

# **COPY BOARD**

**M-5**

**SERVICE MANUAL**

**PLUS**

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# 1. COMPLIANCE OF SAFE REPAIR

Be sure to read this Service Manual before providing services. In the PLUS Copyboard, full consideration is taken to ensure the safety for a fire, electric shock, injury, harmful radiation, and substance. Therefore, observe the notice described in this Service Manual so that the safety is kept when providing services. Moreover, be sure to observe the notice described in the Instruction Manual.

Pay attention to the following during service inspection.

## 1-1. Cautions during Product Movement

- It is necessary to remove the products when making the service of products put on the wall. At that time, hold the products by two or more persons to prevent the products from dropping or a person from falling down.

## 1-2. Cautions during disassembling and assembling

1. This equipment contains parts under high voltage. When doing repairs, make sure that power plug is pulled out to insure safety.
2. Make sure that parts and screws and wiring, etc. are returned to their original positions. Tube, tape and other insulation materials have been used for safety reasons. The internal wiring has been designed to avoid direct contact with hot parts or parts under high voltage when using clamps or other tools.
3. The parts used in this device have special safety features such as flame-resistance and anti-voltage properties. When replacing parts, always use parts supplied from the factory.
4. After finishing operations make sure that all parts and wires have been returned to their original position and that there has been no deterioration of the area around the location that was worked on.
5. Be sure to use an earth band (wrist band) during repair and inspection.

## 2. SPECIFICATIONS

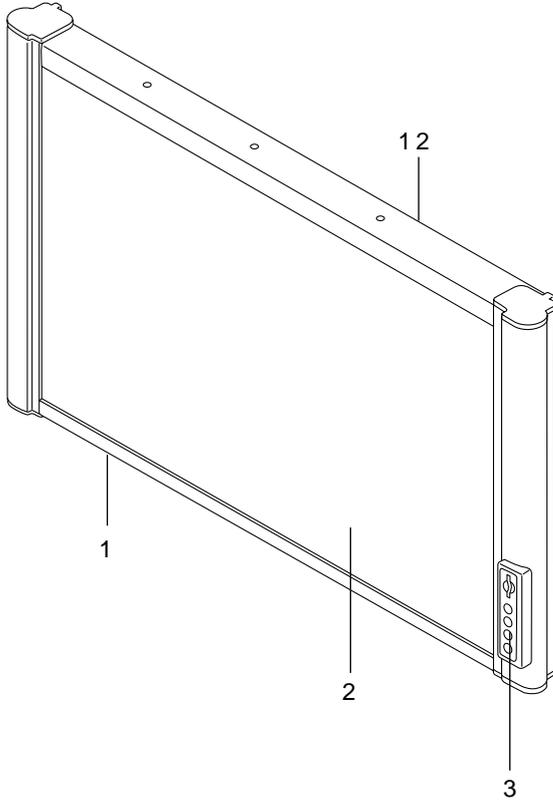
### 2-1. Product Specifications

MODEL NAME		M-5
DIMENSIONS	Installation system	Wall type (Horizontally installed as standard.) Option: Stand installed vertically and horizontally, and partition installed horizontally
	Dimensions (Main set only)	W1175 × H708 × D93mm (not including protrusion)
	Weight (Main set)	12.5Kg
BOARD	Panel Size	W1018 × H625mm
	Copy Area	W978 × H578mm
	Number of Pages	2
	Paging	One-way endless (Horizontal or vertical scroll)
	Drive system	Sheet movement type (Horizontal type: Left scroll, Vertical type: Upper scroll)
	Read system	Optical system of monochromatic CCD sensor reduction
	Read resolution	2.7 dots/mm (66 dpi or the equivalent)
	Read time	Approximately 12 seconds
MEMORY	Built-in memory	Internal flash memory, effective capacity: Approximately 1.8 MB
	External memory	Compact flash card (CF card) TYPE I, ATYPE II *1
	Compatible FAT format	FAT12, 16, 32
	File Format	TIFF Format (Pack bits Compressed)(A PNG format can be specified optionally.)
CONTROL PANEL	Buttons	Power, Memory, Clear, Feed/Stop, Position
	Indicators	Power LED (Green), Memory LED (Orange)
PC Connection	Interface	Conforms to USB2.0 Full Speed 12Mbps
	Port	USB B Type
	PC connection	Personal computer in which a USB terminal is provided as standard and in which Windows 98SE/Me/2000/XP is installed
	Driver software	Windows 98SE: Provides a dedicated driver. (Windows Me/2000/XP provides an OS standard driver.)
POWER SUPPLY	AC Power Adapter	Input: AC100-240, 50/60Hz
		Output: DC19V, 3.42A
		Power consumption: about 40W
ENVIRONMENTAL	Temperature	10°C ~ 35°C
CONDITION	Humidity	30% ~ 85% (non-condensing)
THE OTHERS	Grid Line	34 × 34mm
ACCESSORIES		Marker (Red, Black), Eraser, AC power adapter, Power cord (3m), USB cable (3m), Driver setup CD-ROM, Operation manual

\*1: A CompactFlash Card is not included in the package.

**2-2. Location of Main Set**

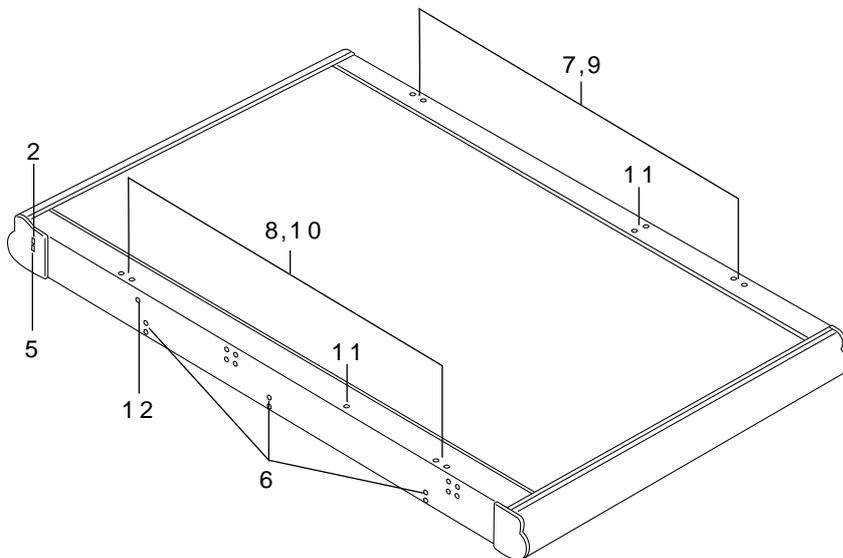
**FRONT AND TOP**



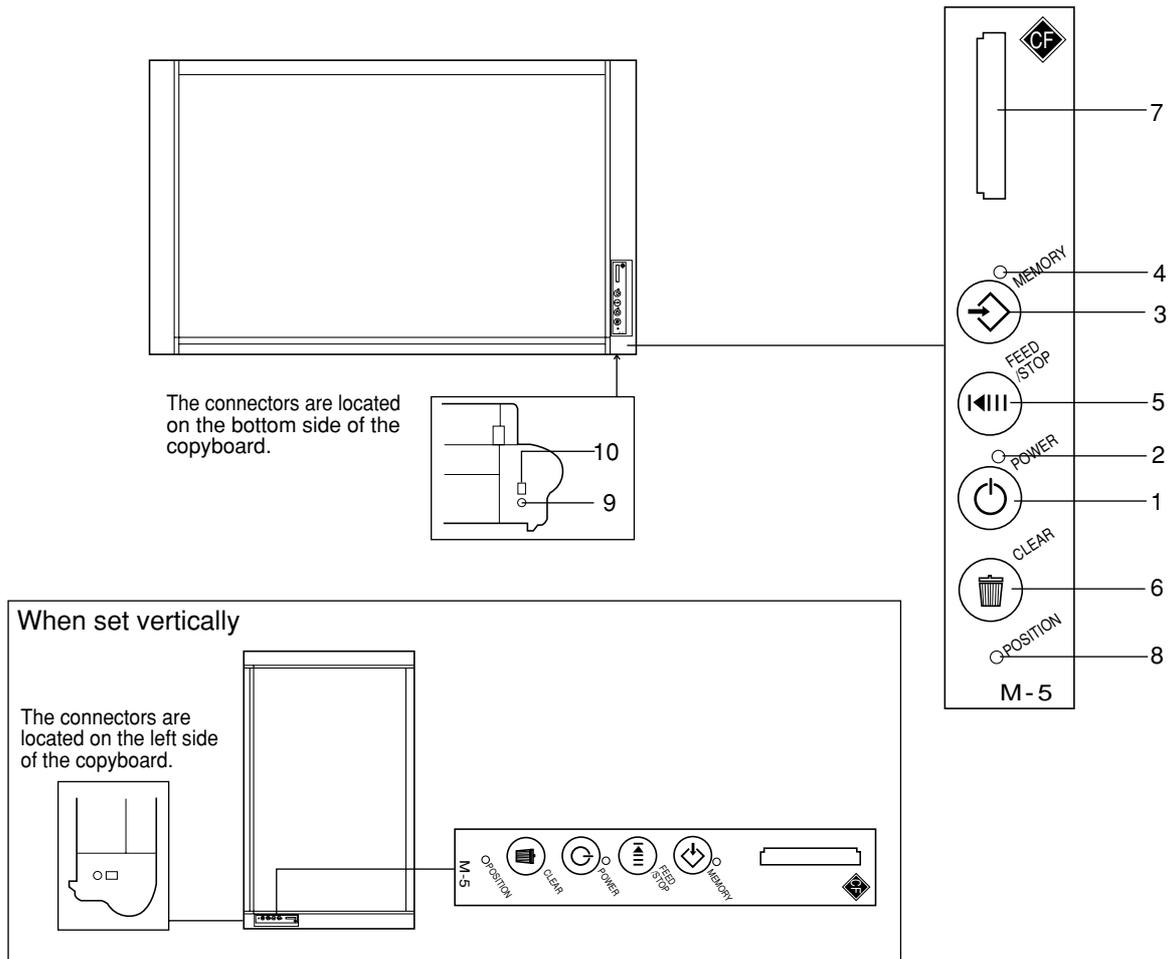
1. Copyboard
2. Sheet
3. Control panel (see page 20)
4. DC Input jack (see page 20)
5. USB connector (type B) (see page 20)
6. Screw holes for mounting the marker tray
7. Screw holes for mounting the wall mount fittings (for upper brackets)
8. Screw holes for mounting the wall mount fittings (for brackets)
9. Screw holes for installing the stand horizontally (for upper brackets)
10. Screw holes for installing the stand horizontally (for lower brackets)
11. Screw holes for installing the stand vertically (for upper brackets)
12. Screw holes for installing the stand vertically (for lower brackets)

**BACK AND BOTTOM**

The diagram shows the copyboard set with the front side facing down.



## 2-3. Operation Panel of Main Unit, Location of Terminal



### 1 POWER button

Turns on and off the power.

### 2 POWER indicator (Green)

The Power lamp lights when the power is turned on. It goes off when the power is turned off. This lamp indicates an error or the operation state when it blinks.

### 3 MEMORY button

The Memory button is used to save the figures or characters, drawn on the sheet surface, in memory.

### 4 MEMORY indicator (Amber)

The Memory lamp blinks while figures or characters are saved in memory. It notifies the error state according to the blinking speed.

### 5 FEED/STOP button

The Feed/Stop button is used to feed one sheet surface automatically and stop it forcibly.

### 6 CLEAR button

The Clear button is used to delete all image files of internal memory. (Press this button for more than three seconds in this case.)

### 7 Card slot

The card slot is exclusively used for a CF memory card.

### 8 POSITION button (Pinhole: The button exists in the inner part of a hole.)

The Position button is used for vertical and horizontal switching of the image saved in memory.

### 9 DC Power jack

Connect the DC side of an AC power adapter to the DC input terminal. (Connect only the AC power adapter exclusively used for this set to this terminal.)

### 10 USB connector (Type B)

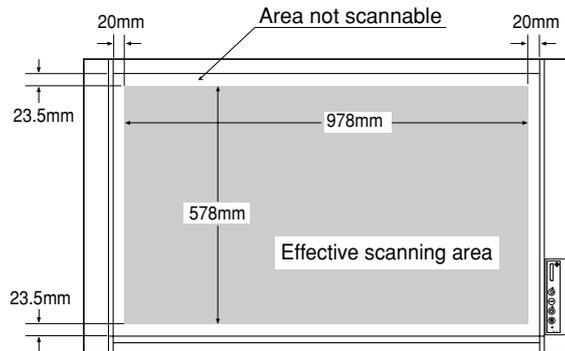
Connect the USB terminal to the USB terminal (type A) of a personal computer.

**2-4. Scanning area**

**Effective scanning area**

Scanning is not possible on the edges of sheet. Write or draw with in the effective scanning area.

\* The effective vertical scanning area is within the ruled lines.



**2-5. Movements state indicators**

Blinking period of Power and Memory indicator and notation in this manual

Notation in this manual	Blinking period
Low-speed blink	Lights for 0.5 sec/Goes off for 0.5 sec.
High-speed blink	Lights for 0.18 sec/Goes off for 0.18 sec.
Intermittent blink	Lights for 0.25 sec/Goes off for 0.25 sec/Lights for 0.25 sec/Goes off for 1.25 sec.
Error blink	The Memory indicator (Amber) and Power indicator (green) alternately blink at high speed.

LED display

LED display	State	Blinking period	Situation of occurrence
Error blink	The internal Flash write of an image file fails.	Continued	During file storage
	The CF write of an image file fails.	5 seconds	During file storage
	The whole erasure of internal Flash fails.	Continued	When the Position key is pressed and during AC ON
	An SRAM test fails.	Continued	During AC ON
	An internal Flash format fails.	Continued	During AC ON and during non-Format detection
	Abnormality is detected in the light quantity of CCFL OFF.	Continued	When the Power key is pressed
	The no-lighting of CCFL is detected.	Continued	When the Power key is pressed
	The detection of a CCD output peak value fails.	Continued	When the Memory key is pressed
	The internal flash write of scan data fails.	Continued	When SRAM capacity is full
	The access to an Ini/inf file fails.	Continued	During scan start
	The access to an Ini/inf file fails.	5 seconds	During CCFL ON
	The access to an Ini/inf file fails.	5 seconds	During Feed start
	CF configuration fails.	5 seconds	During USB/CF insertion
	The empty capacity check of CF fails.	5 seconds	When the Memory key is pressed
	The empty capacity check of internal Flash fails.	Continued	When the Memory key is pressed
	An error occurs in calibration.	Continued	During calibration
	The creation of an Ini file fails.	Continued	During AC ON and during nonexistence/destruction of Ini file
	The creation of an Inf file fails.	Continued	During AC ON and during nonexistence/destruction of Inf file
	The erasure of an image file in internal Flash fails.	Continued	When the Clear key is pressed

Go to next page.

## SPECIFICATIONS

LED display	State	Blinking period	Situation of occurrence
Power indicator blinks at low speed	During check of CCFL-ON light quantity.	Until the quantity of light is stabilized	When the Power key is pressed
	During check of CCFL-ON light quantity.	Until the quantity of light is stabilized	When the Memory key is pressed in the Standby state
	JOB execution is terminated normally.	5 seconds	When a JOB exists and during CF insertion
	The whole erasure of internal Flash is terminated normally.	5 seconds	When the Position key is pressed and during AC ON
	During setting of installation in the horizontal position.	5 seconds	When the Position key is pressed
	The upgrading of firmware is terminated normally.	Continued	During upgrading
Memory indicator blinks at low speed Power indicator lights	During scan/image file storage.	-	When the Memory key is pressed
	During period of stabilized CCFL light quantity queue by quick calibration.	5 minutes	During quick calibration
	During period of stabilized CCFL light quantity queue by quick calibration.	Till the specified time	During calibration
	During setting of installation in the vertical position.	5 seconds (The Power lamp goes off.)	When the Position key is pressed
	During erasure/movement of image file in internal Flash.	Till completion	When the Clear key is pressed
Memory indicator blinks intermittently Power indicator lights	Insufficient empty capacity in internal Flash and CF. Media memory full detection.	Continued Continued	When the Memory key is pressed During storage of image file
Memory indicator blinks at high speed	The upgrading of firmware is terminated abnormally.	Continued	During upgrading
Memory indicator lights Power indicator lights	During calibration (except during stabilized CCFL quantity period).	Till completion	During calibration
Power indicator lights Memory indicator lights dimly	During upgrading of firmware (during flash erasure and write of CPU).	Till completion	During upgrading
Power indicator lights	Normal state (Power ON/standby state).	-	-
	During upgrading of firmware (during expansion of MOT file).	Till completion	During upgrading
Power indicator goes off Memory indicator goes off	Power OFF state.	-	-

# 3. TROUBLE SHOOTING

## 3-1. Trouble Shooting

By checking operations normal usage time, it is possible to carry out judgments on malfunction to a certain extent. Carry out the following checks before disassembling the equipment.

### 1. Press the POWER button and turn on the power.

The Power Lamp blinks. The Power Lamp lights. (Is the power turned on?)

- No →
- The AC Adapter is not connected.
  - The Power Cable is not connected.
  - The AC Adapter is defective.
  - The power cable is disconnected.
  - The Main Board Assy is defective.

↓ Yes

Does the error display appear?

- Yes → The Power and Memory lamps alternately blink at high speed.
- The Main Board Assy is defective.
  - The CCFL Unit is defective.
  - The CF is defective.
  - The CCD Unit is defective.

The Memory indicator blink at high speed and the Power lamp ON.

- The connector is disconnected.  
Main Board Assy : CN4, 6  
CCD Unit : CN1  
CCFL Inverter Unit : CN1, 2
- The CCD harness is disconnected.
- The CCFL harness is disconnected.
- The Main Board Assy is defective.
- The CCD Unit is defective.
- The CCFL Unit is defective.

↓ No

### 2. Press the FEED/STOP button.

Does the sheet operate normally?

- No → No operation sound or abnormal sound is generated.
- The connector is disconnected.  
Main Board Assy : CN1  
Connector between Sheet Motor Assy and Motor Harness
  - The Sheet Motor Assy is defective.
  - The Main Board Assy is defective.

Only the operation sound of the Sheet Motor Assy is generated.

- The Timing Belt is disconnected.
- An abnormal sound is generated..
- The Sheet Motor Assy is defective.
  - The Sheet Assy is attached to the plate surface.
  - Out-of-adjustment of Timing Belt.

↓ Yes

### 3. Press the MEMORY button.

Does the error display appear?

- Yes → The Power and Memory indicator alternately blink at high speed.
- The Main Board Assy is defective.
  - The CF is defective.
  - The CCD Unit is defective.

↓ No

Does the Memory indicator blink intermittently? (The Power lamp lights.)

- Yes → The empty capacity of internal flash and CF is insufficient.

↓ No

### 4. Confirm the read image.

Does abnormality (such as a dark line or character rubbing) exist?

- Yes →
- Out-of-adjustment of CCD Unit.
  - Dust adheres to the mirror of the CCFL Unit.
  - The brightness adjustment of M-5 setup utility is too thick or thin.
  - The written character is too thin.
  - Markers other than black and red markers are used.
  - The installation surface for a wall type is distorted.
  - The joint of the Sheet Assy is dirty.
  - The CCD Unit is defective.
  - The CCFL Unit is defective.

↓ No

Normal operation

## 3-2. Error Log List

When an error occurs during normal processing, an "M5.ERR" file is created and the contents of an error are left based on the additional write system. The "M5.ERR" file is created in CF during CF insertion. It is created in internal flash during CF non-insertion.

The contents of log and the corresponding contents of an error are shown in the table below.

No	Contents of log	Contents of error
1	Initial Flash Erase Error	The erasure of internal Flash fails during AC ON.
2	Initial SRAM Test Error	An error occurs in R/W of SRAM during AC ON.
3	Initial Flash Format Error	The format of internal Flash fails during AC ON.
4	CCFL Off Over Error	The CCD output is too high just before CCFL lights.
5	Scan CCFL Can't ON Error	CCFL lights, but the CCD output is too low.
6	Scan Peak Detect Error	The peak value of CCD output cannot be detected during scan start.
7	Image Buff Write Error	The write of special compression data in a buffer fails during scan.
8	Image Buff Overflow Error	The amount of special compression data exceeded the capacity of a buffer during scan.
9	User Cal. Flash Access Error	An ini/inf file cannot be accessed by simplified calibration.
10	User Cal. White Level Store Error	The White Level write in an inf file by simplified calibration fails.
11	Scan Start Flash Access Error	An ini/inf file cannot be accessed during scan start.
12	CCFL ON Flash Access Error	An ini/inf file cannot be accessed during start of stabilized CCFL light quantity operation.
13	Feed Flash Access Error	An ini/inf file cannot be accessed during feed start.
14	Conf. Load Flash Access Error	An ini file cannot be loaded.
15	CF Write (Image) Error	The write of image data in CF fails. (CF access error)
16	Flash Write (Image) Error	The write of image data in flash fails. (Flash access error)
17	Position Set Conf. Load Error	The loading of an ini file fails during position setting.
18	Position Set Conf. Scan Error	The search of an ini file fails during position setting.
19	Position Set Write Cal. Error	The write of an ini file fails during position setting.
20	USB_in CF Config Error	The configuration execution of CF fails during USB insertion. (CF access)
21	CF_in CF Config Error	The configuration execution of CF fails during CF insertion. (CF access)
22	CF_in JOB ck Error	The JOB file check of CF fails during CF insertion.
23	CF Free Byte ck Error	The empty capacity check of CF fails. (CF access)
24	Flash Free Byte ck Error	The empty capacity check of Flash fails. (Flash access)
25	Ini_file_ck Write Cal. Error	The write of a default ini file fails during AC ON.
26	Ini_file_ck Change Conf. Error	The modified write of the illegal data in an ini file fails during AC ON.
27	Inf_file_ck Write Cal. Error	The write of a default inf file fails during AC ON.
28	Inf_file_ck Change Conf. Error	The modified write of the illegal data in an inf file fails during AC ON.
29	Image File Move Error	The movement of image data from Flash to CF fails.
30	Image Move Flash Delete Error	The image deletion of flash fails during movement of image data from Flash to CF.
31	Image Erase Flash Delete Error	The image deletion of flash fails during erasure of the whole Flash image data.

The following parts may be defective when the error log described above is generated.

Defective parts	Contents of error log (Nos.1 to 31 in the table above)
Main Board Assy	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31
CCD Unit	4, 5, 6
CF	15, 20, 21, 22, 23, 29
No part defects	8 (Adjustment patterns are excessively written in the plate surface. For example, the patterns are written so that they were painted out black.)

# 4. DISASSEMBLY AND ASSEMBLY

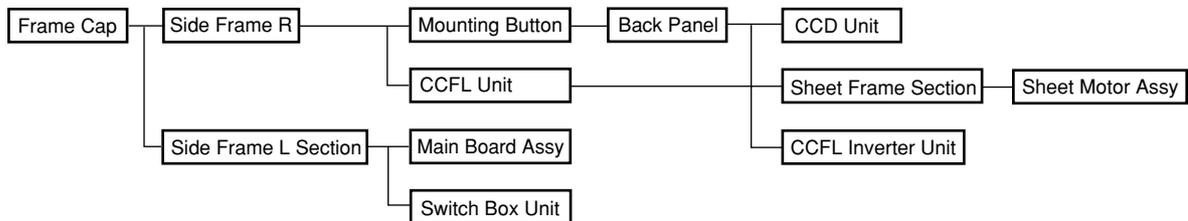
## 4-1. Tools Required

- Phillips screwdriver No. 2
- Cutting pliers
- Electrostatic elimination wrist band

## 4-2. Caution

- See “1. Compliance of Safety Repair and Safety Inspection” before disassembling and assembling.
- Put on gloves so that you do not cut your hand at the sharp edge of a frame during disassembly and assembly.
- See “6. Wiring Diagram” and “7. Parts List” for the parts name or wiring.
- The point especially requiring attention when handling parts or performing disassembly and assembly contains a caution. Be sure to follow this caution.

## 4-3. Disassembly and Assembly Procedures



## 4-4. Disassembly and Assembly

The disassembly and assembly procedures described here are one example. During actual operation, disassemble and assemble the required parts referring to “4-3. Disassembly and Assembly Procedures”.

### 1) Remove the Frame Cap. (See Figure 1.)

1. Remove Frame Caps A, B, and C as shown in Figure 1.

#### Notes:

- Put the hooks of the Frame Caps in the main set as shown in the expanded section of Figure 1 when installing the Frame Caps.
- Double-sided adhesive tape is attached to the Frame Caps.

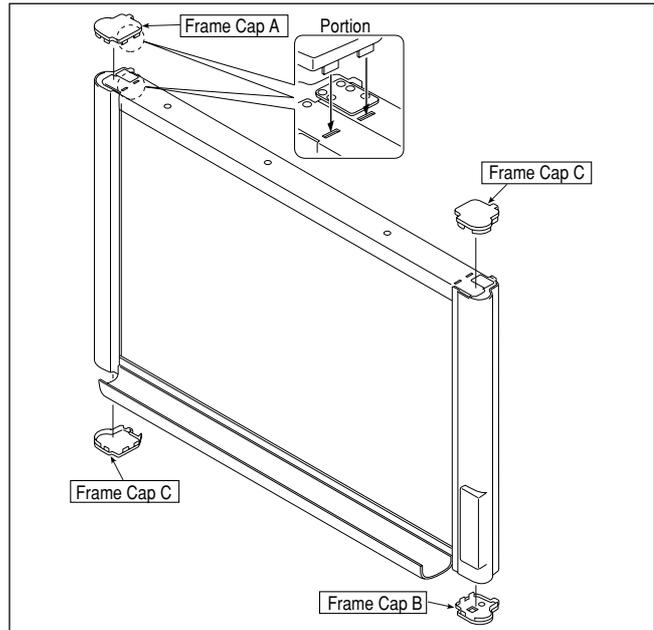


Fig. 1

### 2) Remove the Side Frame R. (See Figure 2.)

1. Loosen the screw shown in portion A of Figure 2. (Tightening torque: 10.0kgfcm)
2. Remove the “S-1” screw shown in Figure 2 and then remove the Side Frame R. (Tightening torque: 10.0kgfcm)

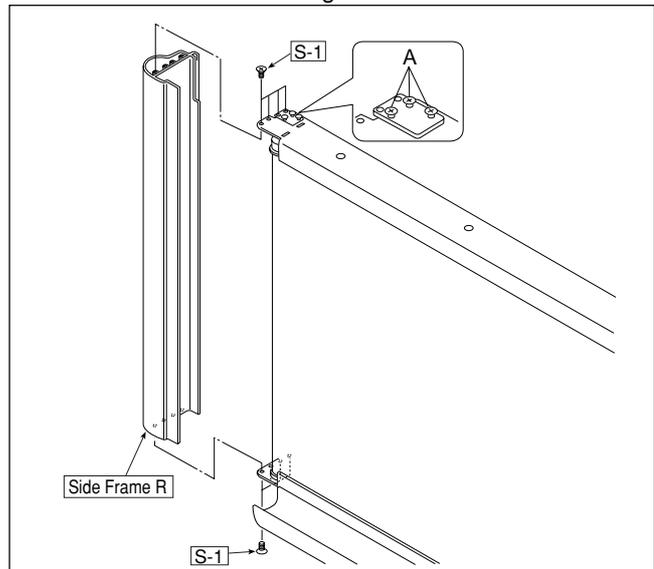


Fig. 2

### 3) Remove the Back Panel. (See Figure 3.)

1. Remove the Mounting Button shown in Figure 3.
2. Slide the Back Panel and remove it.

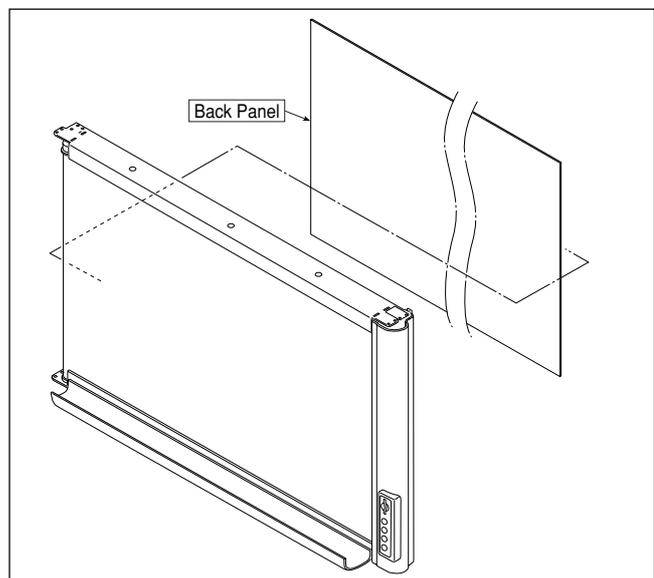


Fig. 3

## DISASSEMBLY AND ASSEMBLY

### 4) Remove the Side Frame L Section. (See Figure 4.)

1. Remove the "S-1" screw shown in Figure 4.  
(Tightening torque: 10.0kgfcm)
2. Disconnect the harness connected to the Main Board Assy.
3. Remove the Side Frame L Section.

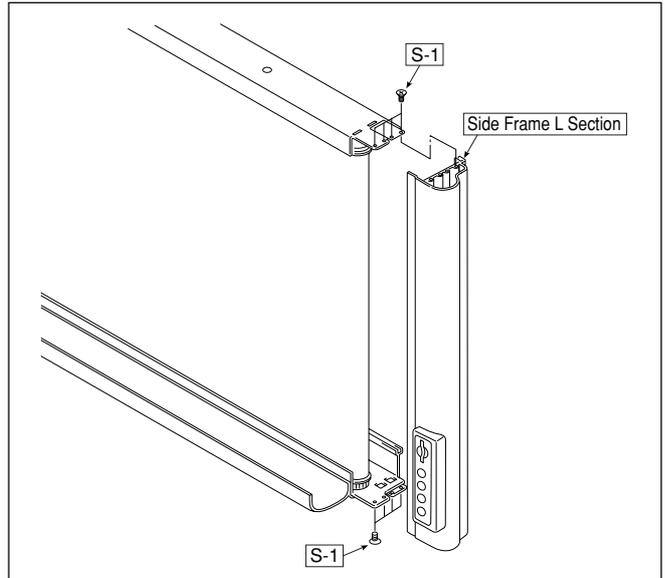


Fig. 4

### 5) Remove the Main Board Assy and Switch Box Unit. (See Figure 5.)

1. Remove Main Board Cover A shown in Figure 5.
2. Remove the "S-2" screw fixing the Main Board Cover Unit and then remove the Main Board Cover Unit. (Tightening torque: 4.5kgfcm)
3. Remove the "S-2" screw fixing the Main Board Assy and then remove the Main Board Assy. (Tightening torque: 4.5kgfcm)
4. Remove the Switch Sheet.
5. Remove the "S-3" and "S-4" screws shown in Figure 5 and then remove the Switch Box Unit. (Tightening torque: 4.5kgfcm)

#### Notes:

- Main Board Cover A is attached to the Main Board Cover Unit. Main Board Cover A can be reused if you can peel it well.
- The Switch Sheet cannot be reused. Therefore, prepare a new one when removing the Switch Box Unit.

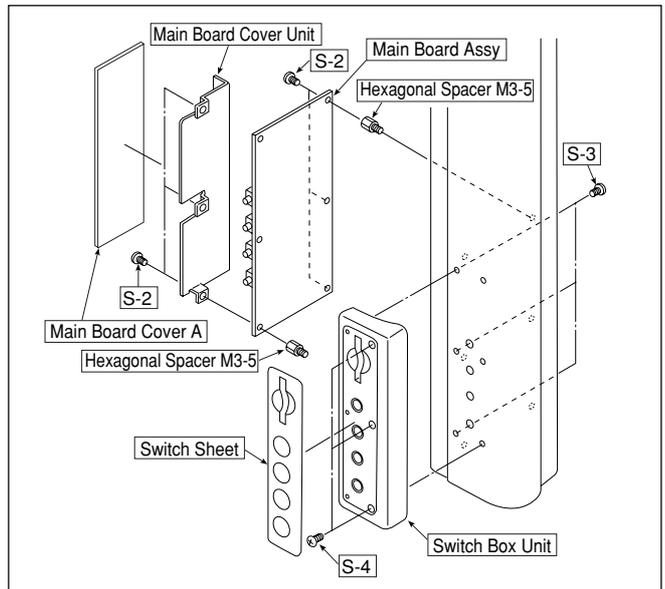


Fig. 5

### 6) Remove the CCFL Unit. (See Figure 6.)

1. Disconnect the harness of the CCFL Unit from the CCFL Inverter Unit.
2. Remove the "S-1" screw shown in Figure 6 and then remove the Side Frame Plate. (Tightening torque: 10.0kgfcm)
3. Remove the "S-5" screw shown in Figure 6 and then remove the CCFL Unit. (Tightening torque: 4.5kgfcm)

#### Notes:

- Be careful not to damage the mirror surface of the CCFL Unit.

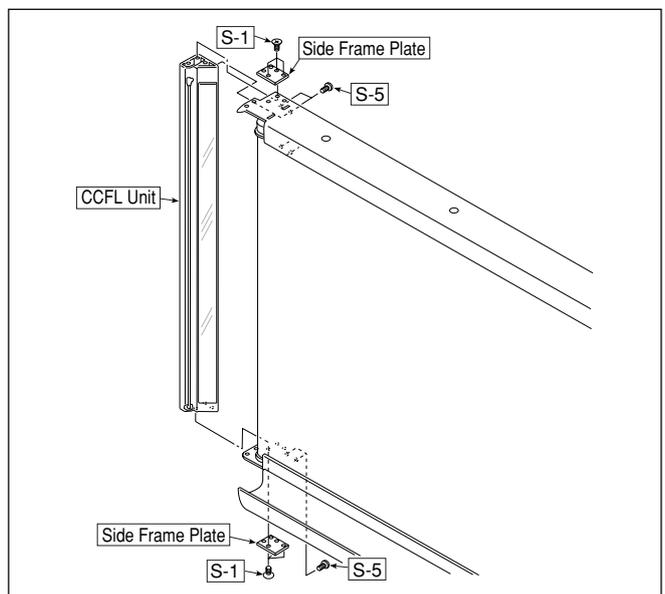


Fig. 6

## DISASSEMBLY AND ASSEMBLY

- 7) Remove the Sheet Frame Section.  
(See Figures 7 and 8.)
1. Disconnect the Motor Harness from the Sheet Motor Assy. (See Figure 8.)
  2. Remove the "S-5" screw shown in Figure 7. (Tightening torque: 4.5kgfcm)
  3. Remove the "S-6" screw shown in Figure 7. (Tightening torque: 10.0kgfcm)
  4. Slide the Sheet Frame Section from the Board Frame Section in the direction indicated by the arrow shown in Figure 7 and remove it.

**Notes:**

- Be careful not to damage the Sheet during installation and removal.

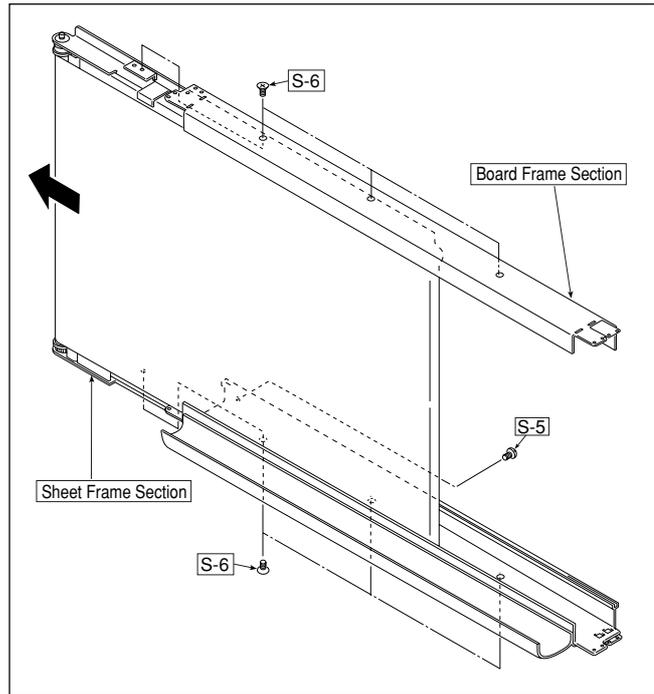


Fig. 7

- 8) Remove the Sheet Motor Assy. (See Figure 8.)
1. Remove the "S-7" screw shown in Figure 8 and then remove the Sheet Motor Assy. (Tightening torque: 4.5kgfcm)

**Notes:**

- Be careful not to forget the Vibration Proof Rubber during assembling.

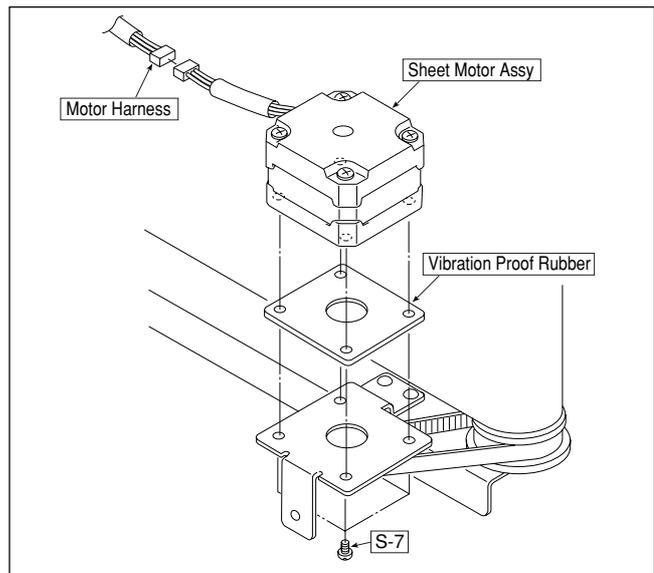


Fig. 8

- 9) Remove the Sheet Assy.  
(See Figures 9, 10, and 11.)
1. Push the sheet roller section toward the inside as shown in Figures 9 and 10.
  2. Remove the Sheet Assy as shown in Figure 11.

**Notes:**

- Be careful not to do damage or make a fold when handling the Sheet Assy.

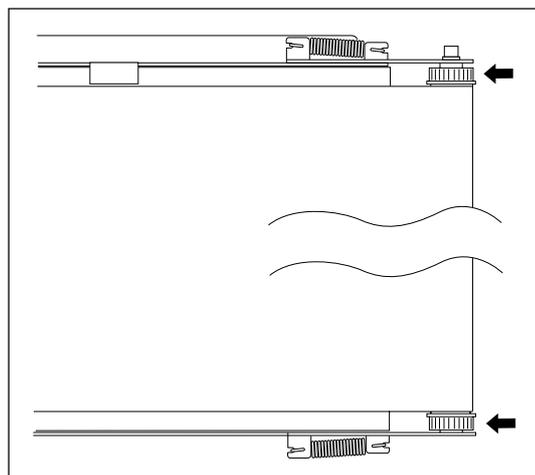


Fig. 9

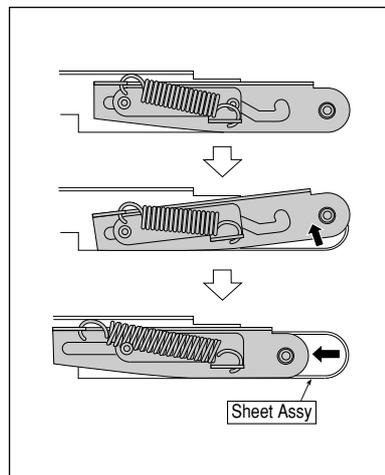


Fig. 10

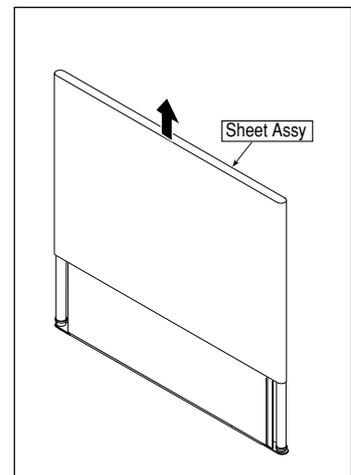


Fig. 11

## DISASSEMBLY AND ASSEMBLY

10) Remove the CCD Unit. (See Figure 12.)

1. Disconnect the CCD Harness from the CCD Unit.
2. Remove the "S-7" screw shown in Figure 12 and then remove the CCD Unit. (Tightening torque: 4.5kgfcm)

**Notes:**

- Adjustment is required when replacing and removing the CCD Unit. (See 5. Adjustment method.)

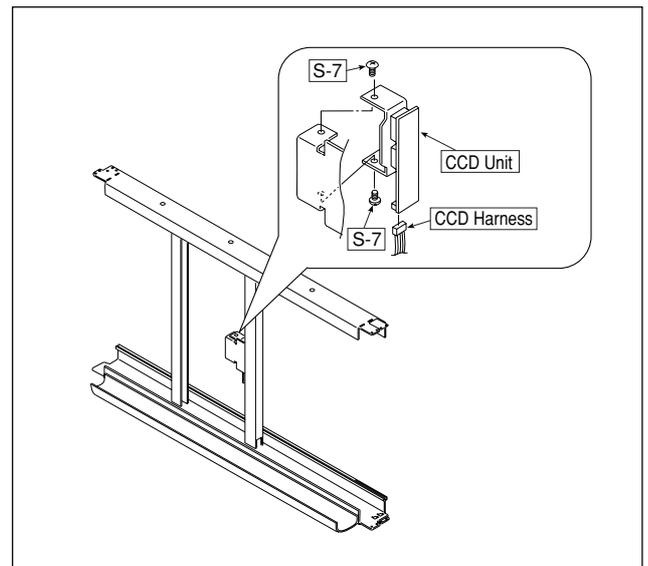


Fig. 12

11) Remove the CCFL Inverter Unit. (See Figure 13.)

1. Disconnect the CCFL Harness from the CCFL Inverter Unit.
2. Remove the "S-8" screw shown in Figure 13 and then remove the CCFL Inverter Unit. (Tightening torque: 4.5kgfcm)

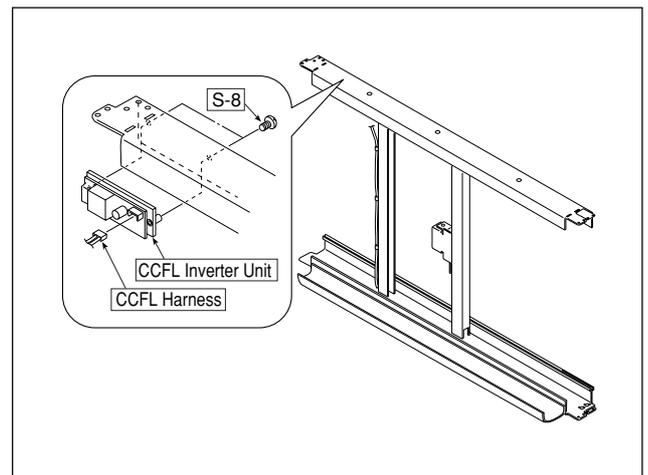


Fig. 13

# 5. ADJUSTMENT

## 5-1. CCD Unit Adjustment

Adjustment is required in the following case. (Calibration is also required. See 5-2. Calibration method.)

- When a CCD Unit is replaced
- When adjustment gets out of order due to the failure during shipping (shock during transportation such as vibration)
- Severest deterioration in picture quality (The picture quality may not be improved.)

### Preparation

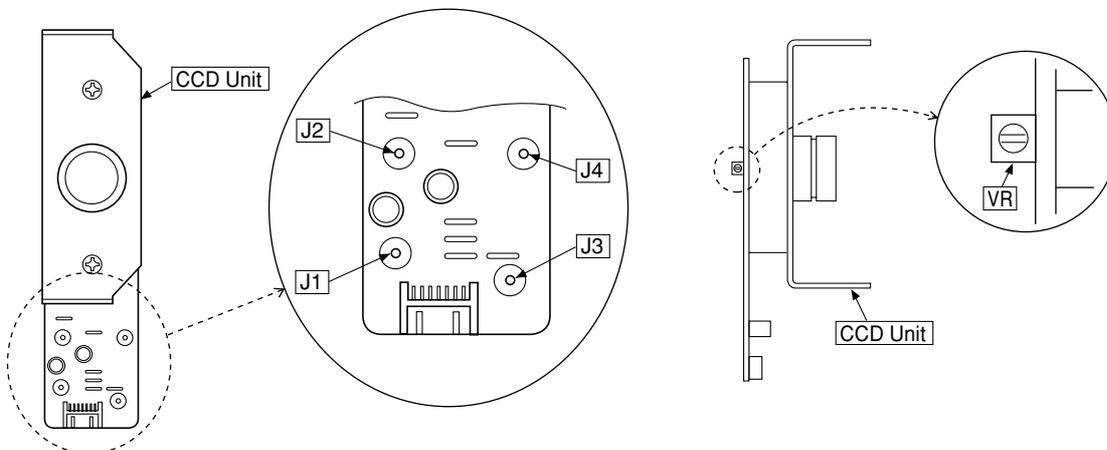
- Oscilloscope
- Phillips screwdriver No. 2
- Screwdriver for ceramic adjustment (2mm wide)
- Allen wrench (Across flat has 1.5 mm)

Turn ON the power to an oscilloscope. Clean the plate surface sufficiently.

\* Insufficient cleaning may influence the subsequent calibration and cause sometimes irregular color.

### CCD Unit adjustment procedure

- 1) Remove the Back Panel.
- 2) Connect an oscilloscope to the CCD Unit (CCD board).  
(See the figure on the right.)
  - Connect GND in Ch2 (Ext TRG) to J4.
  - Connect the measurement pin in Ch2 to J3 (TRG).
  - Connect GND in Ch1 to J1.
  - Connect the measurement pin in Ch1 to J2.
- 3) Setting of oscilloscope
  - Set the Ch1 mode to 2 V/DIV AC.
  - Set the Ch2 (Ext TRG) mode to 1 V/DIV DC.
  - Set the sweep to 500  $\mu$ sec/DIV.
  - Set the trigger to EXT or Ch2.
  - Only Ch1 is displayed.



4) Focus adjustment screw of lens unit (See Figure 1.)

Fix screw A temporarily so that the distance between the lens unit and holder is 1.7 mm.

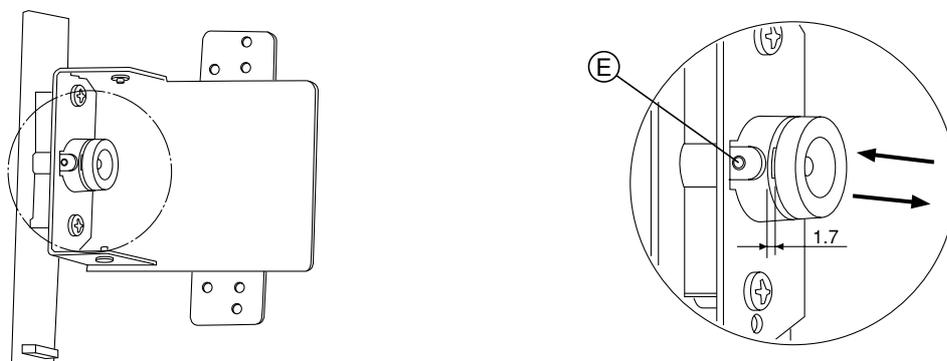


Fig. 1

5) Write test patterns on the sheet surface. (See Figures 2 and 3.)

(Clean the plate surface sufficiently. If not, the subsequent calibration cannot be performed correctly.)

As shown in Figure 2, write test patterns on the plate surface using a black marker.

- Write horizontal lines of 68 mm (two ruled lines) in the upper, middle, and lower positions according to the ruled line.
- Write vertical lines in the upper, middle, and lower positions, 68 mm (two ruled lines) away from the horizontal lines, according to the ruled line.  
(In only the middle position, the vertical line is 68 mm (two ruled lines). In the upper and lower positions, the vertical lines are 34 mm (one ruled line).)

**Notes:** Write them so that the horizontal lines in the upper and lower positions are put in the ruled lines as shown in Figure 3.

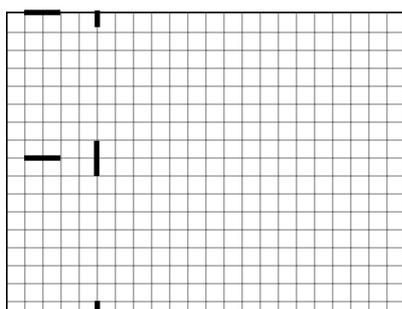


Fig. 2

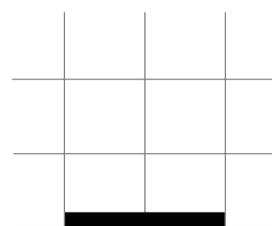


Fig. 3

6) Put the set into the adjustment mode.

- Turn ON the power.
- Insert CF in which a command in the adjustment mode was put.  
The set is put into the CCD adjustment mode, so confirm that CCFL lights.

7) Adjustment of oscilloscope (See Figures 4 and 5.)

- Adjust the trigger level, CH1 vertical position, Ch1 horizontal position, luminance, and focus so that a CCD waveform appears on the oscilloscope. Also, adjust the trigger level in Ch2 (Ext TRG) and fix the waveform.
- Adjust VR on the CCD board so that the waveform is set to 4 Vp-p using a ceramic adjustment screwdriver. Perform the adjustment described above. The adjustment is satisfactory if the waveform shown in Figure 4 or 5 appears.

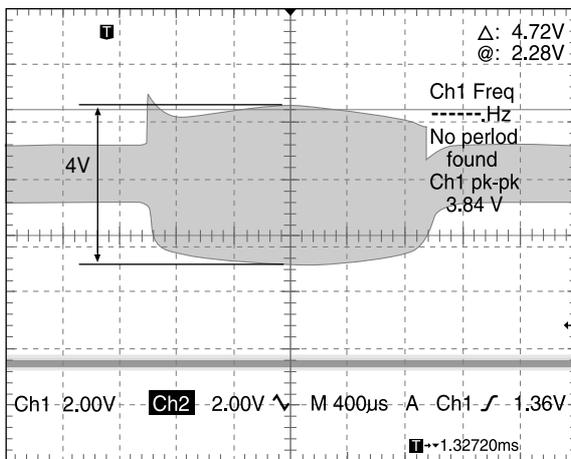


Fig. 4

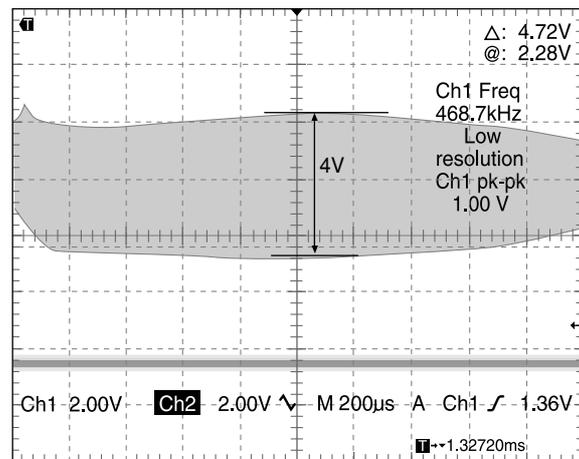


Fig. 5

8) Right and left swing adjustment of CCD Unit (See Figures 6 to 9.)

- As shown in Figures 6 and 7, insert a scale of 19 mm from the external and center positions of a CCFL unit.
- Loosen screw B shown in Figure 8, move sheet metal C, and fix screw B when the waveform falls to the intermediate level as shown in Figure 9.

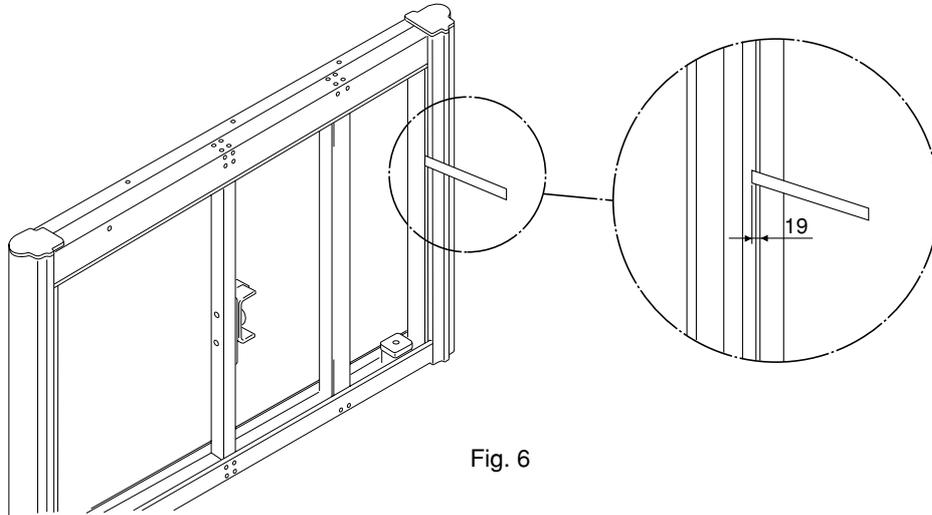


Fig. 6

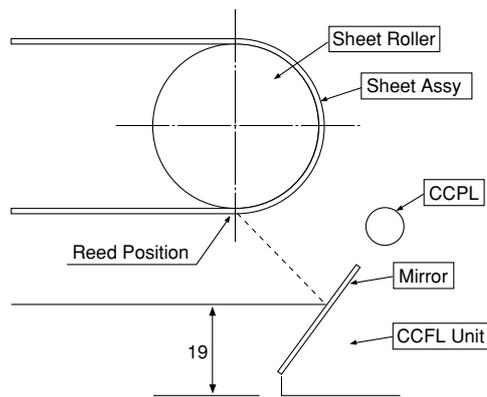


Fig. 7

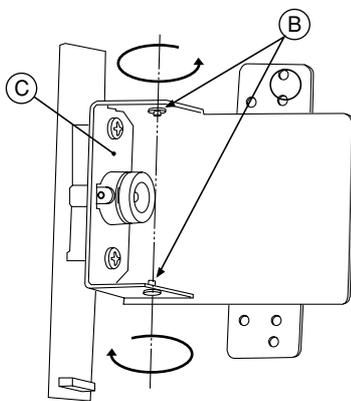


Fig. 8

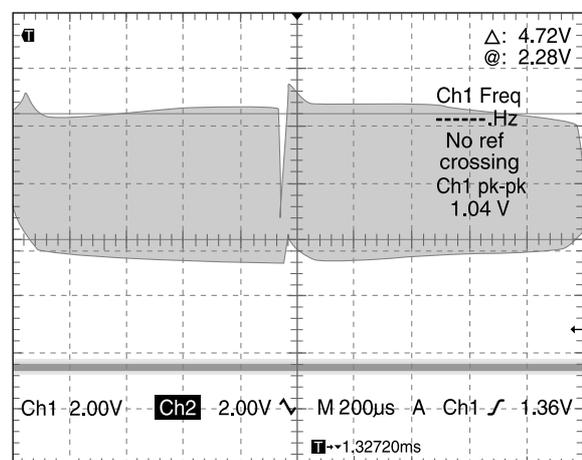


Fig. 9

## 9) Torsion adjustment of CCD Unit (See Figures 10 and 11.)

- Move a sheet so that the test patterns (vertical lines) written in step 5) are displayed on an oscilloscope.
- Loosen screws D shown in Figure 10, move the CCD board, and fix screws D when the upper and lower vertical lines equally go down as shown in Figure 11.

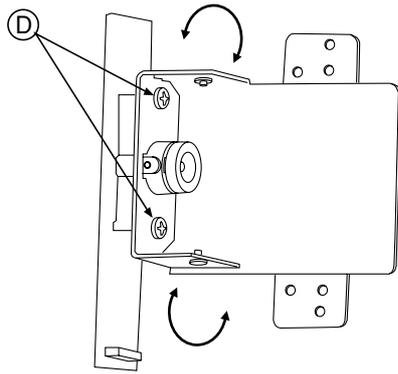


Fig. 10

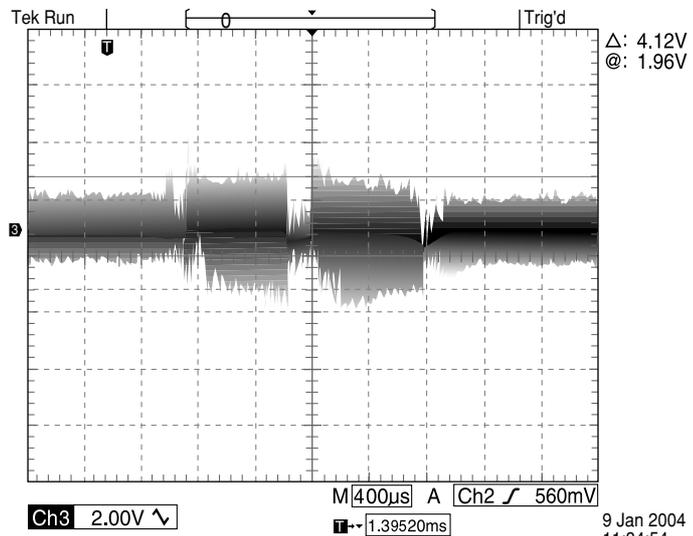


Fig. 11

## 10) Focus adjustment (See Figures 12 and 13.)

- Loosen screw E shown in Figure 12, monitor the waveform on the oscilloscope displayed during adjustment in step 9), and move the lens unit for focus adjustment so that the waveform becomes sharp as far as possible.
- Fix screw E when the waveform becomes sharp as shown in Figure 13.

**Notes:** If the focus is insufficiently adjusted, an error may occur during calibration offset correction described later.

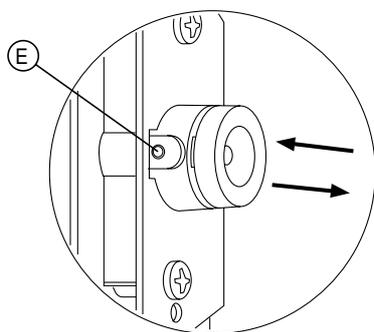


Fig. 12

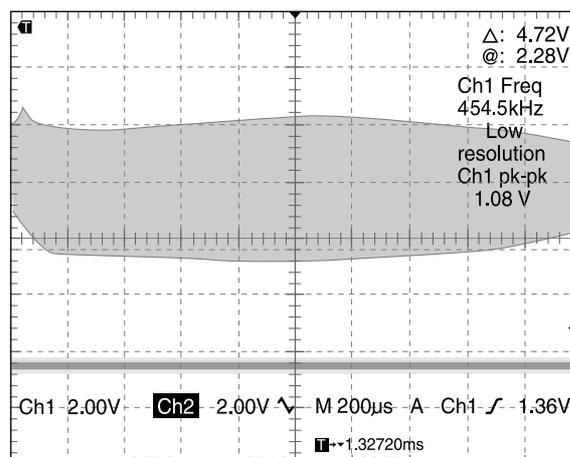


Fig. 13

11) Adjustment made according to the outside air temperature

- Adjust VR on the CCD board using a ceramic adjustment screwdriver according to the outside air temperature.

(Adjust portion F (the width of a waveform) shown in Figure 14.)

**Notes:** Confirm that five minutes or more passed after CCFL lights and that the outside air temperature is also stabilized when performing this adjustment.

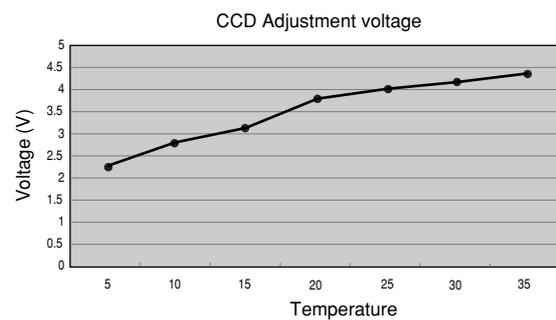
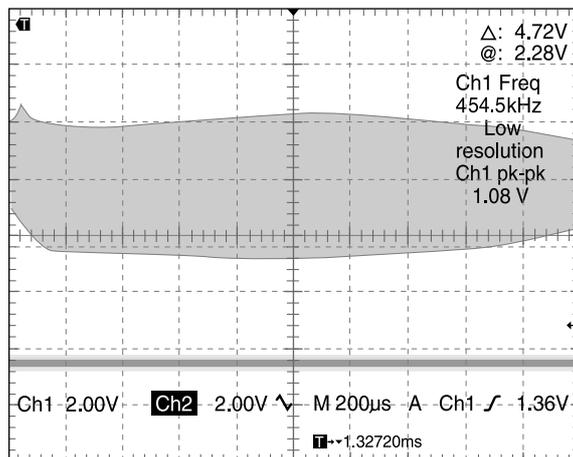


Fig. 14

Outside air temperature	Voltage (V)
10°C	2.70V
15°C	3.09V
20°C	3.77V
25°C	4.00V
30°C	4.19V
35°C	4.34V

## 5-2. Calibration Method

### Calibration is required in the following case.

- When a CCD Unit is adjusted
- When the Main Board Assy is replaced
- When a CCFL Unit is replaced
- Slight deterioration in picture quality

### Preparation

Clean the sheet surface sufficiently. Insufficient cleaning may influence the calibration and cause sometimes irregular color.

- 1) Write test patterns on the sheet surface. (See Figures 1 and 2 or step 5) in 5-1. CCD Unit adjustment.)  
When CCD Unit adjustment was performed, execute calibration directly because test patterns have been already written.  
Write adjustment patterns on the sheet surface using a black marker as shown in Figure 1 when executing only calibration.
  - Write horizontal lines of 68 mm (two ruled lines) in the upper, middle, and lower positions according to the ruled line.
  - Write vertical lines in the upper, middle, and lower positions, 68 mm (two ruled lines) away from the horizontal lines, according to the ruled line.  
(In only the middle position, the vertical line is 68 mm (two ruled lines). In the upper and lower positions, the vertical lines are 34 mm (one ruled line).

**Notes:** Write them so that the horizontal lines in the upper and lower positions are put in the ruled lines as shown in Figure 2.

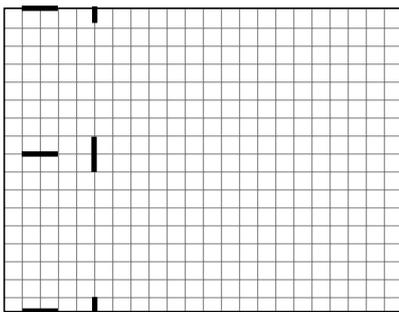


Fig. 1

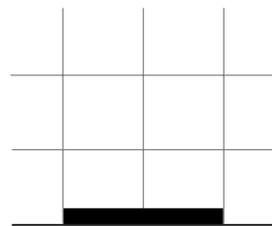


Fig. 2

2) Start calibration.

- Press the Power key and turn off the Power.
- Disconnect the probe of an oscilloscope (only when CCD Unit adjustment is performed).
- Install a Back Panel to prevent the external light.
- Insert a CF card in which a calibration start JOB file was put.

The contents of the data below are saved in CF as "M5.JOB".

```

;Cal. JOB
Lamp:Cal                ; CCFL ON(Cal. Mode)
Wait:300                ; Wait 300 sec
Cal:F                   ; Cal. Execute
CalDataOut:             ; Cal Result Write to CF
;DeleteFile:M5.JOB     ; Comment if use delete ';'
End:
    
```

**Notes:** Be sure to set Wait: to 300.

The Power indicator is turned ON when calibration is terminated normally.

3) When an error occurs in calibration;

- The Power and Memory lamps blink as an error.
- "M5.log" is created in CF.
- The contents of an error are written in the end line of M5.log for reference. (See the table below.)

No.	Contents of log	Contents of error
1	Cal.Flash Access Error (Load ini)	An init file cannot be loaded.
2	Horizontal line Error	The detection of a horizontal marker in the middle position fails.
3	Side line Error (Lower)	The detection of a horizontal marker in the lower position fails.
4	Side line Error (Upper)	The detection of a horizontal marker in the upper position fails.
5	White Level Error (None Maker)	No adjustment pattern exists.
6	Vertical line Error	The first detection of a vertical marker fails.
7	2'nd Vertical line Error	The second detection of a vertical marker fails.
8	Saving Error (Initial White Level)	The first write of a White Level fails.
9	Saving Error (White Level)	The second write of a White Level fails.
10	Saving Error (Feed line)	The number of Feed lines fails in write.
11	Saving Error (Scan Line Dots)	The number of scan dots fails in write.
12	Cal.Flash Access Error (1'st Write Ini)	The first write of an ini file fails.
13	Cal.Flash Access Error (2'nd Write Ini)	The second write of an ini file fails.

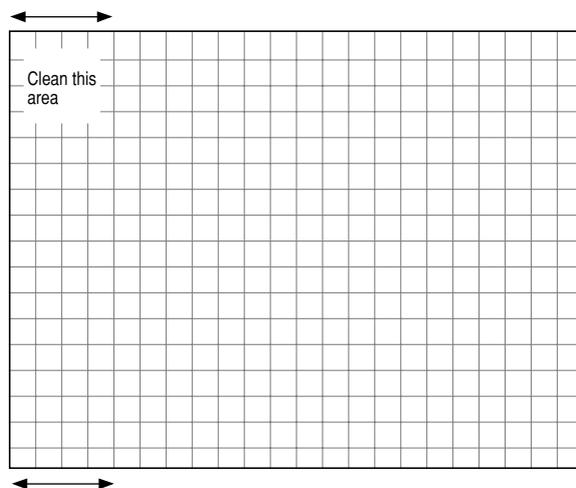
- 4) Confirmation of print
  - Write a proper pattern (such as a character or symbol) fully in the scanning area using a black/red marker.
  - Confirm that the written pattern can be read normally.
    - When abnormality (such as a dark line or rubbing) is found as a confirmation result;
  - Confirm that any dirt does not adhere to the mirror of CCFL Unit.
  - Confirm the brightness adjustment of utility.
  - If there is no problem in the items described above, perform the CCD Unit adjustment again.

## 5-3. Quick Calibration

Simplified calibration is required in the following case.

- When the installation position is changed and an error occurs during read operation
  - When the setting is changed from horizontal to vertical or from vertical to horizontal and an error occurs during read operation
- 1) Clean the four-ruled line area on the left of a sheet. (See the figure below.)

**Notes:** Clean all areas between the top and bottom. Insufficient cleaning may cause a failure during read operation.



- 2) Start the simplified calibration.
  - Turn on the power while pressing and holding the Clear key.
  - The Memory lamp begins to blink when calibration is started.
  - The Power indicator is turned ON when calibration is terminated.
- 3) Confirmation of print
  - See “4) Confirmation of print” in 5-2. Calibration method.

## 5-4. Tension Adjustment of Timing Belt

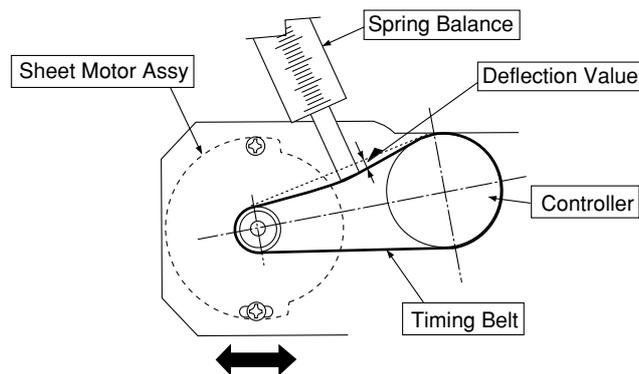
The tension of a timing belt must be adjusted when the Sheet Motor Assy is replaced and removed.

### Tool required

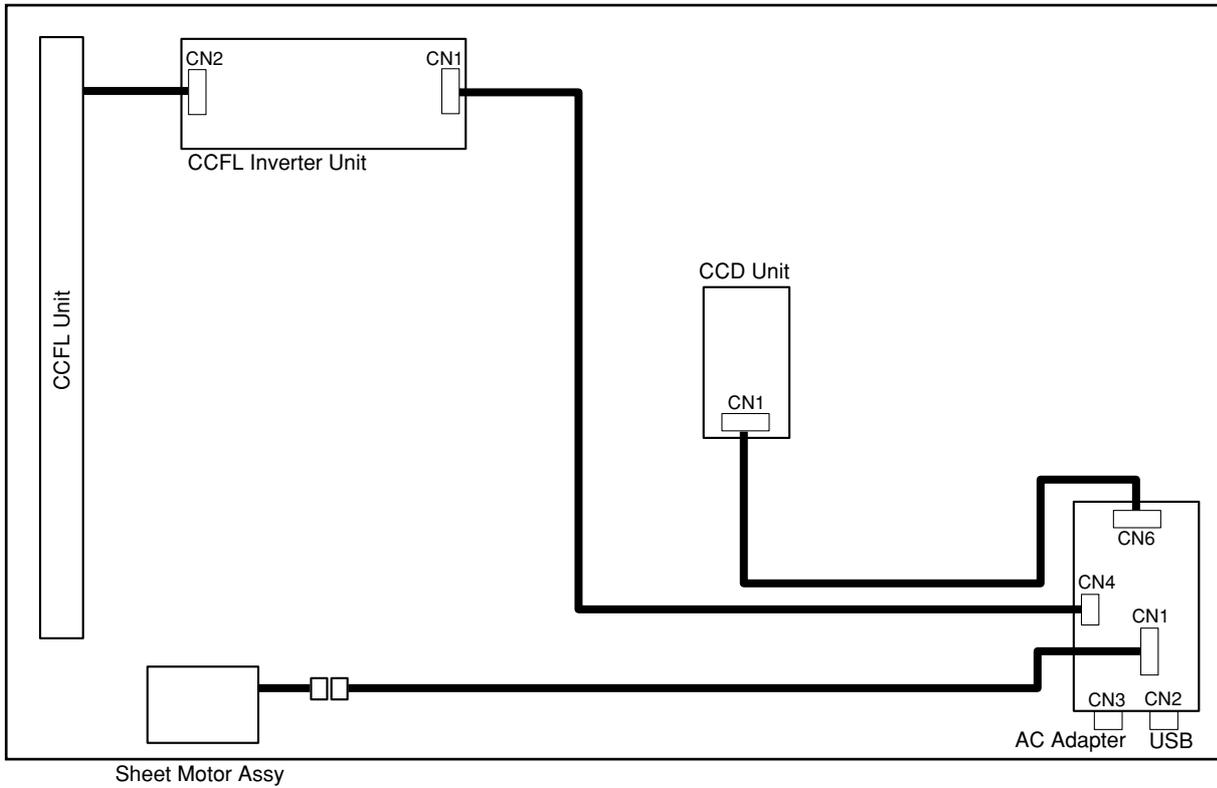
- Spring balance

**Adjustment** (See the illustration shown below.)

- Fix the Sheet Motor Assy tentatively and measure the tension of a timing belt using a spring balance.
- Move the Sheet Motor Assy and fix it in the position where proper load is obtained.
- The proper load is 0.3 to 0.6 kgf with the timing belt bent by approximately 1 mm.

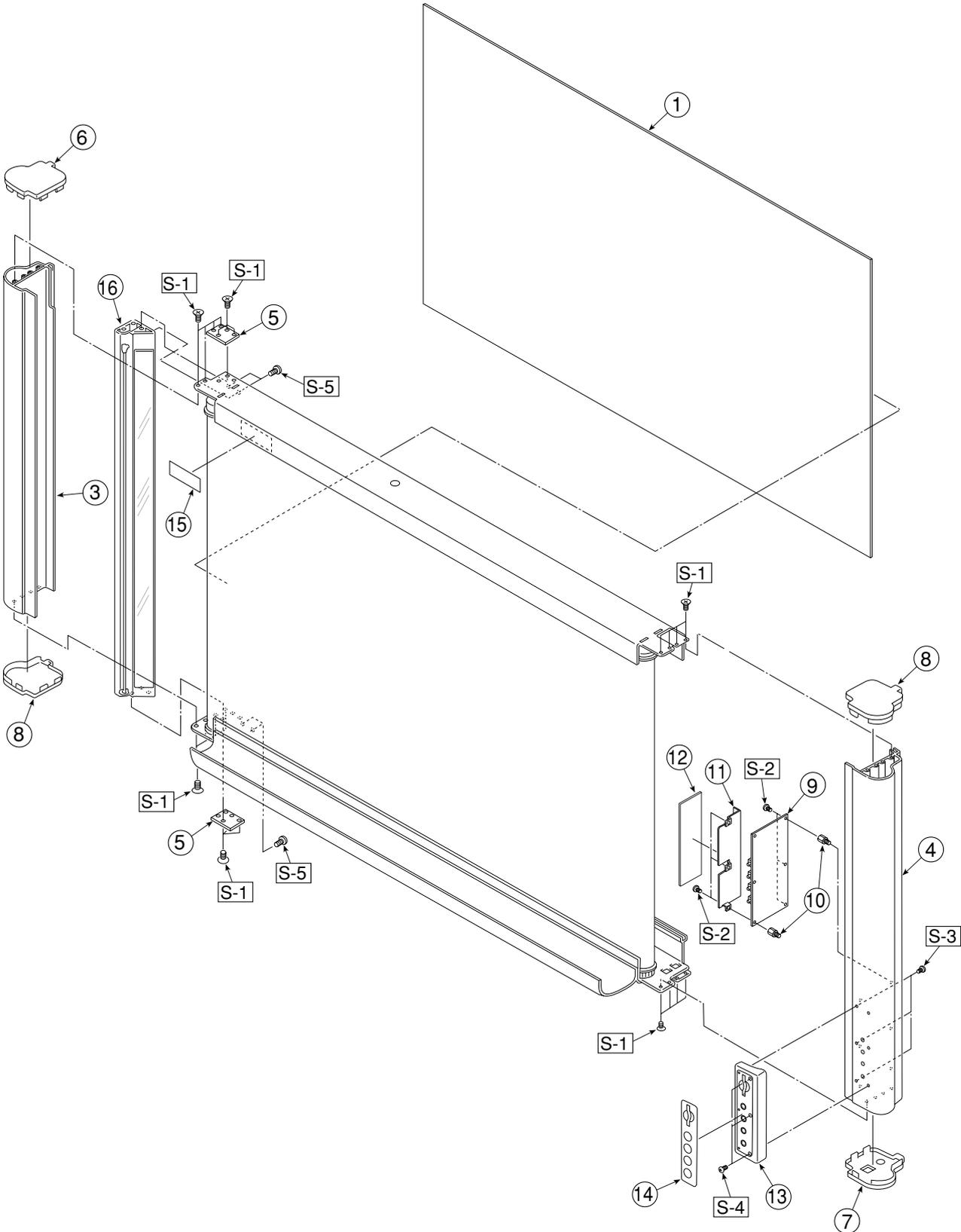


## 6. CABLE AND CABLE CONNECTION



# 7. PARTS LIST

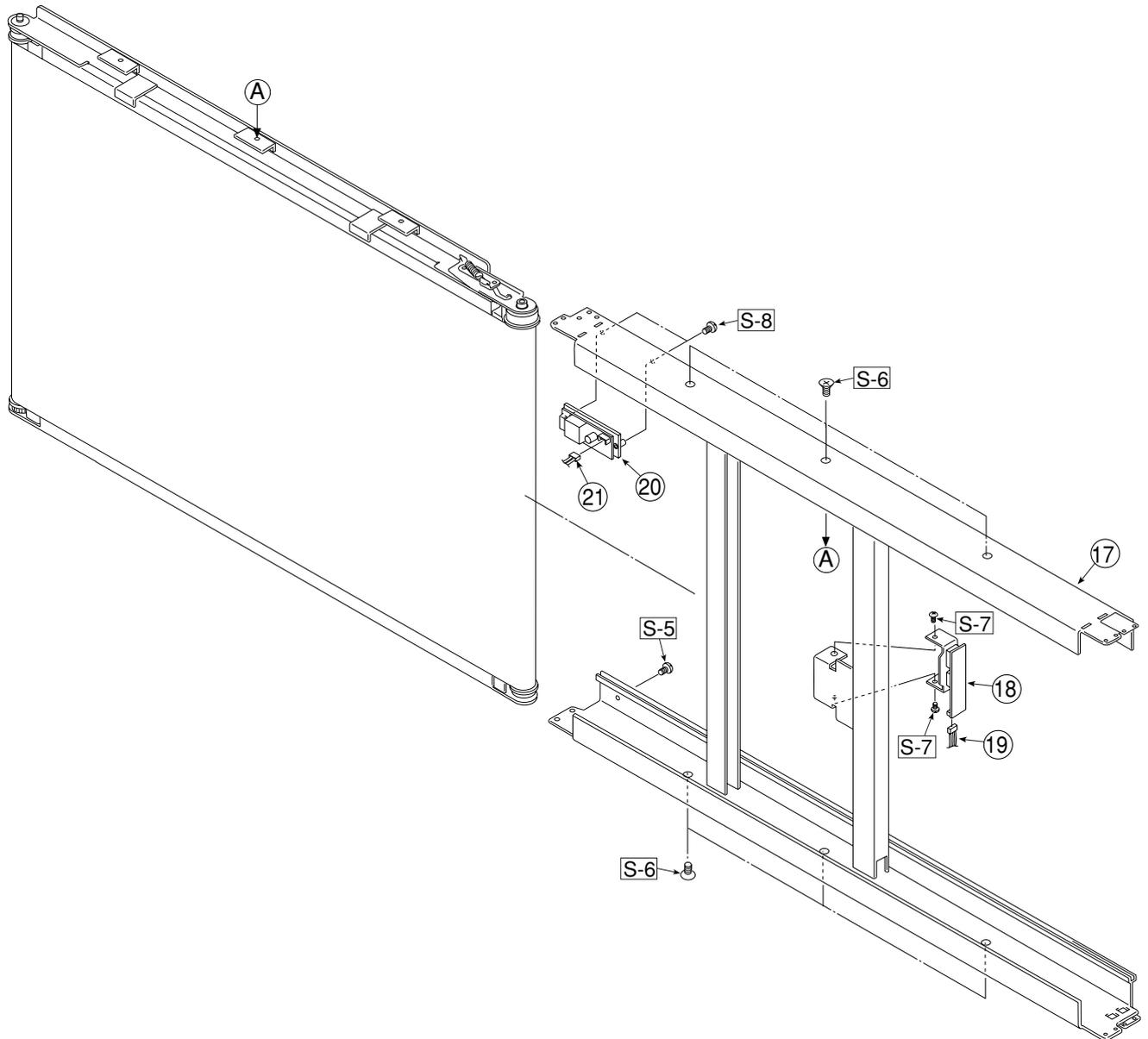
## 7-1. FRAME COVER SECTION



## PARTS LIST

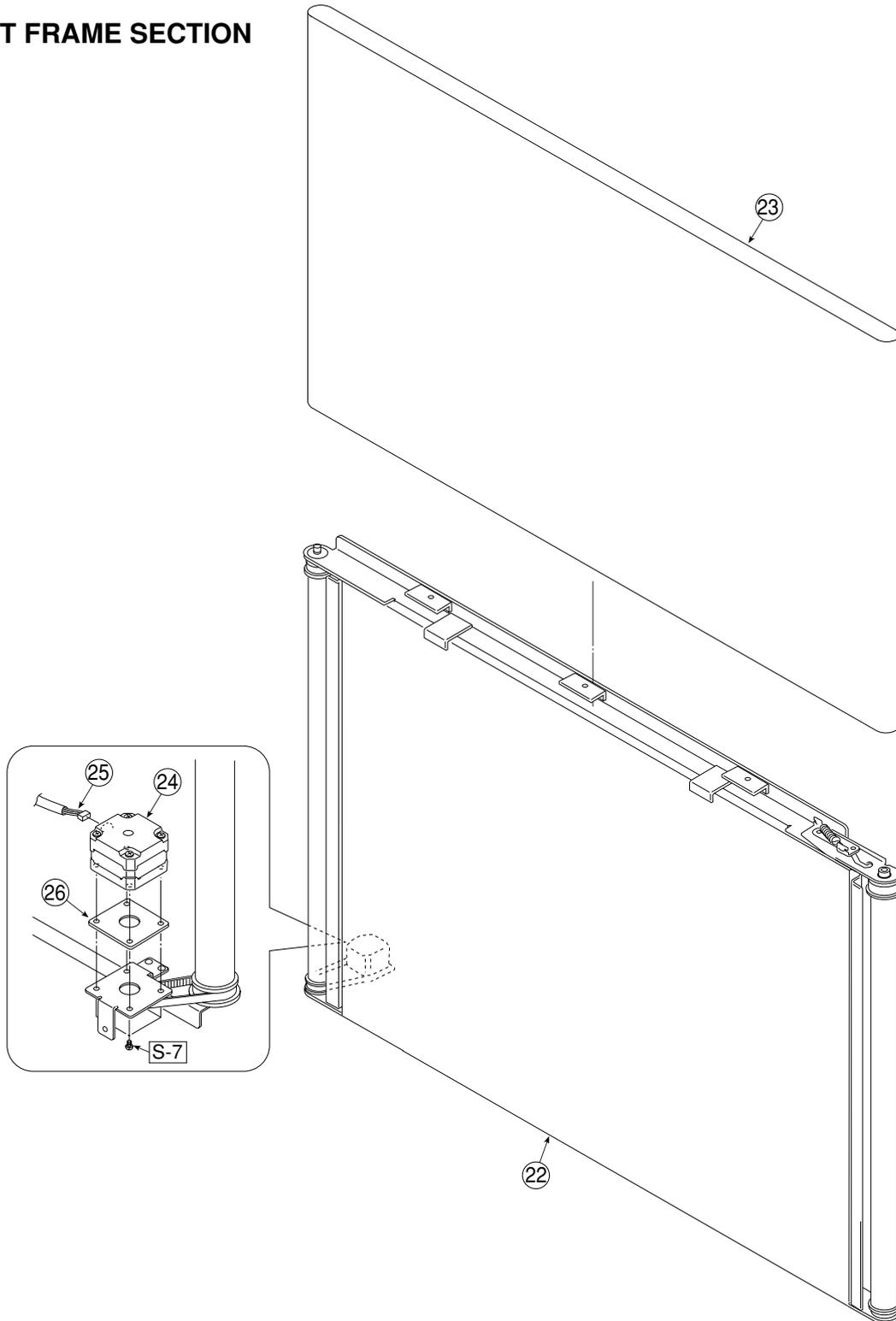
<b>7-1. FRAME COVER SECTION</b>				
<b>No</b>	<b>PARTS NAME</b>	<b>PARTS No.</b>	<b>Q' ty</b>	<b>REMARK</b>
1	Back Panel	718203100	1	
3	Side Frame R	718203400	1	
4	Side Frame L Unit	718080010	1	
5	Side Frame Plate	718202500	2	
6	Frame Cap A	718203900	1	
7	Frame Cap B	718204000	1	
8	Frame Cap C	718204100	2	
9	Main Board Assy	718500000	1	
10	Hexagonal Spacer M3-5	718208900	6	
11	Main Board Cover Unit	718080020	1	
12	Main Board Cover A	718209700	1	
13	Switch Box Unit	718080030	1	
14	Switch Sheet	718207000	1	
15	Name Plate	718209000	1	
16	CCFL Unit	718080040	1	

## 7-2. BOARD FRAME SECTION



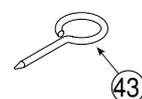
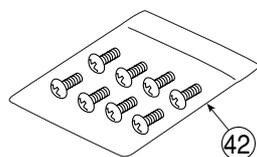
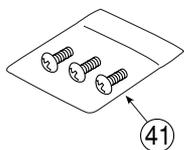
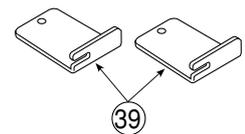
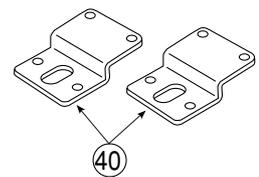
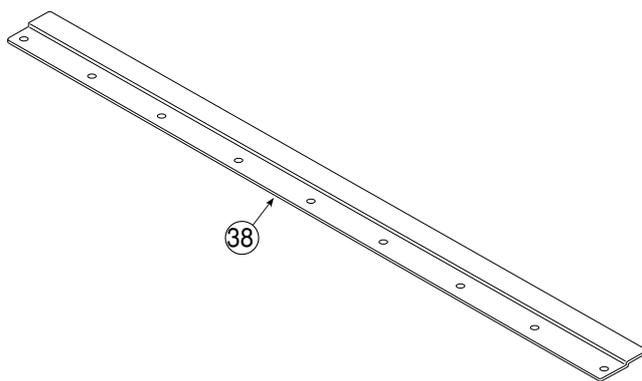
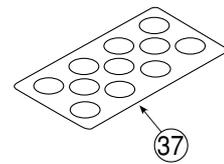
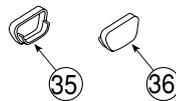
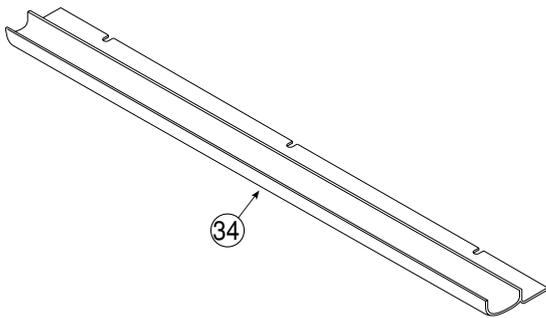
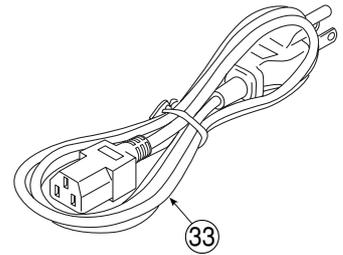
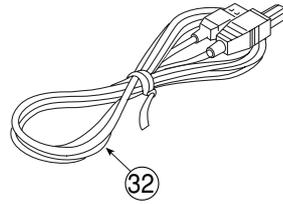
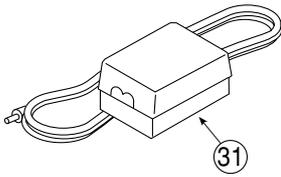
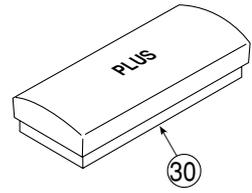
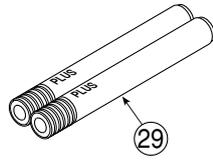
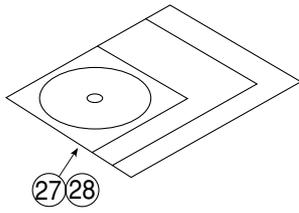
7-2. BOARD FRAME SECTION				
No	PARTS NAME	PARTS No.	Q' ty	REMARK
17	Board Frame Unit	718080050	1	
18	CCD Unit	718080060	1	
19	CCD Harness	718500700	1	
20	CCFL Inverter Unit	718080070	1	
21	CCFL Harness	718500800	1	

**7-3. SHEET FRAME SECTION**



<b>7-3. SHEET FRAME SECTION</b>				
<b>No</b>	<b>PARTS NAME</b>	<b>PARTS No.</b>	<b>Q' ty</b>	<b>REMARK</b>
22	Sheet Frame Unit	718080080	1	
23	Sheet Assy	718201900	1	
24	Sheet Motor Assy	718501200	1	
25	Motor Harness	718500600	1	
26	Vibration Proof Rubber	718209300	1	

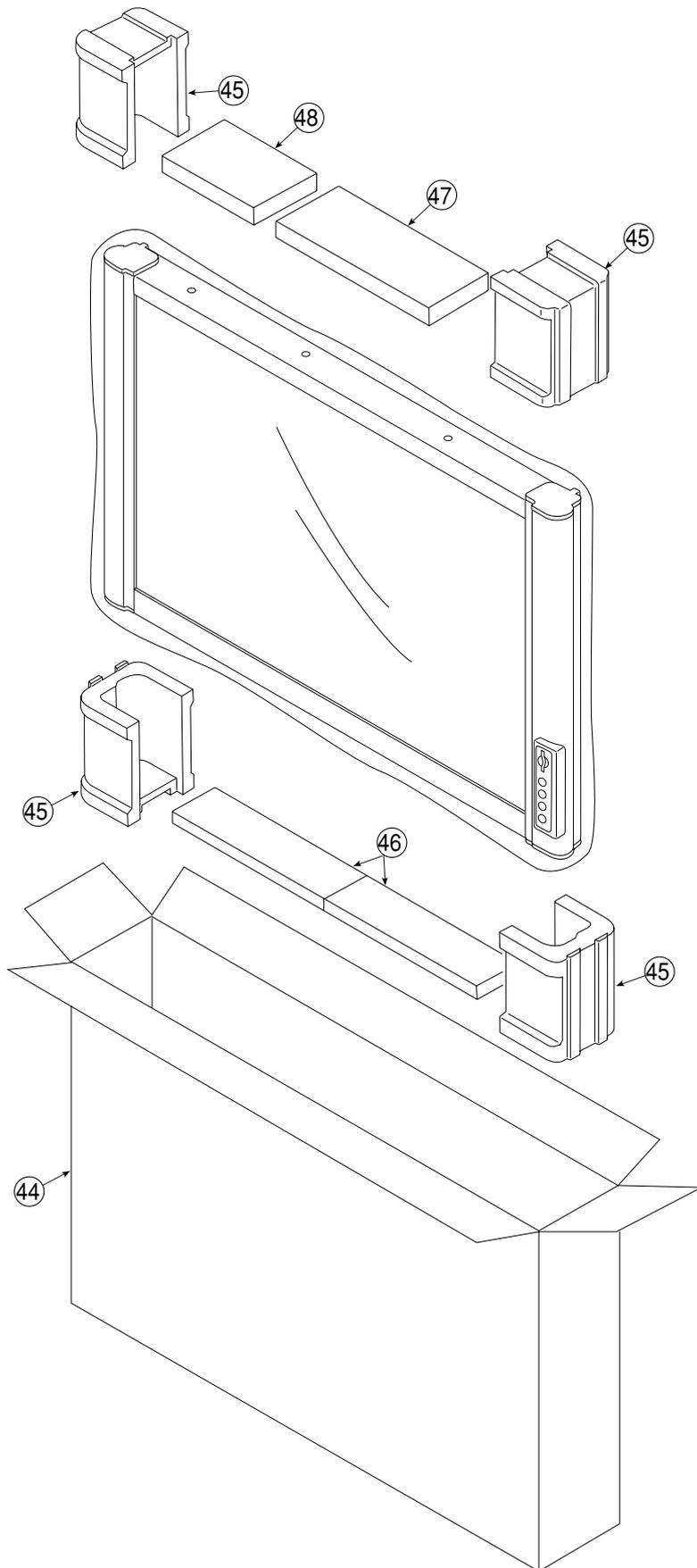
**7-4. ACCESSORIES SECTION**



## PARTS LIST

<b>7-4. ACCESSORIES SECTION</b>				
<b>No</b>	<b>PARTS NAME</b>	<b>PARTS No.</b>	<b>Q' ty</b>	<b>REMARK</b>
27	User's Manual (CD-ROM)	718207800	1	
28	User's Manual (OS)	718212700	1	
29	Marker Set (OS)	718207700	1	No Parts Supply
30	Dry Eraser	714173000	1	No Parts Supply
31	AC Adapter	718501300	1	
32	USB Cable (3m)	718500900	1	
33	Power Code (EU) 3m	718501500	1	
	Power Code (UK) 3m	718501600	1	
	Power Code (US) 3m	718501700	1	
	Power Code (AU) 3m	718501800	1	
	Power Code (CH) 3m	718501900	1	
34	Marker Tray	718203000	1	
35	Marker Tray Cover R	718202800	1	
36	Marker Tray Cover L	718202900	1	
37	Cosmetic seals	718209900	1	
38	Hook for Wall Mount	718204200	1	
39	Wall Mount Bracket Upper	718204300	2	
40	Wall Mount Bracket Lower	718204400	2	
41	Screw Unit for Marker Tray	718080090	1	
42	Screw Unit for Wall Mount Plate	718080100	1	
43	Screw Driver	-	1	No Parts Supply

7-5. CARTON PACKING SECTION



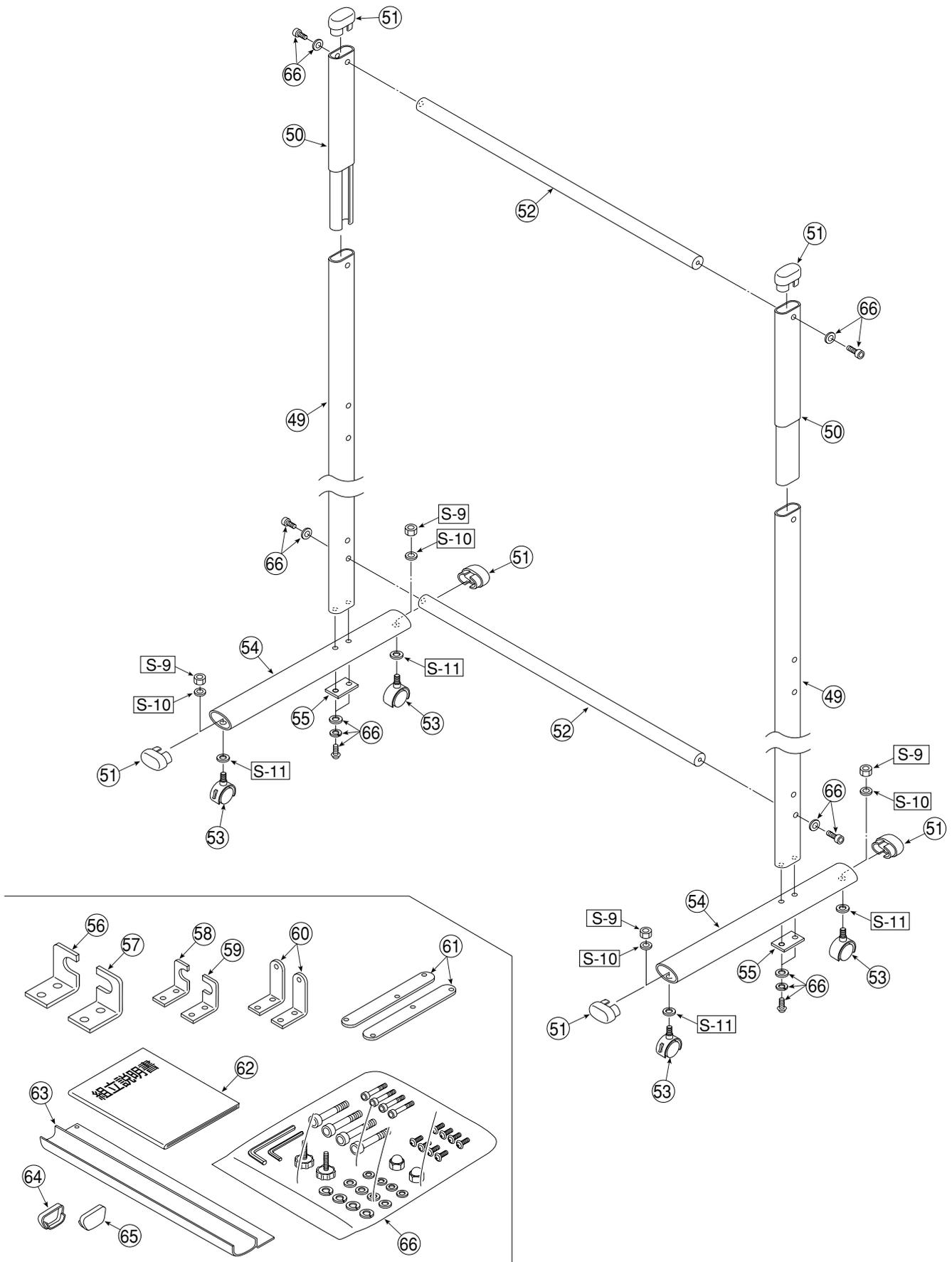
## PARTS LIST

<b>7-5. CARTON PACKING SECTION</b>				
<b>No</b>	<b>PARTS NAME</b>	<b>PARTS No.</b>	<b>Q' ty</b>	<b>REMARK</b>
44	Carton	718204900	1	
45	Corner Packing	718204700	1	
46	Packing for Marker Tray	718204800	2	
47	Upper Packing	718205000	1	
48	Accessory Box	718205100	1	

**7-6. SCREWS AND WASHERS SECTION**

<b>7-6. SCREWS &amp; WASHERS SECTION</b>				
<b>No</b>	<b>PARTS NAME</b>	<b>PARTS No</b>	<b>Q' ty</b>	<b>SURFACE</b>
S-1	M4-12 Cross Recessed Flat Head	951341280	22	MFZnI-C-B
S-2	M3-6 Cross Recessed Binding Head	951230610	6	MFZnI-C
S-3	∅ 3-5 P-Tight Cross Recessed Binding Head	953230510	3	MFZnI-C
S-4	∅ 3-12 S-Tight Cross Recessed Binding Head	953631210	3	MFZn
S-5	M3-6 Cross Recessed Flat Head	951330650	5	MFZnI-C-B
S-6	M4-8 Cross Recessed Flat Head	951340850	6	MFZnI-C-B
S-7	M3-8 Cross Recessed Pan Head 3-Point Type	952530810	6	MFZnI-C
S-8	M3-8 P-Tight Cross Recessed Flat Head	953331080	2	MFZnI-C-B

7-7. M-5-T (OS)



**PARTS LIST**

<b>7-7. M-5-T (OS)</b>				
<b>No</b>	<b>PARTS NAME</b>	<b>PARTS No.</b>	<b>Q' ty</b>	<b>REMARK</b>
49	Foot Pipe A Assy	718206300	2	
50	Lengthen Pipe Assy	718206400	2	
51	Pipe Frame Cap	714112600	6	
52	Rail Assy	718206600	2	
53	Front Caster	714660400	4	
54	Foot Pipe B (OS)	718207900	2	
55	Foot Plate	718206900	2	
56	Stands Hanger Upper R	718205600	1	
57	Stands Hanger Upper L	718205700	1	
58	Stands Hanger Upper R (Vertical)	718210600	1	
59	Stands Hanger Upper L (Vertical)	718210700	1	
60	Stands Hanger Lower (Vertical)	718206000	2	
61	Stands Hanger Lower	718205800	2	
62	Assemble Manual for Stand	718211200	1	
63	Marker Tray for Upright	718209100	1	
64	Marker Tray Cover R for Upright	718212000	1	
65	Marker Tray Cover L for Upright	718212100	1	
66	Screw Unit for Stand	718080110	1	
S-9	M3-8 Hexagonal Stop Bolt	955217610	4	-
S-10	No.2-10 Spring Washer	957410210	4	MFZnI-C
S-11	No.2-10 Flat Washer	957210210	4	MFZnI-C

## 8. REVISION HISTORY

No	Revision History	Revision page	Date
1			
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