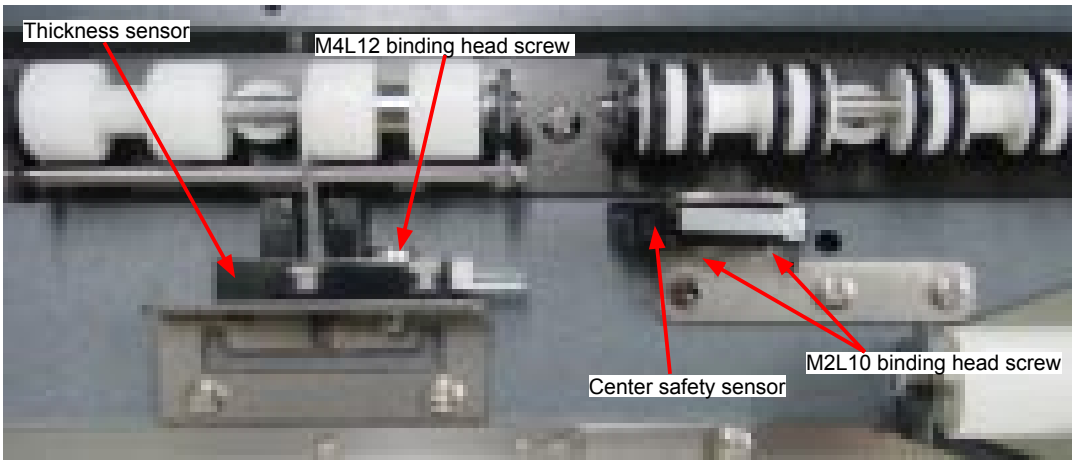



(3) Disconnect the cable and then detach the left safety sensor from the top cover assembly.

### Detaching the center safety sensor

(1) Detach the pinch roller covers (see Section 8.15).

(2) Remove the two M2L10 binding head screws holding the center safety sensor.




(3) Disconnect the cable from the center safety sensor and then detach the center safety sensor.

### Reattaching the safety sensors

(1) Reattach the safety sensors in the reverse order in which they were detached.

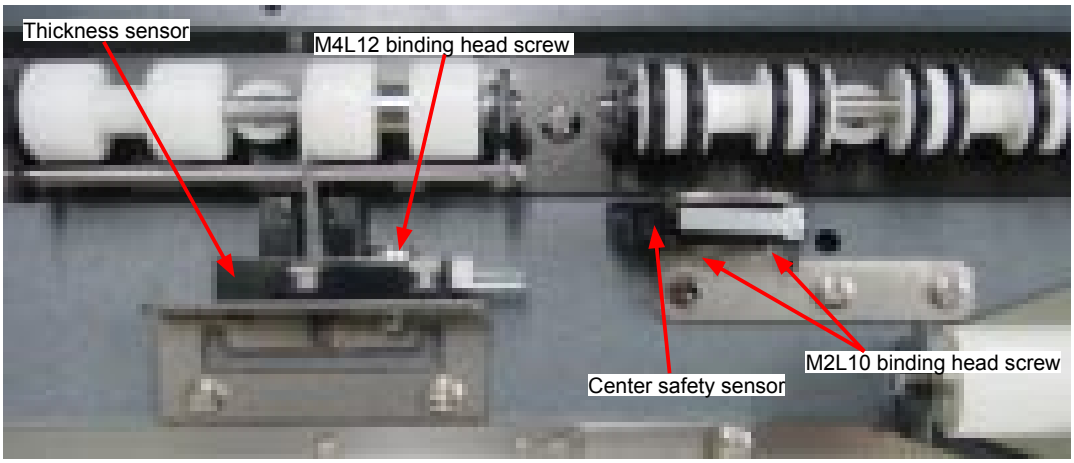
(2) Adjust the height level of the safety sensors (see Section 8.23).

## 8.20 Thickness Sensor

### Detaching the thickness sensor

(1) Detach the pinch roller covers (see Section 8.15).

(2) Remove the two M2L10 binding head screws holding the thickness sensor.




(3) Disconnect the cable from the thickness sensor and then detach the thickness sensor.

### Reattaching the thickness sensor

(1) Reattach the thickness sensor in the reverse order in which it was detached.

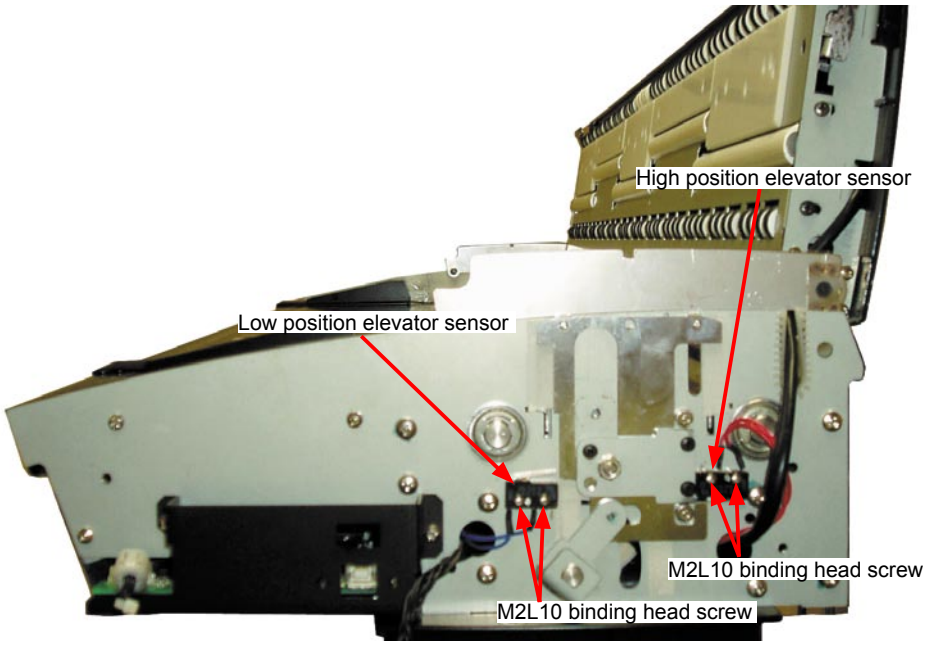
(2) Adjust the thickness sensor height level (see Section 8.22).

# 8.21 Elevator Sensor

### Detaching the elevator sensors

(1) Detach the right cover (see Section 8.1).

(2) Remove the two M2L10 binding head screws holding each elevator sensor.




(3) Disconnect the cable from each elevator sensor and then detach each elevator sensor.

### Reattaching the elevator sensors

(1) Reattach the elevator sensors in the reverse order in which they were detached.

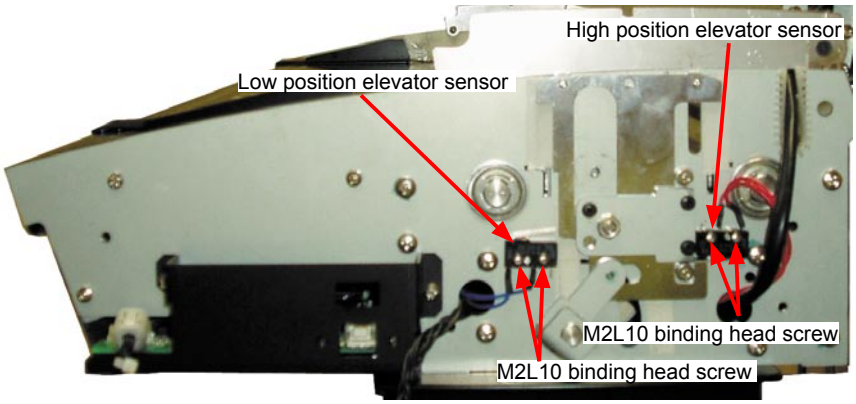
(2) Adjust the elevator sensor positions (see Section 8.22).

## 8.22 Adjusting the Thickness Sensor and the Elevator Sensors

### Adjusting the thickness sensor

(1) Detach the right cover but do not disconnect any cables from the right cover (see Section 8.1).

(2) Remove the two M2L10 binding head screws holding the low position elevator sensor and then detach the low position elevator sensor.




(3) Verify that the POWER LED and READY LED are lit.

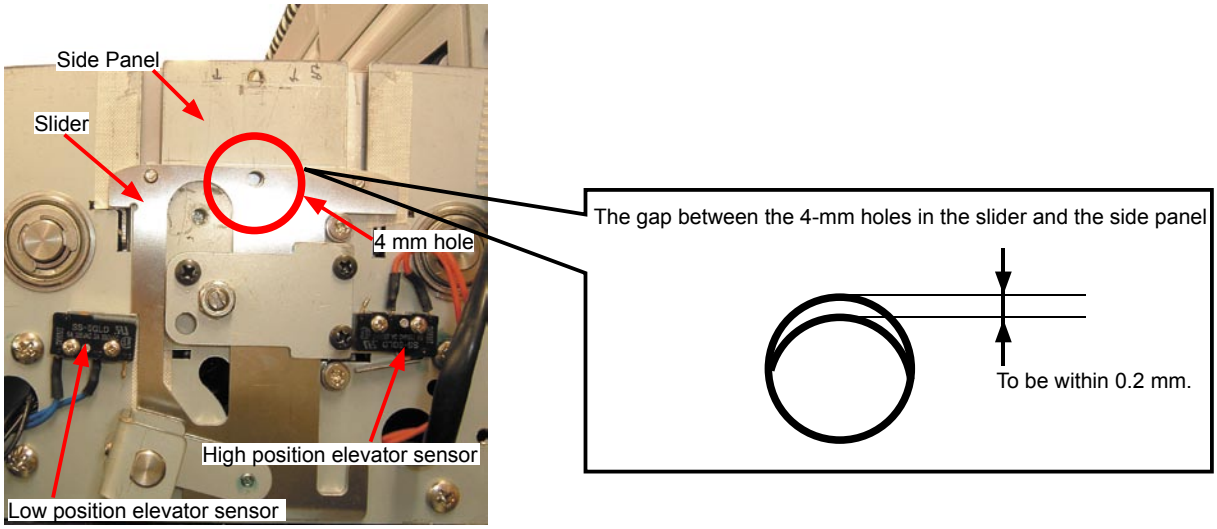
(4) Press the ITA button and then verify that the READY LED goes out, and that the ITA LED lights instead.

(5) Place a sheet of copy paper (paper which is thinner than 1 mm) on the front paper sensor and insert it into the recess. The top cover starts to rise automatically.

(6) When the top cover has risen to the upper limit position, insert the copy paper further so that it can be seen from the rear of the scanner. (Lowering starts approximately 5 seconds after the test target is detected by the front and rear paper sensors.)

(7) When the copy paper is inserted into position, the top cover automatically descends to detect the thickness.

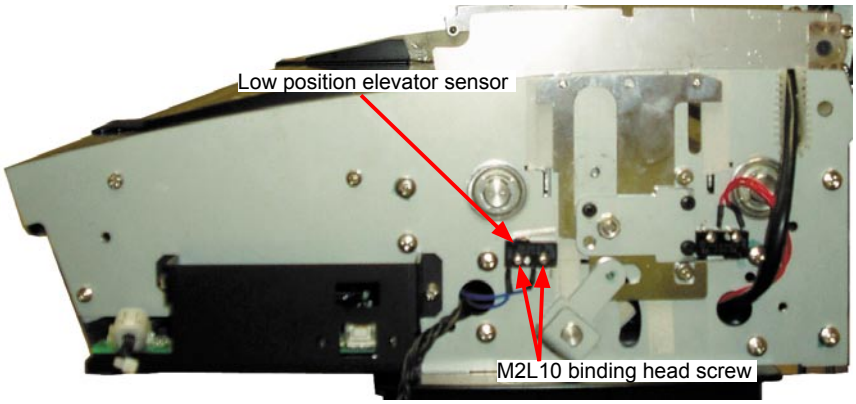
(8) Confirm the gap between the 4-mm holes in the slider and the side panel.



(9) Adjust the gap so that it is within 0.2 mm, using the screw in the center adjustment hole.
(The slider will lower when you turn the screw clockwise.)

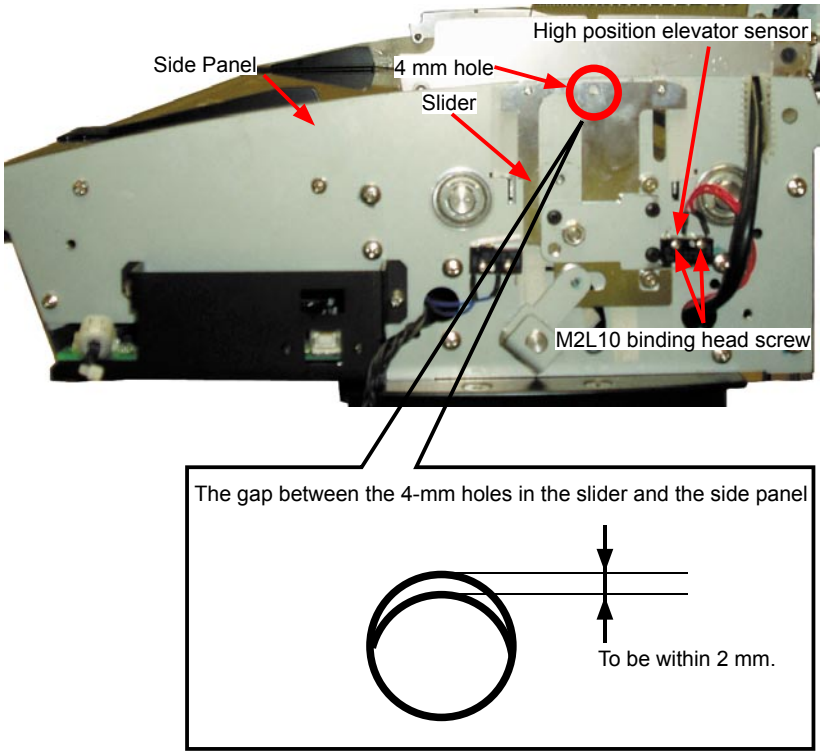
### Adjusting the low position elevator sensor (Thickness mode sensor)

(1) After adjusting the thickness sensor, install the sensor at the position where the slider goes down. The sensor should be on at this position.



### Adjusting the high position elevator sensor

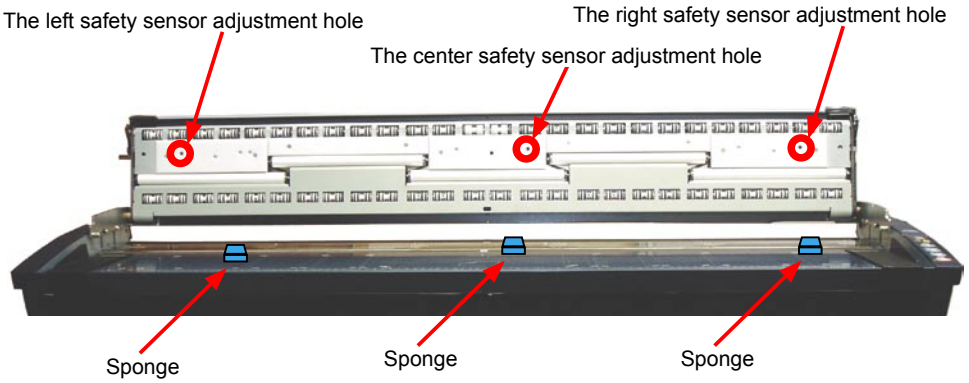
(1) After adjusting the low position elevator sensor, press the FORWARD button until the slider goes up.
(2) Confirm the gap between the 4-mm holes in the slider and the side panel.
(3) Adjust the gap using the FORWARD button and the REVERSE button.
(4) Install the sensor at the position where the slider goes up. The sensor should be on at this position.



## 8.23 Adjusting the Safety Sensors

### Adjusting the safety sensors

(1) Open the top cover assembly.
(2) Insert a piece of sponge (thickness about 20 mm) or something similar under the center safety sensor.



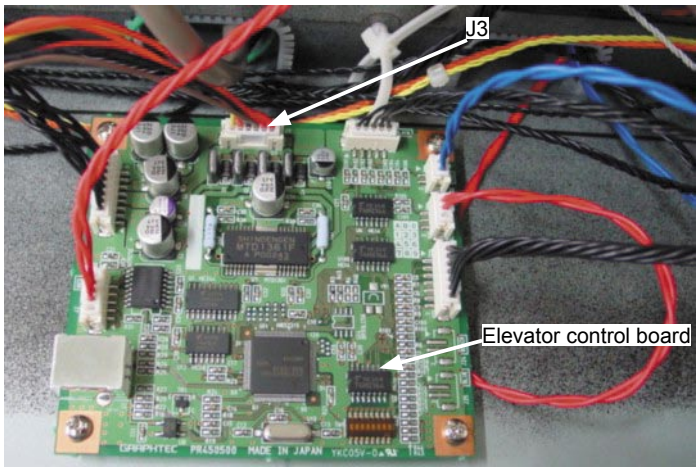

(3) Close the top cover assembly.
(4) Verify that the POWER LED and READY LED are lit.
(5) Press the ITA button and then verify that the READY LED goes out, and that the ITA LED lights instead.
(6) Place a sheet of copy paper on the front paper sensor and insert it into the recess. The top cover starts to rise automatically.
(7) When the top cover has risen to the upper limit position, insert the copy paper further so that it can be seen from the rear of the scanner.
(8) Lowering starts. If the top cover does not start to lower, press the REVERSE button.
(9) When the top cover has descended, and the error lamp is not lit, make the following adjustment.
When the top cover has descended, and the error lamp is lit, make the adjustment described in step (12).
(10) Adjust the center safety sensor height, using the screw in the center safety sensor adjustment hole.
(The sensor will lower when you turn the screw clockwise.)
(11) Turn off the scanner and then redo the procedure starting from step (2).
(12) Remove the piece of sponge from the scanner and then redo the procedure starting from step (4).
(13) When the top cover has descended, and the error lamp is not lit, adjustment is complete.
When the top cover has descended, and the error lamp is lit, turn the center safety sensor adjustment screw counterclockwise.
(14) Turn off the scanner and then redo the procedure starting from step (2).
(15) Make adjustments for the left and right sensors in the same way.

## 8.24 Elevator Gear Box

### Detaching the elevator gear box

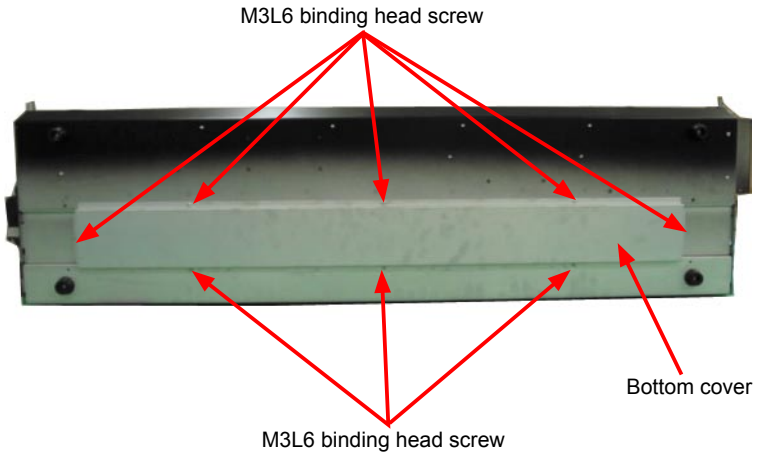
(1) Detach the front guide assembly (see Section 7.4).

(2) Disconnect connector J3 on the elevator control board.

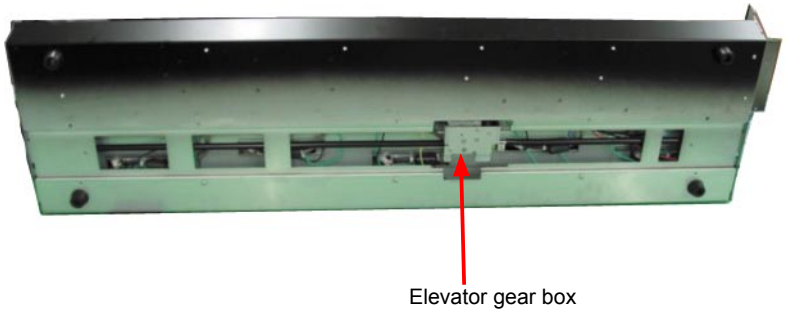



(3) Loosen the three M3L6 binding head screws holding the rear of the bottom cover.

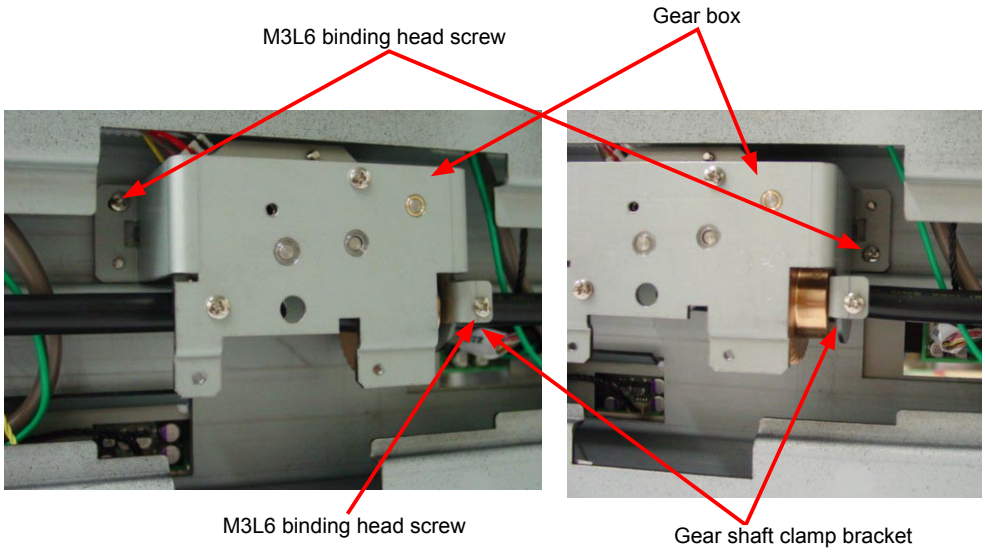
(4) Remove the three M3L6 binding head screws holding the front of the bottom cover and the two M3L6 binding head screws holding both sides of the bottom cover.




(5) Detach the bottom cover from the scanner.

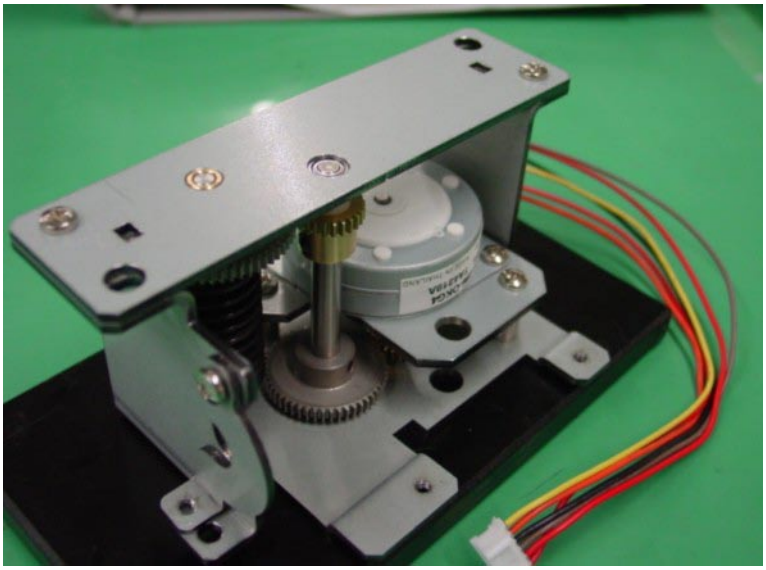


(6) Remove the two M3L6 binding head screws holding the gear box.




(7) Remove the M3L6 binding head screws holding the gear shaft clamp bracket.

(8) Detach the gear box from the scanner.



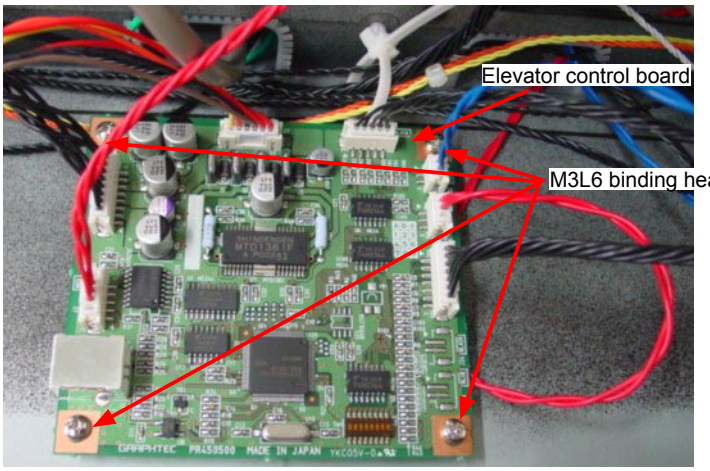
### Reattaching the elevator gear box

(1) Reattach the elevator gear box in the reverse order in which it was detached.

# 8.25 Elevator Control Board

### Detaching the elevator control board

(1) Detach the front guide assembly (see Section 8.4).
(2) Remove the four M3L6 binding head screws holding the elevator control board.
(3) Disconnect all the connectors on the elevator control board.



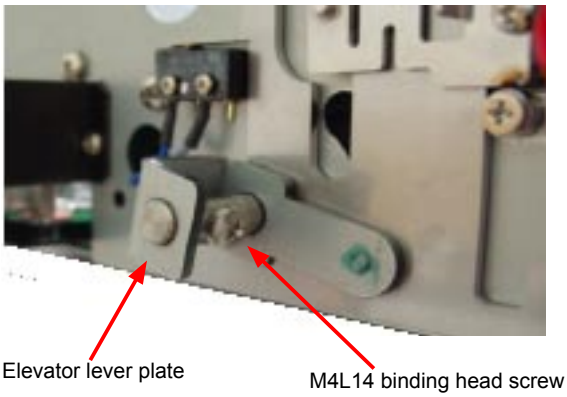

(4) Detach the elevator control board from the scanner.

### Reattaching the elevator control board

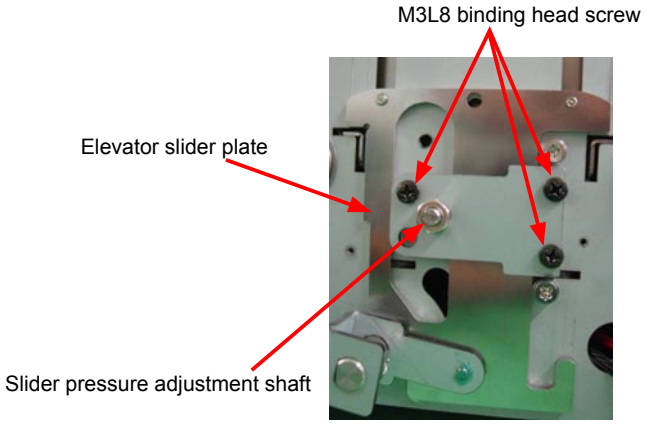
(1) Reattach the elevator control board in the reverse order in which it was detached.
(2) Prepare corresponded the elevator control board before replacing the data controller board.

## 8.26 Adjusting the Elevator Slider Plate

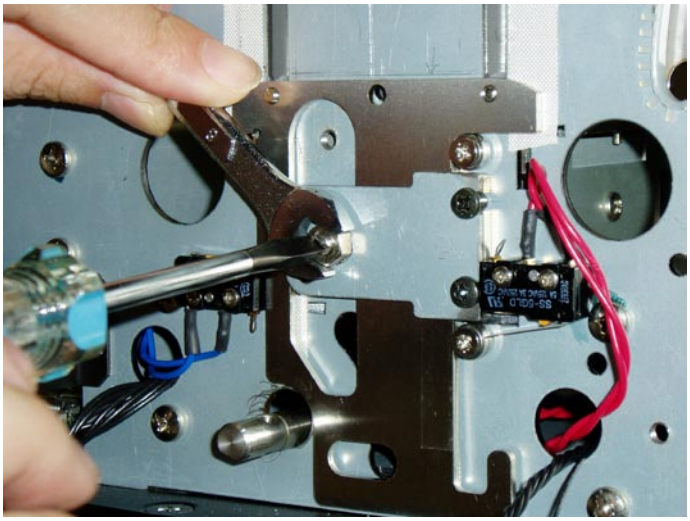
(1) Detach the front guide assembly (see Section 8.4).
(2) Detach the right and left side covers (see Sections 8.1 and 8.2).
(3) Detach the top cover assembly (see Section 8.3).
(4) Remove the M4L14 binding head screw holding the elevator lever plate.




(5) Loosen the three M3L8 binding head screws and the slider pressure adjustment shaft.




(6) Adjust the slider pressure using the slider pressure adjustment shaft and then tighten those screws.

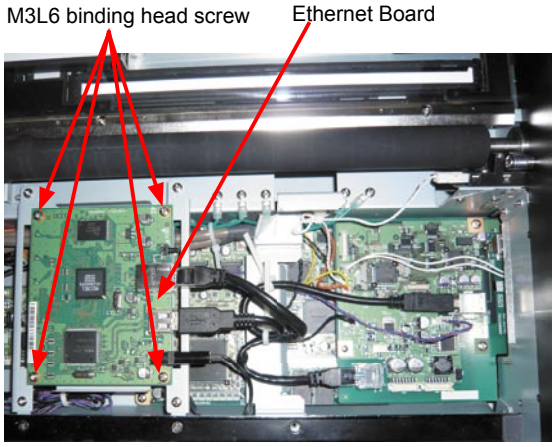


(7) Confirm that there is no play and that the slider moves smoothly.
(8) Adjust the left side slider pressure adjustment shaft in the same way.

# 8.27 Ethernet Board

### Detaching the ethernet board

(1) Detach the right and left side covers (see Sections 8.1 and 8.2).
(2) Detach the front guide assembly (see Section 8.4).
(3) Disconnect all the connectors on the ethernet board.




(4) Remove the four M3L6 binding head screws holding the ethernet board and then detach the ethernet board from the unit.

### Reattaching the ethernet board

(1) Reattach the ethernet board in the reverse order in which it was detached.

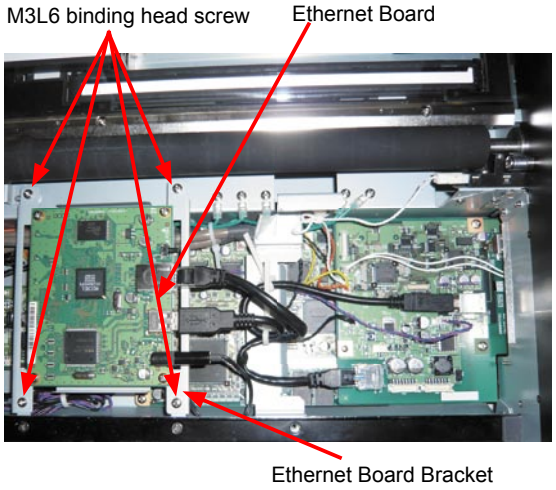
## 8.28 Data Controller Board

**⚠CAUTION**

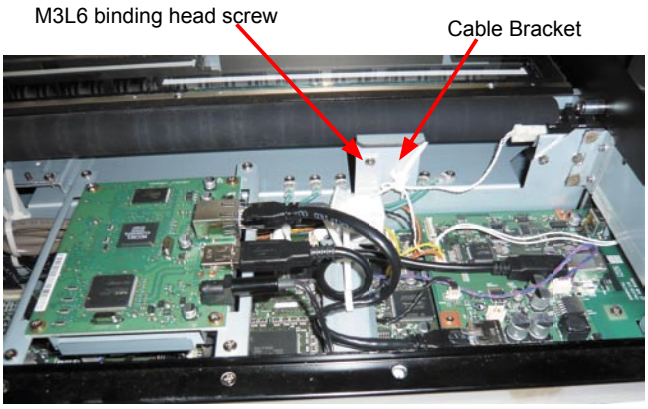
When replacing the data controller board, perform the software adjustment to obtain the former setting values from the data controller board.

### Detaching the data controller board

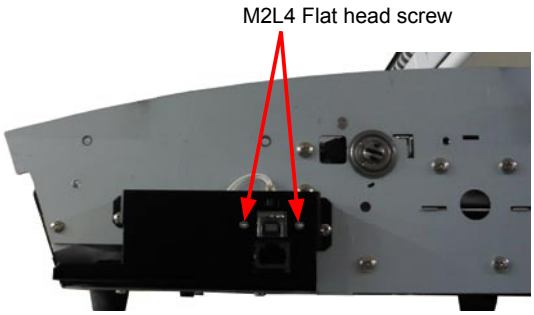
(1) Detach the right and left side covers (see Sections 8.1 and 8.2).
(2) Detach the front guide assembly (see Section 8.4).
(3) Disconnect all the connectors on the ethernet board.
(4) Remove the four M3L6 binding head screws holding the ethernet board bracket and then detach the ethernet board with ethernet board bracket from the main unit.



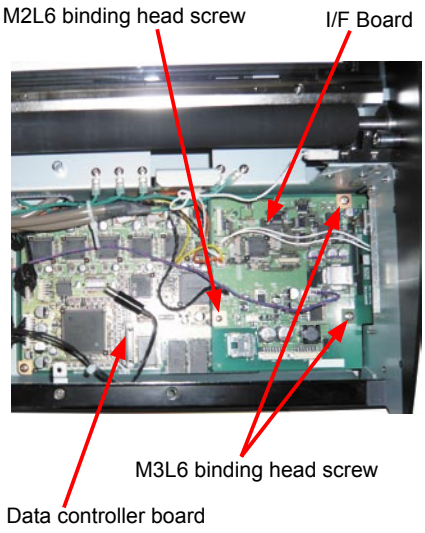

(5) Remove the M3L6 binding head screw holding the cable bracket and then detach the cable bracket from the main unit.



(6) Remove the two M2L4 flat head screws holding the I/F selector switch braket and then detach the I/F selector switch braket from the main unit.

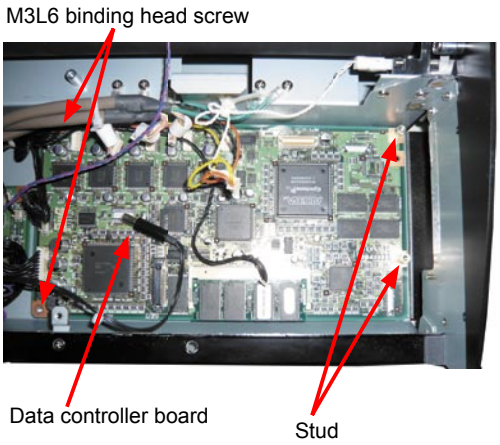



(7) Remove the M2L4 flat head screw and the two M3L6 binding head screws holding the I/F board and then detach the I/F board from the data controller board.




(8) Disconnect all the connectors on the data controller board.

(9) Remove the two M3L6 binding head screws and the two studs holding the data controller board.




(10) Detach the data controller board from the unit.

### Reattaching the data controller board

(1) Reattach the data controller board in the reverse order in which it was detached.
(2) Prepare corresponded the data controller board before replacing the data controller board.
(3) Set the DIP switch setting for each model (See "Replacing the Data Controller Board" in Section 9.2).
(4) Perform the software adjustment to input the former setting values or adjust the scanner by software adjustment. (See "Preparations before Making Adjustments" in Section 10.2)
(5) When replacing the data controller board, write down the MAC address that is shown on the old data controller board on the new data controller board.

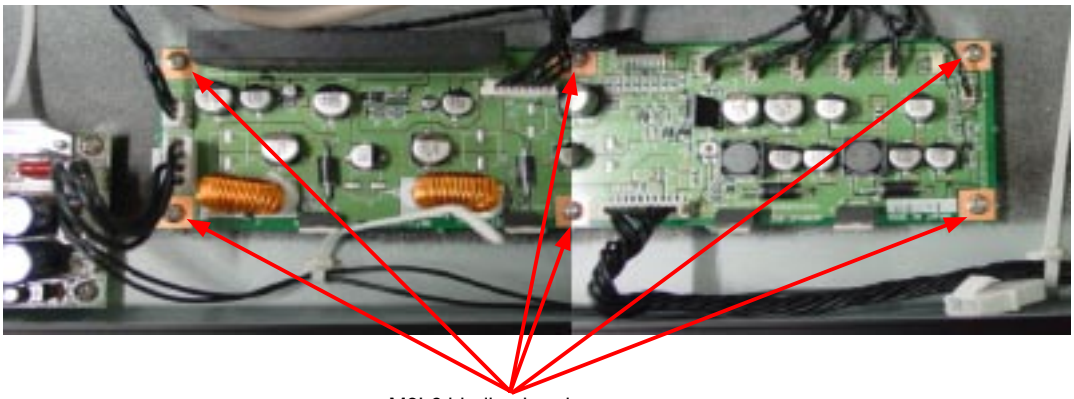
**⚠CAUTION**

When replacing the data controller board, perform the software adjustment to obtain the former setting values from data controller board. (See "Preparations before Making Adjustments" in Section 10.2)

## 8.29 Power Board

### Detaching the power board

(1) Detach the right and left side covers (see Sections 8.1 and 8.2).
(2) Detach the front guide assembly (see Section 8.4).
(3) Remove the six M3L6 binding head screws holding the power board.



M3L6 binding head screw

(4) Disconnect all the connectors on the power board.
(5) Detach the power board from the unit.

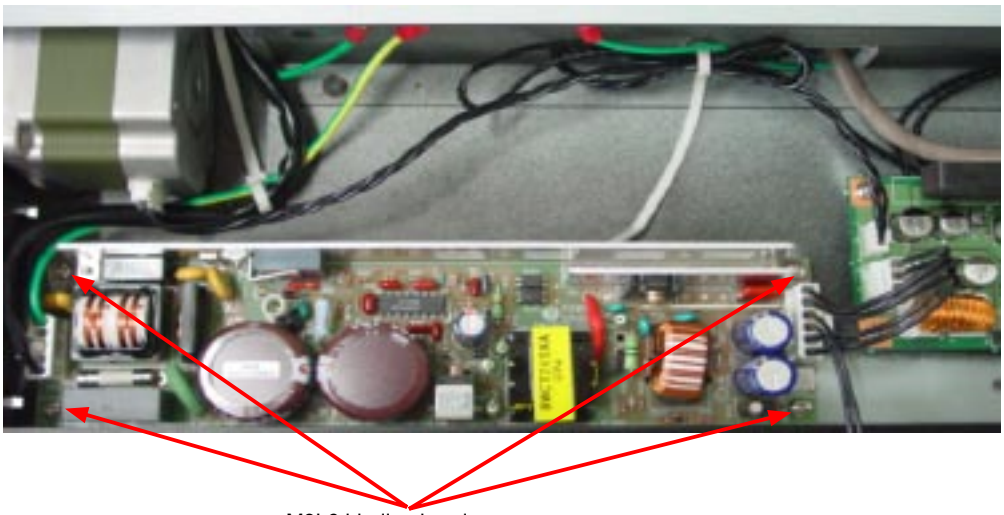
### Reattaching the power board

(1) Reattach the power board in the reverse order in which it was detached.
(2) Prepare corresponded the power board before replacing the data controller board.

## 8.30 Switching Power Supply Board

### Detaching the switching power supply board

(1) Detach the right and left side covers (see Sections 8.1 and 8.2).
(2) Detach the front guide assembly (see Section 8.4).
(3) Remove the four M3L6 binding head screws holding the switching power supply board.



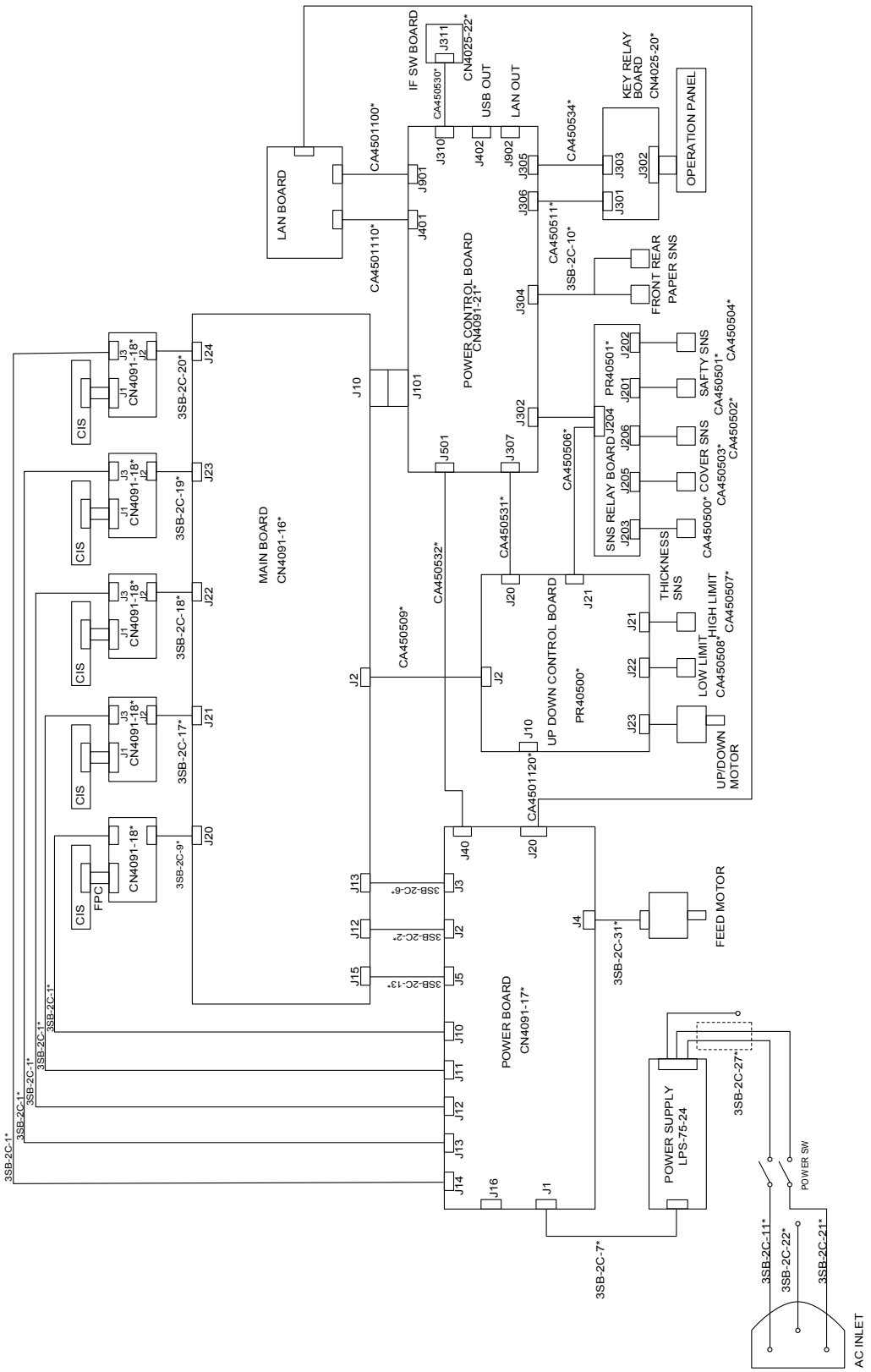

(4) Disconnect all the connectors on the switching power supply board.
(5) Detach the switching power supply board from the unit.

### Reattaching the switching power supply board

(1) Reattach the switching power supply board in the reverse order in which it was detached.

# 9. BOARDS AND ELECTRICAL COMPONENTS

## 9.1 Wiring Diagrams



# 9.2 Replacing the Data Controller Board

## 1. Precautions for replacing the data controller board

(1) Prepare corresponded the data controller board before replacing the data controller board.
If the model name is CS600-11, use the old type of data controller board.
If the model name is CS500-11-A, use the new type of data controller board.
(2) Before replacing the data controller board, note the feed correction value, X overlap and Y offset values currently selected for the scanner, if these values can be checked. (To check these values, follow the procedure given in "Preparations before Making Adjustments" in Section 10.2.)
(3) Use Scanning Master 21+ to make adjustments.

## 2. Replacing the data controller board

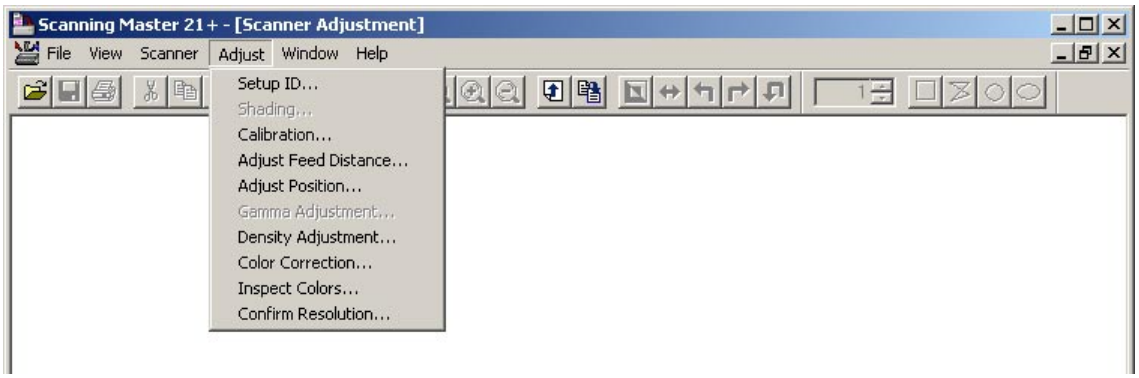
(1) Before replacing the data controller board, note the feed correction value, X overlap and Y offset values currently selected for the scanner, if these values can be checked. (To check these values, follow the steps given in "Preparations before Making Adjustments" in Section 10.2.)
(2) Detach the data controller board (See "Data Controller Board" in Section 8.28).
(3) Write down the MAC address that is shown on the old data controller board on the new data controller board.
(4) Attach the new data controller board by reversing the sequence of steps in which the old board was removed.
(5) Set the DIP No.5 and 6 switches to ON on the data controller board.
(6) Initialize all adjustments by turning ON the power while pressing and holding down the STOP and SCAN keys.
(7) Perform Calibration (white correction). (See "Calibration (white correction)" on p. 10-8.)
(8) Adjust the feed distance. (See "Feed distance adjustment" on p. 10-10.)
(9) Adjust the offset (origin). (See "Scaning Start position adjustment" on p. 10-17.)
(10) Align the sensor images (X overlap, Y offset). (See "Sensor Stitch Adjustment" on p. 10-13.)
(11) Perform Color correction (using a color correction sheet). (See "Color correction" on p. 10-22.)

## 9.3 Replacing the Ethernet Board

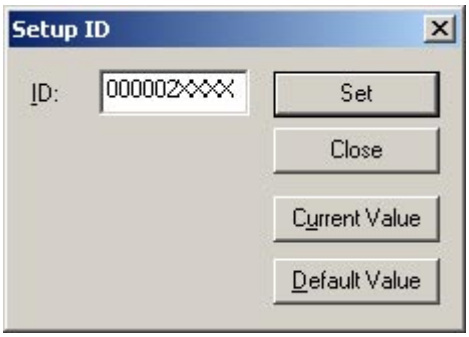
(1) After replacing the ethernet board, you need to input the MAC address to the ethernet board.
(2) Use Scanning Master 21+ to input the MAC address.

### Input the MAC address to the ethernet board

(1) Use the USB cable to connect the CS610 and PC.
(2) Turn on the power for your PC and start OPS112.
(3) When OPS112 starts, follow the steps given below to input the MAC address.
   1. Access the "Help" menu and select "About." At this time, a dialog box will appear.
   2. Point to the icon in the window and click while pressing and holding down the "Ctrl" key.
   3. Click the "OK" button while pressing and holding down the "Shift" key. This makes the status available for adjustment.
   4. Select "Setup ID" from the "Adjust" menu to display the Adjust Scanner window.




   5. The following dialog box appears. Input the 10-digit MAC address shown on the data controller board.




   6. Click the "Set" button to register the MAC address.
   7. Click the "Close" button to end the adjustment mode.

# 9.4 Downloading Firmware

This section describes how to download firmware (system programs) via the USB interface to the flash memory provided on the data controller board, to which the boot program has been downloaded.

## 1. Items required to download firmware

• sc_csis4vxxx.x file (Firmware)
• CS600 scanner
• PC (Windows 2000/XP and an operating environment that provides USB 2.0 compatibility)
• OPS112 (Scanning Master 21+ Ver 5.22 or later)
• USB interface cable

## 2. Procedure

(1) Use the USB cable to connect the CS610 and PC.
(2) Turn on the power while pressing and holding down the STOP key, the REVERSE key and the FORWARD key until the green and orange LED come on the power LED.
(3) Turn on the power for your PC and start OPS112.
(4) When OPS112 starts, follow the steps given below to download the firmware.
    1. Access the "Help" menu and select "About." At this time, a dialog box will appear.
    2. Point to the icon in the window and click while pressing and holding down the "Ctrl" key.
    3. Click the "OK" button while pressing and holding down the "Shift" key.
       This makes the status available for adjustment.
    4. Select "Adjust Scanner" from the "Tools" menu to display the Adjust Scanner window.
    5. Select "Update Scanner/Firmware" from the "Scan" menu to display the Download dialog box.
(5) Insert the floppy disk containing the firmware (filename: argos2.X) into the floppy disk drive, click the "View" button on the Download dialog box, select the floppy disk, and click the "OK" button.
(6) Click the "Start" button to begin downloading.
(7) After the download is complete, a message will appear. At this time, the paper and error LEDs on the scanner should start flashing simultaneously.
    After confirming this, turn off the power.

# 10. ADJUSTMENTS USING THE SOFTWARE

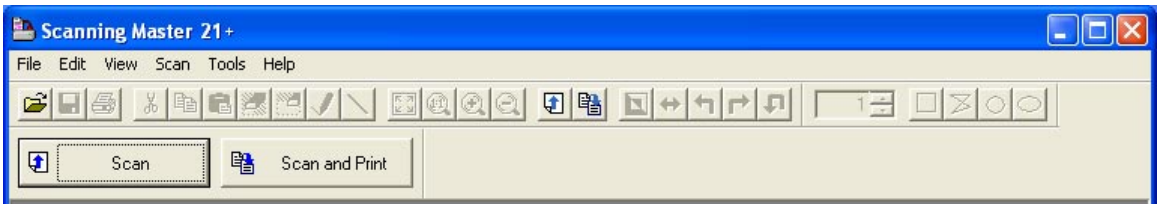
## 10.1 Starting the Software

• Ensure that OPS112 (Scanning Master 21+ Ver 6.60 or later) is installed.

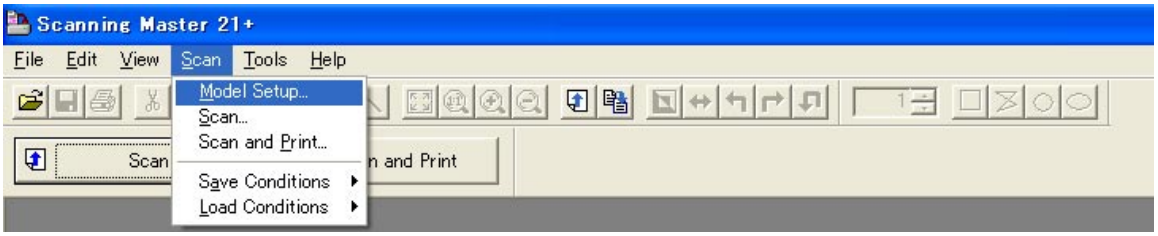
(1) Connect the scanner to the PC using a USB cable and switch on the scanner.

(2) Start Windows (OS).

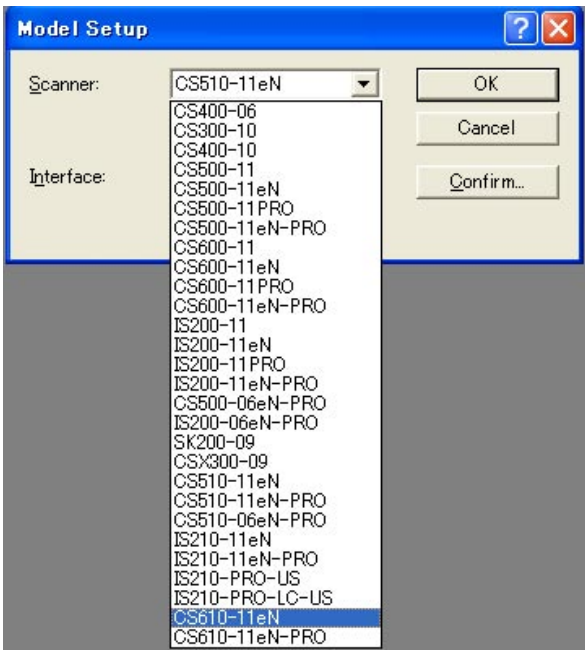
(3) Start OPS112 (SCANNING MASTER 21+).



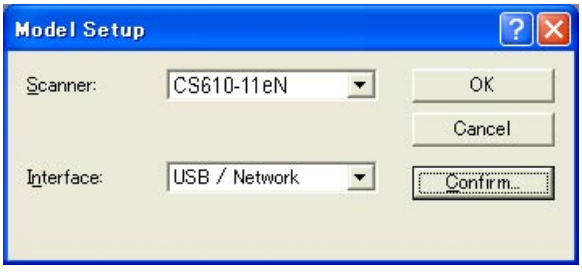

(4) Select "Model Setup" from the "Scan" menu.




(5) Select model that is connecting from the pull down menu.

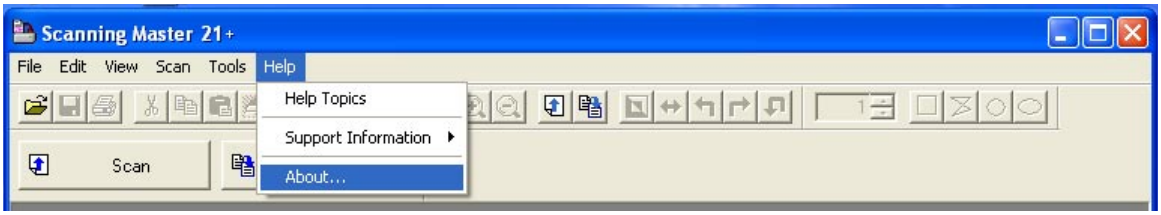



(6) Click the "Confirm" button to confirm the scanner is connected.

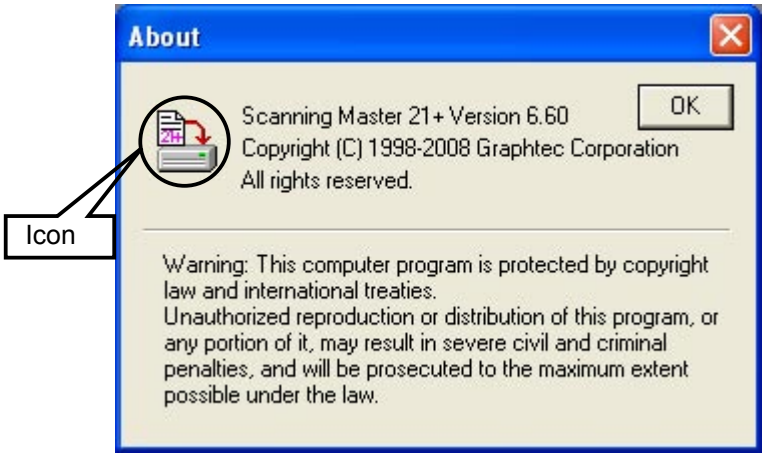


(7) The following message is displayed when the scanner is detected.
Click "OK" button.

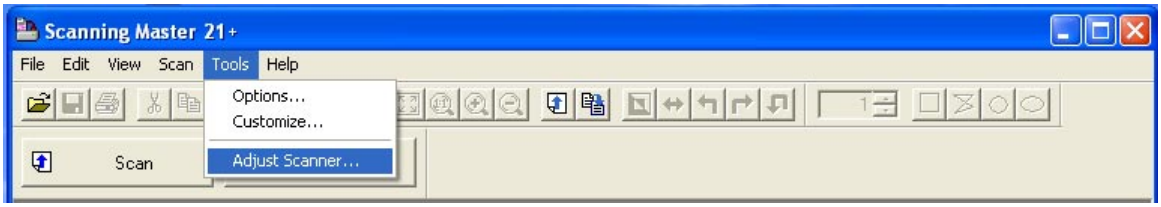

(8) Select "About" from the "Help" menu.



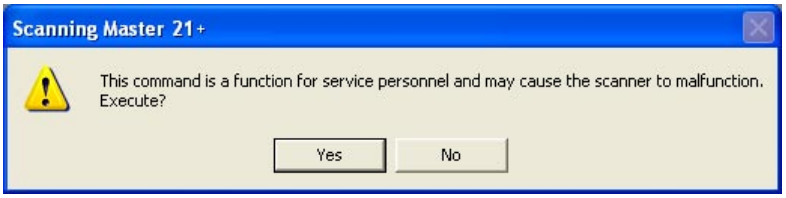

(9) Click the scanner icon while pressing and holding down the "Ctrl" key.
Next, click the "OK" button while pressing and holding down the "Shift" key.



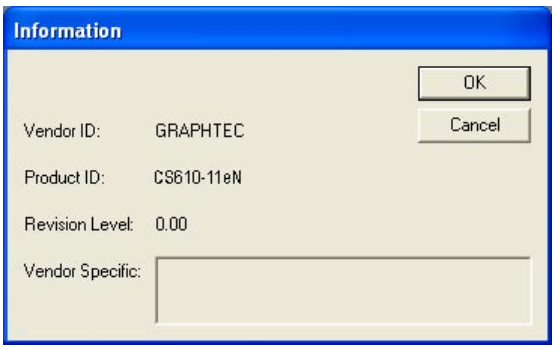

(10) Select "Adjust Scanner" from the "Tools" menu.

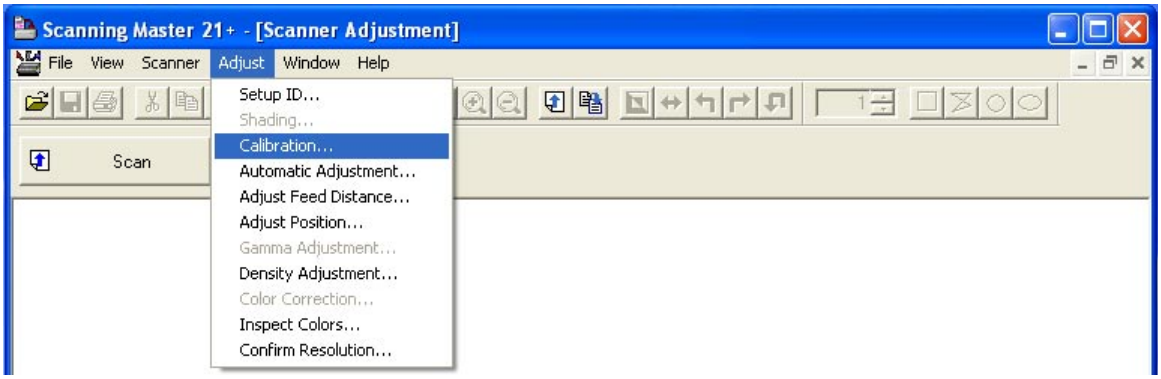



(11) Select "Yes".



(12) When you click the "OK" button in the following window, the Scanner Adjustment window will appear with an Adjust menu.



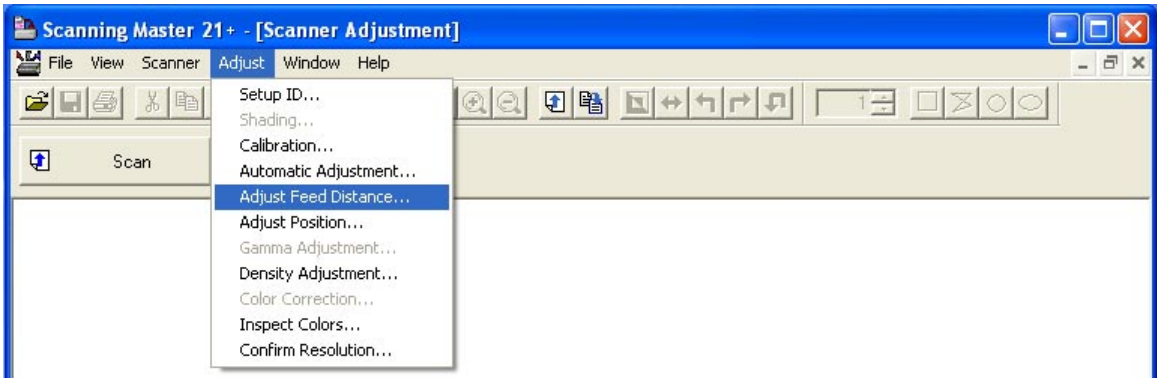
## 10.2 Preparations before Making Adjustments

Note the current feed distance adjustment and position adjustment values while making adjustments.
This enables the values to be entered directly from the keyboard to restore the scanner to its previous status if adjustment fails.
In main board replacement, the time required for adjustment can be reduced by setting the previously noted feed distance adjustment and position adjustment values. However, for image sensor unit replacement, all settings must be adjusted, eliminating the need to record the previous values.

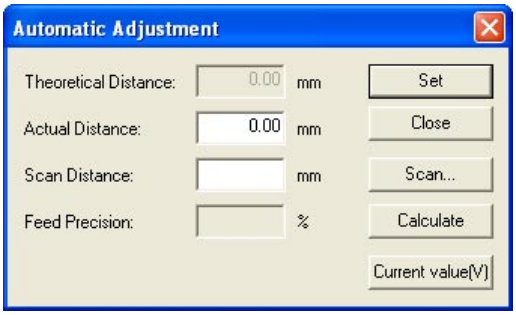
### Adjustment Procedure

(1) Start Scanning Master 21+. (See p. 10-1.)

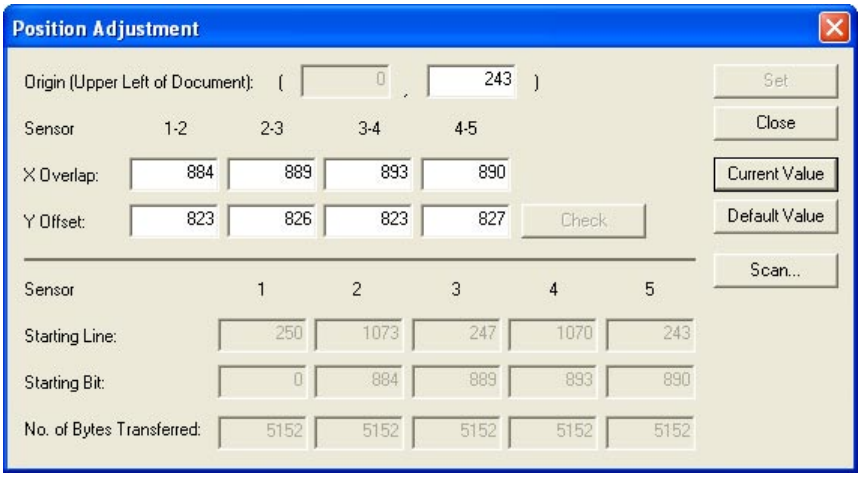
(2) Select "Adjust Feed Distance" from the "Adjust" menu.




(3) Click the "Current Value" button and note the value shown in the Feed Adjustment Value box. After finishing, click the "Close" button.



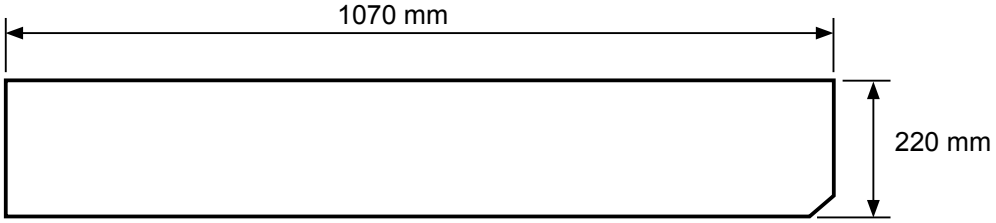

(4) Similarly, select "Adjust Position" from the "Adjust" menu and click the "Current Value" button. Note the values shown in the Origin, the X Overlap and Y Offset boxes and click the "Close" button.



## 10.3 Preparing Adjustment Charts

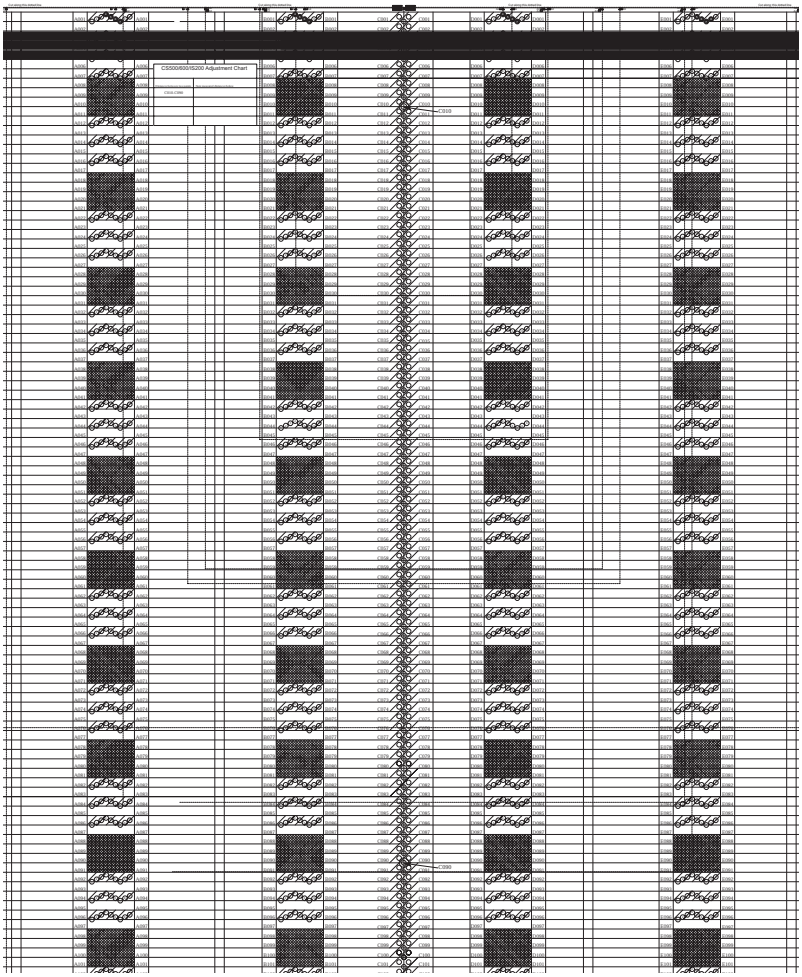
There are the three kind of adjustment charts.

- Calibration Sheet: This sheet is used for the sensor sensitivity adjustment.

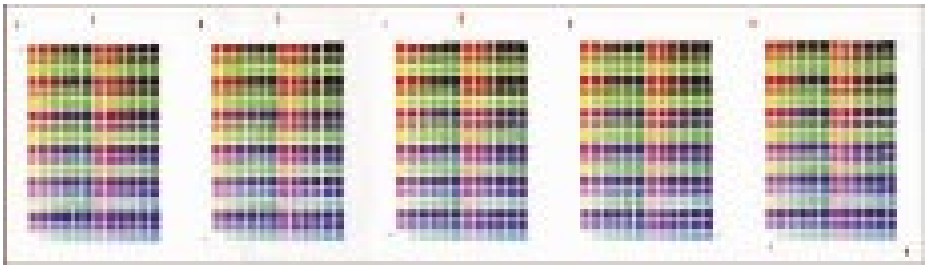



Calibration sheet

- C600/500/IS200 adjustment test chart: This chart is used for the manual sensor stitch adjustment, the feed distance adjustment and the scanning start position adjustment.

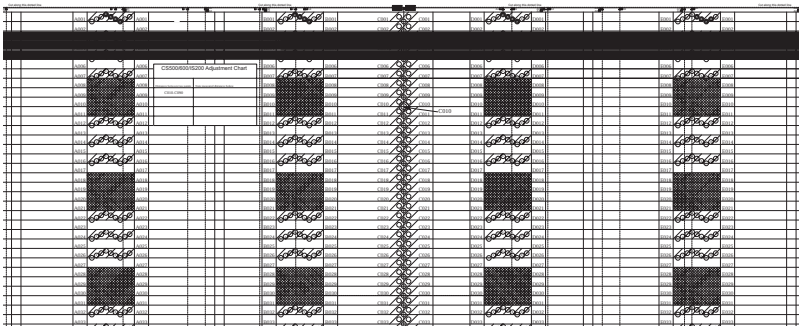


- Color correction chart: This chart is used for the color correction.



### Preparing the CS600/500/IS200 adjustment test chart

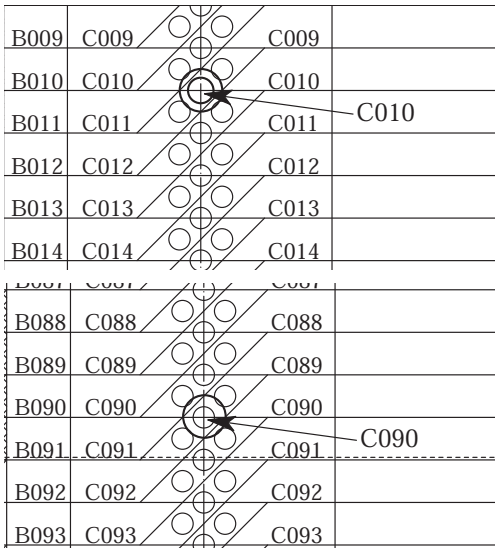
(1) Prepare a CS600/500/IS200 adjustment test chart.
Print the Test Chart CS600/500/IS200.pdf by the printer that is able to print A0 size.



(2) Make sure that the distances (measured with a glass scale) between the two points in all pairs are included in the chart in advance. (See the chart shown above.)

<<Tip 1>> The test chart is made of Mylar paper.
For use in normal office environments (normal temperatures and humidity levels), you should only need to measure each distance once.
Make sure that each distance is measured with the utmost accuracy.

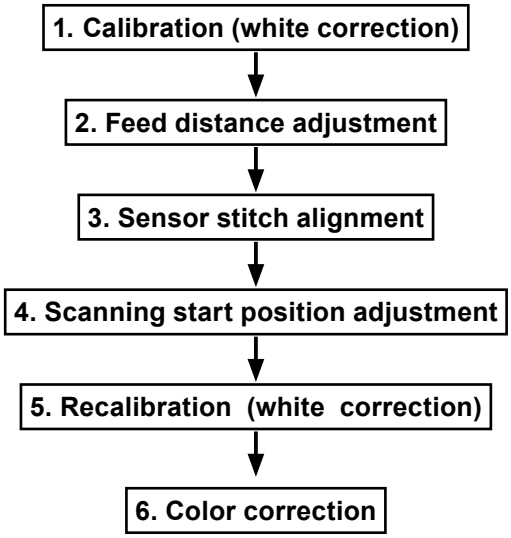
<<Tip 2>> Make sure that all staff members using this test chart select the same measurement points.
This chart has been designed with the assumption that the point shown below is used for measurement.




<<Tip 3>> If user-specified paper must be used for adjustments, you should make the measurements over as long a period of time as possible to obtain good results.

## 10.4 Making Adjustments

When you replaced the main board or the CIS sensors, follow the sequence of adjustments below.




**CHECKPOINT**

Before beginning calibration, clean the contact glass plates and scanning-table surface. Any dust or dirt on those surfaces may affect the calibration results and resulting image quality.
Check that the calibration sheet is free of any dust or dirt.

## 10.4.1 Calibration (white correction)

In the following cases, perform this adjustment.

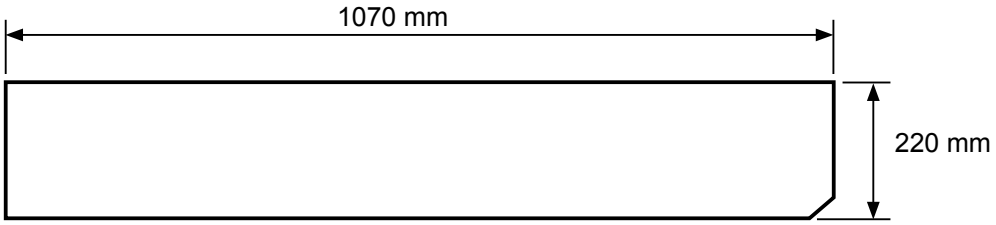
- When difference color appeared between each sensor.
- When you replaced the main board.
- When you replaced the CIS board.
- When you replaced or removed the CIS sensors.
- When you replaced or removed the contact glasses.

### How to perform the calibration

(1) Connect the scanner to the computer. Switch on the scanner, then switch on the PC.

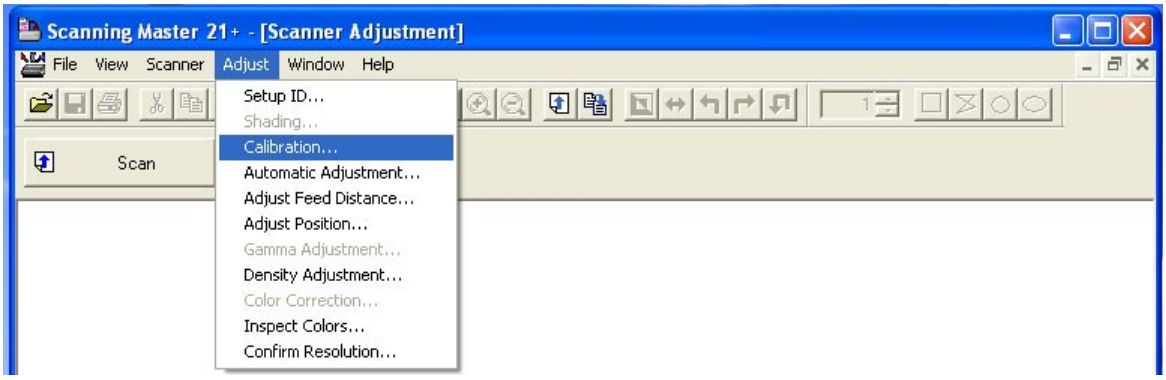
(2) Start Scanning Master 21+. (See p. 10-1.)

(3) Remove the white calibration sheet (220 x 1070 mm) from its special storage box.
Clean the sensor glass surface and the document hold-down unit.




Calibration sheet

(4) Select "Calibration" from the "Adjust" menu.




(5) Select All in Calibration and click the Execute button.


(6) The following message is displayed. Insert the calibration sheet into the scanner as instructed.

(7) Click the OK button to start scanning.
The scanned data is displayed when scanning is complete. Colors may differ slightly for individual sensors to make it easier to identify problem areas in calibration. This does not indicate a defect. Check that there are no vertical streaks, such as white patches, in the scanned data.
(Streaks occur when calibration is not performed correctly due to contamination by dust or dirt.)

(8) If the data is normal, calibration is complete.
Click the Close button and exit calibration mode.

(9) If any abnormal data is observed, clean the sensor glass surface and the document hold-down unit.
Remove the calibration sheet and clean the glass and table surfaces. Check the calibration sheet for dust.

(10) Repeat step (5) to step (7).

(11) Return to step (5) and verify the calibration results.

## 10.4.2 Feed distance adjustment

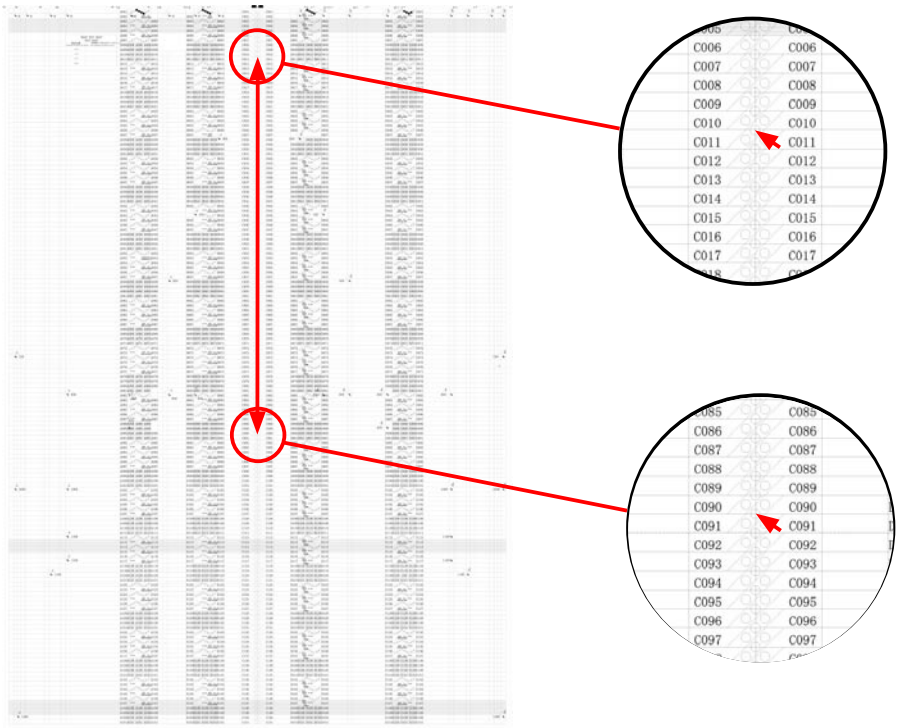
In the following cases, perform this adjustment.

- When the distance is different in the direction of the feed.
- When you replaced the main board.
- When you replaced or removed the CIS sensors.
- When you replaced or removed the feed motor.
- When you replaced or removed the feed rollers.

### How to perform the feed distance adjustment

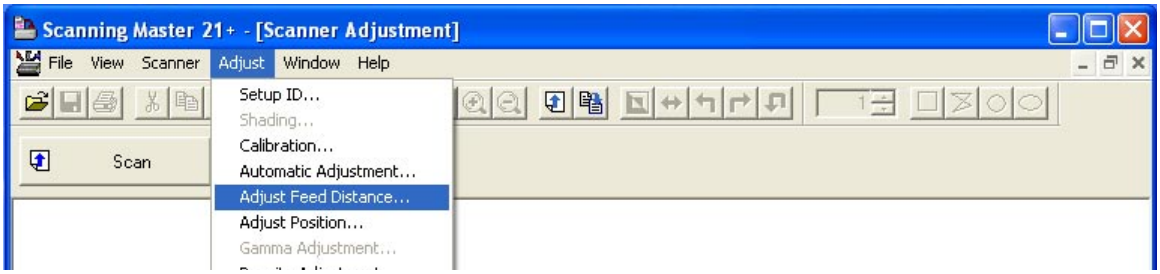
(1) Prepare the CS600/500/IS200 Test Chart.

(2) Measure the distances between the C010 and the C090 points in the CS600/500/IS200 Test Chart with a glass scale. And then record it.

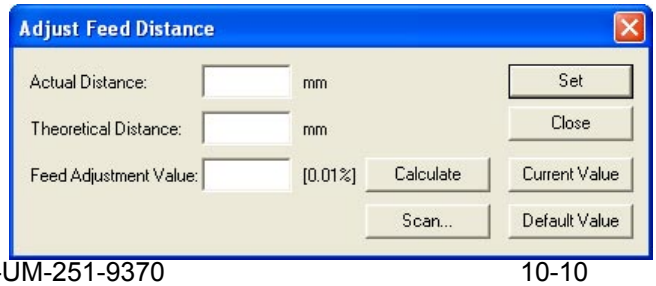



(3) Run the software. (See page 10-1) This is not necessary when the software is running already.

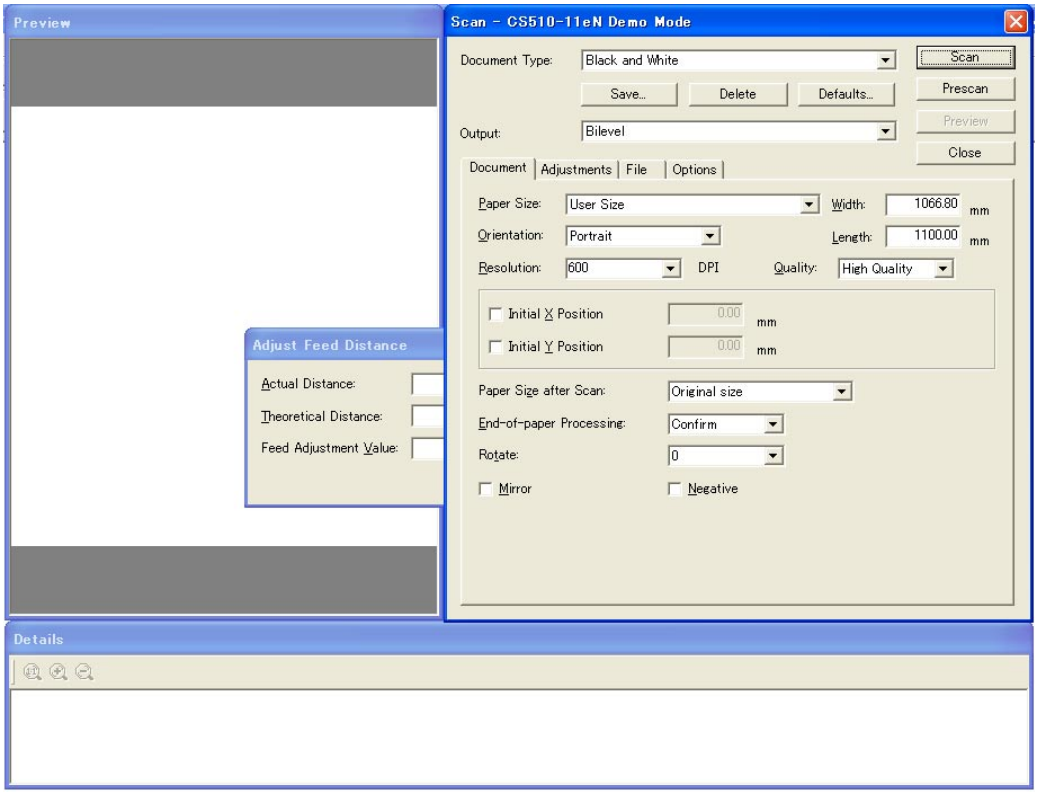
(4) Select "Adjust Feed Distance" from the "Adjust" menu.




(5) The following dialog box will appear. Correctly insert the CS600/500/IS200 test chart to the scanner, and then click the "Scan" button.



(6) The following dialog box will appear. Click the "Scan" button.



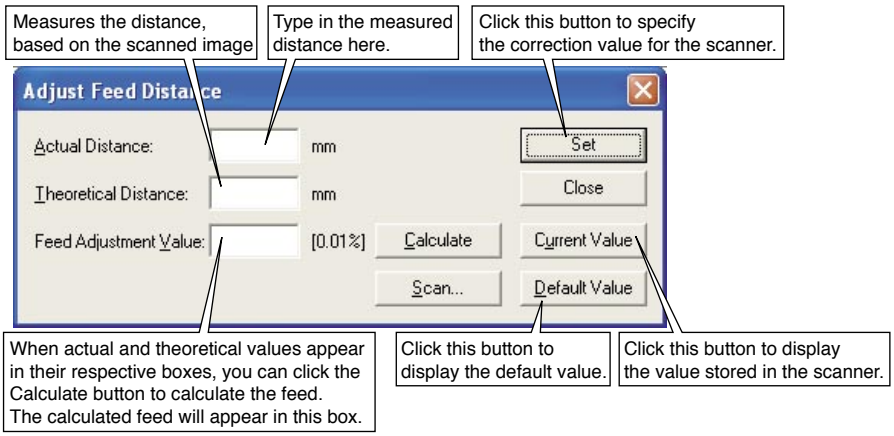

Select the following for "Document Info" and "Scan Settings":

"Document Info" Paper Size : User Size, Width: 1066, Length 1100, Resolution: 600 dpi

Document Type : Black and White

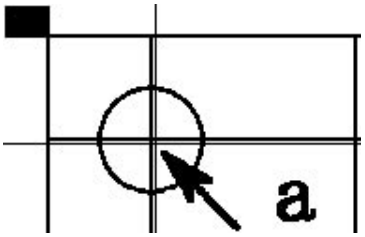
"Scan Settings" Output : Bilevel

The following dialog box appears, together with the scanned image.



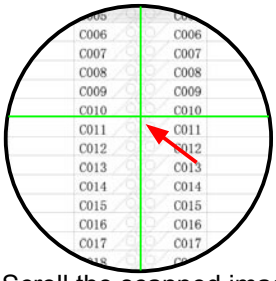

(5) Type the distance between a and c measured with a glass scale in the "Actual" box.

(6) Click anywhere within the "Theoretical" box and use the crosshairs cursor to click the white corner indicated by arrow "a" on the scanned image.

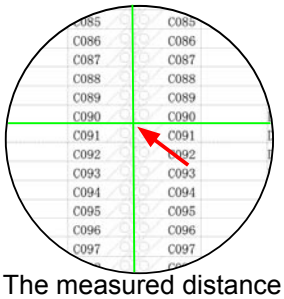


(7) Input the distance between C010 and C090 measured with a glass scale in the "Actual" box.

(8) Click anywhere within the "Theoretical" box and use the crosshairs cursor to click the white corner indicated by arrow "C010" on the scanned image.




(9) Scroll the scanned image to click the white corner indicated by arrow "C090" with the crosshairs cursor.




(10) The measured distance appears in the "Theoretical" box. Click the "Calculate" button.

(11) The correction value appears in the "Feed" box.
Click the "Set" button to allow the scanner to store the correction value.

(12) Place the test chart on the scanner again and click the "Scan" button.

(13) Repeat Steps 4 through 10 to perform the following calculations, based on the figures displayed in the dialog box.
[ (Theoretical value - Actual value) / Actual value ] x 100%
Confirm that this value is within ±0.1.

**CHECKPOINT**

The scanner may be defective if the calculated values do not fall within the above ranges.

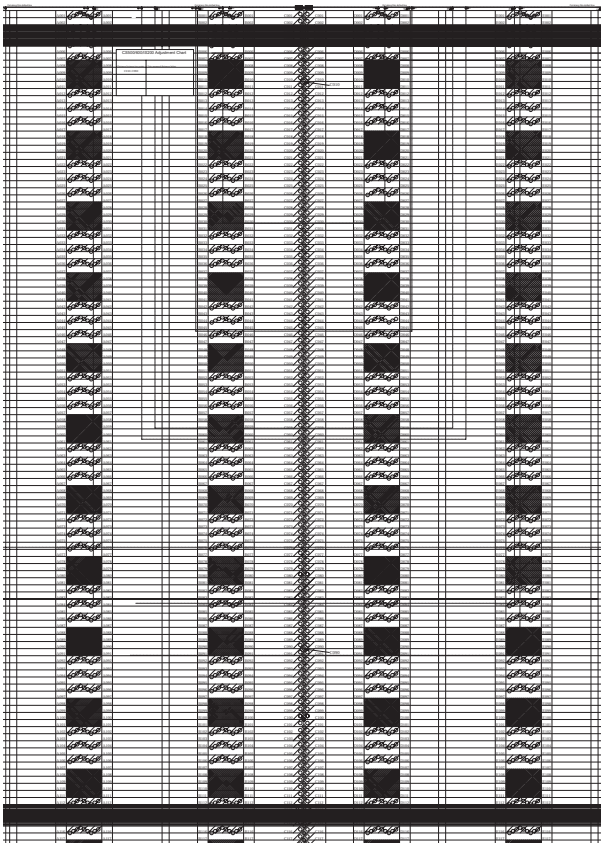
## 10.4.3 Sensor Stitch Adjustment

In the following cases, perform this adjustment.

- When the sensor jointing is misaligned.
- When you replaced the main board.
- When you replaced or removed the CIS sensors.

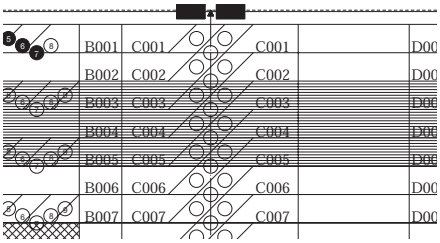
### Adjusting the sensor stitch by manual sensor stitch adjustment

(1) Prepare the CS600/500/IS200 Test Chart.

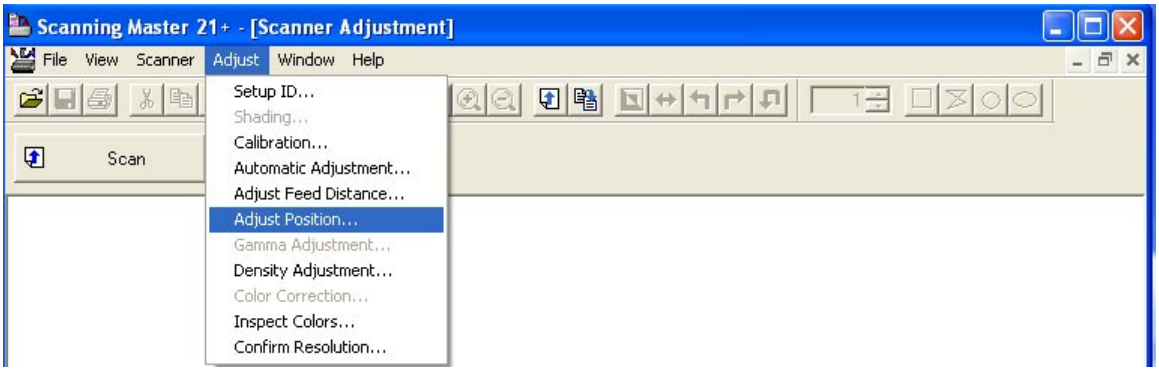


(2) Run the software. (See page 10-1) This is not necessary when the software is running already.

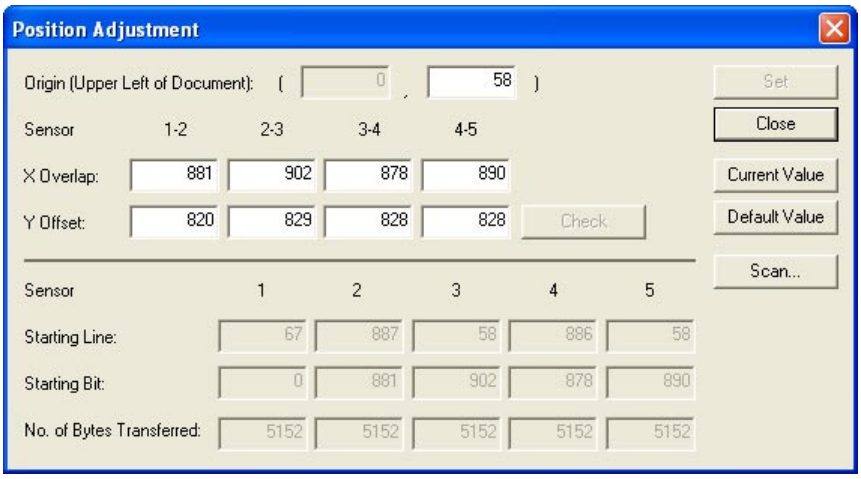
(3) Insert the CS600/500/IS200 Test Chart into the scanner.
Position the center arrow mark of the CS600/500/IS200 adjustment test chart to the center of the scanner and insert the CS600/500/IS200 Test Chart.



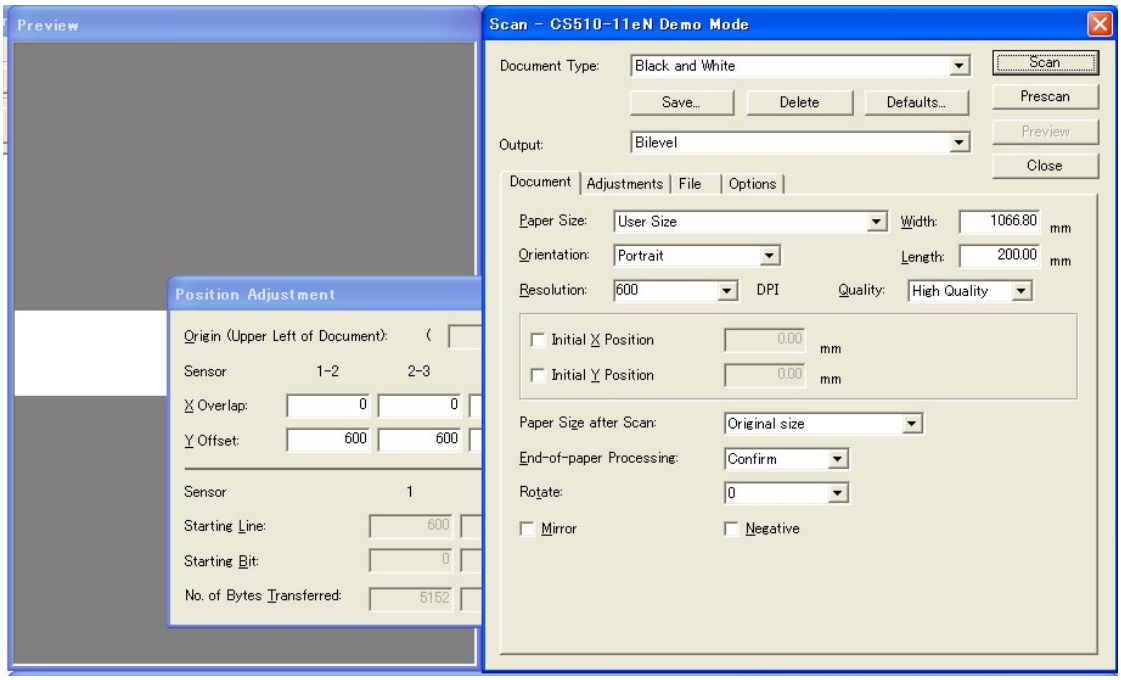
(4) Select "Adjust Position" from the "Adjust" menu.



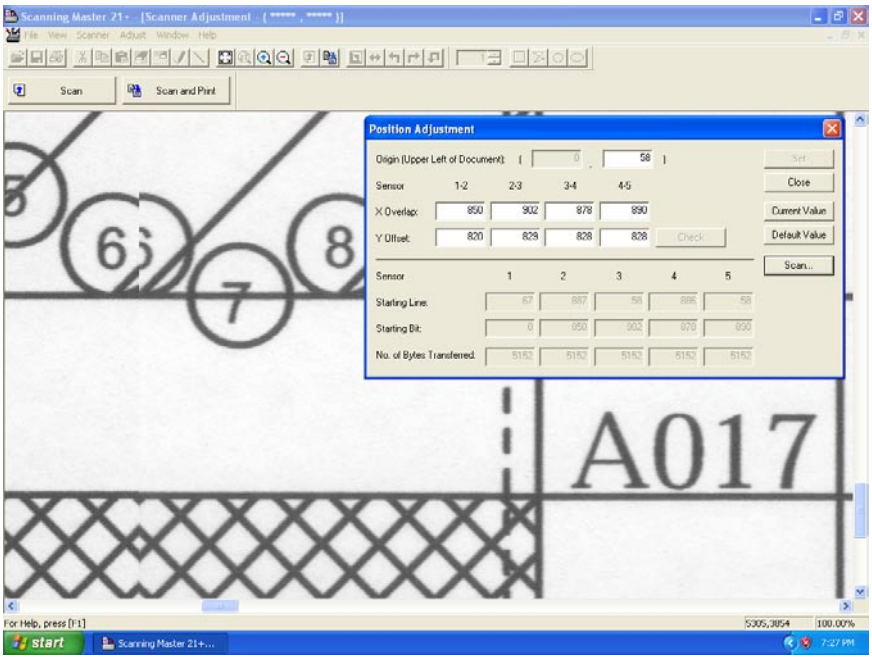

(5) The following dialog box will appear. Confirm that the CS600/500/IS200 Test Chart is inserted to the scanner correctly, and then click the "Scan" button.




(6) The following dialog box will appear. Click the "Scan" button.

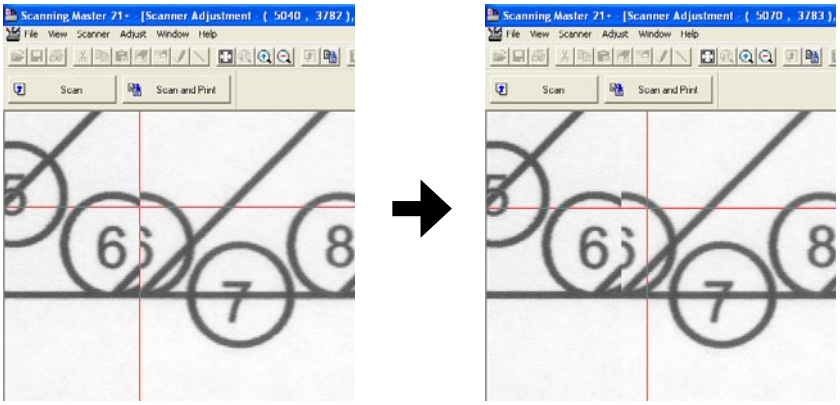


(7) The image appears as shown below.
Then confirm the jointing area of sensors from the A area to E area.
At this time, confirm around 017 lines, because the top part of target is not stable to contact the CIS sensors.




(8) The image appears as shown above with the left-hand portion of the image misaligned with the right-hand portion.
Click anywhere in the X Overlap box under "1-2" (A area).

(9) The crosshairs cursor will appear. First click a position on the left-hand portion, then click the position of the right-hand portion that corresponds to the position you selected first.

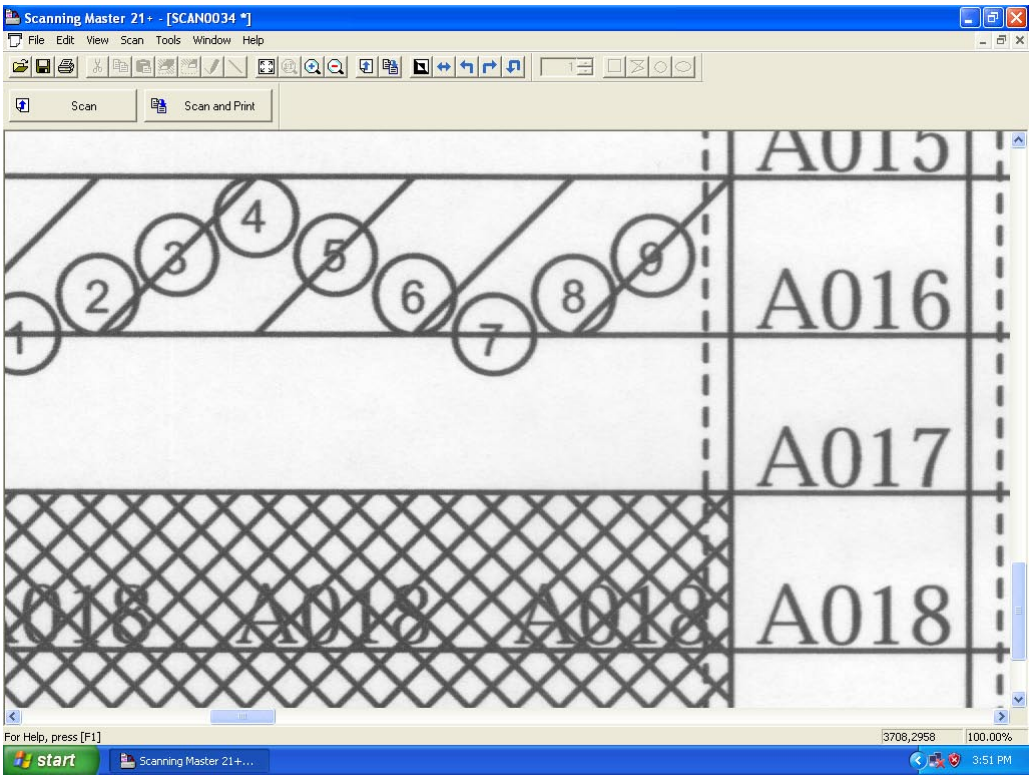


(10) Click the "Check" button first, then click the "Set" button. Follow the on-screen instruction to place the adjustment chart on the scanner again.

(11) Repeat these steps until the left-hand portion is properly aligned with the right-hand portion.
In this task, you need to adjust the X overlap and Y offset at the same time.
See "Tips for Making Fine Adjustments" on the next page if you encounter difficulties making fine adjustments.

(12) Similarly, make adjustments for 2-3 (B area), 3-4 (D area), and 4-5 (E area) in this order if there is misaligned.
After finishing, close all the adjustment menu windows. Use the CS600/500/IS200 Test Chart to perform a normal scan, and confirm that the image appears properly.

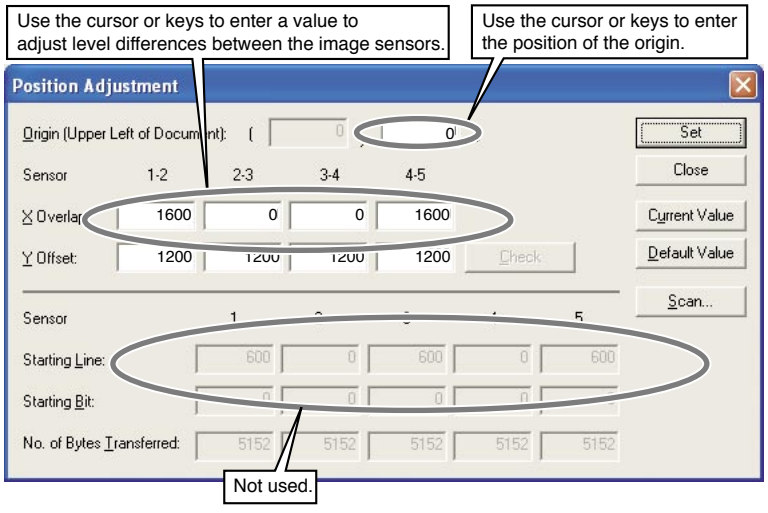
### Image after adjustments




### Tips for Making Fine Adjustments

• Two portions of the aligned image become misaligned during adjustments using the crosshairs cursor.
• You wish to move a portion of the image by one pixel.
• You find it difficult to find whether any portions of the image are misaligned.
• You feel that some portions of the image remain misaligned, despite efforts to correct the alignment.

In these cases, simply type in numbers to make adjustments.
In this section, we will give you a rough idea of what the numbers in the dialog box mean.
Once you become familiar with the meanings of these numbers and know which numbers to type in, you can make adjustments more accurately and quickly than by using the crosshairs cursor.



## 10.4.4 Scanning Start Position Adjustment

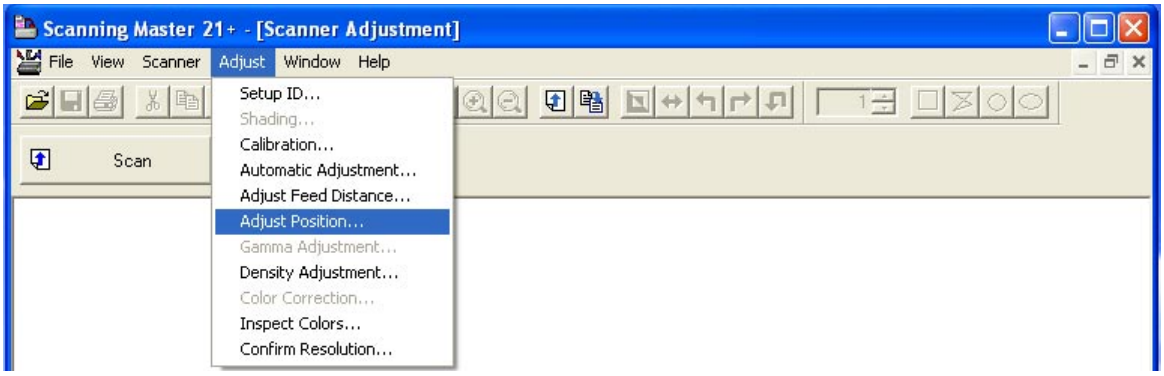
In the following cases, perform this adjustment.

- When the start position is shifted.
- When the stitch of sensors were adjusted by the auto-stitch adjustment.
- When you replaced or removed the paper edge detecting sensor.
- When you replaced the main board.

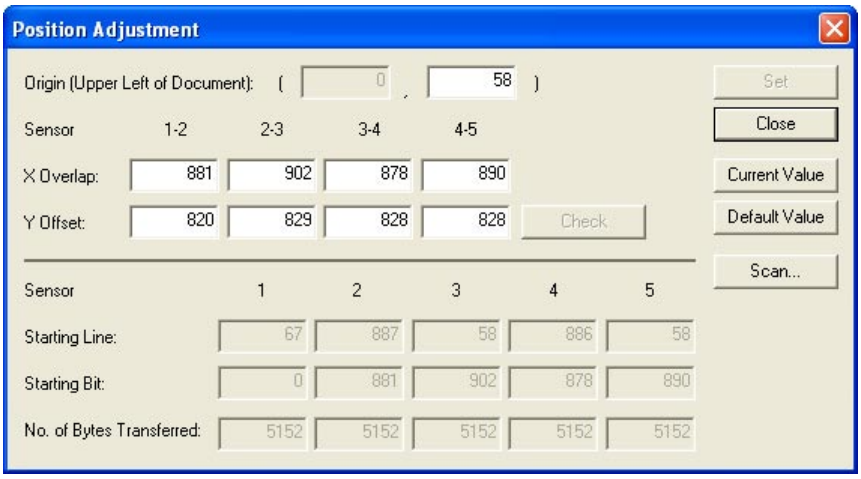
**Adjusting the scanning start position (origin adjustment)**

(1) Start the OPS112 software. (See p. 10-1.)

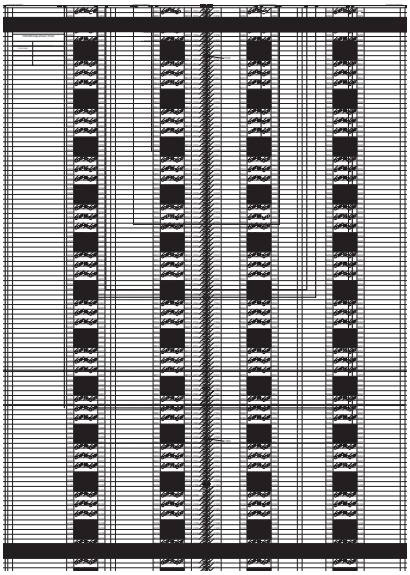
(2) Select "Adjust Position" from the "Adjust" menu.



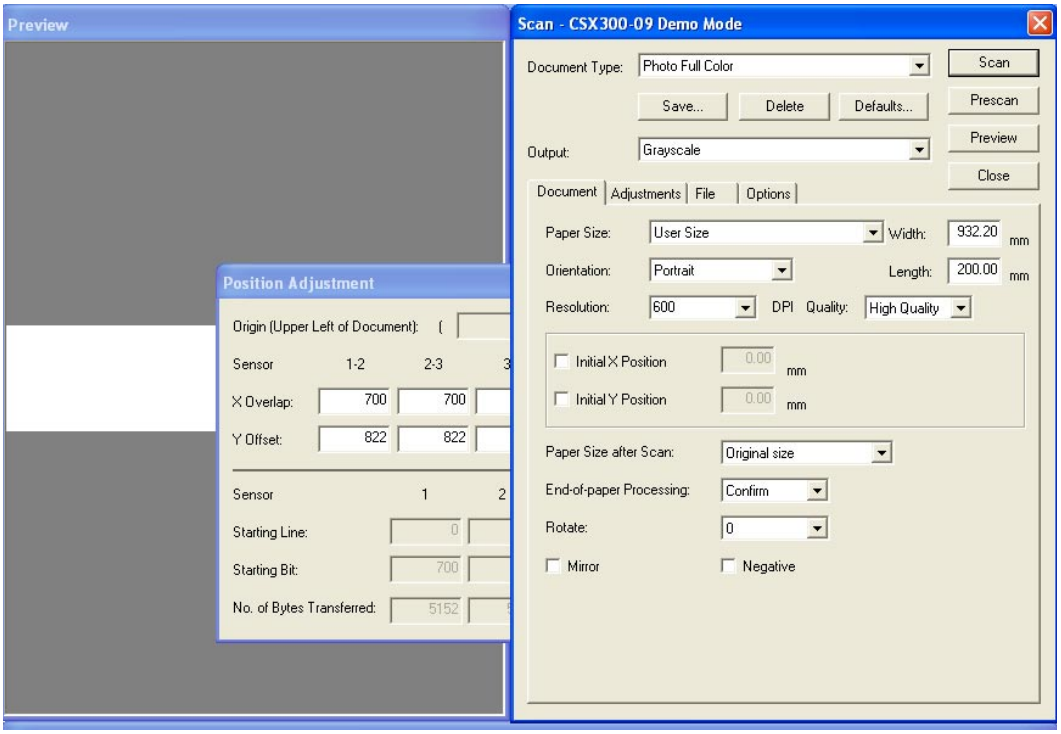

(3) The following dialog box will appear.




(4) Correctly insert the CS600/500/IS200 adjustment test chart into the scanner and click the "Scan" button.



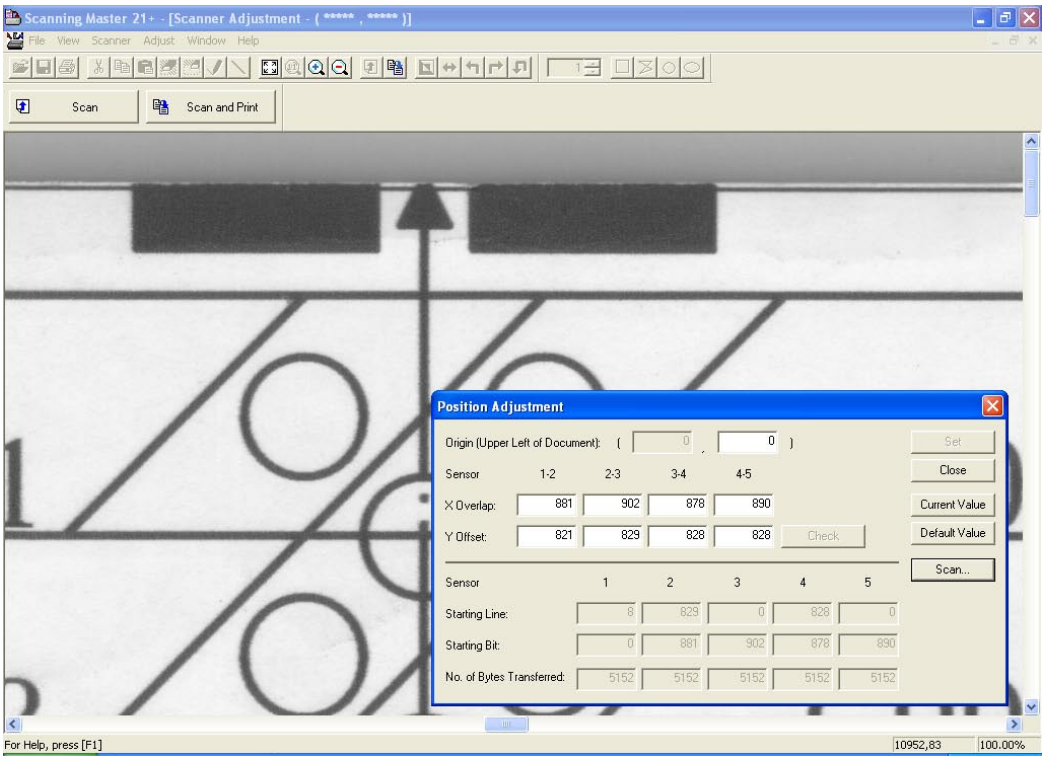
(5) The following dialog box will appear. And confirm the scanning condition. Then click the "Scan" button.



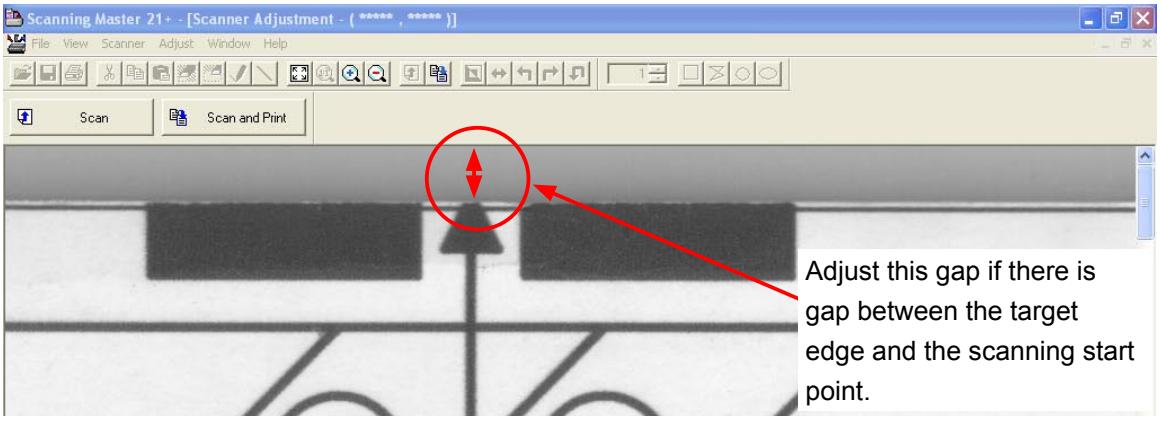

**Scan conditions:**

"Document Info" Paper Size: User Size, Width: 1066, Length 200, Resolution: 600 dpi
Document Type: Black and White
"Scan Settings" Output: Bilevel

(6) A dialog box appears together with the Scanner Adjustment window, as shown below.

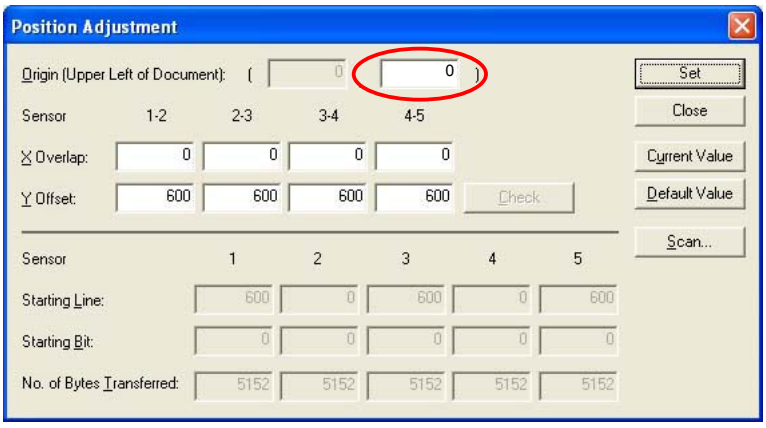


(6) Check the scanning point of the top center area.




(7) Zoom in to the top center area using the zoom button.
If the start point of the scanning is within the top center area as shown below, it does not require offset adjustment.


(8) If the starting point of the scanning is outside of the top center circle, click the Origin box and then input "0".

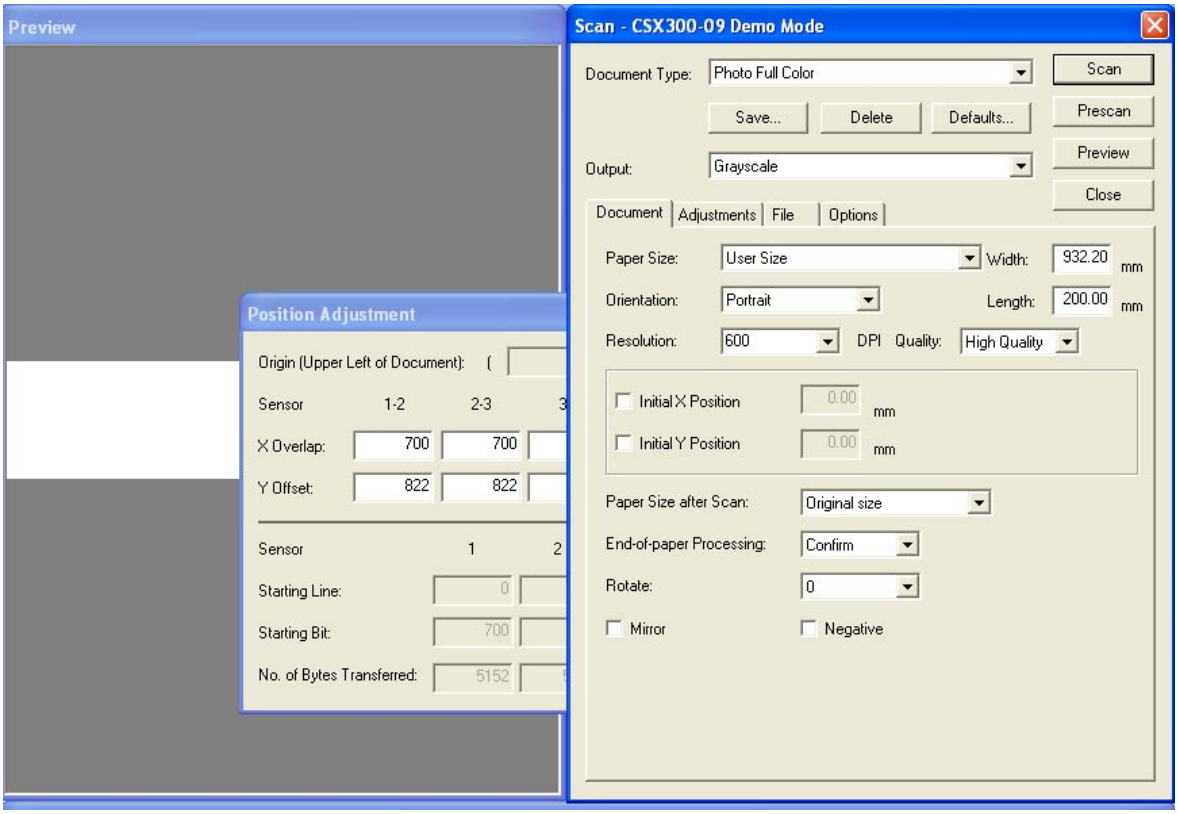



(9) Click the "Check" button, then click the "Set" button. The following dialog box will appear.
Click the "OK" button.

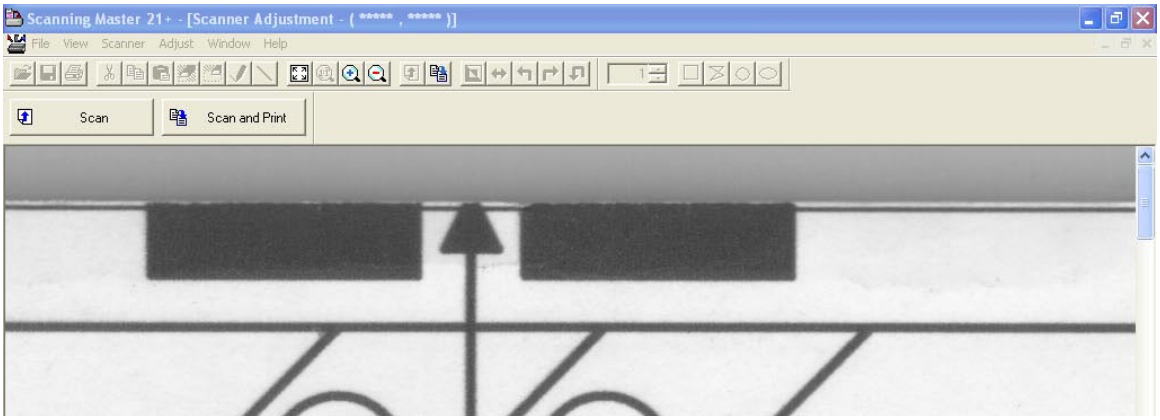

(10) Take out the CS600/500/IS200 adjustment test chart from the scanner. And then reinsert the CS600/500/IS200 adjustment test chart to the scanner.

(11) Click the "Scan" button.

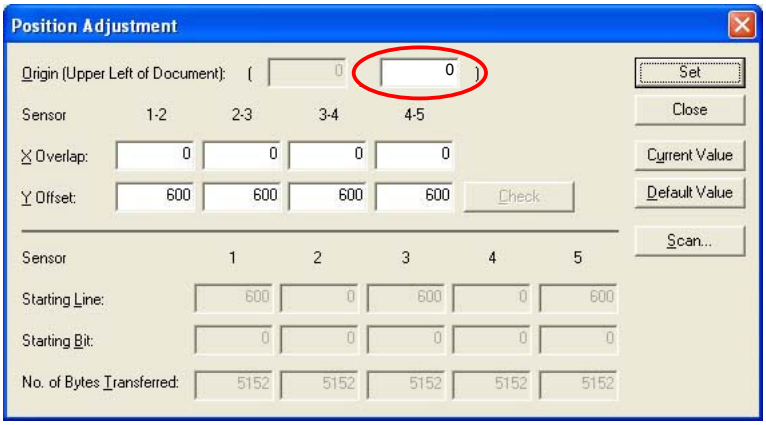
(12) The following dialog box will appear. Then click the "Scan" button.



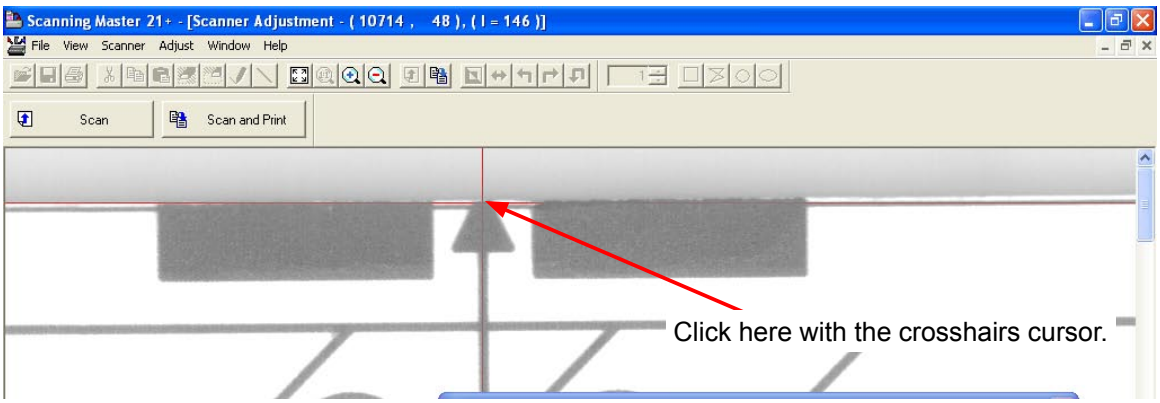

(13) Zoom in to the top center circle using the zoom button.




(14) Click anywhere within the Origin box. The crosshairs cursor appears in the Scanner Adjustment window.



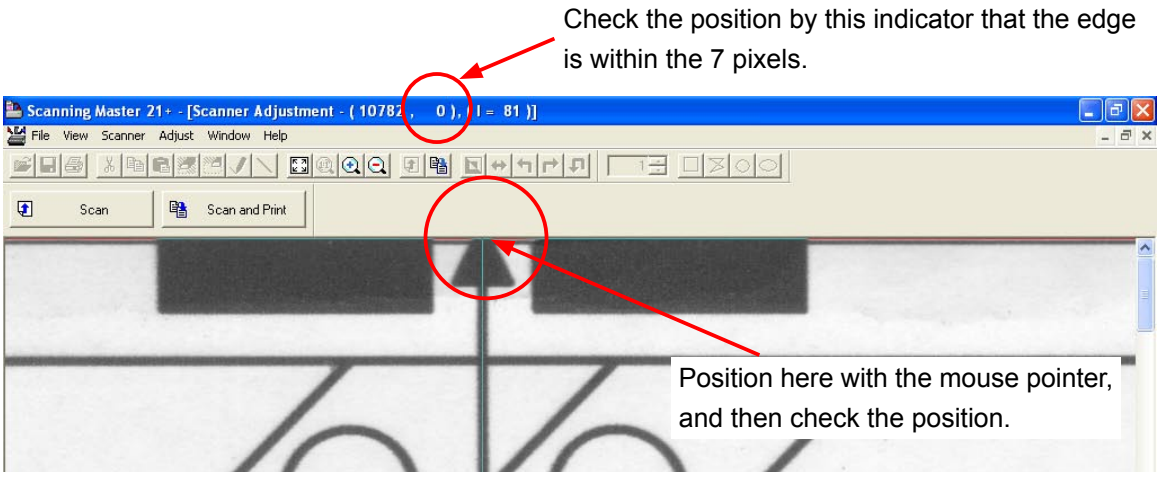
(15) When the crosshairs cursor appears in the Scanner Adjustment window, click on the center of the top center edge with the crosshairs cursor.




(16) Click the "Check" button, then click the "Set" button. The following dialog box will appear. Click the "OK" button.


(17) Take out the CS600/500/IS200 adjustment test chart from the scanner. And then reinsert the CS600/500/IS200 adjustment test chart to the scanner.

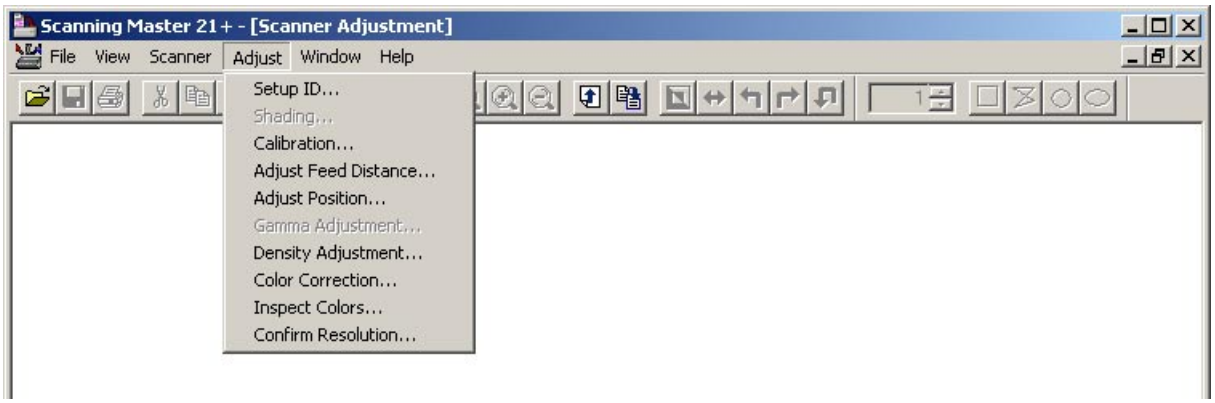
(18) Scan the offset target chart again.
Confirm that the starting point of the scanning is within the 7 pixels from the top of window as shown below.



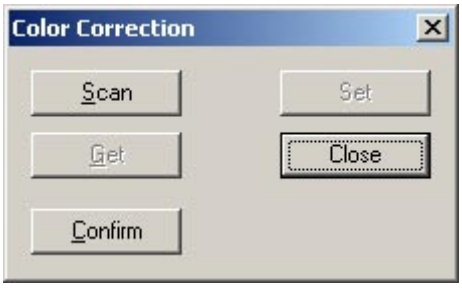
## 10.3 Color correction (using a color correction sheet)

(1) Prepare the color correction sheet.

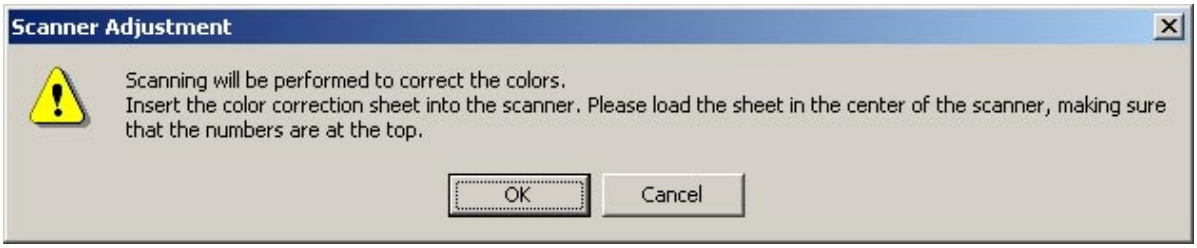
(2) Select “Color Correction” from the “Adjust” menu.




(3) Click the Scan button.




(4) The following message is displayed. Insert the color correction sheet in the scanner.



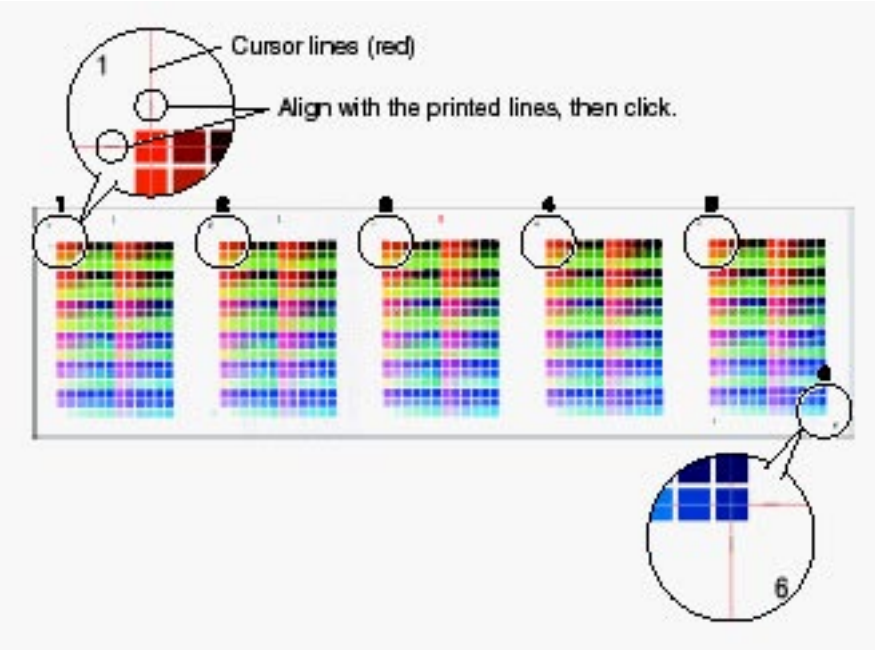

**CHECKPOINT**

Position the color correction sheet so that the red bar in the center of the sheet is centered in the scanner (but with the printed side down).

(5) Click the OK button to start scanning.
The scanned data is displayed when scanning is complete. Colors may differ slightly for individual sensors, but this does not indicate a defect.

(6) When the data is displayed, click the Get button.

(7) Click in the center of the color tile indicated by the numbers 1 to 6, in ascending order.
For numbers 1 to 5, click the center of the upper left tile; for number 6, click in the center of the bottom right tile. Align the cursor crosshairs with the printed lines at the sides of the tile.




**CHECKPOINT**

- The next reference point to be checked is displayed on the Status bar.
- If you click in error, click the Esc. key to cancel the operation and return to the immediately previous step.
- If you click on the wrong tile, color correction will not be performed correctly and the colors of the image displayed after color correction will be incorrect.

(8) After you have clicked tile number 6, click the Set button.


Click the OK button.

(9) To check the color correction results, click the Confirm button.

(10) The following message is displayed. Insert the color correction sheet in the scanner as instructed.


**CHECKPOINT**

Position the color correction sheet so that the red bar in the center of the sheet is centered in the scanner (but with the printed side down).

(11) Click the OK button to start scanning.
After scanning has been completed, an enlarged view of the color-corrected data is displayed.
(12) Click the Fit icon to display the entire image, and check whether there is any discrepancy in color. If there is no discrepancy, color correction is complete. Click the Close button.

**CHECKPOINT**

If there is still some color discrepancy after performing Color Correction, repeat steps (7) through (12).

# 10. TROUBLESHOOTING

| Cause | Checkpoint | Remedy |
|---|---|---|
| Lamps on the control panel remain unlit. | Confirm that the power switch has been switched on. | Switch on the power switch. |
| | Confirm that the power cable is properly connected. | Connect the cable properly. |
| | Confirm that the cable is properly connected to the control device. | Connect the cable properly. |
| | Confirm that the power outputs (+24 V, +5 V, +3.3 V) are appropriate. | Check the power supplies and replace if necessary. |
| | Other | Replace the control panel.<br>Replace the data controller board. |
| The document is not scanned, although it is moved to the scanning position. | Confirm that the PAPER LED is lit. | Check the document detection photosensor. |
| | Confirm that the USB cable is properly connected. | Connect the cable properly. |
| | Confirm that the USB cable is properly connected within the scanner. | Connect the cable properly. |
| | Confirm that the appropriate model has been specified. | Use Scanning Master 21+ to specify the correct scanner model. |
| | Other | Replace the main control board. |
| The document is not transported properly. | Check for foreign objects in the document scanning section. | Open the center cover and remove foreign objects. |
| | Confirm that the roller rotates when you press a control key. | Check for anomalies around the control boards. |
| | Confirm that the feed motor is running. | Check for anomalies around the motor. |
| | Confirm that +24 V is output. | Check the power supply and replace if necessary. |
| | Other | Replace the control boards.<br>Replace the main control board. |
| The document is not automatically returned when the scan is complete. | Confirm that “Front” is selected for “Paper Control” in Scanning Master 21+. | Select “Front” for “Auto Eject.” |
| | Confirm that the document is properly fed back. | Check for anomalies around the paper feed section and the motor. |
| The scanned data is completely black. | Confirm that an appropriate white correction value has been specified. | Perform Calibration (white correction). |
| | Confirm that the image sensor cables are properly connected. | Confirm that the image sensor cables are properly connected, with no broken wires. |
| | Confirm that the image sensor LEDs are lit. | Check the +5 V power supply and replace it if it is faulty.<br>Replace the data controller board.<br>Replace the image sensors. |
| | Confirm that an appropriate value is specified for “Intensity (Brightness)” in Scanning Master 21+. | Adjust “Intensity (Brightness)” in Scanning Master 21+. |

| Cause | Checkpoint | Remedy |
|---|---|---|
| The scanned drawing has undesired black lines. | Clean the scanning glass and replace if necessary. | Clean the scanning glass and replace if necessary.<br>Clean the image sensors. |
| | Confirm that calibration (white correction) has been properly performed. | Perform calibration from the beginning (white correction). |
| | Check the document hold-down plate for stains. | Clean the document hold-down plate. |
| | Check whether the problem persists after cleaning and adjustments. | Replace the image sensors. |
| The scanned drawing has undesired white lines. | Check the scanning glass for dust and damage. | Clean the scanning glass and replace if necessary. |
| | Confirm that calibration (white correction) has been properly performed. | Perform calibration from the beginning (white correction). |
| Part of the scanned drawing is missing (the scanned drawing is horizontally compressed). | Confirm that the sensor X overlaps and Y offsets are appropriate. | Align the sensor joints. |
| Part of the scanned drawing is overlapped. | Confirm that the sensor X overlaps and Y offsets are appropriate. | Align the sensor joints. |
| The image quality is poor. | Check whether the scanning glass is dirty. | Use purified water or alcohol to clean the scanning glass. (Do not use chemical solvents.) |
| | Confirm that the image resolution is appropriate. | Select an appropriate resolution. |
| The PC does not detect the scanner. | Confirm that the scanner has been turned on. | Turn on the scanner. |
| | Confirm that the PC has detected the USB or IEEE 1394 card properly. | Reattach the USB or IEEE 1394 card, set it up, and reinstall the USB or IEEE 1394 driver. |
| | Check the cable for broken wires, shorting, and bent connector pins. | Replace the cable. |
| | Confirm that the power supply for the scanner unit functions properly. | Check the supply voltage and replace the power supply as necessary. |
| | Use a PC that correctly detects other scanners to determine whether the problem is with the PC itself. | Replace the data controller board or IEEE 1394 board.<br>(Reinstall the boot program.) |
| When placed on the scanner, the paper is moved beyond the scanning section and drops to the back of the scanner. | The paper sensor does not function properly. | Clean the paper sensor.<br>Check the sensor cable for contact with other cables.<br>Replace the paper sensor. |

| Cause | Checkpoint | Remedy |
|---|---|---|
| Paper jam occurs. | Check the transfer section for foreign objects. | Remove foreign objects. |
| There is a difference in color density between the right- and left-hand portions of the document scanned in grayscale. | The sensor color density has not been properly corrected. | Adjust color density. |

# 12. OPTION

## 12.1 Optional Item

| Code | Item Name |
|---|---|
| OPS115-KIT-E | Software to upgrade OPS112 Scanning Master 21+ to OPS115 Scanning Master Pro Color |

## 12.2 Consumables

| Code | Item Name |
|---|---|
| IS0907 | Carrier Sheet (A0) |
| IS0908 | Carrier Sheet (A1) |
| IS0926 | Calibration Sheet (42 inch) |
| EM-CP | Cleaning paper (50 sheets) |

# 13. PARTS LIST

**Regarding the rank of spare parts**

Rank A: This rank of part will be stocked always until product discontinued.

Rank B: This rank of part will not be stocked always. This parts will need a lead time maximumly 3 month.

Rank C: This rank of part will not be stocked always. This parts will need a lead time at least 3 month.

Rank D: This rank of part will not be supplied as spare parts.

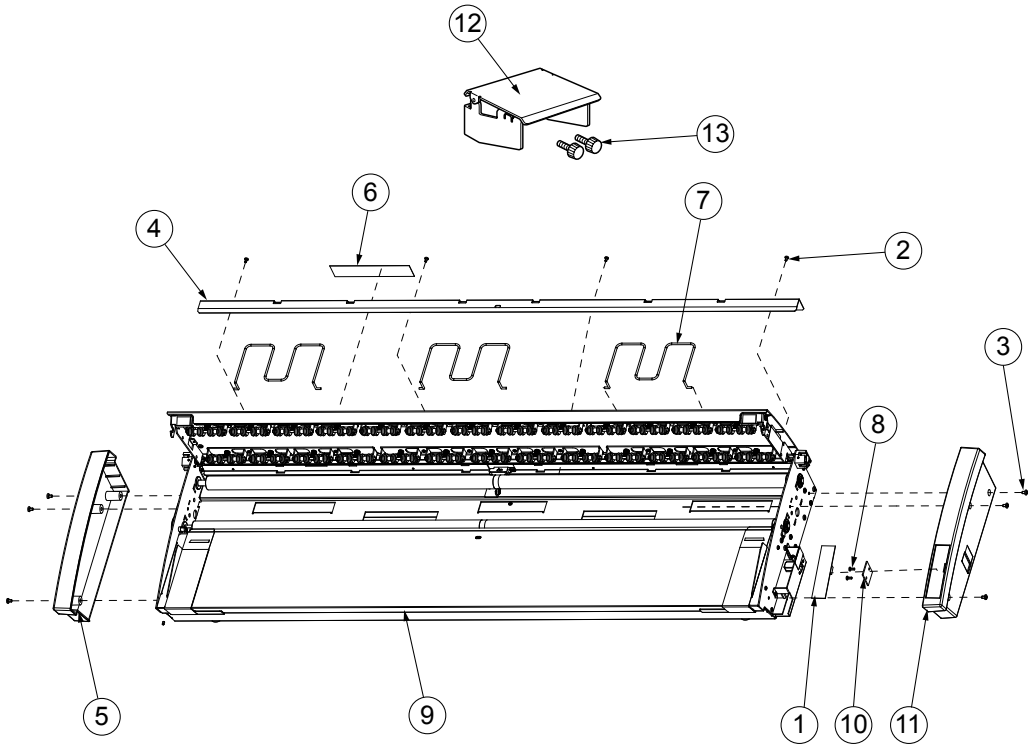
The parts will be supplied during five years unless the part run out after discontinued product.

Some of outer parts may not be supplied after discontinued product.

## 13.1 Outer Casing

| No. | Part No. | Part name | Description | Q'ty | Remarks | SR |
|---|---|---|---|---|---|---|
| 1 | 641500000 | Control Panel 4SB | | 1 | | A |
| 2 | 480003061 | M3L6 Binding Head Screw | | 4 | | D |
| 3 | 480004061 | M4L6 Binding Head Screw | | 6 | | D |
| 4 | 641300070 | Rear Cover | | 1 | | C |
| 5 | 641050090 | Left Side Cover | | 1 | | C |
| 6 | 641075210 | Model Name Label CS610-11 | | 1 | CS610-11 | B |
| | 641075200 | Model Name Label CS610-11PRO | | 1 | CS610-11PRO | B |
| 7 | 640310450 | Document Guide | Document Guide IS31 | 3 | | C |
| 8 | 391526069 | M2.6L6 Self Tapping Screw | | 2 | | D |
| 9 | 641070000 | Front Guide 4-CS61 | | 1 | | C |
| 10 | 774017154 | Control Panel Relay Board | | 1 | | B |
| 11 | 641050060 | Right Side Cover | | 1 | | C |
| 12 | 774017121 | Document Support Unit | | 1 | Including thumb screw L10 x 2 | C |
| 13 | 621113591 | Thumb Screw L10 | | 2 | | C |
| | 694505110 | Cable, CA450511 | Relay Board to Motor Control Board | 1 | | C |
| | 694500910 | Cable, 3SB-2C-14 | Relay Board to Data Control Board | 1 | | C |

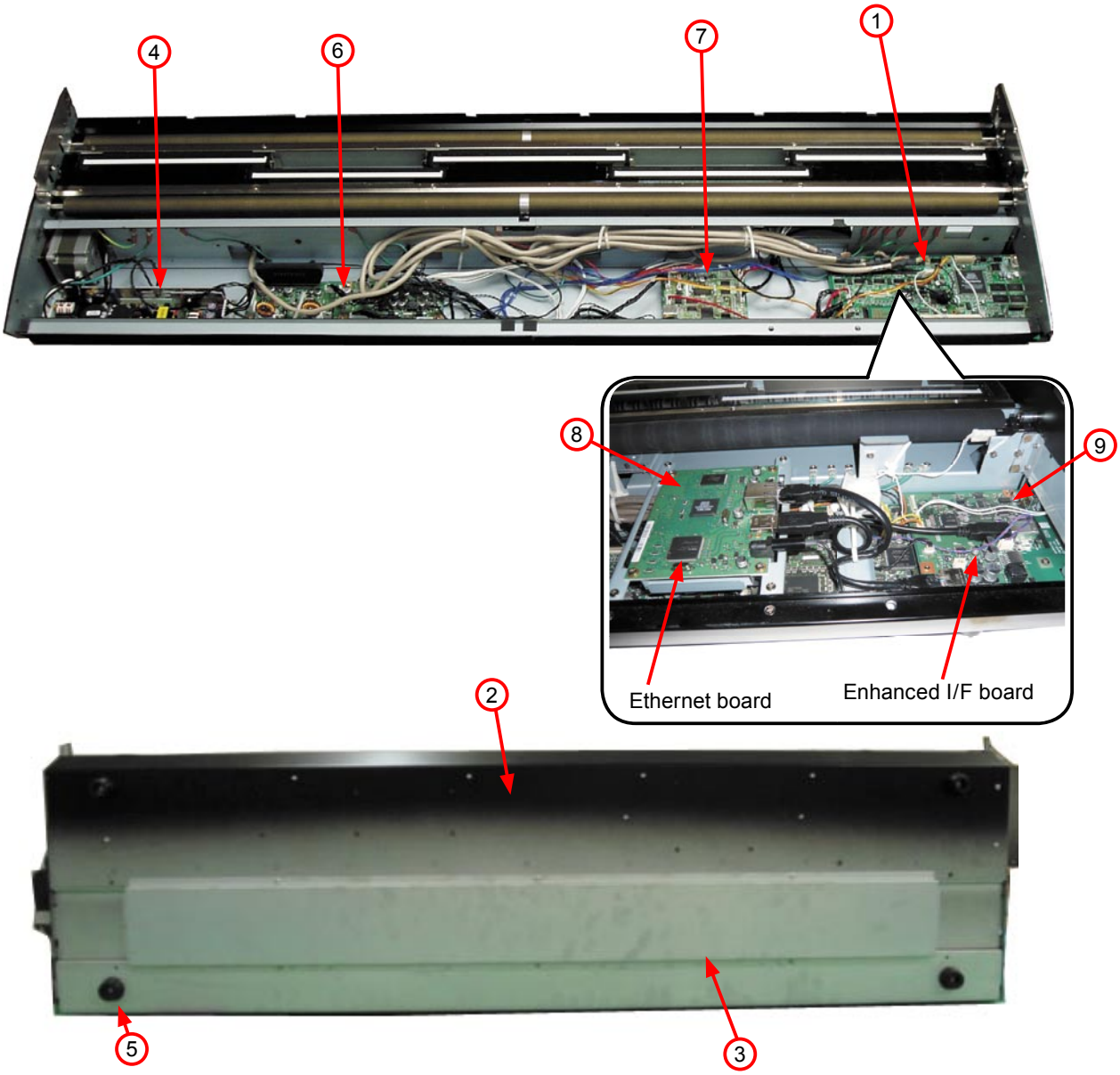
**Outer Casing**



## 13.2 Main Frame

| No. | Part No. | Part name | Description | Q'ty | Remarks | SR |
|---|---|---|---|---|---|---|
| 1 | 444105030 | Data Controller Board CS610PRO | | 1 | CS610PRO | A |
| | 444105040 | Data Controller Board CS610 | | 1 | CS610 | A |
| 2 | 641500060 | Under Base 42 | | 1 | | C |
| 3 | 6415001511 | Bottom Cover | | 1 | | C |
| 4 | 774015535 | Switching Power Supply Board | BWC24SX-U | 1 | | A |
| 5 | 363028182 | Rubber Foot | C30RK28UL | 4 | | C |
| 6 | 794050004 | CIS Power Board (For A version) | Use for A version | 1 | A version | A |
| 7 | 774017150 | Elevator Control Board | | 1 | | A |
| 8 | 684504150 | Ethernet Board | | 1 | eN Models | A |
| 9 | 794050005 | Enhanced I/F Board | | 1 | eN Models | A |
| | 641301831 | Bracket, Ethernet Board | | 1 | eN Models | B |

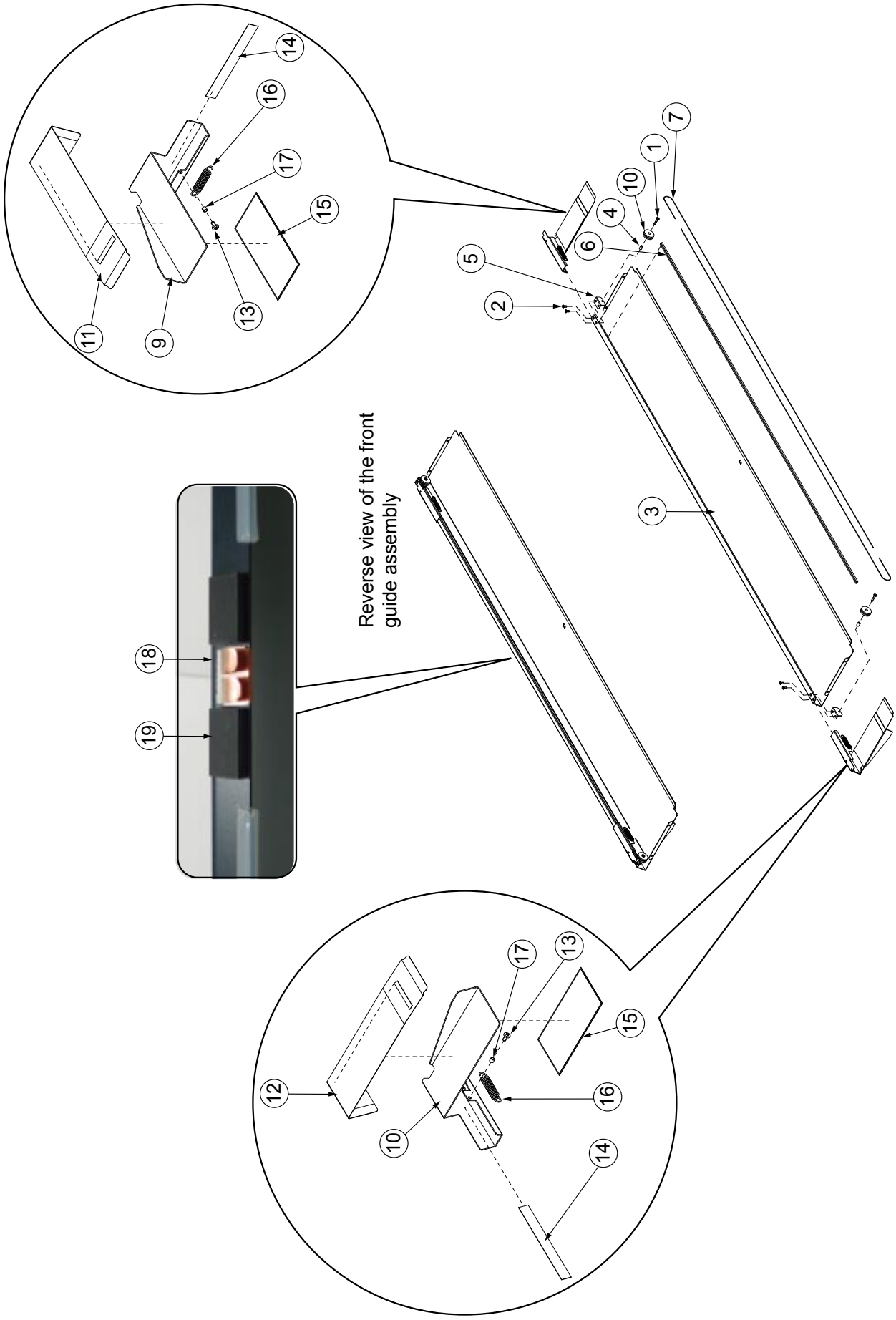
## Main Frame



## 13.3 Front Guide

| No. | Part No. | Part name | Description | Q'ty | Remarks | SR |
|---|---|---|---|---|---|---|
| 1 | 480003161 | M3L16 Binding Head Screw | | 2 | | D |
| 2 | 480033081 | M3L8 Flat Head Screw | | 4 | | D |
| 3 | 641070000 | Front Guide | | 1 | | C |
| 4 | 774016500 | Collar 5-7.5 | | 2 | | D |
| 5 | 641301200 | Pulley Bracket | | 2 | | C |
| 6 | 361204001 | Edging Plate | | 1 | | C |
| 7 | 641300290 | Wire | | 1 | | C |
| 8 | 350195011 | Pulley | VDC-277/57 | 2 | | C |
| 9 | 641300200 | Right Guide | | 1 | | C |
| 10 | 641300210 | Left Guide | | 1 | | C |
| 11 | 641300220 | Sheet A | | 1 | | C |
| 12 | 641301230 | Sheet B | | 1 | | C |
| 13 | 480003061 | M3L6 Binding Head Screw | | 2 | | D |
| 14 | 641300390 | Felt 10 | | 2 | | C |
| 15 | 641300380 | Felt 100 | | 2 | | C |
| 16 | 360600661 | Spring E661 | | 2 | | C |
| 17 | 392060070 | Collar 3L3.5 | | 2 | | D |
| 18 | 308004008 | Finger E01C11 | | 1 | | C |
| 19 | 641300250 | Rubber Plate | | 4 | | C |

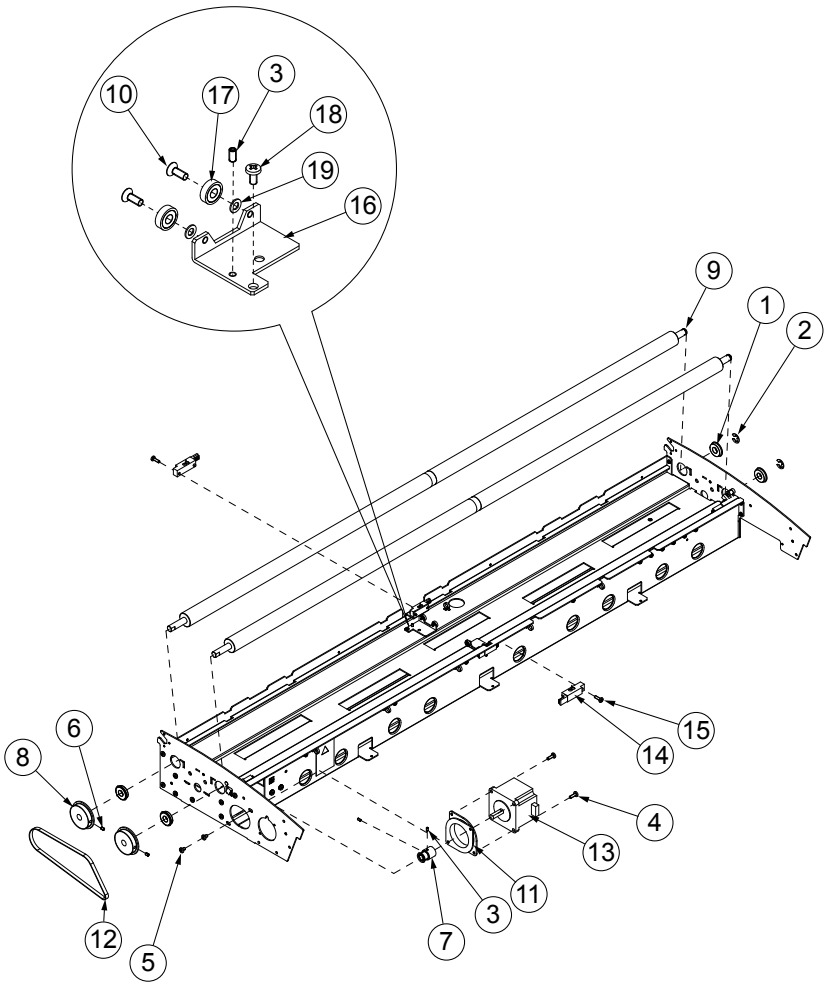
**Front Guide**



## 13.4 Drive Roller

| No. | Part No. | Part name | Description | Q'ty | Remarks | SR |
|---|---|---|---|---|---|---|
| 1 | 314690020 | Bearing | 6900ZZNXR | 4 | | C |
| 2 | 331608019 | E-ring C8 | | 2 | | D |
| 3 | 481003063 | M3L6 WP Set Screw | | 2 | | D |
| 4 | 480004121 | M4L12 Binding Head Screw | | 2 | | D |
| 5 | 480004061 | M4L6 Binding Head Screw | | 2 | | D |
| 6 | 481004063 | M4L6 WP Set Screw | | 2 | | D |
| 7 | 641300170 | Pulley | Pulley 22Z | 1 | | C |
| 8 | 641300180 | Pulley | Pulley 66Z | 2 | | C |
| 9 | 641300130 | Drive Roller 43 | | 2 | | B |
| 10 | 480033081 | M3L8 Flat Head Screw | | 1 | | D |
| 11 | 308004002 | Motor Mount | RF2600-A5 | 1 | | C |
| 12 | 378020021 | Belt | S2M-400 | 1 | | B |
| 13 | 500051794 | Motor | KT60M06-551 | 1 | | A |
| 14 | 502210002 | Paper Sensor | PS-R50L-A | 2 | | A |
| 15 | 480004101 | M4L10 Binding Head Screw | | 1 | | C |
| 16 | 641300190 | Roller Holder Bracket | | 1 | | C |
| 17 | 309011003 | Roller Bearing | 10SRF41Z | 2 | | C |
| 18 | 480003061 | M3L6 Binding Head Screw | | 1 | | D |
| 19 | 484003001 | Washer C3 | | 2 | | D |

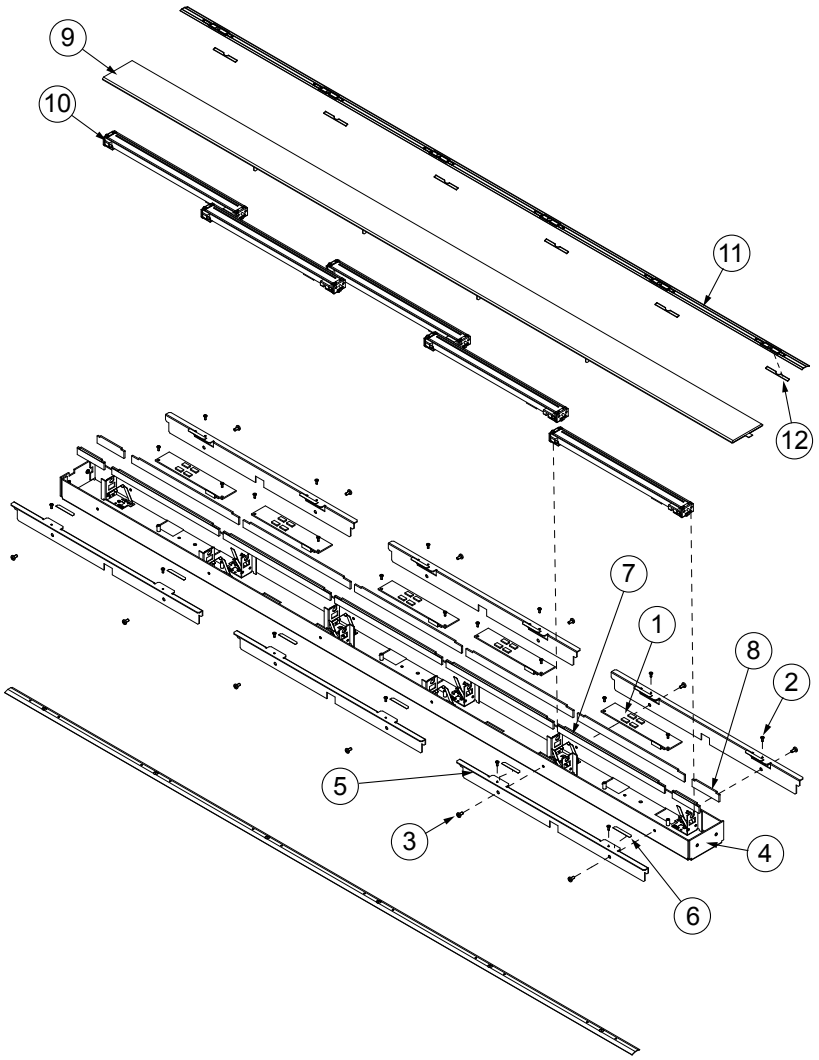
**Drive Roller**



## 13.5 CIS Unit

| No. | Part No. | Part name | Description | Q'ty | Remarks | SR |
|---|---|---|---|---|---|---|
| 1 | 794050003 | CIS Controller Board | | 5 | | A |
| 2 | 480002051 | M2L5 Binding Head Screw | | 22 | | D |
| 3 | 480003061 | M3L6 Binding Head Screw | | 12 | | D |
| 4 | 641500401 | Unit Base 42 | | 1 | | C |
| 5 | 641300400 | Glass Guide Plate | | 6 | | C |
| 6 | 641300440 | Glass Guide Rubber | | 12 | | C |
| 7 | 641300680 | Rubber Sponge 1 | | 10 | | C |
| 8 | 641300690 | Rubber Sponge 2 | | 4 | | C |
| 9 | 774017027 | Glass 42 Assembly | | 1 | | A |
| 10 | 774019980 | CIS Sensor Assembly, Rank A | Select the same rank of sensor that is used in your scanner. | 5 | | A |
| | 774019981 | CIS Sensor Assembly, Rank B | | | | A |
| | 774019982 | CIS Sensor Assembly, Rank C | | | | A |
| | 774019983 | CIS Sensor Assembly, Rank D | | | | A |
| | 774019984 | CIS Sensor Assembly, Rank E | | | | A |
| | 774019985 | CIS Sensor Assembly, Rank F | | | | A |
| | 774019986 | CIS Sensor Assembly, Rank G | | | | A |
| | 774019987 | CIS Sensor Assembly, Rank H | | | | A |
| 11 | 641300531 | Glass Holding Plate | | 2 | | C |
| 12 | 641300550 | Glass Rubber Stopper | | 12 | | C |

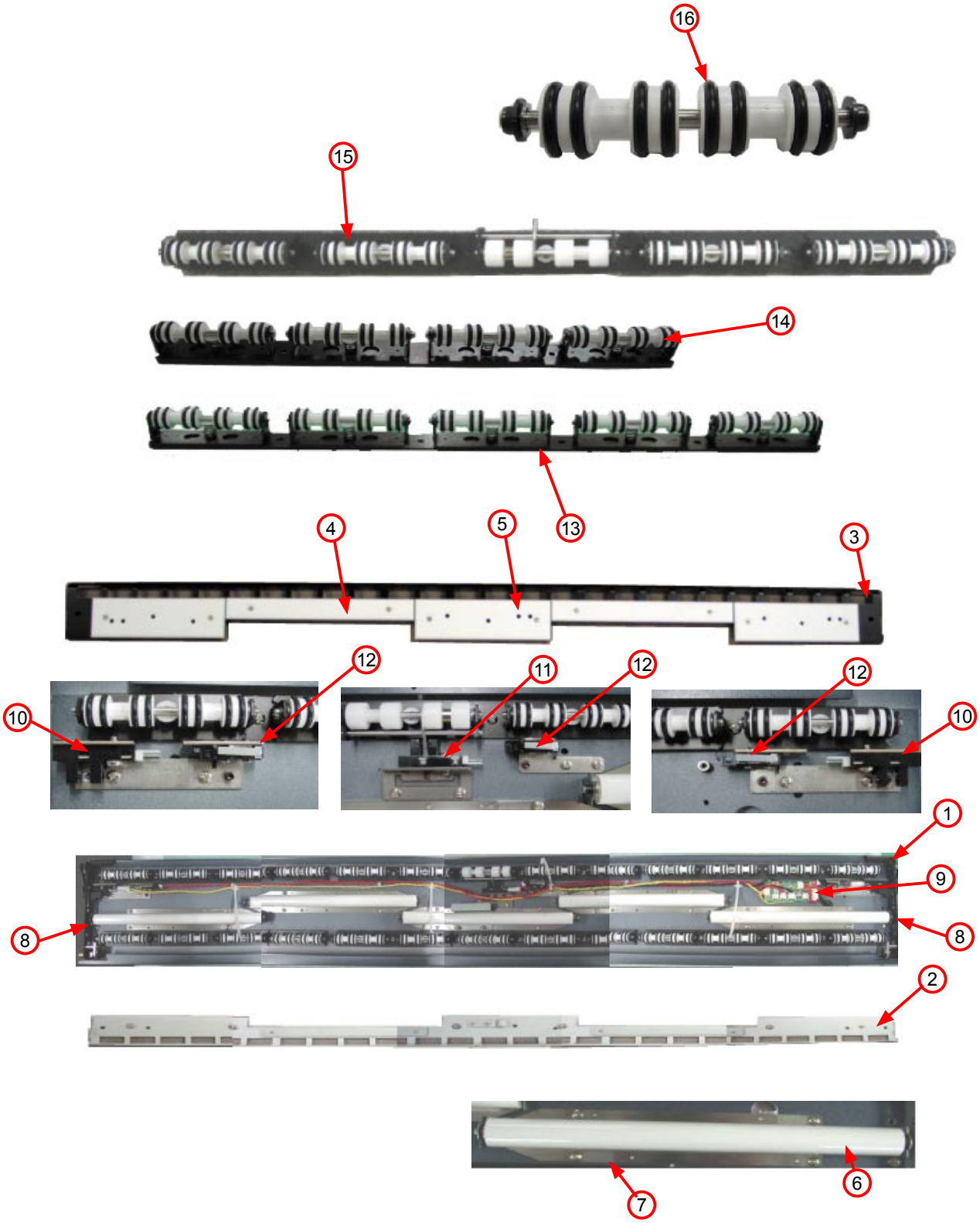
**CIS Unit**



## 13.6 Top Cover

| No. | Part No. | Part name | Description | Q'ty | Remarks | SR |
|---|---|---|---|---|---|---|
| 1 | 641070070 | Top Cover 42 | | 1 | | C |
| 2 | 641300360 | Front Pinch Roller Cover | | 1 | | C |
| 3 | 641300370 | Rear Pinch Roller Cover | | 1 | | C |
| 4 | 641501060 | Hold Down Plate L | | 3 | | C |
| 5 | 641501070 | Hold Down Plate S | | 2 | | C |
| 6 | 641301502 | Hold Down Roller | | 5 | | B |
| 7 | 641501101 | Roller Hold Spring Plate 3 | | 8 | | C |
| 8 | 641501110 | Roller Hold Spring Plate 4 | | 2 | | C |
| 9 | 774017152 | Sensor Relay Board | | 1 | | A |
| 10 | 502211000 | Cover Sensor | GP1A05A | 2 | | A |
| 11 | 500524130 | Thickness Sensor | | 1 | | A |
| 12 | 500524130 | Safety Sensor Switch | | 3 | | B |
| 13 | 774017109 | Roller Bar 5B42 Assembly | | 1 | | C |
| 14 | 774017108 | Roller Bar 4B42 Assembly | | 4 | | C |
| 15 | 774017110 | Roller Bar 5B42 BOS Assembly | | 1 | | C |
| 16 | 341511001 | O-ring | 1AP12 | 208 | | B |

## Top Cover



## 13.7 Cables

| No. | Part No. | Part name | Description | Q'ty | Remarks | SR |
|---|---|---|---|---|---|---|
| 1 | 694500901 | 3SB-2C-13A | DCB to PB (J15-J5) | 1 | | C |
| 2 | 694500792 | 3SB-2C-2B | DCB to PB (J12-J2) | 1 | | C |
| 3 | 694500833 | 3SB-2C-6C | DCB to PB (J13-J3) | 1 | | C |
| 4 | 694500841 | 3SB-2C-7A | Switching Power Supply | 1 | | C |
| 5 | 694501121 | CA4501120A | PB to LAN board | 1 | | C |
| 6 | 694501111 | CA4501110A | LAN Board to PCB (J401) | 1 | | C |
| 7 | 694501102 | CA4501100B | LAN Board to PCB (J901) | 1 | | C |
| 8 | 694450110 | FPC Cable CS20 | CIS Flexible Cable | 5 | | A |
| 9 | 694500784 | 3SB-2C-1D | CIS Board Power Supply | 5 | | C |
| 10 | 694500864 | 3SB-2C-9D | CIS Board to DCB Cable (J20) | 1 | | C |
| 11 | 694500942 | 3SB-2C-17B | CIS Board to DCB Cable (J21) | 1 | | C |
| 12 | 694500952 | 3SB-2C-18B | CIS Board to DCB Cable (J22) | 1 | | C |
| 13 | 694500962 | 3SB-2C-19B | CIS Board to DCB Cable (J23) | 1 | | C |
| 14 | 694500972 | 3SB-2C-20B | CIS Board to DCB Cable (J24) | 1 | | C |
| 15 | 694505340 | CA450534 | Control Panel Relay Cable | 1 | | C |
| 16 | 694505110 | CA450511 | Control Panel Relay Cable | 1 | | C |
| 17 | 694505311 | CA450531A | Control Panel Relay to Motor Control Board | 1 | | C |
| 18 | 694500873 | 3SB-2C-10 | Front & Rear Sensor | 1 | | C |
| 19 | 694505060 | CA450506 | Motor Control Board to Sensor Relay Board | 1 | | C |
| 20 | 694505071 | CA450507A | Motor Control Board to High Limit Sensor | 1 | | C |
| 21 | 694505081 | CA450508A | Motor Control Board to Low Limit Sensor | 1 | | C |
| 22 | 694505090 | CA450509 | Motor Control Board to DCB | 1 | | C |
| 23 | 694505000 | CA450500 | Sensor Relay Board to Thickness Sensor | 1 | | C |
| 24 | 694505012 | CA450501B | Sensor Relay Board to Safety Sensor L | 1 | | C |
| 25 | 694505021 | CA450502A | Sensor Relay Board to Cover Sensor R | 1 | | C |
| 26 | 694505030 | CA450503 | Sensor Relay Board to Cover Sensor L | 1 | | C |
| 27 | 694505041 | CA450504A | Sensor Relay Board to Safety Sensor R | 1 | | C |
| 28 | 694505060 | 3SB-2C-31 | PB to Stepping Motor | 1 | | C |

# 13.8 Other Parts

### Standard Accessories

| No. | Part No. | Part name | Description | Q'ty | Remarks | SR |
|---|---|---|---|---|---|---|
| 1 | 640310450 | Document Guide Wire | | 3 | | C |
| 2 | 774017121 | Document Support Unit | | 1 | | C |
| 3 | 641050431 | CS610-UM-151 | Manual | 1 | | B |
| 4 | IS0926 | Calibration Sheet Assembly | | 1 | | A |
| 5 | 641600862 | CS400-CDM20M | CD-ROM | 1 | | B |
| 6 | IS0907 | Carrier Sheet (A0) | | 1 | | A |

### Stand Assembly

| No. | Part No. | Part name | Description | Q'ty | Remarks | SR |
|---|---|---|---|---|---|---|
| 1 | 641050501 | Stand Assembly Z | ST0075 | 1 | | B |
| 2 | 641050510 | Center Bar Z | | 1 | | C |
| 3 | 444063451 | Right Side Stay Z | | 1 | | C |
| 4 | 444063461 | Left Side Stay Z | | 2 | | C |
| 5 | 444063410 | Foot Z | | 2 | | C |
| 6 | 641300860 | Frame A | | 3 | | C |
| 7 | 301112009 | Caster | | 4 | | C |
| 8 | 390914101 | M4L10 Coin Screw | | 4 | | C |
| 9 | 480165161 | M5L16 Flange Socket | | 10 | | C |
| 10 | 641711860 | M5 Shoulder Screw | | 8 | | C |
| 11 | 641050521 | Basket Cloth | Cloth-75 | 1 | | C |
| 12 | 641711900 | M5 Wrench | | 1 | | D |