COPY BOARD

M-115

SERVICE MANUAL

PLUS

CONTENTS

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 User's Manual.

Pay attention to the following during service inspection.

1-1. Cautions during Product Displacement

• 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 portion that was worked on.
5. Pay attention to static electricity when handling electronic parts on a board.

2. SPECIFICATIONS

2-1. Product Specifications

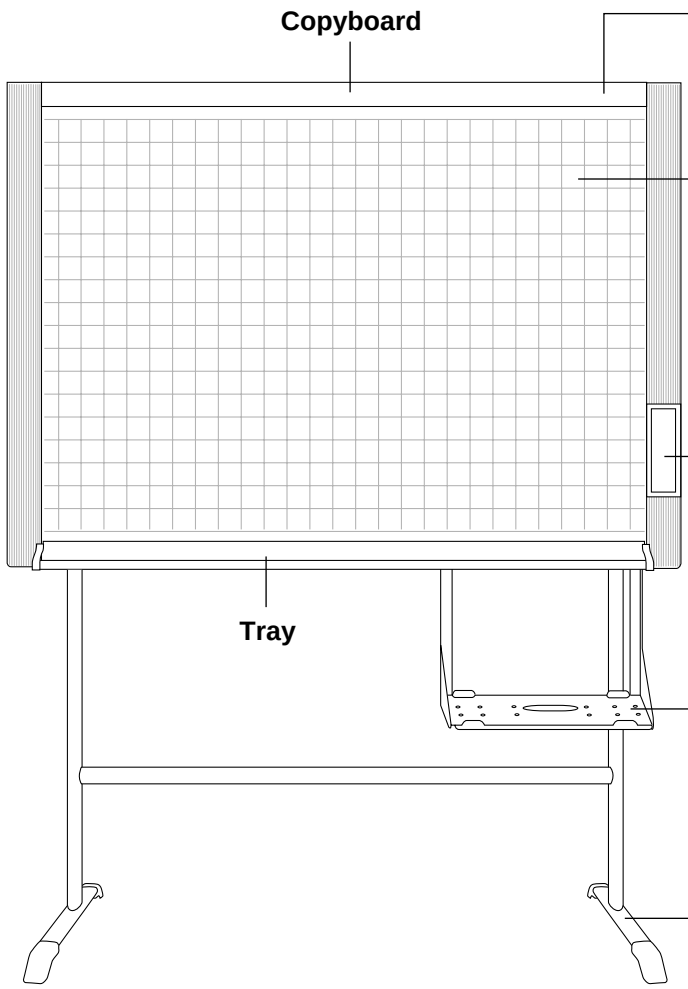
BOARD TYPE (Model name)		Standard (M-115)
Form	Installation method	Self-standing (T-shaped legs), or wall mounting
	External dimensions (T-shaped legs* 1)	W1470 × D700 × H1970 (Max)*2 mm
	Main unit weight	33.0 kg*3 (excluding printer)
	T-shaped legs weight	9.6 kg
Board	Panel Size	H920 × W1300 mm
	Effective reading size	H900 × W1280 mm
	Number of Pages	4 + projection screen
	Paging	Wind-up type
	Drive method	Motorized
	Reading method	CCD sensor reduction optical system
	Reading illumination light source	RGB LED
	Reading resolution	Main scanning direction (vertical sheet surface) 2.4 dots/mm (60 dpi or equivalent) Sub scanning direction (horizontal sheet surface) 2.4 dots/mm (60 dpi or equivalent)
	Reading time	Black & white: approx. 15 s Color: approx. 23 s
Memory	Type	USB Flash memory*4
	Compatible FAT types	FAT 12, 16, 32
	File format	PNG format*5 and HTML format
	Interface	USB1.1 or USB2.0 full-speed mode*6
Control panel	Control buttons	ON/Standby, + , -, Print, Save, Reprint, Color, Density, Page Change, Screen
	LED Indicators	Density, Color, Page LEDs
	Display	7-Segment (Page, Error #), LED (Density, Color), LED Page
Added functions	Clock	Used for the timestamp and for file dating properties (Built-in backup battery for when there is a loss of power)
	PC connection	Via USB (TWAIN supported)
Power supply	AC power adapter	Input : AC100 - 240V/50 - 60 Hz, Max 1.5A Output : DC24 V, 2.71 A
Operating conditions	Temperature	10 - 35°C
	Humidity	30 - 85% (No condensation)
Recording section	Printer interface	USB1.1 or USB2.0 full-speed mode*4 compliant printers are supported
Miscellaneous	Ruled lines	50 mm cross-ruled squares
	Miscellaneous	Special markers (black, red, blue,and green)

Remarks
*1: The height is adjustable at 1770, 1870 and 1970 mm.
*2: The value indicated for “H” (height) is the maximum height.
*3: Not including the weight of the printer.
*4: Not correspond High-speed mode.
*5: Opened using Internet Explorer 6.0 or higher or a WEB browser that can be used to browse a PNG file.
*6: Cannot be used for high-speed operation.

- Please note that for quality improvement purposes, specifications and design are subject to change without prior notice.
- Depending on the product, the printer and T-shaped legs (stand) will be available separately.

2-2. Location of Parts and Controls

Front panel of main unit

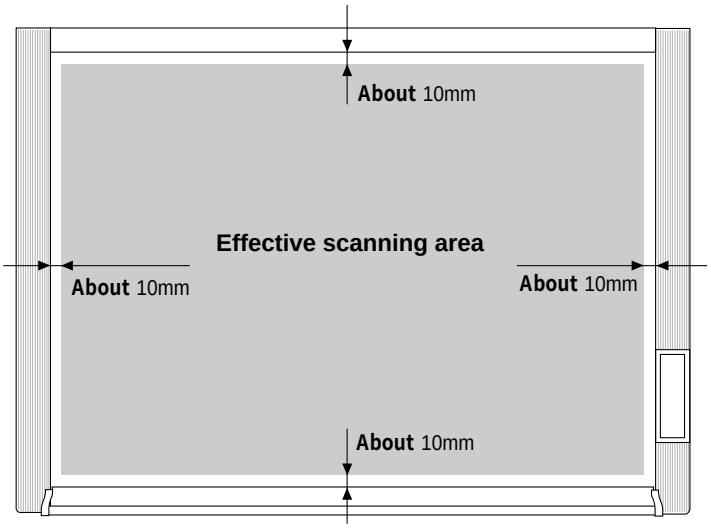


Sheet
Figures or characters are drawn in this sheet using a dedicated marker.

Operation Panel

Printer Tray
A printer is put in this printer stand.
(See Assembling, Installation manual.)

Stand *
Stand holding this unit.
(See Assembling, installation manual.)

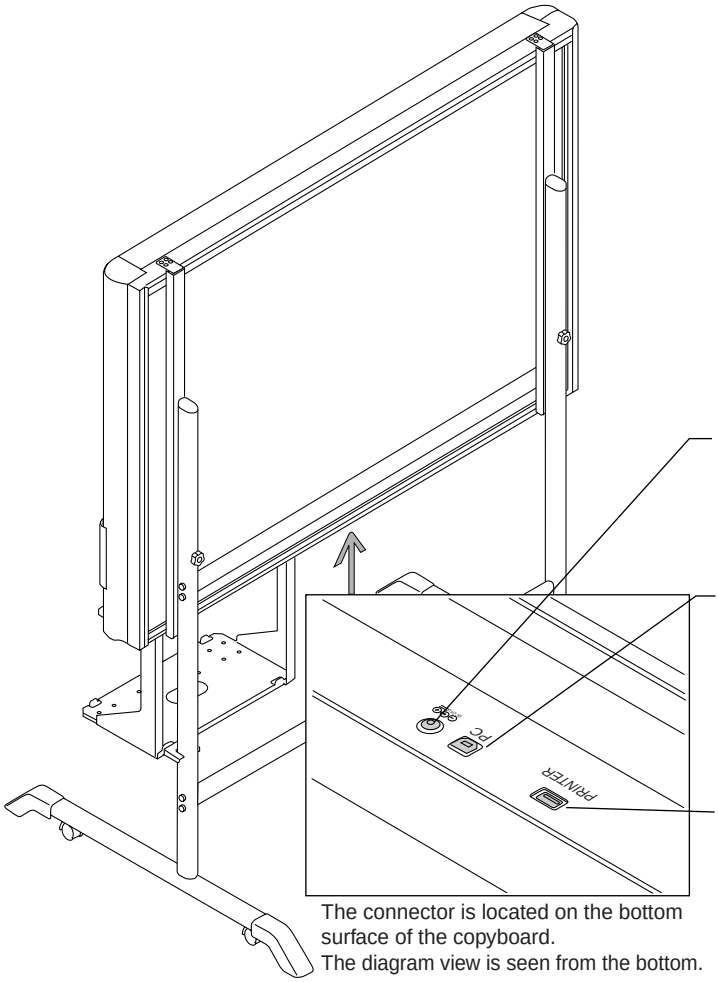


Effective scanning area
The portion where a copy can be made is displayed in gray in the figure.

* In the portion other than described above, a copy may not be able to be made during print, and USB memory or personal computer saving.

* A printer and stand may be available optionally.

Back panel of main unit



DC input connector
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.)

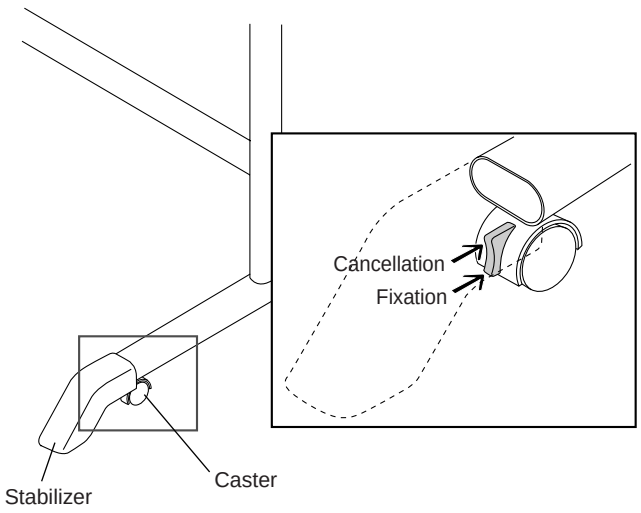
PC-dedicated USB port (Type B)
This function is used when read operation is started from the personal computer side and image data is directly transferred to the personal computer or when the operating environment of this unit is set from the personal computer side. Before using this function, install the driver and software in the supplied CD-ROM.

Printer connector (USB port Type A)
Connect this with the USB connector of the printer. (The printer connector is dedicated for use with a printer; use it only with a printer.)

The connector is located on the bottom surface of the copyboard.
The diagram view is seen from the bottom.

Locking and unlocking the caster of a stand*

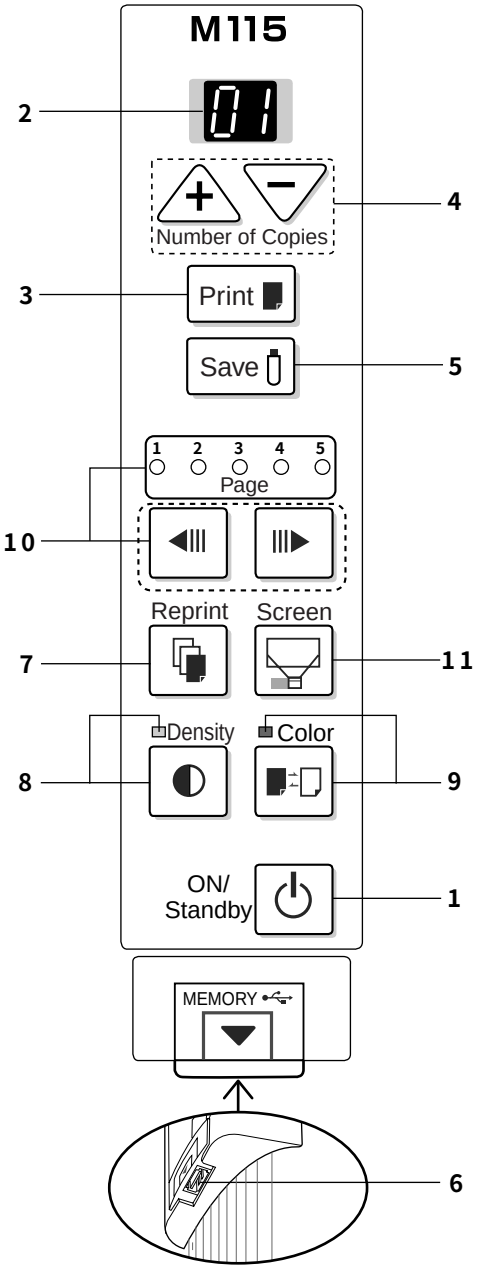
After installation, fix the caster using a stopper. Remove a stabilizer during moving the copyboard and unlock the stopper of a caster. To fix a stopper, push the lower position of the stopper.
To unlock a stopper, push the upper position of it.



* A stand may be available optionally.

2-3. Operation Panel of Main Unit

When pressing a button, please press the center area (i.e., the round and protruding portion). The button may not work if it is pressed on a corner.



1 ON/Standby button

Turns the copyboard's power on and off (standby mode). Use the button to cancel printing, storing or page change. The ON/Standby button is used together with other buttons to set the current time. For details, see page E-17.

2 Display window

This 7-segment LED displays the number of copies to be printed, the USB memory storage operating condition, and error information. Please see Page E-34 for details about error information.

3 Print button

Moves a one page portion of sheet and reads it, then prints the number of copies displayed in the display window.

4 + / - buttons (Number of copies)

Pressing the + button or the - button sets the number of copies to be printed (to a maximum of 20 sheets). The number of copies appears in the display window.

5 Save button (USB memory storage)

Moves a one page portion of sheet and reads it, then stores the data on a USB memory.

6 Memory port (USB port Type A)

Saves in commercially-available USB memory images that have been read by the copyboard.

7 Reprint button

Prints the previously printed sheet surface one more time. (The sheet does not move.)
The number of copies can be changed, but the density and the color/monochrome selection cannot be changed.

8 Density button

Selects the copying density, either "standard" or "dark". This function will be effective at time of printing, USB memory storage, and personal computer storage.

Density mode lamp

The density mode indicator lights green when "dark" is selected.

9 Color button

Selects whether to print (or store in memory) in "color" or "black & white".

Color mode lamp

The indicator lights green when "color" is selected.
*When a black & white printer is connected, the printout will be in black & white even when "Color" is selected.

10 Page change buttons

Use them to change pages.

- Each press of the page change button moves the page indicator one step in the sequence of 1→ 2 → 3 → 4 making it flash, and scrolls the copyboard to the specified page.
- Each press of the page change button moves the page indicator one step in the sequence of S → 4 → 3 → 2 → 1 making it flash, and scrolls the copyboard to the specified page.

Note

- Scrolling to the screen (S page) is not possible with the page change button.

Page indicators

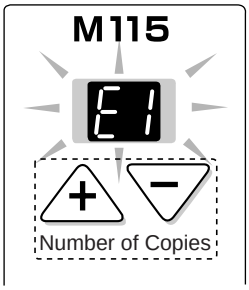
The indicator for the currently displayed page lights (green). When scrolling, the indicator for the specified page flashes while the page is scrolling, then stops flashing, remaining lit, once scrolling stops.

11 Screen button

When pressed, the sheet scrolls to the screen (the S page).

2-4. Error Display

Confirm the following when the blinking display below appears on the display window of the operation panel.
The error display blinks for five seconds. (However, “E4”, “E5”, and “E6” error displays stay lit after blinking.)

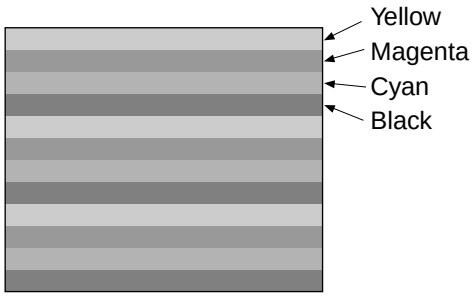


Error display number	Description	Remedy
E1 Printer not connected No printer paper Printer failure	• Is a printer cable connected? • Is the power of a printer turned on? • Is the cable not disconnected for a printer that uses an AC power adapter?	• Connect the printer definitely, and turn on the power.
	• Is paper put in a printer?	• A4 paper is put in a printer.
	• Do not the error lamp of a printer blinks?	• See the Instruction Manual of a printer.
E2 USB memory not recognized	• Is the USB memory formatted?	• This unit supports FAT12/16 and FAT32 formats. Format the USB memory using a personal computer.
	• Is not used an incompatible in this unit?	• Browse our homepage for the USB memory and CF adaptor that can be used in this unit. (http://www.plus-vision.com)
	• Is not properly inserted a USB memory?	• Check the operation using a personal computer.
	• Is the USB memory not damaged?	
E3 Defective USB memory storage	• An error occurred during USB memory storage.	• Repeat storage again. • The USB memory is not removed or inserted during storage.
E4 Read failure	• A read lamp does not light properly or a read signal error occurred.	• Pull out the power plug from the wall outlet and insert it into the wall outlet again.
E5 System error	• A memory or internal are defective.	• Pull out the power plug from the wall outlet and insert it into the wall outletagain.
E6 Page detection error	• The page are not being properly detected.	• Pull out the power plug from the wall outlet and insert it into the wall outletagain.
US USB memory not installed	• The USB memory is not installed in the main unit.	• Install the USB memory in the USB port.
When “USB” character display appears ····· Forget-to-pull out warning. US → Sb → b	• Did you press the POWER button with the USB memory installed in the main unit?	• The USB memory is installed in the main unit. Pull out the USB memory, so the power is turn off and the set enters the standby state.
FL USB memory is full	• There is no empty capacity in the USB memory.	• Delete unnecessary data using a personal computer.
EL An incompatible printer is connected.	• An incompatible printer in this unit is connected.	• Press the power button and turn off the power. Turn on the power and save the recording in USB memory when requiring recording.

Cleaning the color ink jet nozzle

A cleaning pattern (yellow, magenta, cyan, and black) is repeated three times when you press the print button while pressing and holding the color button with the power of the operation panel turned on (in the standby state).

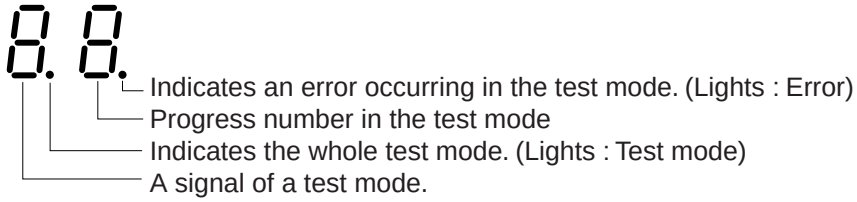
* Valid only when a color ink jet printer whose operation has been confirmed is connected.



2-5. Test and Adjustment Functions

The specifications for inspection and the start of a calibration program are described below.

1) Seven-segment display specifications.



2) To shift to the test/adjustment mode, press the “+” and “-” buttons simultaneously in the sleep mode and then press the Power button.
   The numeric LED display is <AP>.
3) Shift to each test mode by the button operation below.
   ① Printer test mode <4. SPC> (*1)
   A test print is made from the printer connected to a copy board when you press the Page change button and then print button during button operation. (During connection of a color ink jet printer, press the Color button, select the color mode, and then press the Print button.)
   ② Calibration mode start <2. SPC> (*1)
   Calibration is executed when you press the Print button during button operation.
   ③ CCD adjustment mode <6. SPC) (*1)
   An RGB adjustment mode sequence is performed (LED lights in red during CCD adjustment) when you press the additional Reprint button during button operation.
   ④ Program version display & Internal Information write. <1.SPC>
   The major version of a program is displayed when you press the “-” button once.
   The minor version of a program is displayed when you press the “-” button second.
   The model information, the version number of internal software, the read width, the sheet length, and the information of the connected printer are written in USB memory as a text file.
   ⑤ M-115 special adjustment mode <8.SPC>
   The current state is shifted to the M-115 special adjustment mode when you press the screen button during button operation.
   The solenoid forced ON mode is entered when you press the “+” button. The sheet latch is released. (Free) <8.0>
   The solenoid forced OFF mode is entered when you press the “–” button. The sheet latch is fixed. (Lock) <8.1>
   Initial processing is executed when you press the color button. <8.7>
   Initial processing: Moves to page 1 and sets page number 1.
   *1. SPC Indicates the non-lighting state.

Firmware update (for maintenance)

When USB memory is used

The program in FLASH ROM and a color pallet are updated from USB memory so as to improve maintenance.

* All contents of FLASH ROM are erased when the power is turned off during program rewrite.

1) Only the application program of a version you want to update to USB memory is stored.
   The file name of the application program is M11 _xx _xx.mot (xx _xx indicates major and minor version numbers), and the place where the application program is stored is a root directory.
2) USB memory is recognized, and the program file described above can be rewritten when it exists in memory.
3) The file describe above is detected in the sleep mode or standby mode.
   The existing application is executed when no USB memory or file exists.
   The current program version blinks on the numeric LED display for confirmation at intervals of 500 ms. (‘01’ to ‘99’)

4) Press the “Save” button to start update operation.
5) After write operation is normally completed, a new version blinks on the numeric LED display.
6) Remove the USB memory and pull out the AC adapter of the M-115 unit. After ten seconds or more pass, insert the AC adapter again and press the “Power” button of the M-115 unit to make a test print.
   * Calibration is required when the print result is not good.
   An old version blinks (at intervals of 250 ms) when update operation is not completed normally. “00” lights on the numeric LED display when no old version exists.
   “EE” lights when an error occurs (write fails).

When PC is used

1. Tools Required
   PC: PC in which Windows XP and Windows 2000 operate and that has a USB (of version 1.1 or higher) terminal.
   USB cable
   Setup utility: Setup utility (contained in CD-ROM) for M-11
   USB screwdriver (contained in CD-ROM) for M-11

2. Preparations (Set PC first only once.)
   Install setup utility in PC.
   Connect PC to M-11 using a USB cable with the AC power turned on.
   Select “Install from a list or specific place” because new hardware is detected on the PC side.

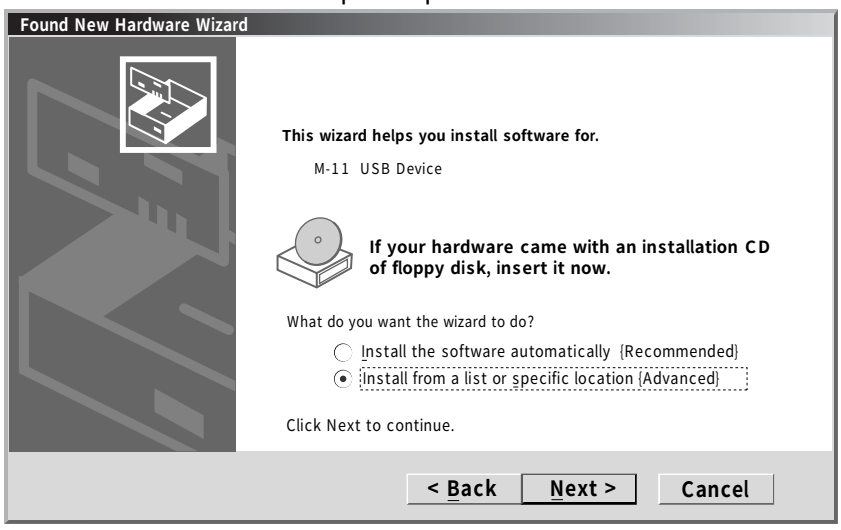


Fig.1 Detection wizard screen of new hardware (1)

Install the driver while referring to the folder (the M11USB folder of a CD-ROM drive in case of CD-ROM) in which a USB driver is contained.

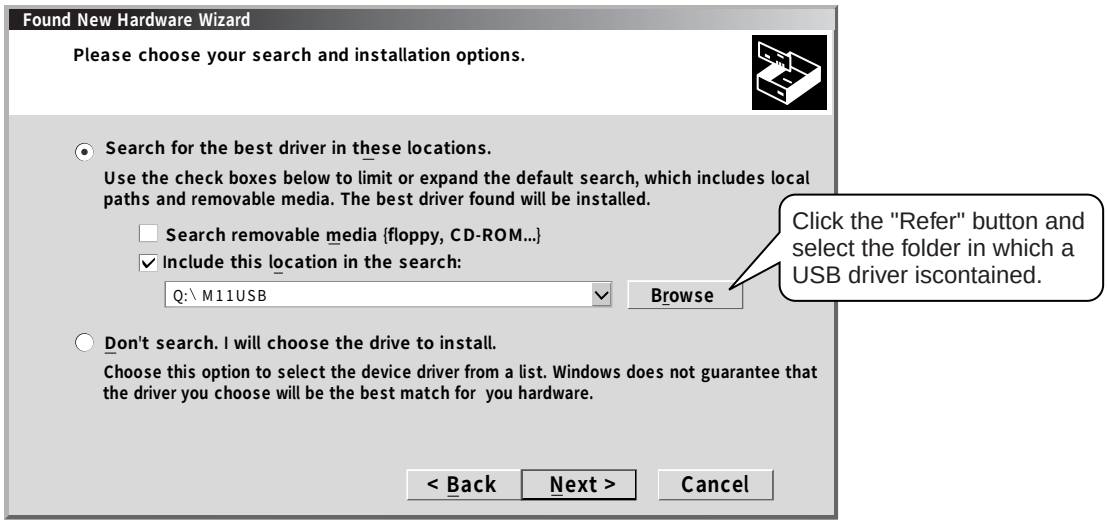
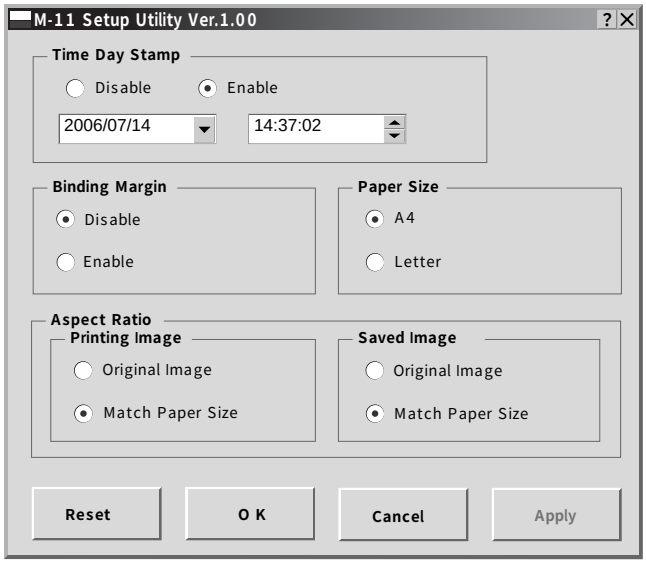


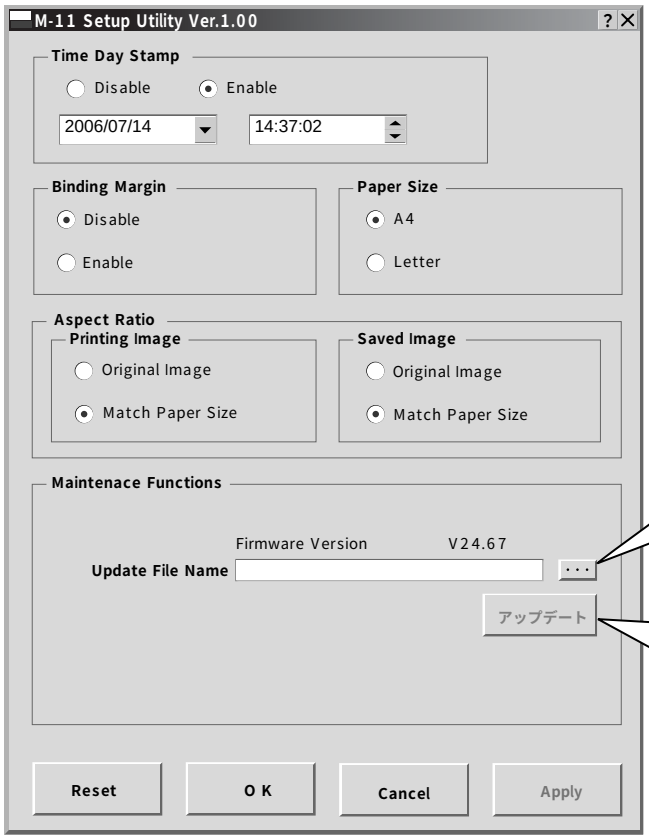
Fig.2 Detection wizard screen of new hardware (2)

3. Rewrite operation
   Connect PC and M-11using a USB cable.
   Screen on which setup utility is started.



Press the "Ctrl", "alt", and "F12" keys simultaneously in the dialog box of setup utility.

Fig.3 Setup utility start screen



Select the (.MOT) file of firmware.

Firmware begins to be updated when you click the "Update" button.

NOTE:
Do not operate M-11 and setup utility during firmware update operation.

Fig.4 Maintenance functions screen

Update operation is completed when the progress bar of setup utility reaches 100% and when the seven-segment LED of M-115 blinks to display a new version.
Terminate the setup utility on the PC side.
Pull out the AC adapter of the M-115 main body. After ten seconds or more pass, insert the AC adapter again and press the “Power” button of the M-115 main body to make a test print.
* Calibration is required when the print result is not good.

3. TROUBLE SHOOTING

By checking operations, 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 ON/Standby button and turn on the power.

Is the power turned on?

No →
- The power cord is disconnected from the wall outlet.
- The AC Adapter is defective.
- The Main Board Assy is defective.
- The Switch Box Unit is defective.
- The connector of the Switch Harness is disconnected.

Yes

Does the error display appear?

Yes → The error display (E4) appears.
- The connectors of the CCD Harness Assy is disconnected.
- The CCD Unit is out of adjustment.
- The CCD Unit is defective.
- The Main Board Assy is defective.

The error display appears.
- The Main Board Assy is defective.

The error display (EE blinking) appears.
- Damaged calibration data → Execute calibration

Caution

Do not pull out the AC adapter for about five seconds after you press the “Power” button and turn off the power when pressing the “Power” button of the main body, turning off the power, and then disconnecting the AC adapter after the firmware is rewritten or calibration is completed.
(It may take much time to restart it next time when the AC adapter is disconnected while the main body is restarted.)

No

2. Press the Page charge button.

Does the sheet operate normally?

No → The error display (E6) appears.
- The connectors of the Solenoid Harness is disconnected.
- The connectors of the Sensor Harness is disconnected.
- The Solenoid Assy is defective.
- The Sensor Assy is defective.

Yes

3. Press the Print button (when a printer is used).

Does the error display (E1) appear?

Yes → Printer failure
- The printer is defective. (See the Instruction Manual of a printer.)
- The power of a printer is not turned on.
- No paper is in a printer.
- The printer is not connected.
- The Main Board Assy is defective.

No

Is the object written in the board printed normally?

No → A black line is put in printing.
- Misalignment of CCD Unit: Slight (It is improved by calibration.)
- Misalignment of CCD Unit: Severe (Perform the CCD adjustment again.)
- Dust adheres to the mirror of the board body.

Printing becomes blurred.
- The marker (written character) becomes blurred
- The ink (toner) of a printer is exhausted.

A specific color is not printed or the printed color is improper (when a color printer is used).
- The ink of a printer is exhausted.
- The ink cartridge of a printer is defective.

Yes

4. Press the Save button (when a USB memory is used).

Do the error displays (E2 and E3) appear?

Yes → Error display: E2 is displayed.
- A USB memory is not formatted.
- An incompatible USB memory is used.
- A USB memory is defective.

Error display: E3 is displayed.
- Memory storage error: Repeat save operation again.
- The Main Board Assy is defective.

No

Is the object written in the board stored normally?

No → A black line is put in a picture.
- Misalignment of CCD Unit: Slight (It is improved by calibration. See section 5-2.)
- Misalignment of CCD Unit: Severe (Perform the CCD adjustment again. See section 5-1.)
- Dust adheres to the mirror of the board body.

A picture becomes blurred.
- Misalignment of CCD Unit. (It is improved by calibration.)
- The marker (written character) becomes blurred.

Yes

Normal operation

4. DISASSEMBLY AND ASSEMBLY

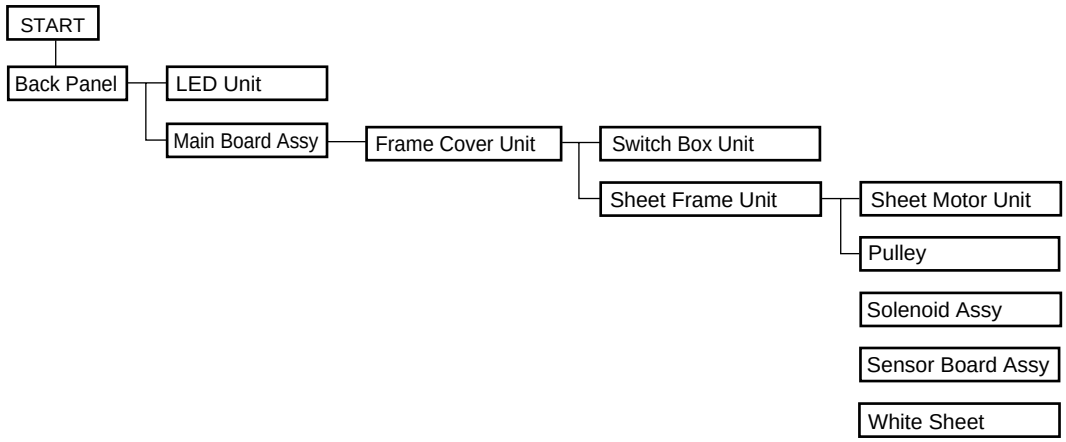
4-1. Tools Required

- 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

This section describes one example of disassembly and assembly procedures. For the actual operation, disassemble and assemble the required parts with reference to “4-3. Disassembly and Assembly Procedures”.

1) Remove the Back Panel. (See Figs. 1 and 2.)

1. Remove the “S-7” screws shown in Fig. 1 and then remove the Back Panel Corner.
2. Remove the Back Panel as shown in Fig. 2.

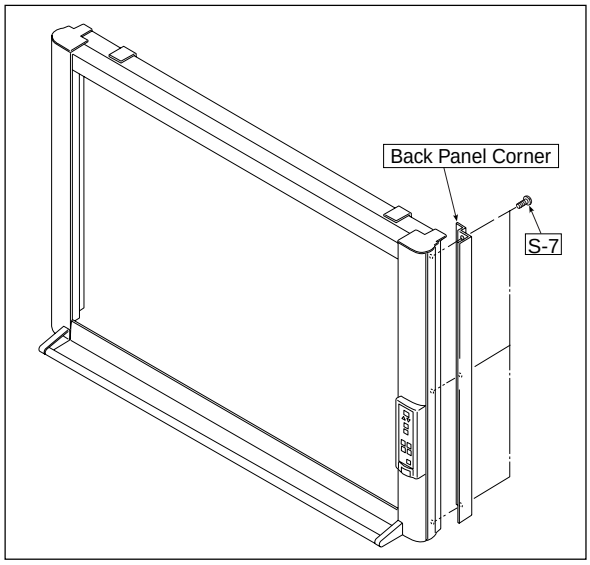


Fig. 1

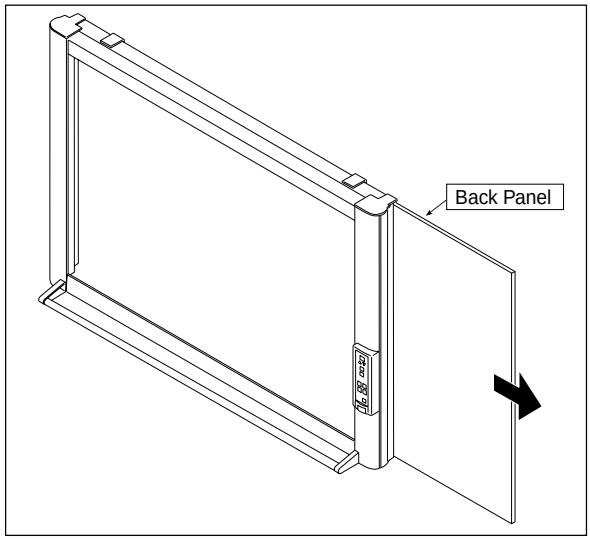


Fig. 2

2) Remove the Main Board Assy. (See Figs. 3 and 4.)

1. Disconnect the connectors (CN2, 7~12) connected to the Main Board Assy shown in Fig. 3.
2. Remove the “S-3” screws shown in Fig. 4 and then remove the Main Board Assy.

Note:

Be careful when the screws are removed and installed.

* Calibration is required after replaced the Main Board Assy and adjusted R82 (CCD signal volume).
* The battery installed in the Main Board Assy can be used without any functional problem for ten years or more.
* When disconnecting the connector of the Main Board Assy, identify (for example, mark) it in advance because the connector size is located in the same place.

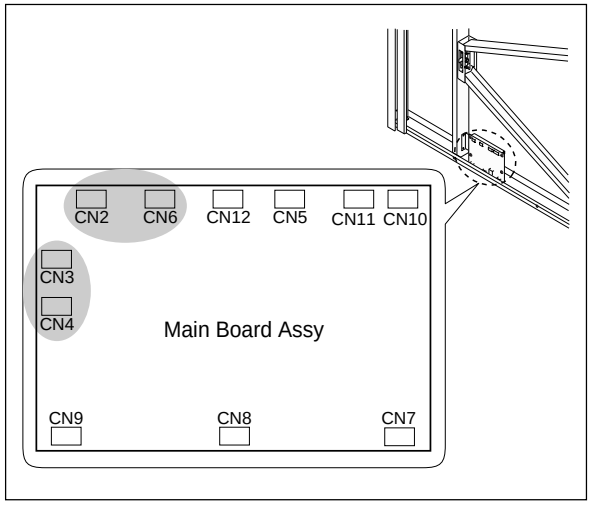


Fig. 3

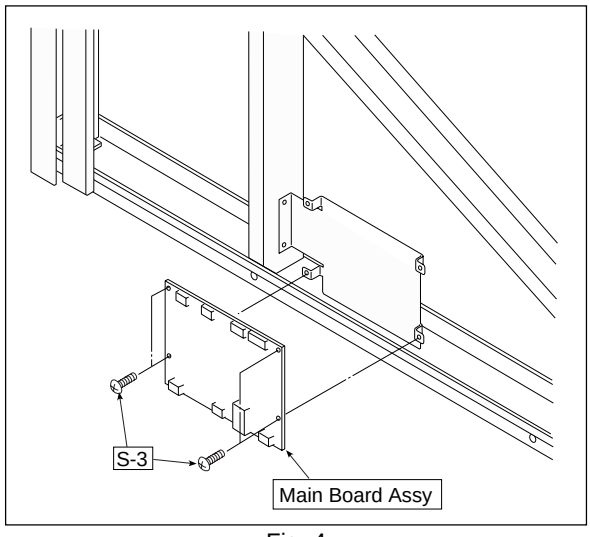


Fig. 4

3) Remove the CCD Unit. (See Fig. 5.)
1. Remove the “S-3” screws shown in Fig. 5.
2. Remove the “S-4” screws shown in Fig. 5 and then remove the CCD Unit.

Note:

The CCD Unit requires adjustment when it is replaced and removed. (See 5. Adjustment.)

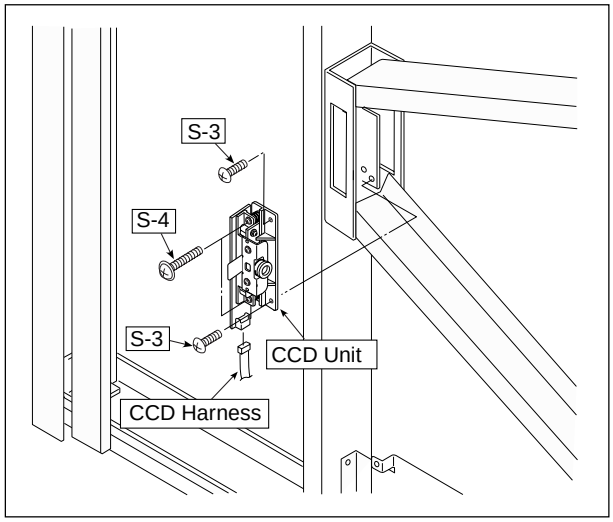


Fig. 5

4) Remove the Frame Cover Section. (See Fig. 6.)
1. Remove the “S-9” screws shown in Fig. 6.
2. Disconnect the Switch Harness of the Main Board Assy from the square hole of the Sheet Frame.

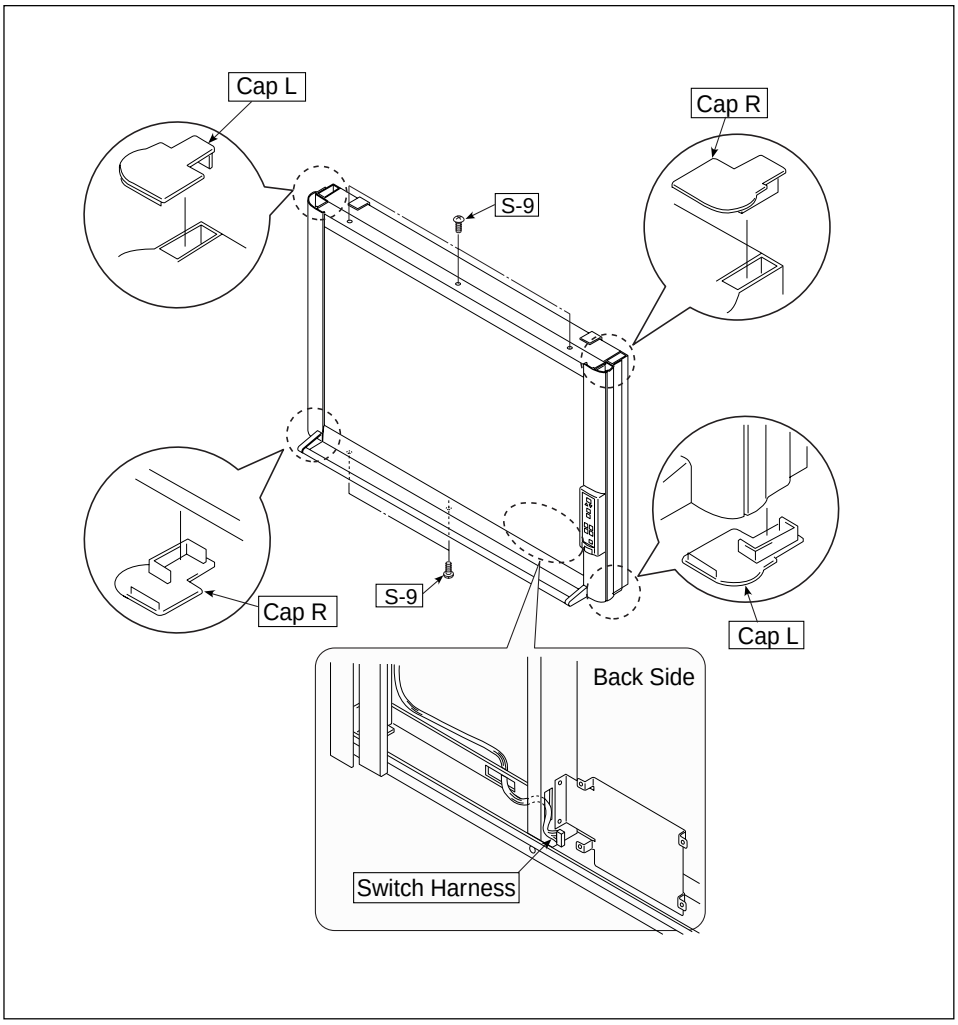


Fig. 6

5) Remove the Switch Box Unit. (See Fig. 7.)

1. Remove the “S-8” and “S-10” screws shown in Fig. 7.
2. Remove the “S-5” screws shown in Fig. 7 and then remove the Switch Box Unit.

Notes:

· Be careful not to mistake the hole through which the Switch Harness is passed. (See Fig. 8.)

· Pay attention to a kind of screw.

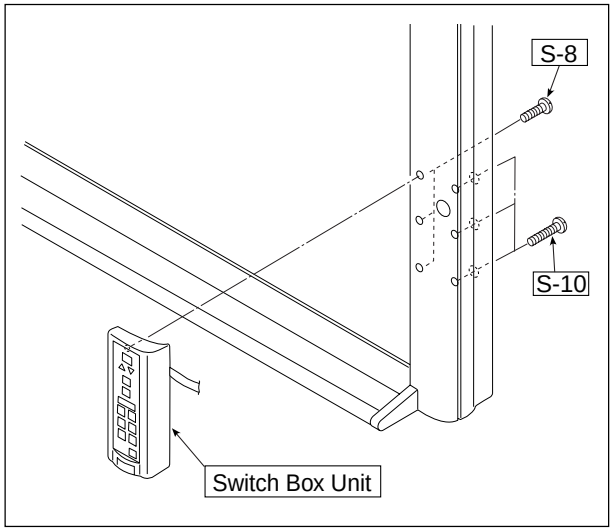


Fig. 7

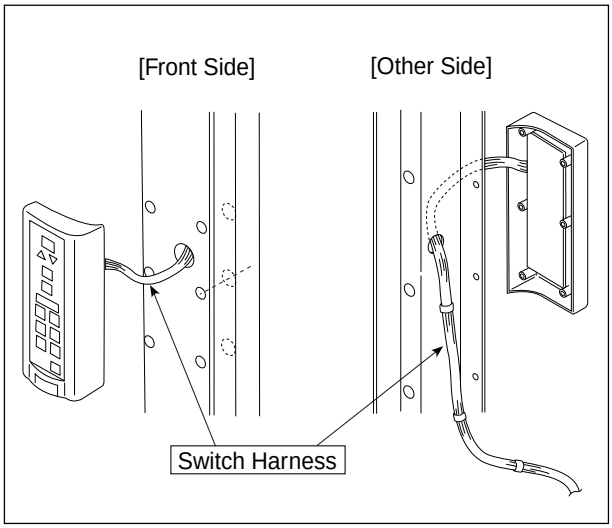


Fig. 8

6) Disassemble the Frame Cover Section. (See Fig. 9.)

Remove the “S-1” and “S-6” screws shown in Fig. 9 and disassemble the Frame Cover.

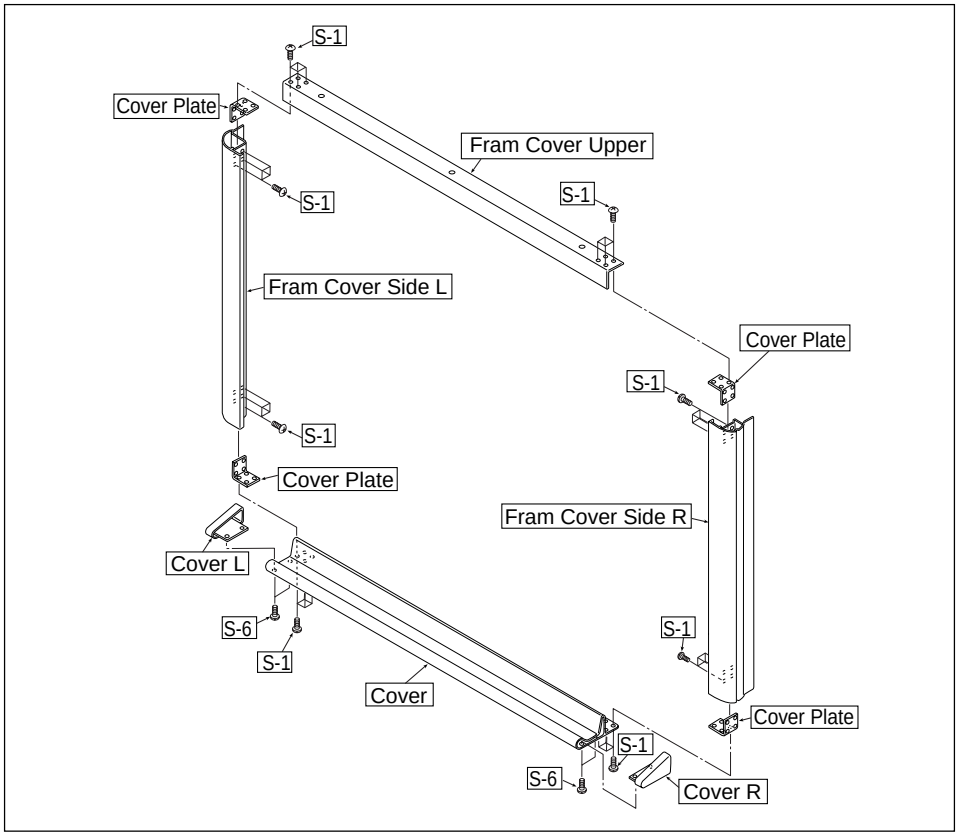


Fig. 9

7) Remove the Sheet Frame Unit. (See Figs. 10 and 11.)
1. Remove the “S-1” screws shown in Fig. 10.
2. As shown in Figure 11, loosen the “S-11” screw to the frame surface and remove the Sheet Frame Unit.

Notes:
· The Sheet Frame Unit is caught on a hook as shown in the portion A of Fig. 10.
* Remove the Motor, the Sensor Board and the Solenoid earlier when the Sheet frame Unit is removed.

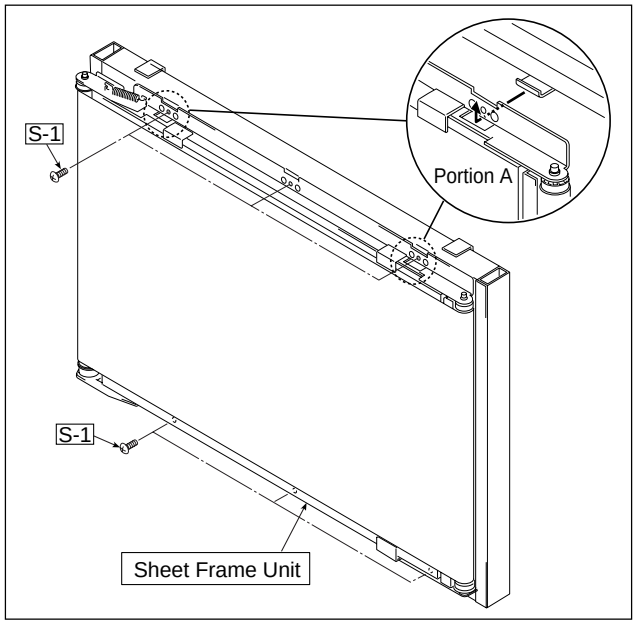


Fig. 10

* The operation in Figures 11 to 14 is performed with the Sheet Frame Unit put upside down.

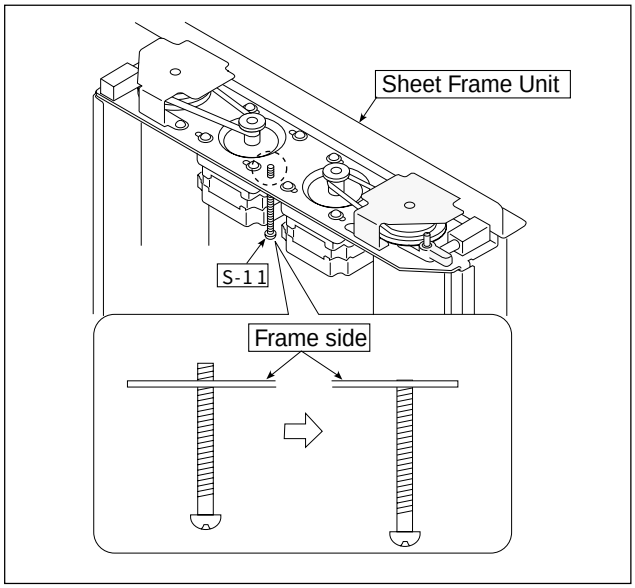


Fig. 11

8) Remove the Sheet Motor Unit. (See Fig. 12.)
1. Remove the “S-12” screws shown in Fig. 12 and then remove the Sheet Motor Unit.

Note:
· Remove the Motor harness earlier when remove the Sheet Motor Unit.
· Adjust the tension of a Timing Belt when installing the Sheet Motor Unit. (See Fig. 5. Adjustment)

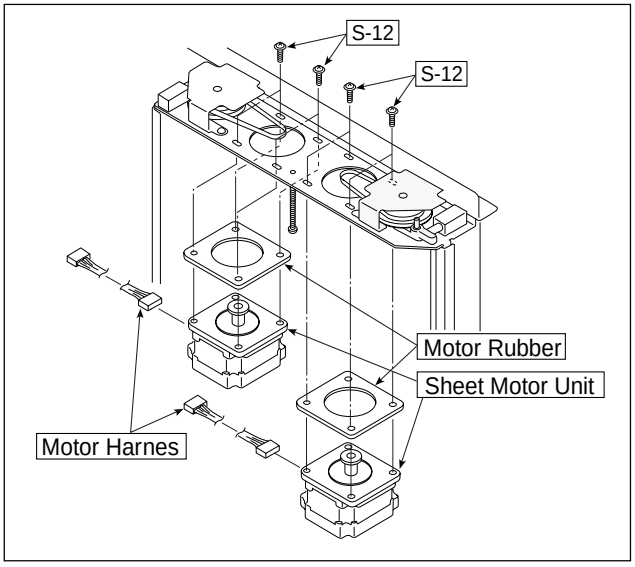


Fig. 12

9) Remove the Pulley, Belt. (See Fig. 13.)
1. Remove the “S-5” and “S-13” screws shown in Fig. 13 and then remove the Gear Plate.
2. Remove the “S-20” E-rings shown in Fig. 13 and then remove the Pulley, Belt.

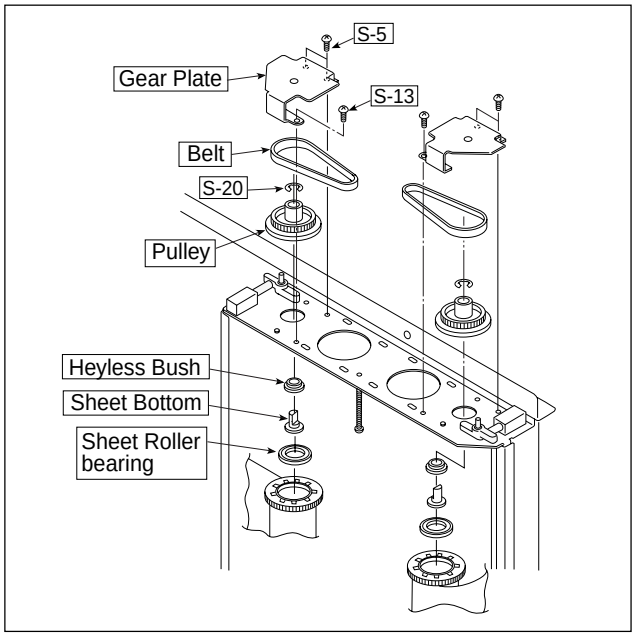


Fig. 13

10) Remove the Solenoid Assy. (See Fig. 14.)
1. Remove the “S-17” screws shown in Fig. 14 and then remove the Solenoid Assy.
2. Remove the “S-19” E-rings shown in Fig. 14 and then remove the Stopper.
   * Replace it in units of “Solenoid Unit” when replacing the Solenoid Assy.

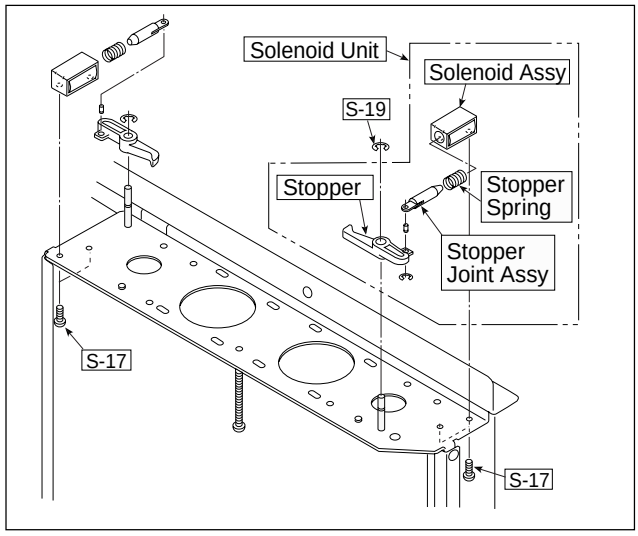


Fig. 14

11) Remove the Sensor Board Assy. (See Fig. 15.)
1. Remove the “S-5” screws shown in figure and then remove the Sensor Board Assy.

Note:

Be careful not to damage the White Sheet when the Sensor Board Assy removed and installed.

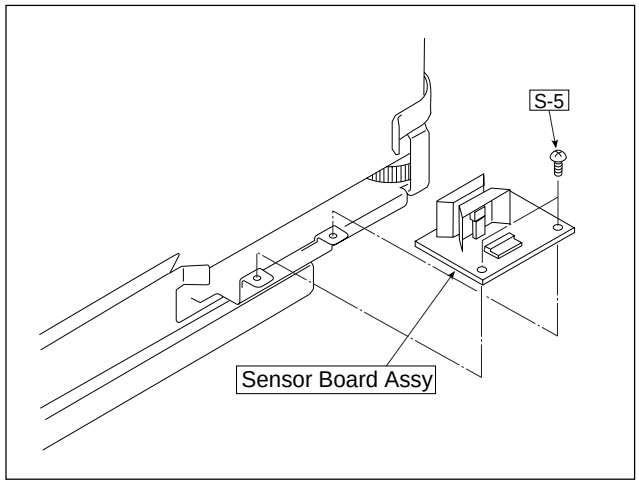


Fig. 15

12) Remove the White Sheet. (See Fige.16.)

1. As shown in portion A in the auxiliary drawing of Figure 16, remove the “S-21” screws and then remove the two Sheet Guides (at the top and bottom).
2. As shown in portion A in the auxiliary drawing of Figure 16, remove the “S-21” screws and then remove the two Sheet Frame L Guides (at the top and bottom). (Used exclusively for M-115.)
3. Remove the “S-5” screws shown in Fig. 16 and then remove the Angle.
4. Loosen the “S-11” screw shown in portion B in the auxiliary drawing of Figure 16 as far as it will go.
5. As shown in portion B in the auxiliary drawing of Figure 16, loosen the Lever Plate and push the top of the Sheet Bearing upward.
6. As shown in Figure 16, remove the bottom of the White Sheet and then remove the top of it.
7. As shown in Figure 16, wind the White Sheet.

Note:

Be careful not to damage or fold it when handling the White Sheet.

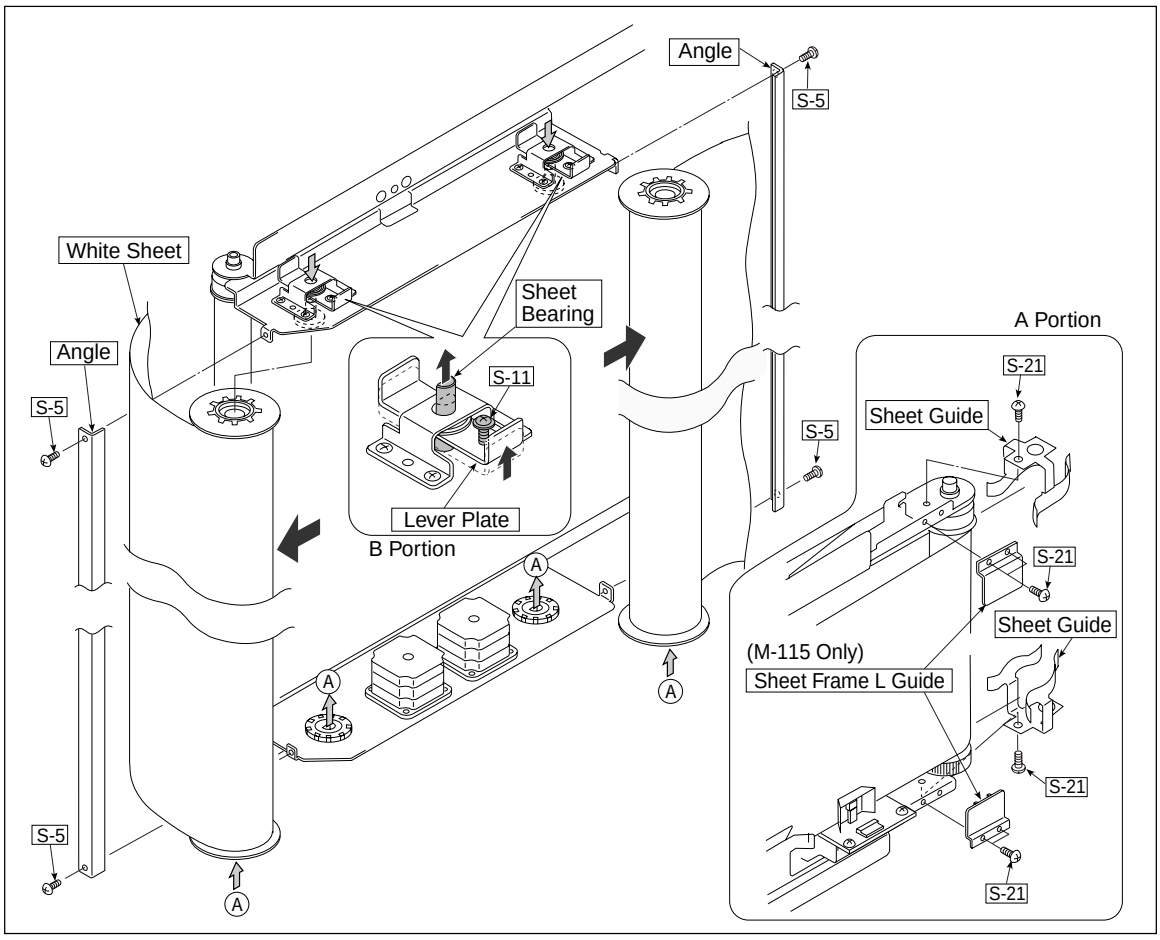


Fig. 16

13) Remove the LED Unit. (See Fig. 17.)

1. Remove the LED Harness as shown in Fig. 17.
2. Remove the “S-3” screws as shown in Fig. 17.
3. Remove the LED Unit as shown in Fig. 16.

Note:

Use the parts assembled in a factory during replacement of an LED unit.

* Calibration is required after replaced.
* Be sure to confirm the CCD waveform after the LED unit is replaced. (An oscilloscope is required in this case.)

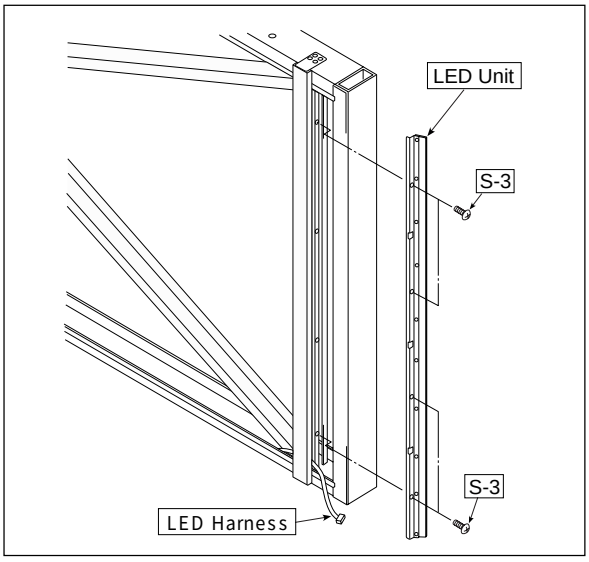
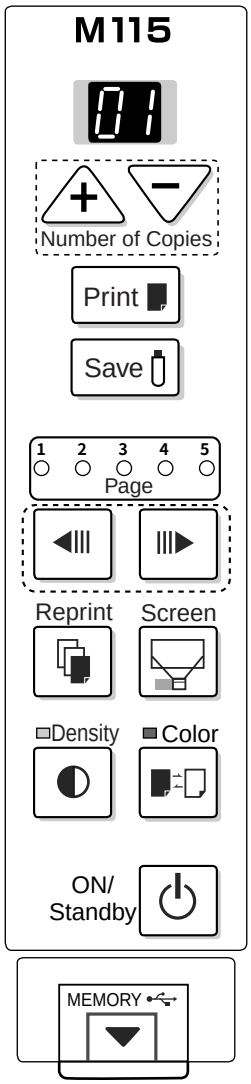


Fig. 17

5. SETTING THE TIME

The clock of the copyboard should be set correctly because the date and time (timestamp) is printed on the printer paper, and it is also recorded in the file information when saving.

Overview of the Operation

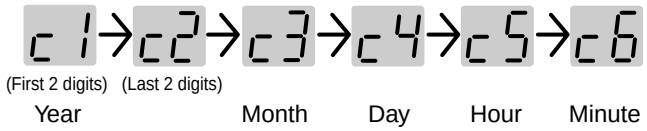


1. Switch to "Time setting"

Press the ON/Standby button while holding down the Density button.

2. Display the day and hour setting mode

Each press of the Print button switches the setting mode as illustrated below.



3. Adjust the date and time of the selected setting mode

One press of the + or the - button will enable the settings to be made.
Press the + or - button and make the adjustment.

4. Press the Print button to finalize

There is a change to the next setting mode.
Perform operation 2, or 3 and 4 to set the current time.

5. Completion

Change over to the minutes setting mode (c6 display) and press the Print button to complete the " Time setting".

Pressing the ON/Standby button during operations 2 to 4 will cancel the incomplete settings and return to the time prior to starting the settings.

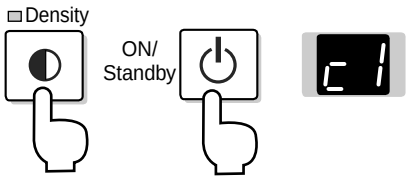
Preparation:
Connect the AC power adapter to the copyboard. See Page E-13.
Example: Set the time to 2:16 pm, November 8, 2006 (2006.11.08 14:16)

1. Press the ON/Standby button to switch on the power.

The LED of the display window will light and power will be switched on.

2. Press the ON/Standby button while holding down the Density button to switch to "Time setting"

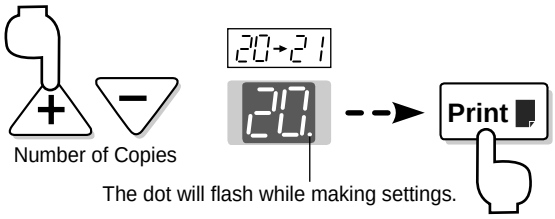
The LED of the display window will light and display "c1"



3. Press the + button or the - button, select 20 (the first 2 digits of the year), and press the Print button to finalize.

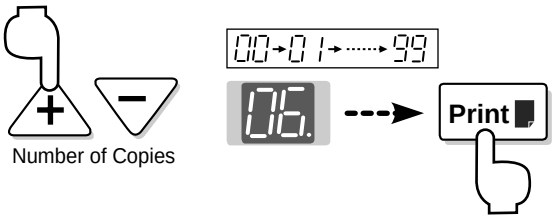
There will be a change to the "last 2 digits of the year" setting mode (c2 display).

Note:
The factory default setting is 20. Pressing the Print button in this condition will result in a change to the "last 2 digits of the year" setting mode.



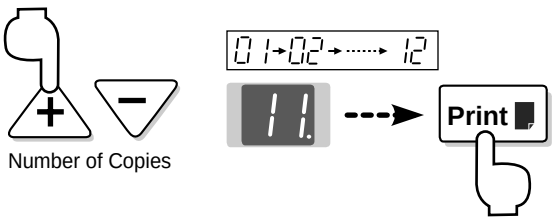
4. Press the + button or the - button, select 06 (the last 2 digits of the year), and press the Print button to finalize.

There will be a change to the "month" setting mode (c3 display).



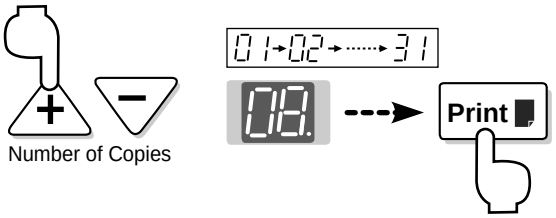
5. Press the + button or the - button, select 11 (the month), and press the Print button to finalize.

There will be a change to the "day" setting mode (c4 display).



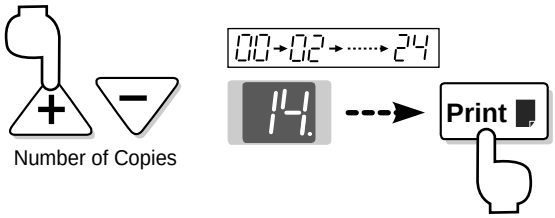
6. Press the + button or the - button, select 08 (the day), and press the Print button to finalize.

There will be a change to the "hour" setting mode (c5 display).



7. Press the + button or the - button, select 14 (the hour of the 24-hour display), and press the Print button to finalize.

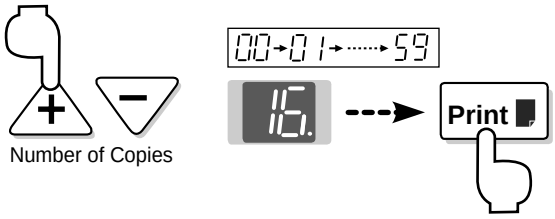
There will be a change to the "minute" setting mode (c6 display).



8. Press the + button or the - button, select 16 (the minutes), and press the Print button to finalize.

The display will change to being lit steadily, and there will be a return to the display indicating the number of sheets to copy.

The completes the time setting.



Note:
The factory default print timestamp is set to "enable (print). " If you do not wish to print the timetamp, use the setup utility in the supplied CD-ROM and set to "disable (do not print)" See the "Setup guide of the supplied software" on Page E-24.

6. ADJUSTMENT

6-1. CCD Adjustment

Tools Required

- Phillips screwdriver (+) No.2
- Ceramic screwdriver
- Oscilloscope

Adjustment is required in the following cases. (Calibration operation is also required after adjustment.)

- When a CCD Board Assy is replaced
- When a LED Unit is replaced
- Main Board Assy is replaced.
- When adjustment got out of order due to the failure during arrival of products
- When the picture quality deteriorates remarkably

When calibration operation is required

- Slight deterioration in picture quality (This may not be improved.)
- When the Sheet Unit is replaced

Preparation

Turn ON the power of an oscilloscope. Clean the plate surface.

* Insufficient cleaning influences the subsequent calibration. Color irregularity may sometimes occur in this case.

Contents of CCD adjustment

- Vertical line read alignment of CCD device and optical lens (Oblique read prevention)
  * During oblique read operation, a dark line easily appears due to the distortion of the main body.
- Sheet read focusing on CCD device (Resolution)
  * The collapse of characters occurs during printing when a focus is out of position.

Contents of calibration

- Vertical readable area adjustment (Setting of effective plate face range (in the vertical direction))
- White level data read (The white level of a sheet face is saved during read.)
- Sheet length count (Number of motor feed pulses)

CCD adjustment procedure

1) Shift the rear panel to the right side (LED side) so that the Main Board Assy can be viewed.
   At that time, put a Back Panel completely to the end of the main board Assy so that the outer light does not influence the CCD waveform. (See Figure 10.)
2) Connect the probe of an oscilloscope to the Main Board Assy. (See Figure 1.)
   - Connect GND in Ch1 to J5, connect the measurement pin in Ch1 to J4.
   - Connect GND in trigger (or Ch2) to J6.
   - Connect the measurement pin in trigger (or Ch2) to J7.
   - Set the Ch1 mode to 1.0 V/DIV AC.
   - Set the trigger to 2 V/DIV DC.
   - Set the sweep to 400 ~ 500µsec/DIV.
   * Set the trigger to EXT or Ch2. Only Ch1 is displayed.

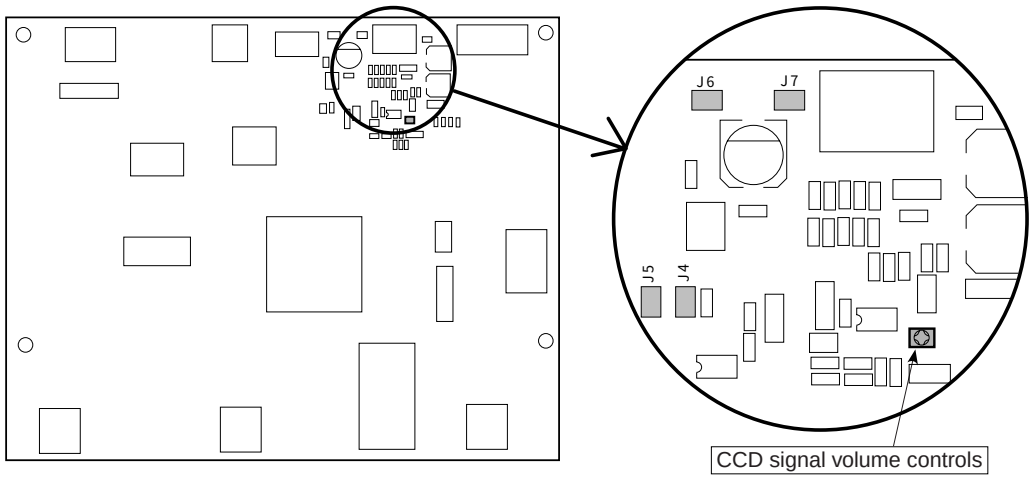


Fig. 1 Main Board Assy

3) Temporary focus adjustment
Adjust the lens to the reference position and fix the two lens fixing screws temporarily. (See Figure 2.)
* Install the lens so that the lens marking is located horizontally and toward you.

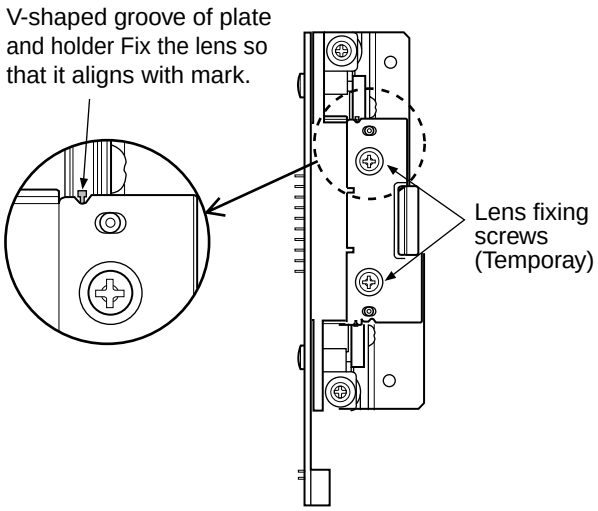


Fig. 2 Temporary focus adjustment

4) ① Clean the plate surface and then write a CCD adjustment pattern.

From power OFF condition

1. Press the Power button to enter the AP mode while pressing and holding the + and - buttons. (“AP” is displayed on LED.)
2. Press the Screen button to enter the M-115 special adjstment mode. (“8” displayed on LED.)
3. Press the Color button to execute the page position initial processing. (A sheet moves to page 1.) (“8.7” is displayed on LED.)
4. Draw three horizontal lines (of 100 mm) in the ruled lines (uppermost, center, and lowermost parts) of a sheet in black for each page.
   * Ninth ruled line including the center and uppermost parts
5. Draw a vertical line (of 4 to 5 mm thick) for the horizontal line in the center part at intervals of two scales (100 mm) and then draw a vertical line of one scale (50 mm) on the upper and lower ends.
6. Turn off the power.

Note:

1. Draw so that three vertical lines are perpendicular to the same line.
2. Draw the vertical lines more thickly and perform tentative adjustment when it is difficult to perform adjustment. After that, return the vertical lines to the former state and perform accurate adjustment.
3. In the sheet position, a page sensor must exist between B and G during page initial processing. (The sheet cannot properly move to page 1 when the page sensor does not exist between B and G.)

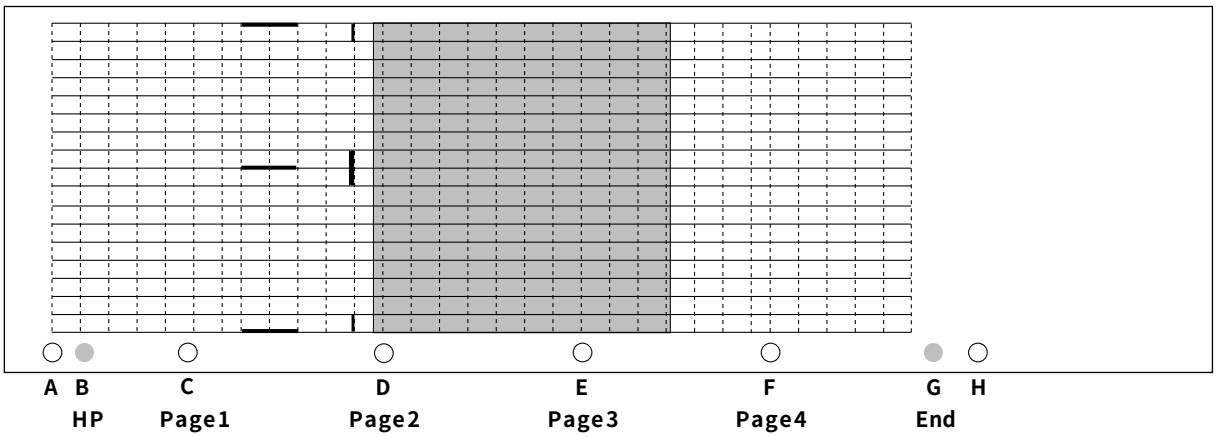


Fig. 3 CCD Adjustment pattern

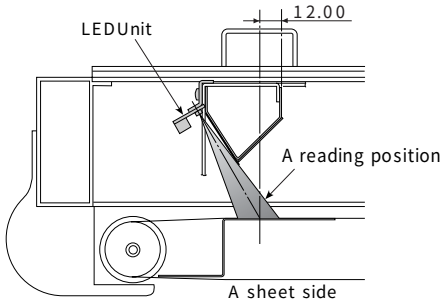
② Move an adjustment pattern to the CCD read position.

From power OFF condition

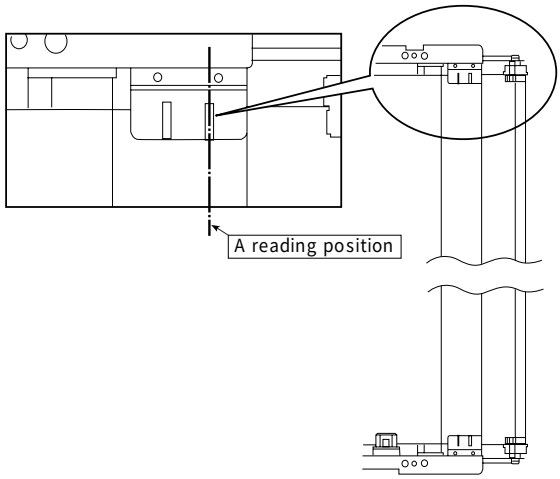
1. Press the Power button to enter the AP mode while pressing and holding the + and - buttons. (“AP” is displayed on LED.)
2. Press the Additional print button to enter the CCD adjustment mode. (“6” is displayed on LED.)
3. Press the Print button to turn on LED. (“6” is displayed on LED.)
4. Press the page selection button and move the three vertical lines at the top and bottom and in the center near the center of LED irradiation on the sheet surface. (“6.1” or “6.2” is displayed on LED.)
5. Press the + and - buttons to release or fix the sheet latch and move the paper tube manually. Then, perform fine-adjustment and move the paper tube to the read mark position (see the figure) of a sheet frame L guide. At that time, tension is applied to tighten the sheet. (“6.3” or “6.4” is displayed on LED.)
6. Turn off the power.

Note:

A current continuously flows through the solenoid for the latch during the operation. Therefore, be sure to turn off the power immediately after fine-adjustment is performed.



Reading position-1



Reading position-2 (M-115 Only)

5) Put the set into the CCD adjustment mode.
Turn OFF the POWER.
1. Turn ON the ON/Standby button while pressing and holding the “+” and “-” buttons, so the LED display is “AP”.
2. Press the “Reprint” button, so the set is put into the CCD adjustment mode. (LED display is “6”.)
3. The light-source LED lights in red when you press the Reprint button.
After that, LED repeatedly lights in green, blue, and red during “additional print”.
The numeric LED displays the saturation amount (%) of a waveform at that time. (See Figure 4.)

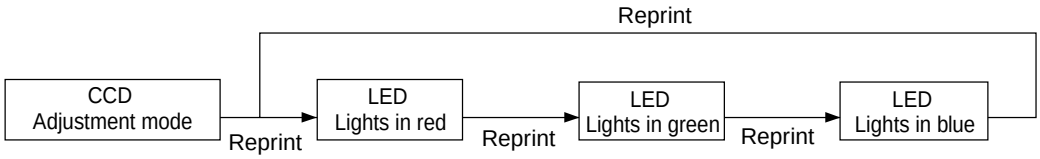


Fig. 4 Adjustment mode sequence

6) Adjustment of oscilloscope
Adjust the trigger level and Ch1 vertical position so that a CCD waveform appears on the oscilloscope display with the light-source LED turned on in red. Adjust the horizontal position, luminance, and focus. (See Figure 5.)
When a waveform is saturated, turn the volume control shown in Figure 1 counterclockwise and adjust the waveform to the position where it is not saturated.

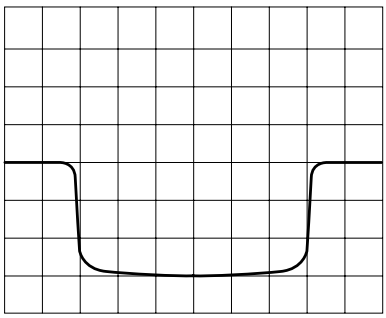


Fig. 5 CCD waveform (Adjustment of oscilloscope)

7) CCD monitoring angle adjustment

Turn the CCD position adjustment screws (see Figure 6.) so that the waveform on the oscilloscope is symmetric on the right and left and so that the three vertical lines at the upper, middle, and lower positions can be read in the same level. Then, fix the screws. (See Figure 6.)

Note:

Fix the CCD fixing screw tentatively so that the CCD Holder smoothly moves and does not float from the Lens Holder.

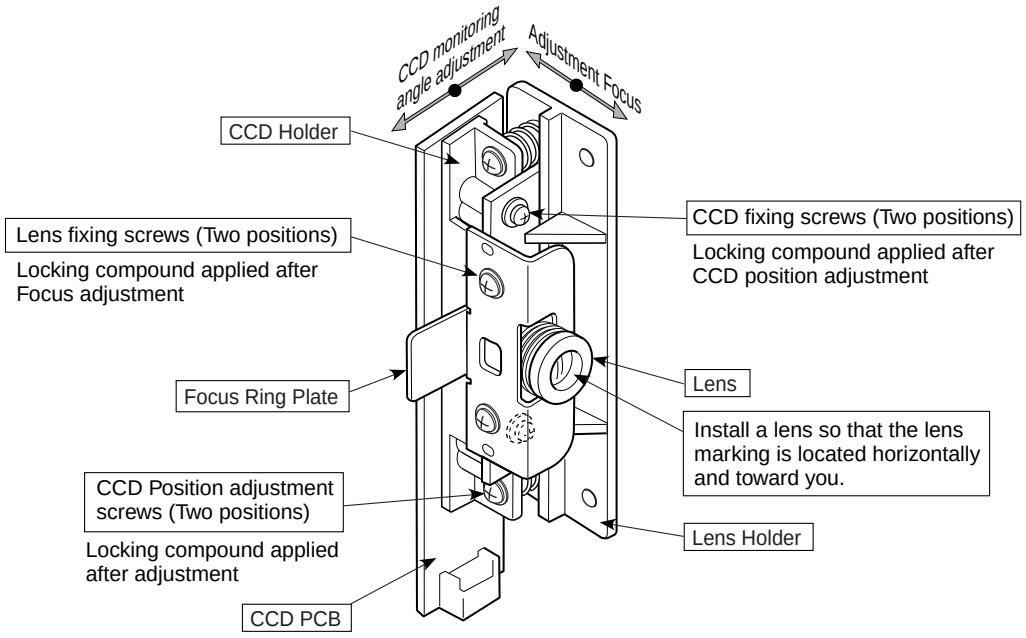


Fig. 6 CCD adjustment screws

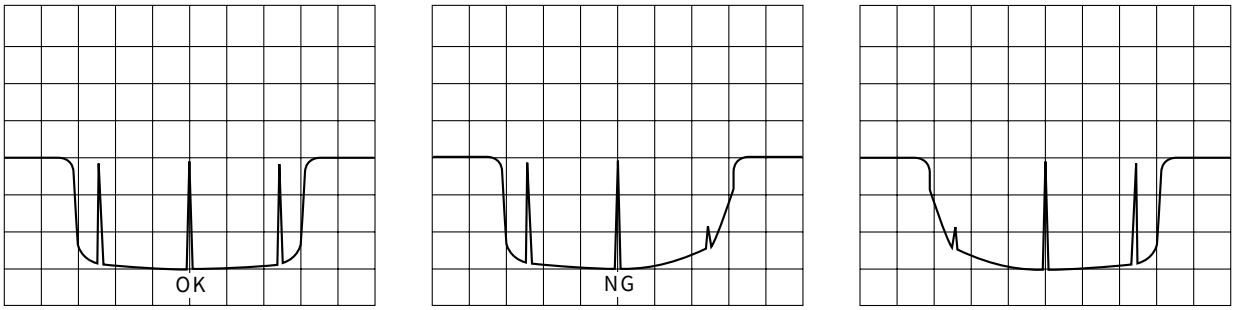


Fig.7 CCD waveform (Monitoring angle adjustment)

8) Focus adjustment
Move the sheet so that an adjustment pattern is displayed on the oscilloscope.
Move the sheet so that three horizontal adjustment patterns are displayed on the oscilloscope.
Monitor the display on the oscilloscope and move the lens so that the displayed waveform is sharp. Adjust the focus and fix the lens fixing screws (see Figure 2). (See Figure 8.)

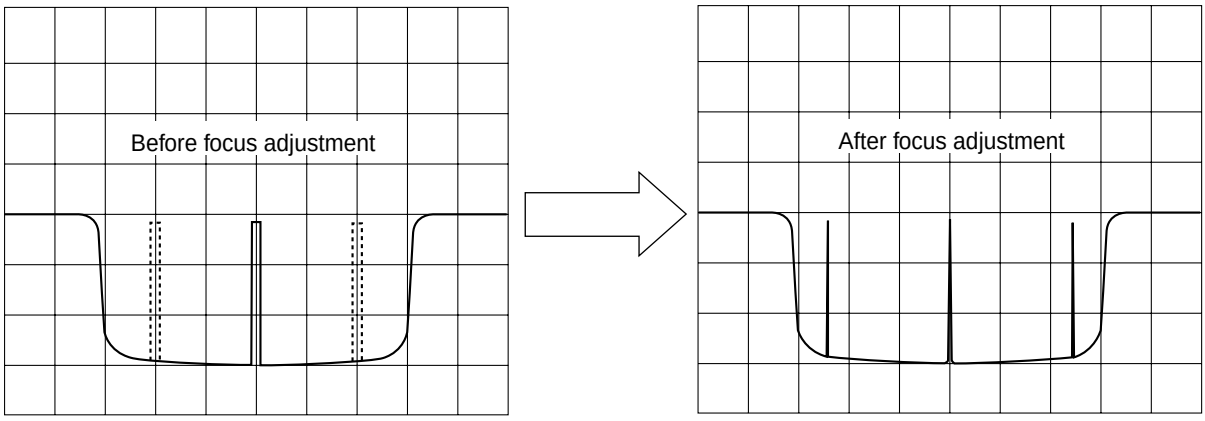
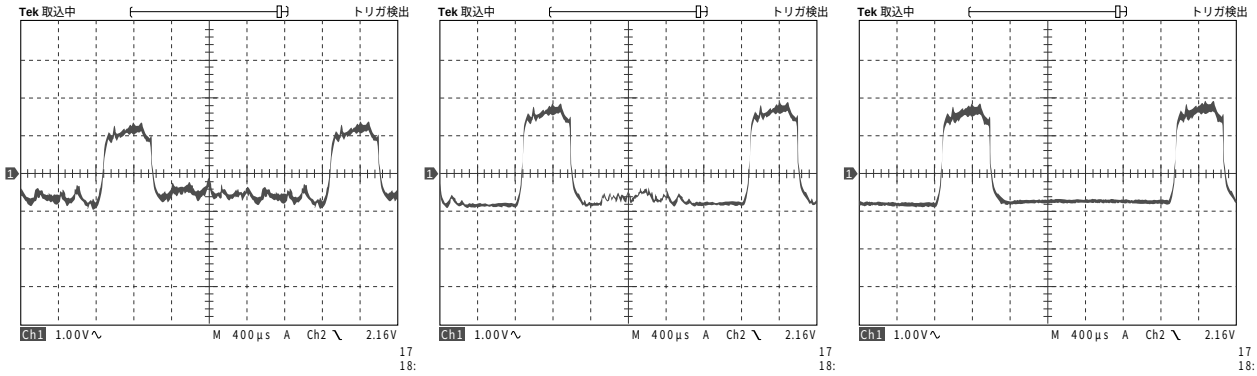


Fig.8 CCD waveform (Focus adjustment)

9) Volume control adjustment
Adjust using an additional Reprint button while turning on light source LED.
Adjust using the volume control of main board Assy (R82) so that a CCD waveform is saturated by about 40% to 60% with the lowest (darkest) signal LED turned on. (See Figure 9.)
The saturation amount (%) is displayed in the display window (segment) of a switchboard as a numeric value.
In this case, external light is cut off with the back panel closed. Segment display “10” = 100 (%)
* Used a ceramic screwdriver (1.8 5 4) when the volume control adjustment.



Not saturated (NG) Saturated by about 50% (OK) Saturated by about 100% (NG)

Fig.9. Volume control adjustment

10) Waveform confirmation
The brightness of the light-source LED is automatically adjusted by CPU when you press the Feed/Stop button in the CCD adjustment mode.
Confirm that the shape of the waveform automatically adjusted for each color (R.G.B) is equal on the right and left.

11) Page initial processing
Power OFF
1. Press the Power button to enter the AP mode while pressing and holding the + and - buttons. (“AP” is displayed on LED.)
2. Press the Screen button to enter the M-115 special adjustment mode. (“8” is displayed on LED.)
3. Press the Color button to execute the page position initial processing. (A sheet moves to page 1.) (“8.7” is displayed on LED.)
4. Turn off the power.

Note:
Be sure to perform the page initial processing after CCD adjustment is completed. The actual page differs from the page display LED if the page initial processing is not performed.

6-2. Calibration procedure

1) Write a calibration pattern on the left end of page 1.
   - Draw three horizontal lines (100mm) of two scales in the ruled lines (uppermost, center, and lowermost parts) of a sheet in black. (See Figure 10.)
   - Draw one vertical line for the horizontal line in the center part at intervals of two scales (100mm).

   *1 Clean the sheet surface on pages 1 and 2 sufficiently. (Clean the diagonally striped portion in the figure below well.)

   *2 When performing calibration, close the back panel completely and take care that any external light is not put.
2) Press the Page selection button on the operation panel of this set and move to page 2.
   Note: Do not perform calibration from the first page.
3) Start calibration.(Calibration time required: Approximately 4 minutes)
   - Press the ON/Standby button and turn off the power.
   - Turn ON the ON/Standby button while pressing and holding the “+” and “-” keys.
   - LED display is “AP”.
   - Press the Print button, so calibration starts. (LED display “2.”)

Start Calibration

	Display
1. When Calibration is started.	<2.SPC>*
2. Rewind a sheet to the start position.	<2.A>
3. Measure the interval of a hole.	<2.b>
4. LED for light quantity adjustment.	<2.c>
5. Search the place where a vertical line is written.	<2.d>
6. Move the sheet to the position where reference data is gotten.	<2.E>
7. Get the reference data.	<2.F>
8. Move the sheet so that the center of a horizontal line is almost put in the image pickup range of CCD.	<2.G>
9. Write the following data into flash ROM.	<2.H>

Operation is normally terminated when <A A> display appears. Turn off the power in this case.

* SPC indicates the non-lighting state.
* <0.0.> is displayed respectively when an error occurred.
* If an error is displayed, confirm the dirt on the sheet surface and a calibration pattern and perform calibration again.

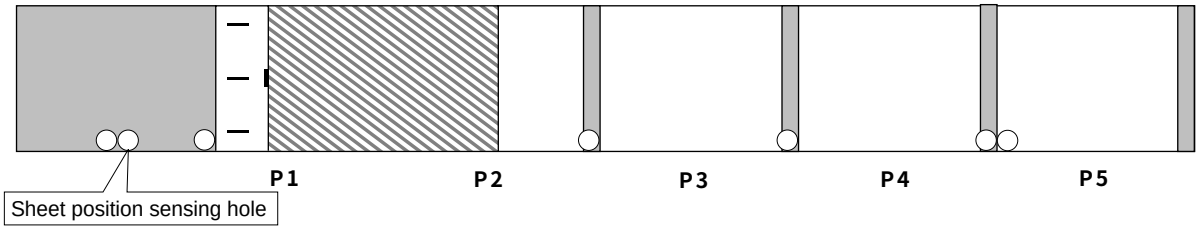
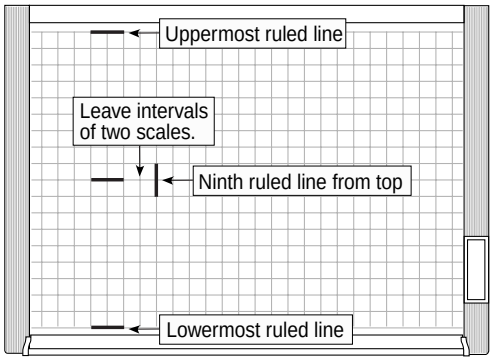


Fig.10 Calibration pattern

Draw the lines below in the arbitrary position on the plate surface using a marker.



a. Draw three horizontal lines (of 100 mm) in the ruled lines of a sheet. Draw one horizontal line in the uppermost ruled line, draw one line in the lowermost ruled line, and then draw one line in the center (the ninth ruled line from the upper part).

b. Draw a vertical line of 100 mm (corresponding to the ruled line of two scales) at intervals of 100mm.

Confirmation of printing

Make a copy using four-color markers.

At that time, confirm that the data written in the inner position about 10 mm away from the portion where the upper and lower sheets can be viewed is printed.

* The outside range (about 30 mm) of a ruled line is also valid.

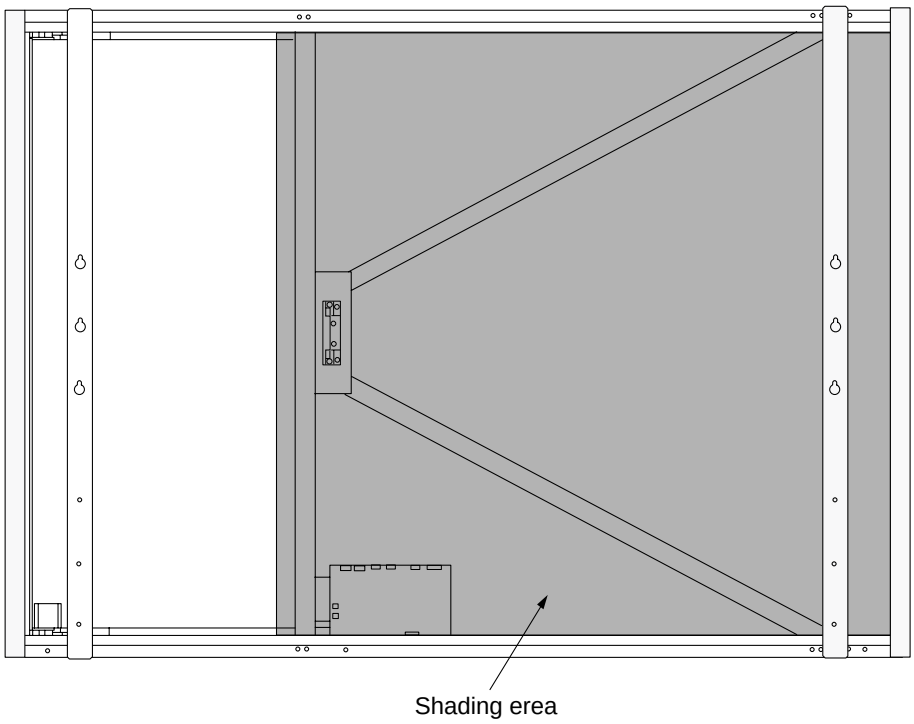


Fig.11 Shielding area

6-3. Tension Adjustment of Timing Belt

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

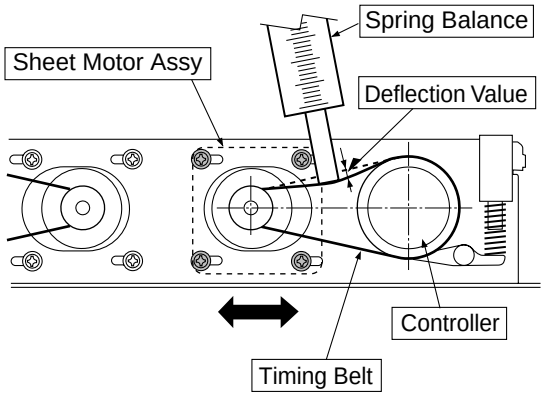
Tool required

- Spring balance

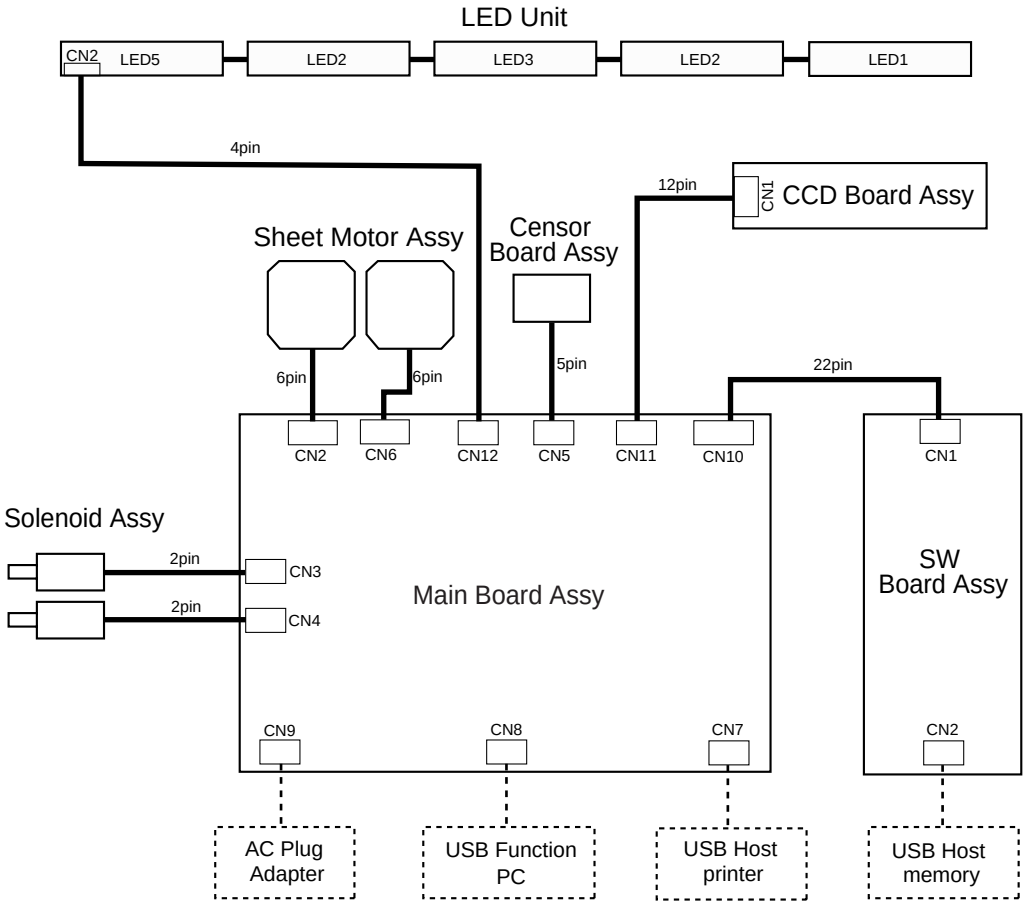
* Tension is adjusted so that the belt does not slip and get out of position at all times when there is not a spring balance.

Adjustment (See the illustration shown below.)

- Fix the Sheet Motor Assy tentatively and measure the tension of a timing belt using a spring balance.(Used as reference during assembling at a factory.)
- Move the Sheet Motor Assy and fix it in the position where proper load is obtained.
- The proper load is 7.9N 500g with the timing belt bent by approximately 5mm ~ 7mm.

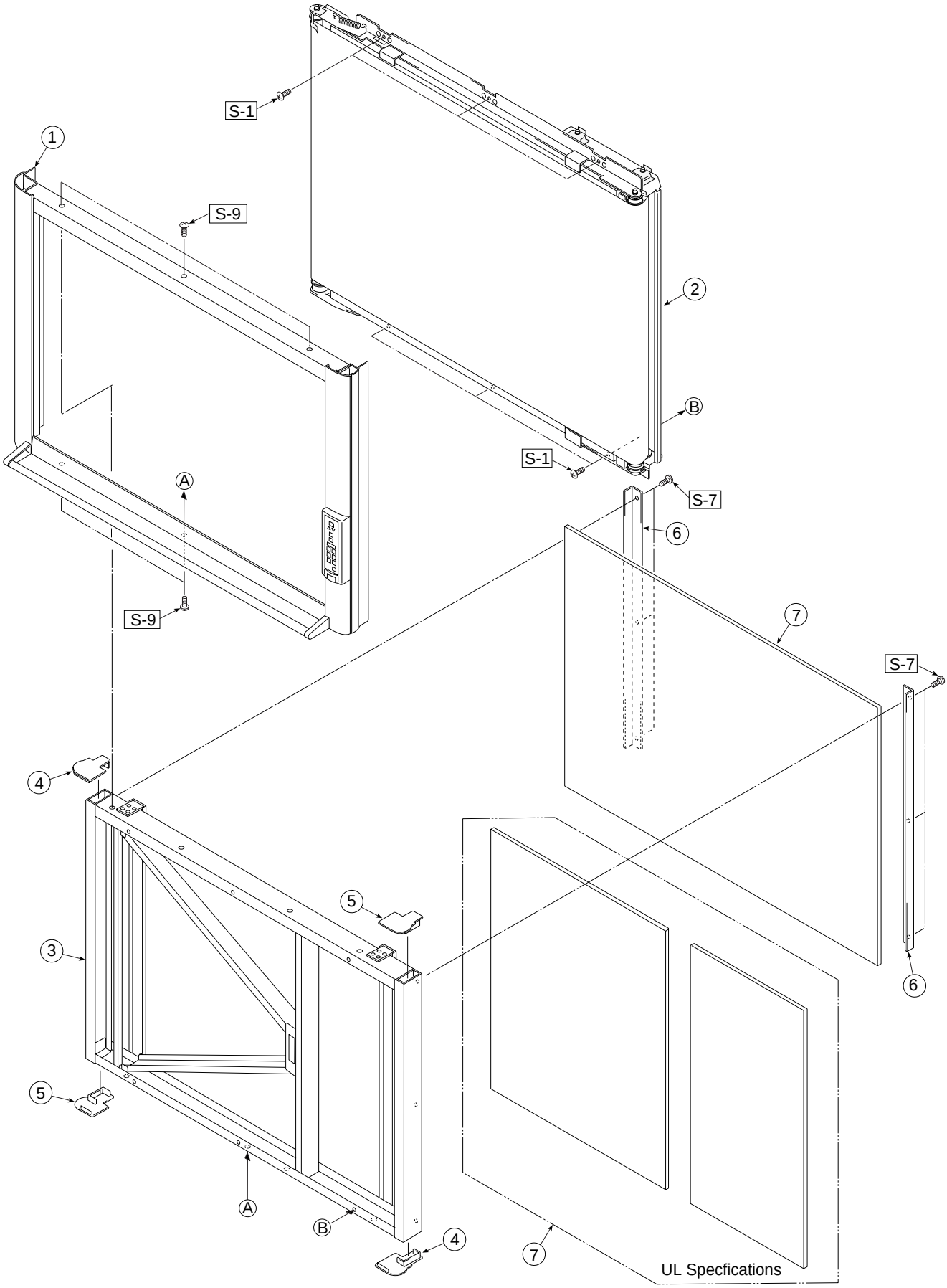


7. CABLE AND CABLE CONNECTION



8. PARTS LIST

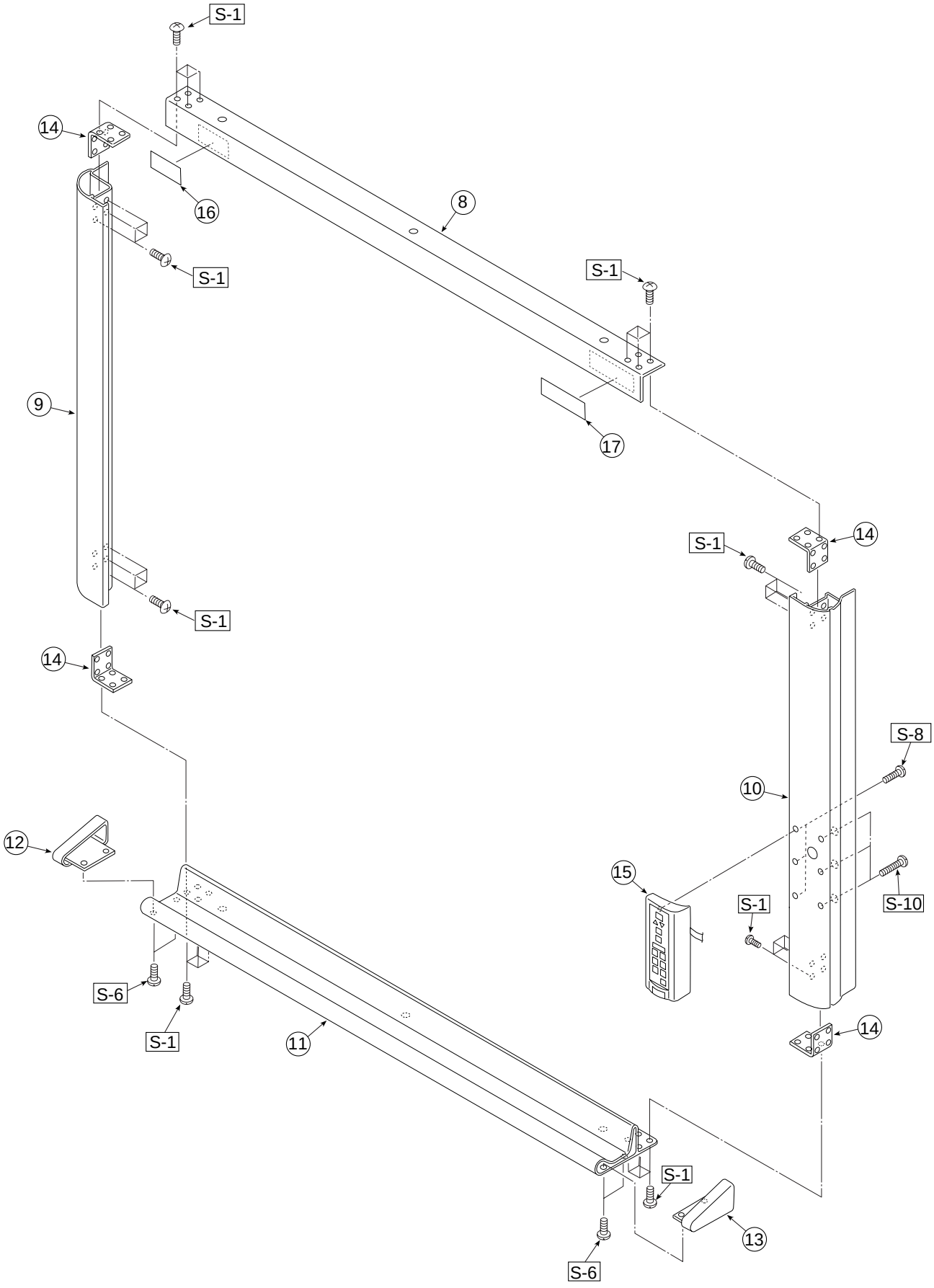
1. Overall configuration



1. Overall configuration

No	PARTS NAME	PARTS No.	Q' ty	REMARK
1	Frame Cover Unit	301103	1	M-11/M-115 Common
2	Sheet Frame	-	1	No Parts Supply
3	Board Frame	-	1	No Parts Supply
4	Cap L	715201800	2	M-11/M-115 Common
5	Cap R	715201900	2	M-11/M-115 Common
6	Back Panel Corner	-	2	Unit Composition Parts for 301103
7	Back Panel S	301101	1	M-11S/M-115 Common
	Back Panel UL UNIT	301117	1	UL Specifications

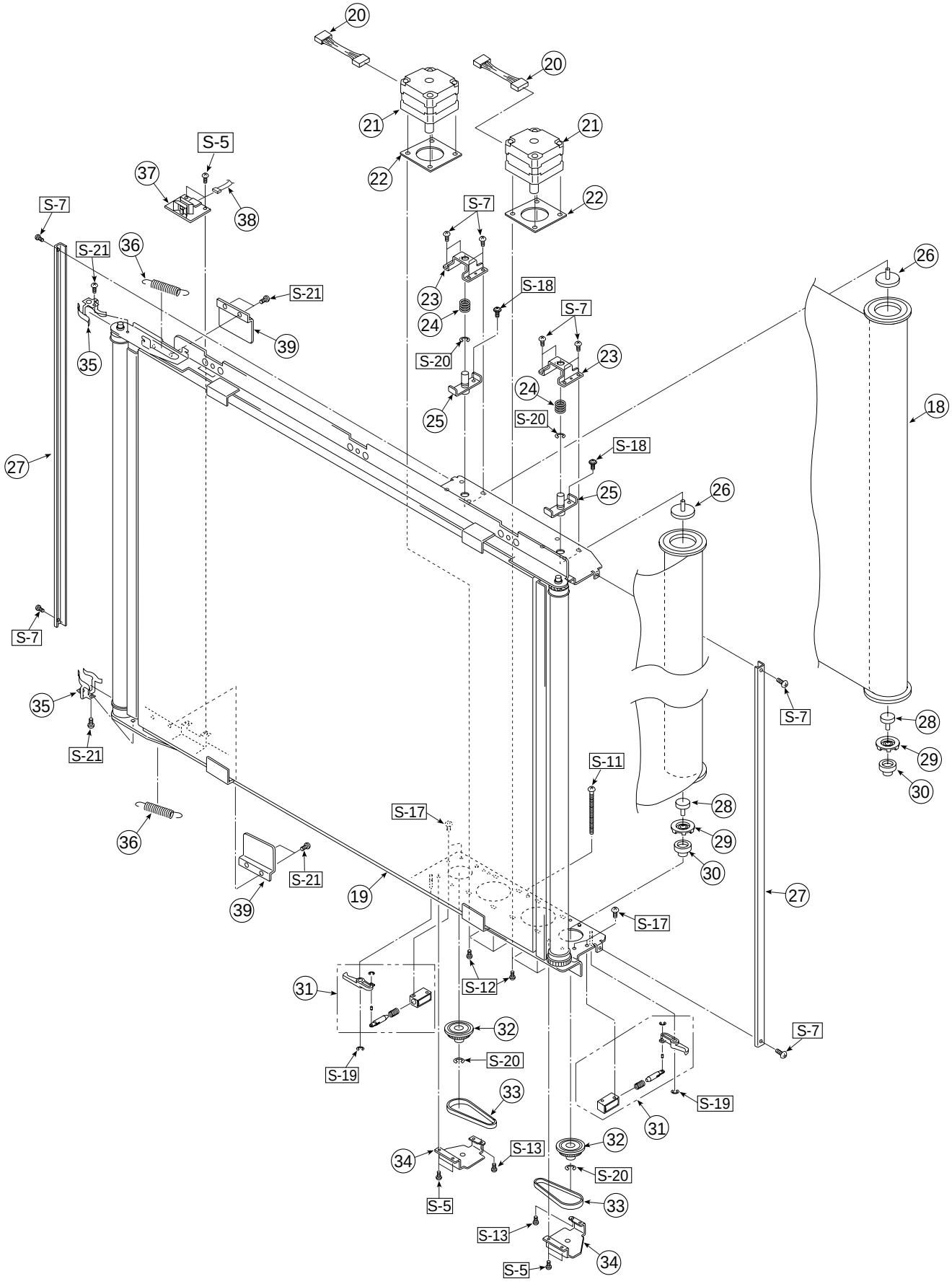
2. Frame Cover Section



2. Frame Cover Section

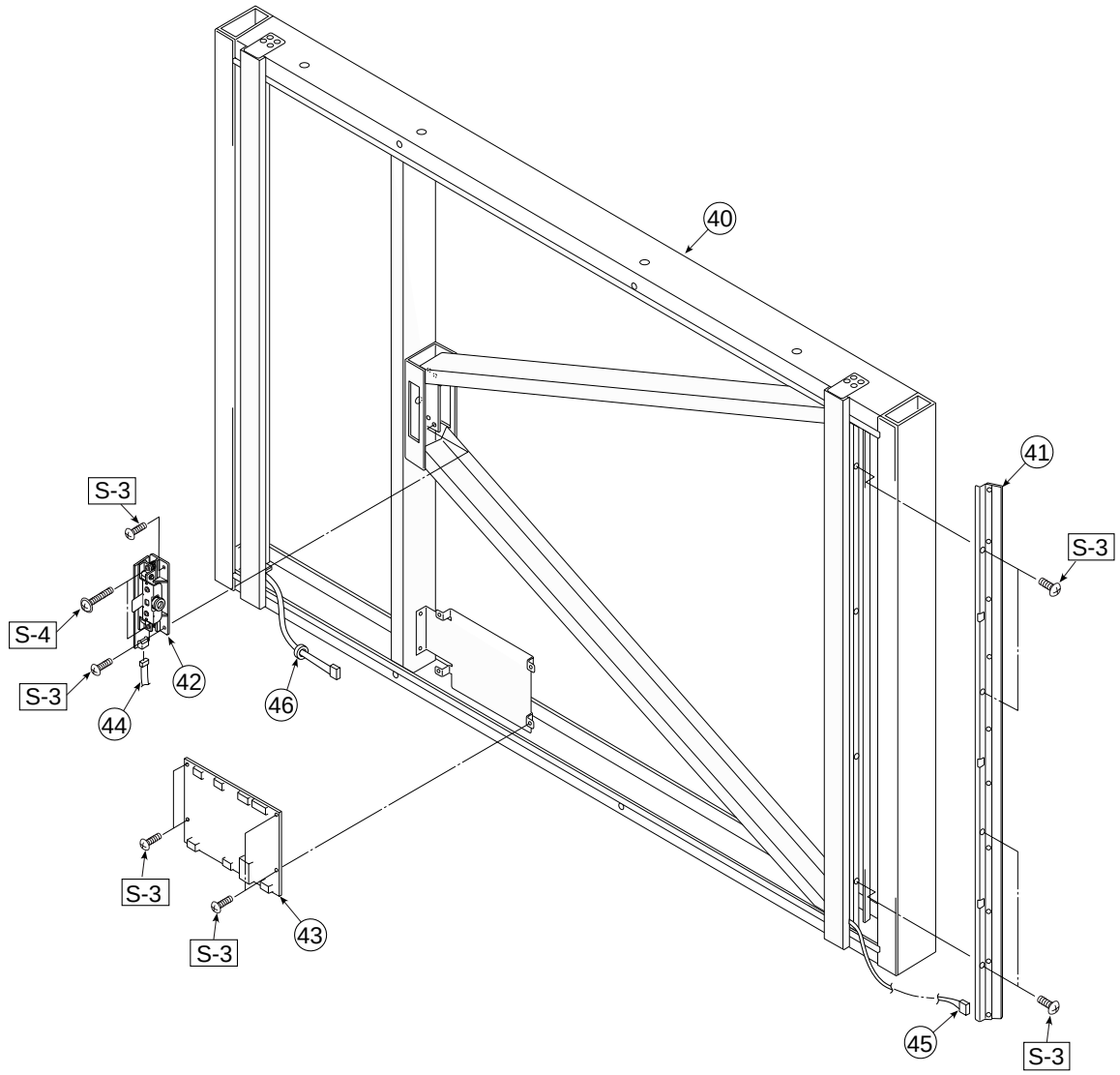
No	PARTS NAME	PARTS No.	Q' ty	REMARK
8	Frame Cover Upper S	-	1	Unit Composition Parts for 301103
9	Frame Cover Side L	-	1	
10	Frame Cover Side R	-	1	
11	Frame Cover Lower Unit S	-	1	
12	Cover L	715357900	1	M-11/M-115 Common
13	Cover R	715358000	1	M-11/M-115 Common
14	Cover Plate	715201000	4	M-11/M-115 Common
15	Switch Box Unit M-115E	715090048	1	M-115 Only
16	Name Plate	715202900	1	M-11/M-115 Common
17	Sheet Maintenance Caution Label	715359300	1	M-11/M-115 Common

3. Sheet Frame Section



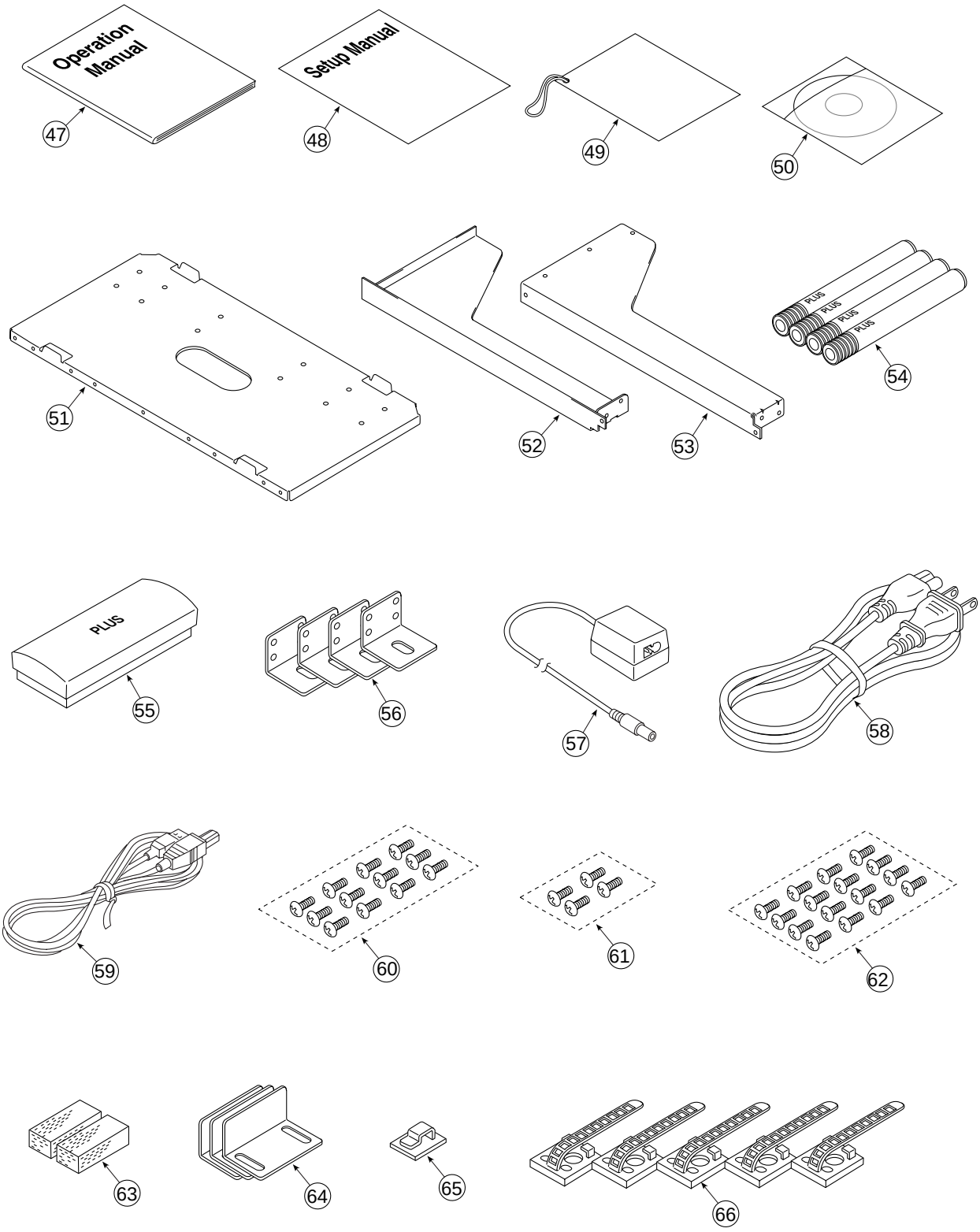
3. Sheet Frame Section				
No	**PARTS NAME**	**PARTS No.**	**Q' ty**	**REMARK**
18	White Sheet M-115	301116	1	M-115 Only
19	Sheet Frame Unit M-115	301115	1	M-115 Only
20	Motor Harness M-115	715260000	2	M-115 Only
21	Sheet Motor Unit M-115	715090043	2	M-115 Only
22	Motor Rubber	716759300	2	
23	Spring Plate	716758000	2	
24	Sheet Spring	716758400	2	
25	Lever Plate	716758200	2	
26	Sheet Bearing	716758500	2	
27	Angle	714902503	2	
28	Sheet Axis Lower	716758600	2	
29	Sheet Roller Bearing	714200100	2	
30	Oil Bush	716760500	2	
31	Solenoid Unit M-115	715090049	2	M-115 Only
32	Pulley XL28	714202100	2	
33	Belt 94XL	716754300	2	
34	Gear Plate	714902305	2	
35	Sheet Guide	715352800	2	
36	Sheet Frame Spring	715366000	2	M-115 Only
37	Censor Board Unit	715260900	1	M-115 Only
38	Censor Harnes	715260600	1	M-115 Only
39	Sheet Frame L Guide	715350900	2	M-115 Only

4. Board Frame Section



4. Board Frame Section				
No	**PARTS NAME**	**PARTS No.**	**Q' ty**	**REMARK**
40	Board Frame Unit M-115	301114	1	M-115 Only
41	LED Unit	301109	1	M-11/M-115 Common
42	CCD Unit	715090013	1	M-11/M-115 Common
43	Main Board Assy M-115	715259700	1	M-115 Only
44	CCD Harness	715257700	1	M-11/M-115 Common
45	LED Harness	715257900	1	M-11/M-115 Common
46	DK Core	714890100	1	M-11/M-115 Common

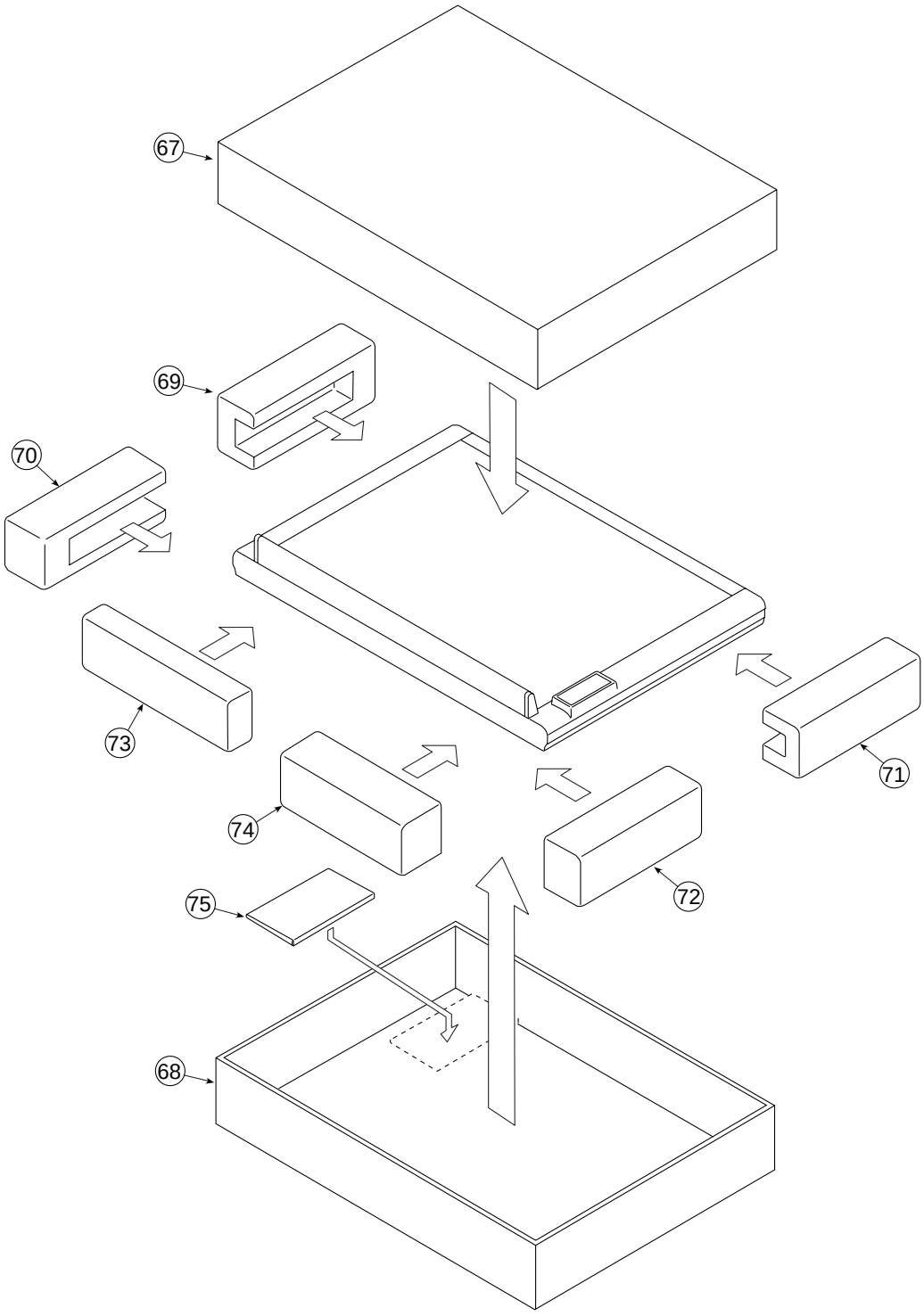
5. Accessories Section



5. Accessories Section

No	PARTS NAME	PARTS No.	Q' ty	REMARK
47	Operation Manual (OS)	715361900	1	M-11/M-115 Common
48	Assembly Manual (OS)	715360300	1	M-11/M-115 Common
49	Quick guide M-115	715362000	1	M-115 Only
50	CD-ROM	715363800	1	M-11/M-115 Common
51	Printer Platform	715353600	1	M-11/M-115 Common
52	Printer Bracket L	715358200	1	M-11/M-115 Common
53	Printer Bracket R	715358100	1	M-11/M-115 Common
54	Marker Set	-	1	No Parts Supply
55	Dry Eraser	-	1	No Parts Supply
56	Wall Mount Plate	715359900	4	M-11/M-115 Common
57	AC Adapter	715259000	1	M-11/M-115 Common
58	Power Cable (2.5m) EU	715259200	1	
	Power Cable (2.5m) UK	715259300	1	
	Power Cable (2.5m) US	715259400	1	
	Power Cable (2.5m) AU	715259500	1	
	Power Cable (2.5m) IRAM	715259900	1	
59	USB Cable	715255400	1	M-5/M-11/M-115 Common
	USB Cable UL	715258900	1	UL Only
60	M3-6 S-Tight Cross Recessed Binding Head	951230650	12	M-11/M-115 Common
61	M4-6 Cross Recessed Binding Head	951240650	4	M-11/M-115 Common
62	M4-8 Cross Recessed Binding Head	951240850	16	M-10/M-11/M-115 Common
63	Printer Bracket Spacer	715217700	2	M-10/M-11/M-115 Common
64	Printer Guide Unit	715090025	3	M-11/M-115 Common
65	Quick Guide Hang	715354600	1	M-11/M-115 Common
66	Cable Clip	714461800	5	M-10/M-11/M-115 Common

6. Carton & Packing

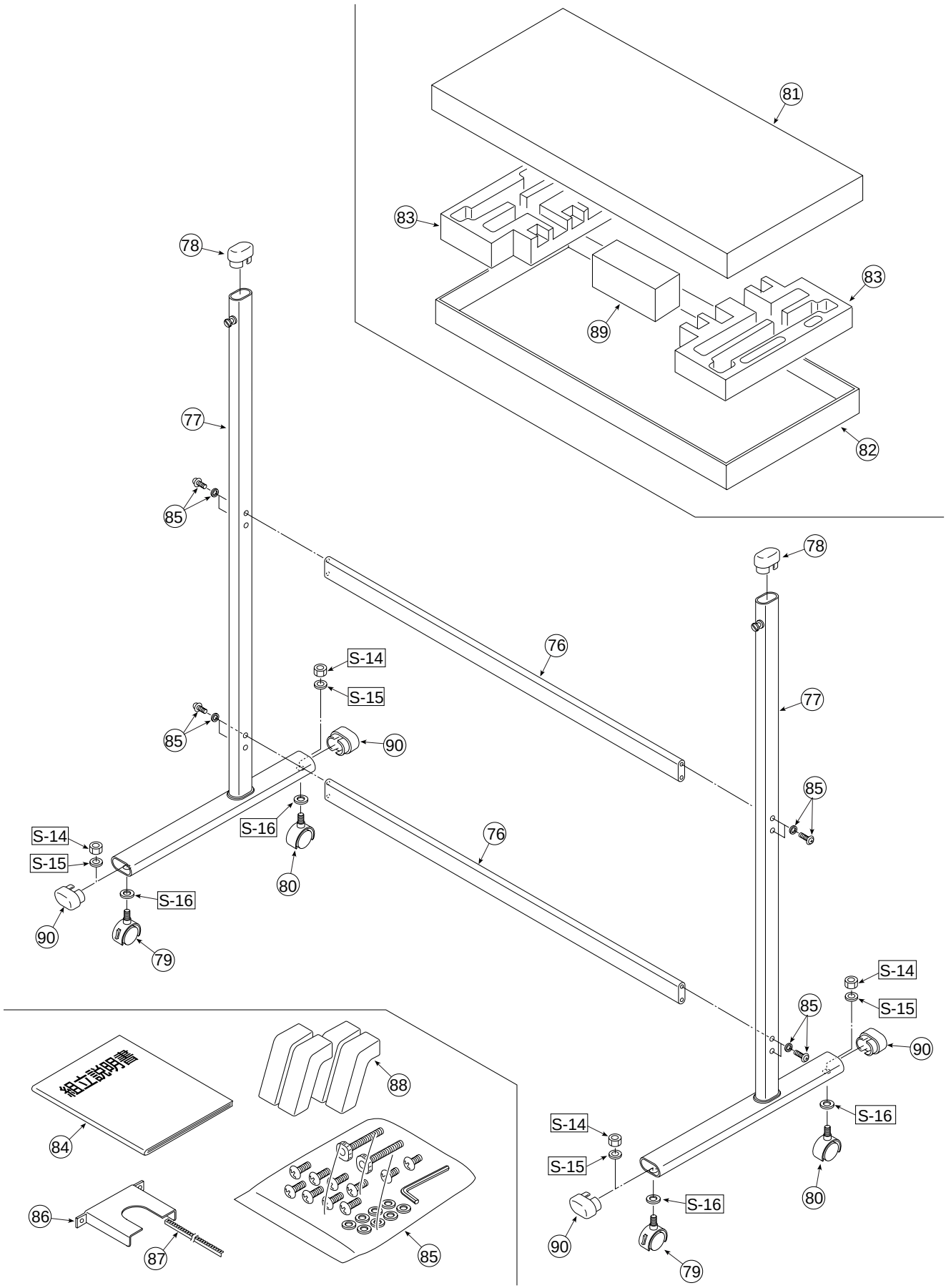


6. Carton & Packing				
No	**PARTS NAME**	**PARTS No.**	**Q' ty**	**REMARK**
-	Carton Unit (S)	301110	1	M-11S/M-115 Common
67	Carton Upper S	-	1	Unit Composition Parts for 301110
68	Carton Lower S	-	1	
69	Corner Packing Upper (L)	-	1	
70	Corner Packing Lower (L)	-	1	
71	Corner Packing Upper (R)	-	1	
72	Corner Packing Lower (R)	-	1	
73	Accessory Box	-	1	
74	Push Box Accessory S	-	1	
75	Printer Platform Pad A	-	1	

7. Screws & Washers

No	PARTS NAME	PARTS No	Q' ty	SURFACE
S-1	M4-6 Cross Recessed Binding Head	951240650	42	MFZn I-C-B
S-2	M4-8 Cross Recessed Binding Head	951240850	16	MFZn I-C-B
S-3	M3-8 Pan Head with Spring Washer and Plane	952530810	20	MFZn I-C
S-4	M3-25 Pan Head with Spring Washer and Plane	952532510	2	MFZn I-C
S-5	M3-6 P-Tight Cross Recessed Binding Head	953230610	30	MFZn I-C
S-6	M3-8 P-Tight Cross Recessed Binding Head	953230850	6	MFZn I-C-B
S-7	M3-6 Cross Recessed Binding Head	951230650	28	MFZn I-C-B
S-8	M4-10 P-Tight Cross Recessed Binding Head	953241010	3	MFZn I-C
S-9	M4-12 Cross Recessed Binding Head	951241250	5	MFZn I-C-B
S-10	M4-15 P-Tight Cross Recessed Binding Head	953241510	3	MFZn I-C
S-11	M4-45 Cross Recessed Binding Head	951244510	1	-
S-12	M4-15 Three points	952541510	8	-
S-13	M3-6 Binding Head	951230610	6	-
S-17	M2.6-5 Cross Recessed Binding Head	951126510	4	-
S-18	M3-12 Two points Binding Head	952331010	2	-
S-19	Ø3 Ering	958130020	2	-
S-20	Ø6 Ering	958160020	4	-
S-21	M3-6 Cross Recessed Binding Head	953630650	4	-

8. M-11-T



8. M-11-T				
No	**PARTS NAME**	**PARTS No.**	**Q' ty**	**REMARK**
76	T-Shaped Stand Assy	-	2	No Parts Supply
77	Side Bar Assy	-	2	No Parts Supply
78	Pipe Frame Cap	714112600	2	
79	Front Caster	714660400	2	
80	Back Caster	714660500	2	
-	Carton Unit (Stand)	301112	1	M-11/M-115 Common
81	Carton Upper (Stand)	-	1	Unit Composition Parts for 301112
82	Carton Lower (Stand)	-	1	
83	Packing Set (Stand)	-	2	
84	Assembly Manual (Stand)	715360900	1	
85	Screw Unit	715090010	1	
86	Printer Steady (Stand)	715353700	1	
87	Edge Bush	715353800	1	
-	Stabilizer Unit	301113	1	M-11/M-115 Common
88	Stabilizer	-	4	Unit Composition Parts for 301113
89	Stabilizer Box	-	1	
90	Pipe Cap	714160600	4	
S-14	W3-8 Hexagonal Stop Bolt	955217610	4	
S-15	No2-10 Spring Washer	957410210	4	
S-16	No2-10 Flat Washer	957210210	4	

9. REVISION HISTORY

No	Revision History	Revision page	Date
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

PLUS Vision Corp.

20-11, Otowa 1-chome, Bunkyo-ku, Tokyo, 112-0013 JAPAN

www.plus-vision.com
email:plusvision@plus.co.jp

Iruma Factory of PLUS Vision Corp. is
certified to ISO 9001.
Certificate No. 12 100 17398 TMS

Otowa Head Office and PLUSLAND of PLUS Corporation,
and Iruma Office/Iruma Factory of PLUS Vision Corp. are
certified to ISO 14001.
Certificate No. NQE-9809008A

*PLUS Vision Corp. is certified to ISO 14001 as a member of the PLUS group.