DSC-T1

SERVICE MANUAL

LEVEL 3

Ver 1.1 2004. 04

Revision History

How to use
Acrobat Reader

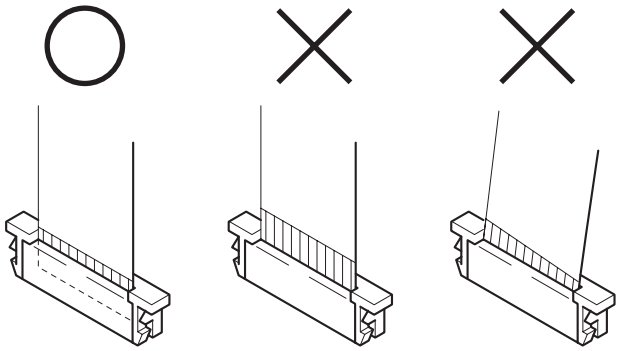
DSC-T1

US Model
Canadian Model
AEP Model
UK Model
E Model
Hong Kong Model
Australian Model
Korea Model
Chinese Model
Tourist Model
Japanese Model

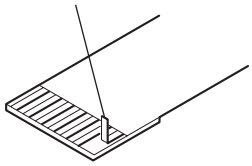
SELF-DIAGNOSIS FUNCTION

• NOTE FOR REPAIR

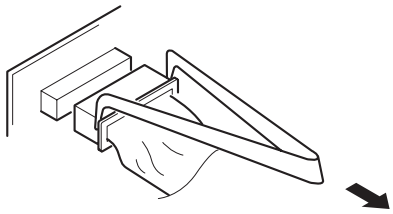
Make sure that the flat cable and flexible board are not cracked of bent at the terminal.
Do not insert the cable insufficiently nor crookedly.



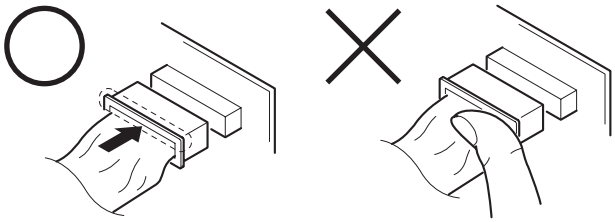
Cut and remove the part of gilt which comes off at the point. (Take care that there are some pieces of gilt left inside)



When remove a connector, don't pull at wire of connector. Be in danger of the snapping of a wire.



When installing a connector, don't press down at wire of connector. Be in danger of the snapping of a wire.

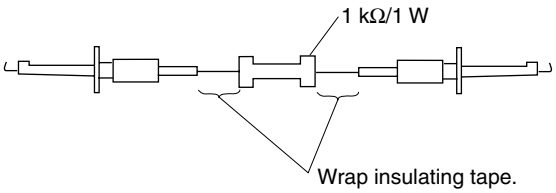


[Discharging of the FLASH unit's charging capacitor]

The charging capacitor of the FLASH unit is charged up to the maximum 300 V potential.
There is a danger of electric shock by this high voltage when the capacitor is handled by hand. The electric shock is caused by the charged voltage which is kept without discharging when the main power of the DSC-T1 is simply turned off. Therefore, the remaining voltage must be discharged as described below.

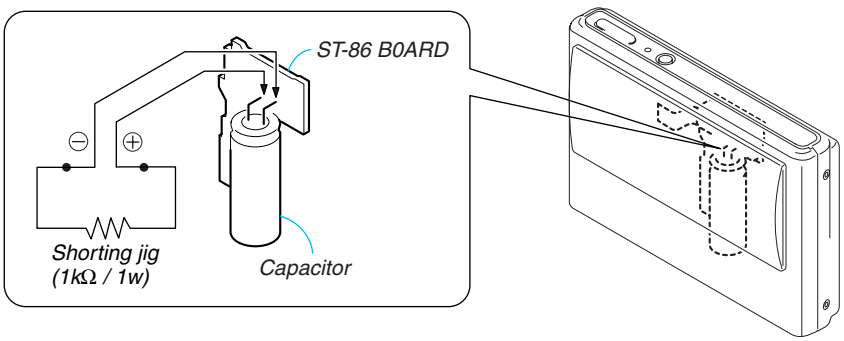
Preparing the Short Jig

To preparing the short jig. a small clip is attached to each end of a resistor of 1 kΩ /1 W (1-215-869-11)
Wrap insulating tape fully around the leads of the resistor to prevent electrical shock.



Discharging the Capacitor

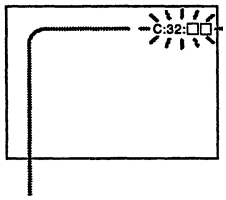
Short circuits between the positive and the negative terminals of charged capacitor with the short jig about 10 seconds.



[Description on Self-diagnosis Display]

Self-diagnosis display

The camera has a self-diagnosis display. This function displays the camera condition with five-digits (a combination of a letter and figures) on the LCD screen. If this occurs check the following code chart. The five-digits display informs you of the camera's current condition. The last two digits (indicated by □□) will differ depending on the state of the camera.



Self-diagnosis display

- C: □□: □□
  The contents which can be handled by customer, are displayed.
- E: □□: □□
  The contents which can be handled by engineer, are displayed.

Display Code	Countermeasure	Cause	Caution Display During Error
C : 3 2 : 0 1	Turn off the main power then back on.	Trouble with hardware.	SYSTEM ERROR
C : 1 3 : 0 1	Replace the memory stick. Format the memory stick with the DSC-T1.	• The type of memory stick that cannot be used by this machine, is inserted. • Data is damaged. • Unformatted memory stick is inserted.	MS ERROR
E : 9 1 : 0 1	Checking of flash unit or replacement of flash unit.	Abnormality when flash is being charged.	Flash LED Flash display Flashing at 3.2 Hz
E:61:00 *1	Checking of lens drive circuit	When failed in the focus initialization.	—
E61:10 *1			

Note : The error code is cleared if the battery is removed, except defective flash unit.
*1: The error display is given in two ways.

4-2. SCHEMATIC DIAGRAMS

Link

4-2. SCHEMATIC DIAGRAMS

For Schematic Diagram

• Refer to page 4-47 for printed wiring board.

SY-95 BOARD(1/8)

CAMERA A/D CONVERTER,TIMING GENERATOR(BLOCK)

XX MARK:NO MOUNT

NO MARK:REC/PB MODE

▲:Voltage measurement of the CSP IC and the Transistors with ▲ mark and the IC with ▲ mark ,is not possible.

IC151
CAMERA A/D CONVERTER, TIMING GENERATOR
▲ IC151
CXD3433GA-T4
CSP(CHIP SIZE PACKAGE)IC

IC152
CLOCK GEN.

SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			⇒
PB			

For Schematic Diagram

• Refer to page 4-47 for printed wiring board.

SY-95 BOARD(2/8)

CAMERA DSP,LENS CONTROL(KIW BLOCK)

XX MARK:NO MOUNT

NO MARK:REC/PB MODE

( ) MARK:WHEN CONNECTED CRADLE and TV MONITOR.

▲Voltage measurement of the CSP IC and the Transistors with ▲mark,is not possible.

Note:Resistor is mounted to the location FB306 is printed.

IC302 VIDEO AMP

IC301 CAMERA DSP, LENS CONTROL

▲ IC301 (KI(SM SA)BOARD) CSP(CHIP SIZE PACKAGE)IC

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡		➡➡	➡
PB	⇨		⇨⇨	⇨

For Schematic Diagram

• Refer to page 4-47 for printed wiring board.

SY-95 BOARD(3/8)
CAMERA SYSTEM CONTROL(EVR BLOCK)
XX MARK:NO MOUNT

NO MARK:REC/PB MODE
▲Voltage measurement of the CSP IC and the Transistors with ▲mark,is not possible.

IC501
CAMERA SYSTEM CONTROL

▲ IC501
JSCIS5018F00GA-T6
CSP(CHIP SIZE PACKAGE)IC

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			▶	▷
PB			▷	▷

For Schematic Diagram

• Refer to page 4-47 for printed wiring board.

SY-95 BOARD(4/8)

HI CONTROL(FR BLOCK)

XX MARK:NO MOUNT

NO MARK:REC/PB MODE

( ) MARK:WHEN ATTACHED BATTERY PACK.

▲:Voltage measurement of the CSP IC and the Transistors with ▲mark,is not possible.

IC491

HI CONTROL

▲ IC491

MB89083LGA-G-105-ERE1 (SUFFIXED-13)

CSP(CHIP SIZE PACKGE)IC

MB89083LGA-G-107-ERE1 (SUFFIXED-14)

For Schematic Diagram
• Refer to page 4-47 for printed wiring board.

SY-95 BOARD(5/8)
AUDIO I/O(AU BLOCK)
XX MARK:NO MOUNT

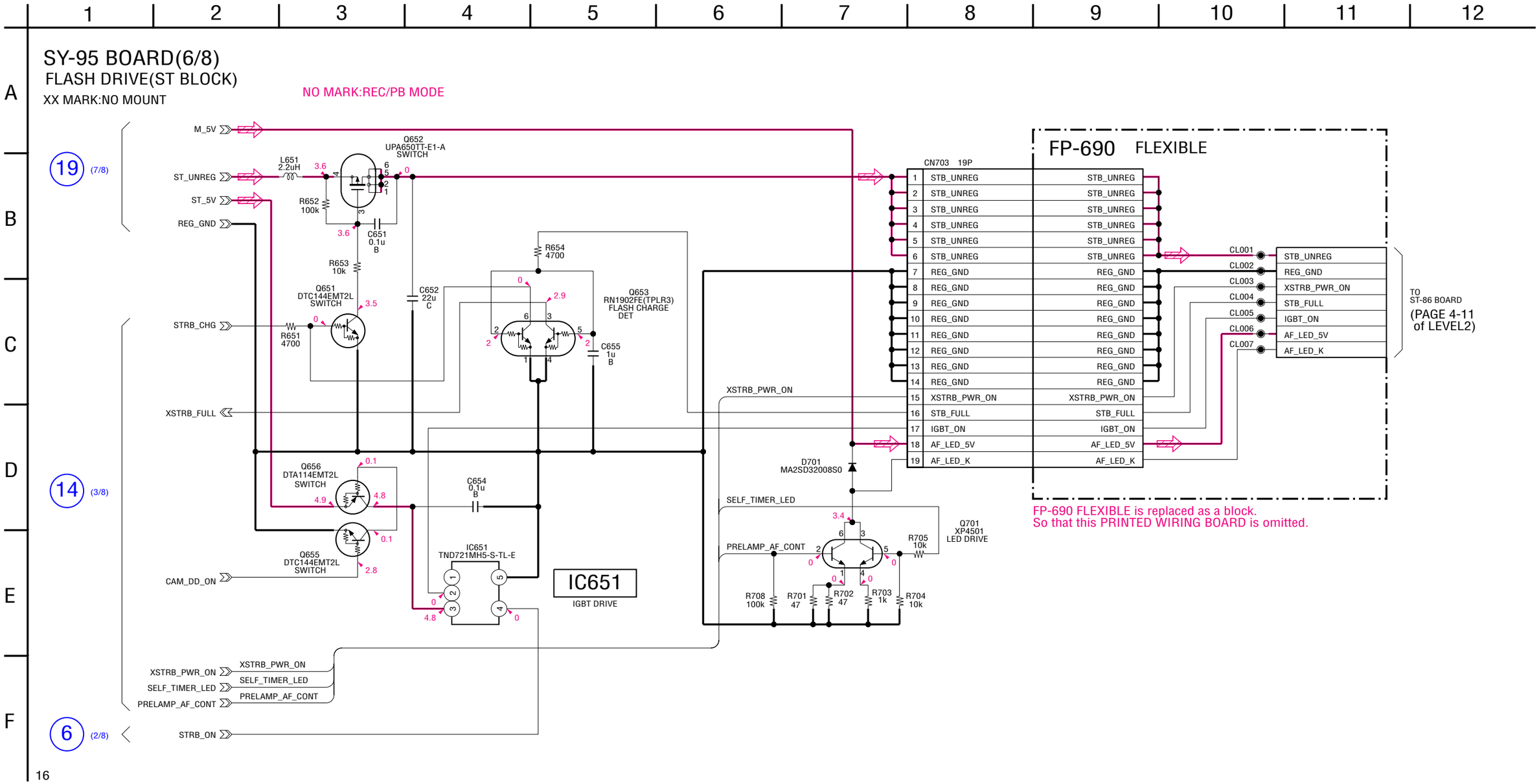
▲:Voltage measurement of the CSP IC and the Transistors with ▲ mark,is not possible.

IC601
AUDIO AMP/ADC
▲ IC601
AN12908A-VB
CSP(CHIP SIZE PACKAGE)IC

SIGNAL PATH

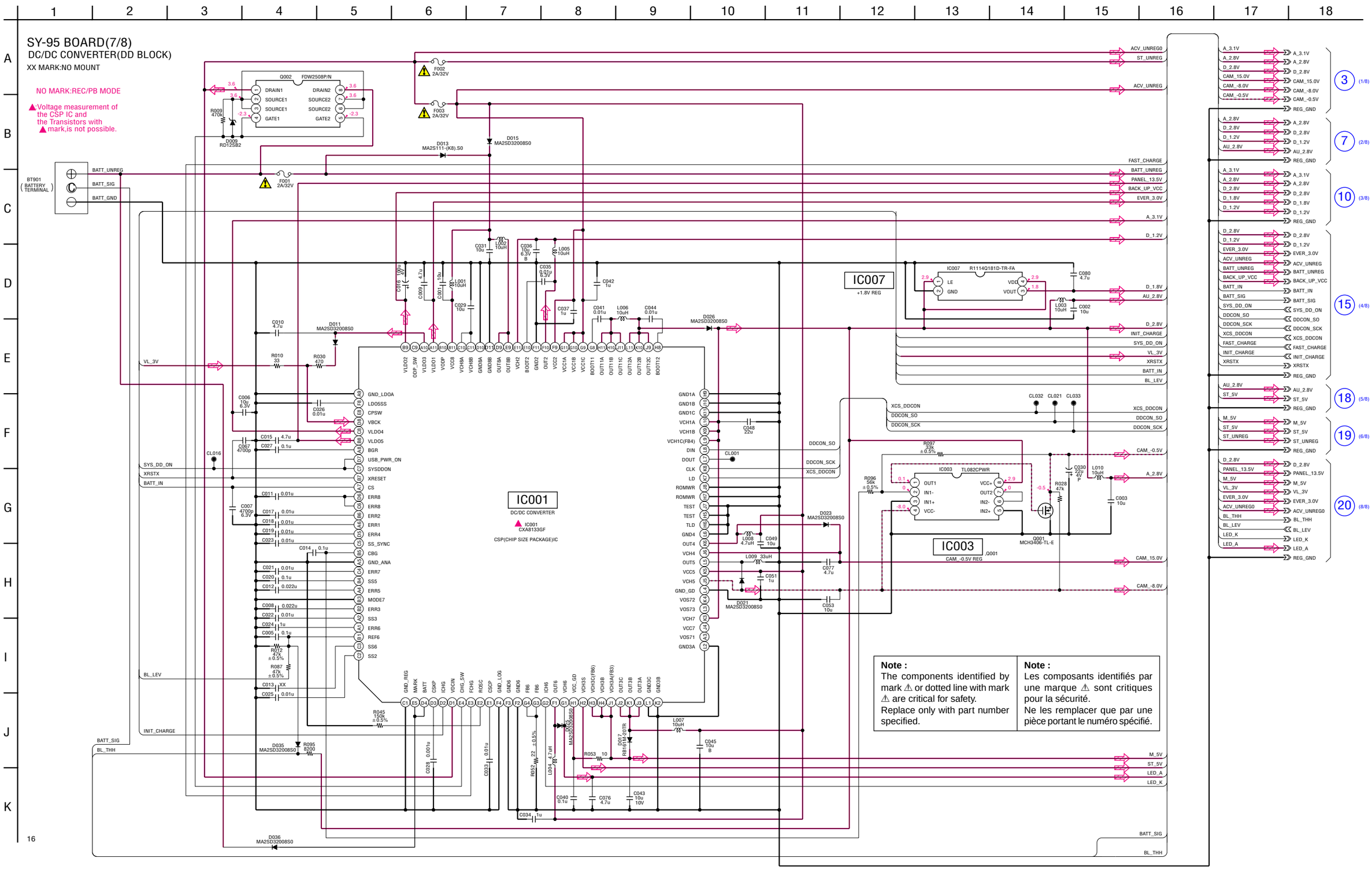
	AUDIO SIGNAL
REC	→
PB	⇨

For Schematic Diagram
• Refer to page 4-47 for printed wiring board.

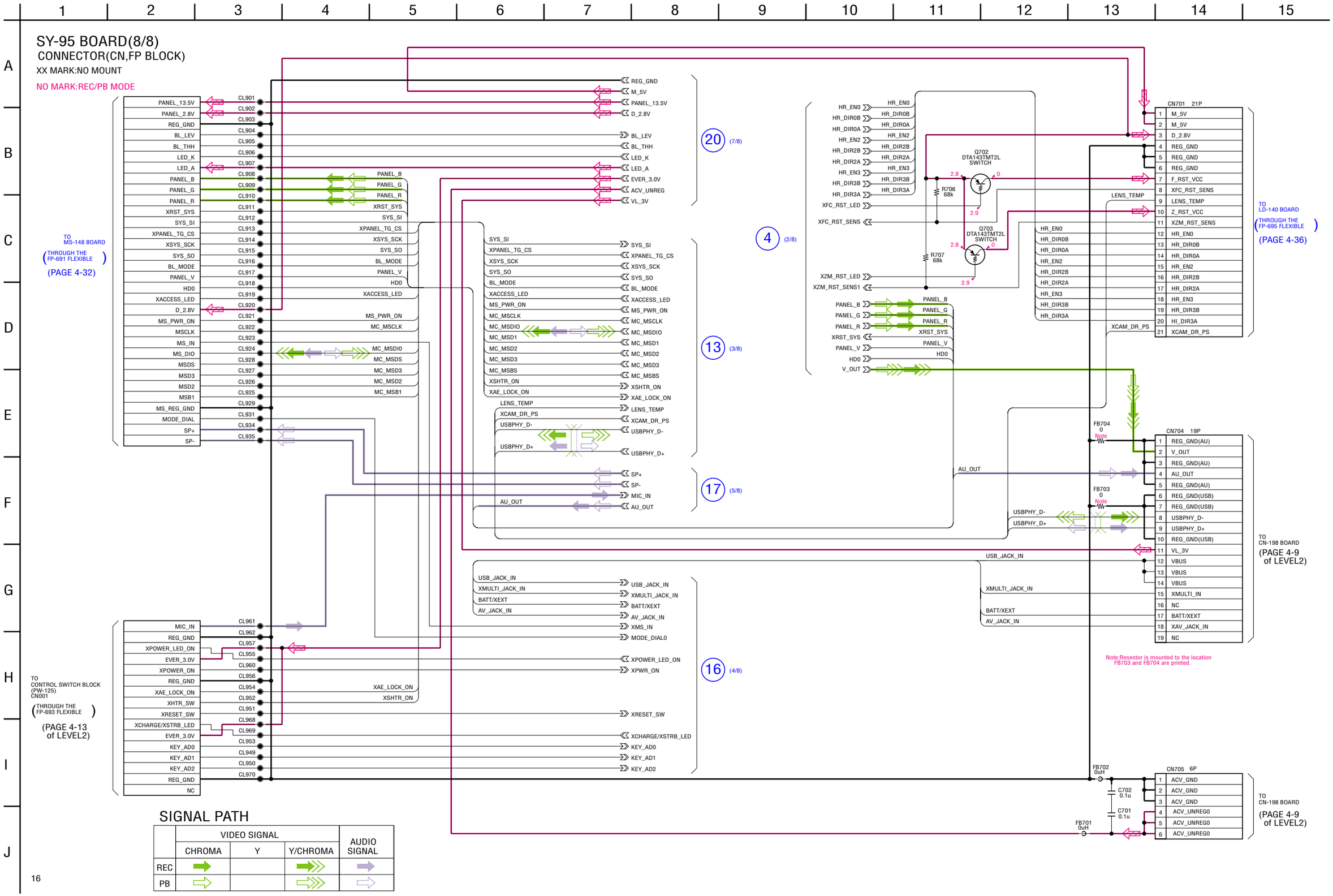


For Schematic Diagram

• Refer to page 4-47 for printed wiring board.



For Schematic Diagram
• Refer to page 4-47 for printed wiring board.

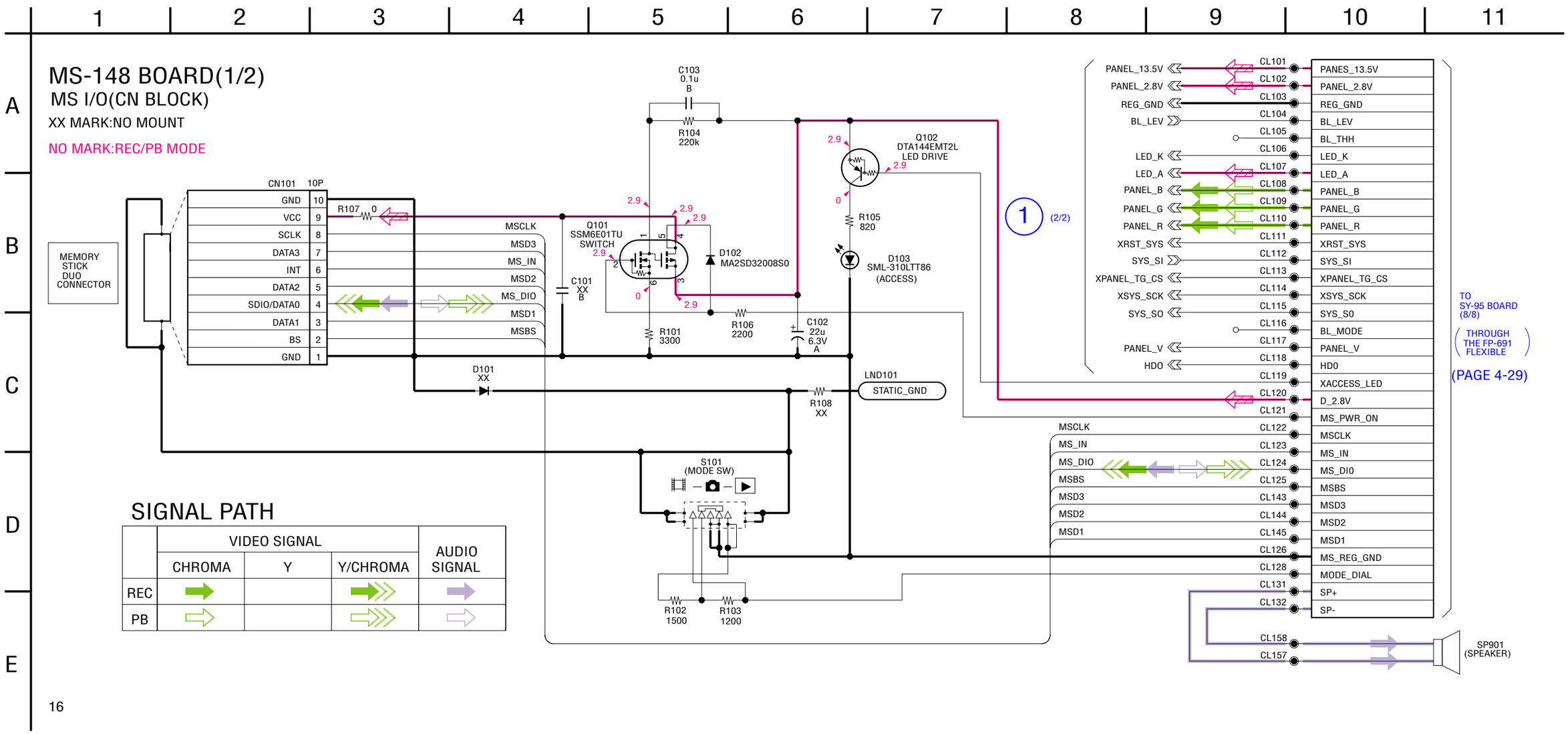


SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡		➡	➡
PB	⇨		⇨	⇨

For Schematic Diagram

• Refer to page 4-51 for printed wiring board.



For Schematic Diagram

• Refer to page 4-51 for printed wiring board.

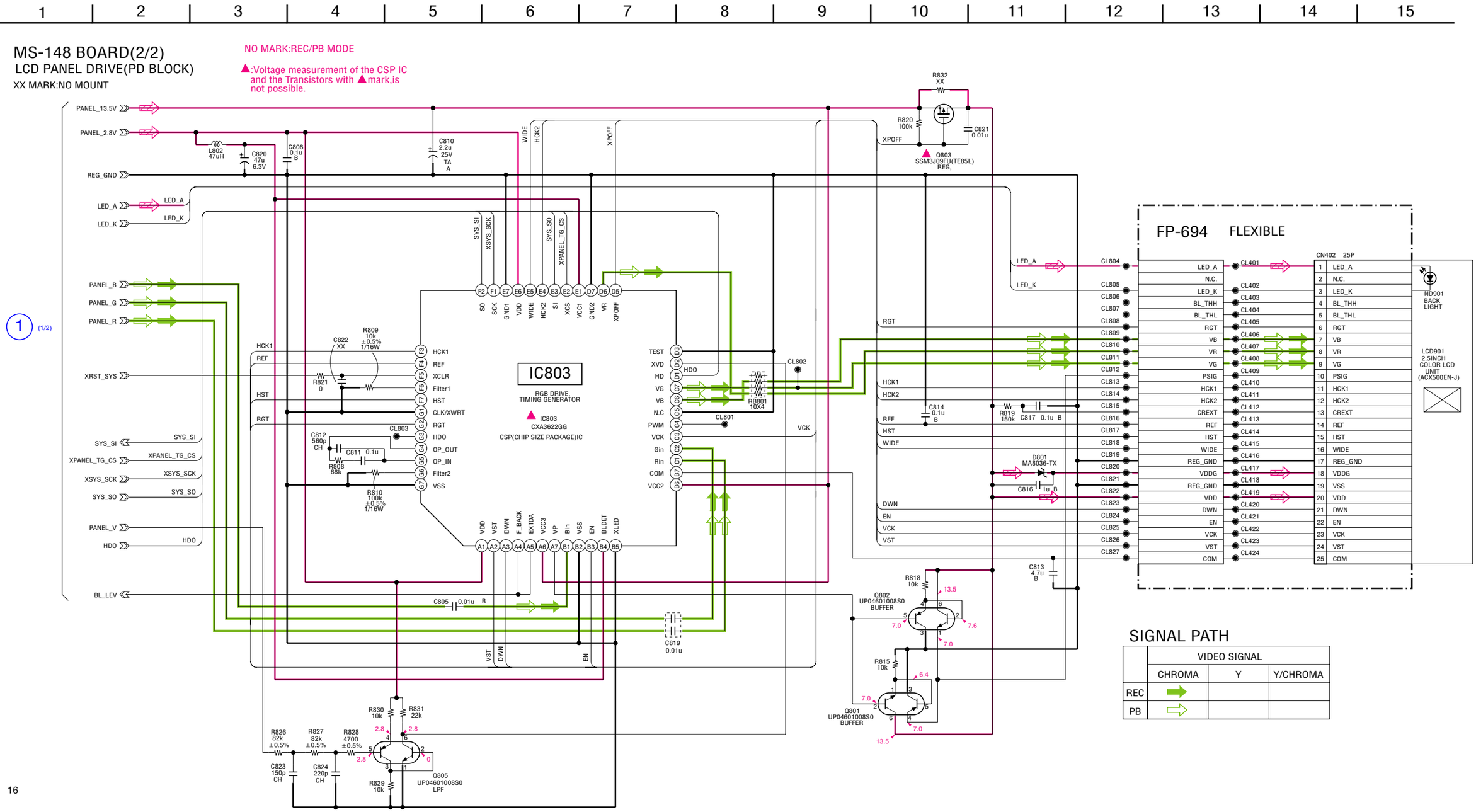
MS-148 BOARD(2/2)

LCD PANEL DRIVE(PD BLOCK)

XX MARK:NO MOUNT

NO MARK:REC/PB MODE

▲:Voltage measurement of the CSP IC and the Transistors with ▲mark,is not possible.



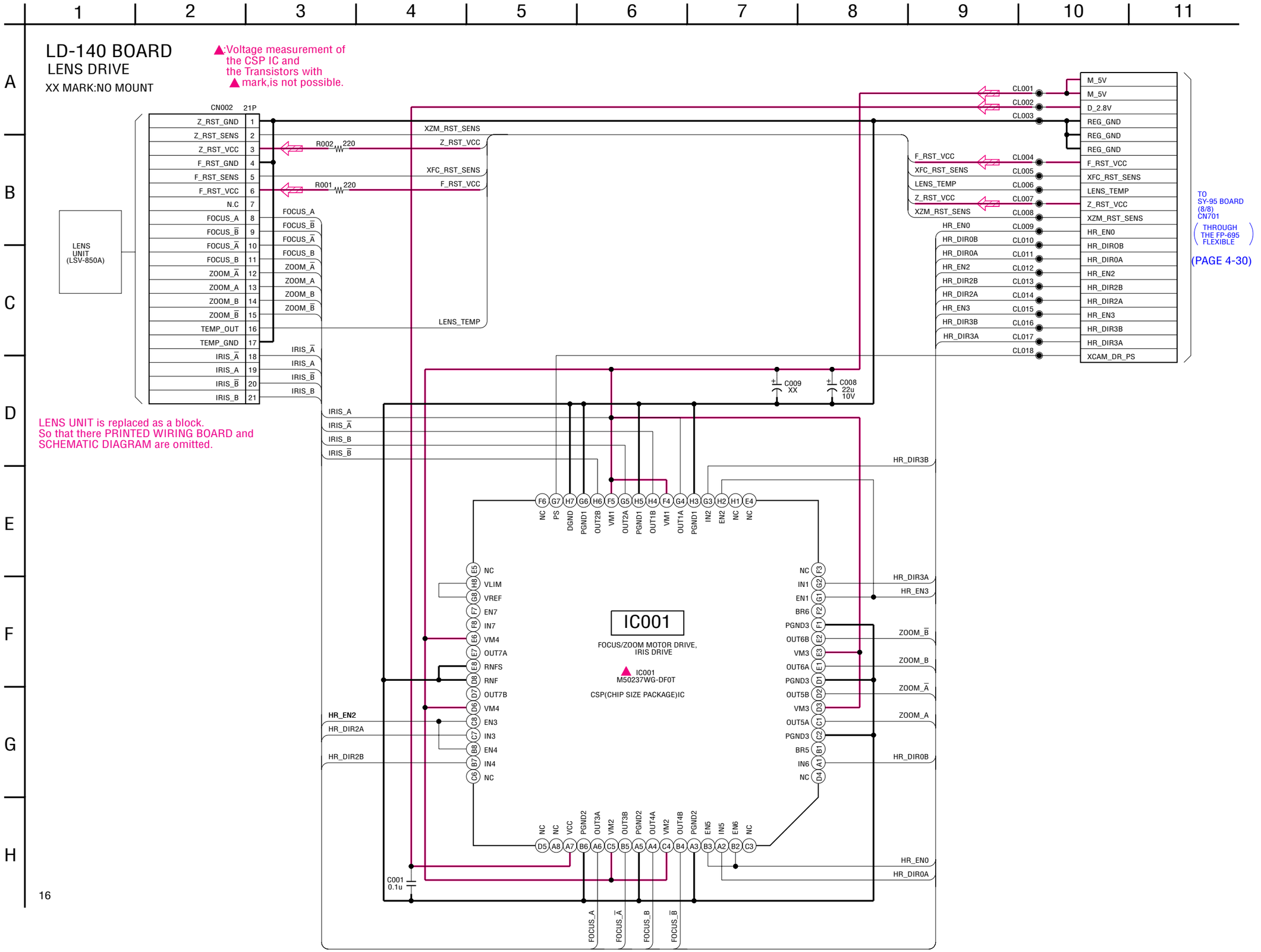
1 (1/2)

SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡		
PB	⇨		

For Schematic Diagram

• Refer to page 4-45 for printed wiring board.



SECTION 6
ADJUSTMENTS

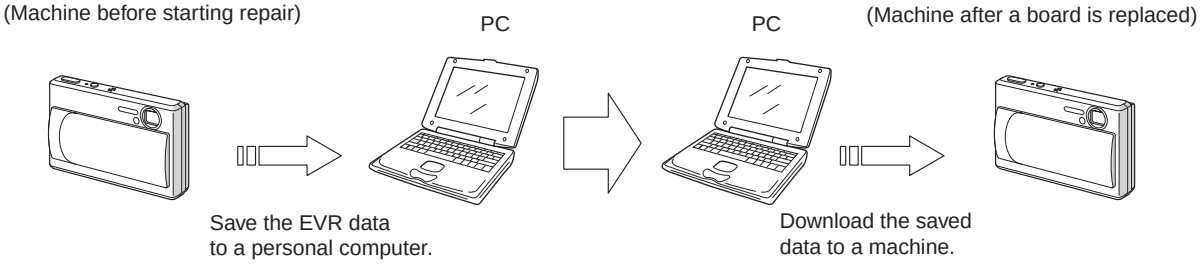
1. Before starting adjustment

EVR Data Re-writing Procedure When Replacing Board

The data that is stored in the repair board, is not necessarily correct.
Perform either procedure 1 or procedure 2 or procedure 3 when replacing board.

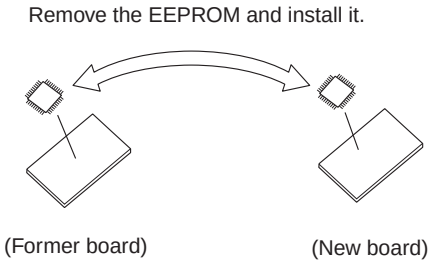
Procedure 1

Save the EVR data of the machine in which a board is going to be replaced. Download the saved data after a board is replaced.



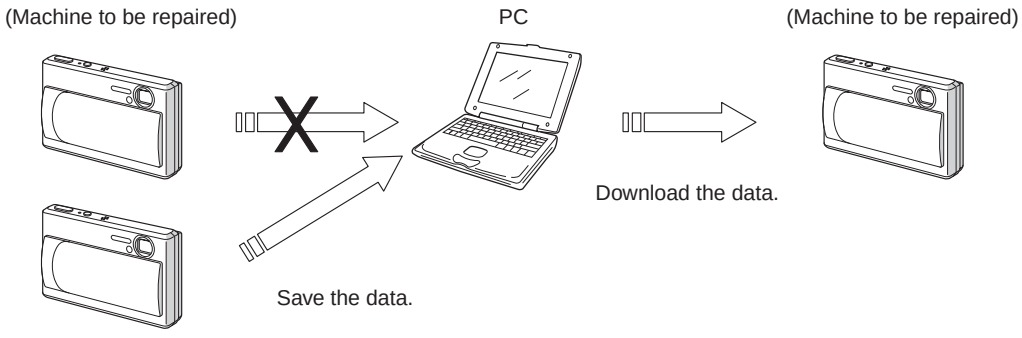
Procedure 2

Remove the EEPROM from the board of the machine that is going to be repaired. Install the removed EEPROM to the replaced board.



Procedure 3

When the data cannot be saved due to defective EEPROM, or when the EEPROM cannot be removed or installed, save the data from the same model of the same destination, and download it.



After the EVR data is saved and downloaded, check the respective items of the EVR data.
(Refer to page 6-2 for the items to be checked.)

1-1. Adjusting items when replacing main parts and boards.

When replacing main parts and boards, adjust the items indicated by ● in the following table.

Adjustment Section	Adjustment	Replaced parts: Block replacement: CCD block	Lens device	Xenon tube	LCD block LCD unit (LCD901)	LCD block Back light unit	Parts replacement: MS-148 board IC803 (RGB drive, Timing gen.) (LCD)	ST-86 board D003 (AF Illumination LED)	SY-95 board IC151 (Timing gen. S/H, AGC A/D conv.)	SY-95 board IC301 (Camera DSP)	SY-95 board IC302 (Video amp.)	Board replacement: MS-148 board (COMPLETE)	ST-86 board (COMPLETE)	SY-95 board (COMPLETE)	EEPROM replacement: SY-95 board IC501 (Camera system control) (With built-in flash memory)
Initialization of data	Initialization of data													●	●
Video	Video output level adj.									●	●			●	●
Camera	Wide limit Adj.		●											●	●
	Flange back adj.	●	●											●	●
	F No. compensation	●	●						●					●	●
	Mechanical shutter adj.	●	●						●					●	●
	Light value adj.	●	●						●					●	●
	AWB 3200K standard data input	●	●						●					●	●
	AWB 5800K standard data input	●	●						●					●	●
	CCD linearity check	●	●						●					●	●
	Color reproduction adj.	●	●						●					●	●
	CCD white defect compensation check	●	●						●					●	●
	CCD black defect compensation check	●	●						●					●	●
	Strobe adj.	●	●	●					●					●	●
	Auto focus illumination check	●	●					●					●	●	●
LCD	LCD initial data input													●	●
	VCO adj.						●					●		●	●
	Bright adj.						●					●		●	●
	Contrast adj.						●			●		●		●	●
	V COM adj.				●		●					●		●	●
	White balance adj. (1)				●	●	●					●		●	●
	White balance adj. (2)				●	●	●					●		●	●

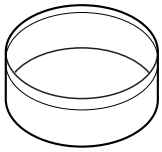
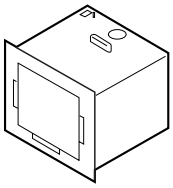
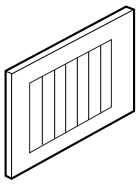
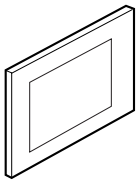
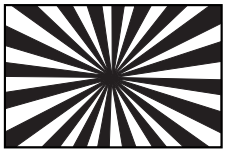
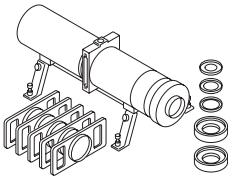
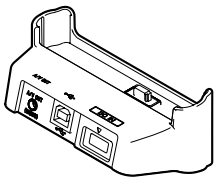
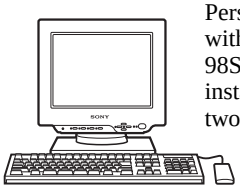
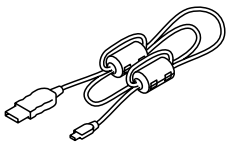
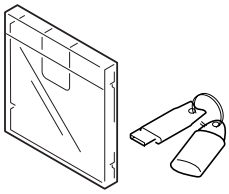
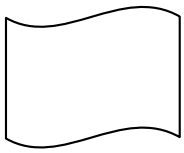
Table. 6-1-1.

6-1. ADJUSTMENT

1-1. PREPARATIONS BEFORE ADJUSTMENT

1-1-1. List of Service Tools

• Oscilloscope • Color monitor • Vectorscope • AC power adapter
• Calculator which can hexadecimal calculation.

J-1  Filter for color temperature correction (C14) J-6080-058-A	J-2  Pattern box PTB-450 J-6082-200-A or Pattern box PTB-1450 J-6082-557-A	J-3  Clear chart for pattern box For PTB-450: J-6020-250-A For PTB-1450: J-6020-559-A
J-4  Clear chart for pattern box For PTB-450: J-6080-621-A For PTB-1450: J-6020-560-A	J-5  Siemens star chart J-6080-875-A	J-6  Mini pattern box J-6082-353-B
J-7  Cradle 1-817-742-11	J-8  Personal computer with Windows98/ 98SE/ME/2000/XP installed and with two USB ports	J-9  USB cable 1-823-073-11
J-10  Application for adjustment (SEUS) and HASP key (Note)	J-11  Backgorund paper J-2501-130-A	

Note : Contact our service headquarter of each area how to get the application for adjustment (SEUS) and HASP key.

Fig. 6-1-1.

1-1-2. Preparations

1) Connect the equipment for adjustments according to Fig. 6-1-4.
2) Start up the application for adjustment (SEUS).

Note1: Setting the "Forced Power ON Mode (Forced STILL Mode)"
1) Select page: 00, address: 01, and set data: 01.
2) Select page: 2F, address: 23, and write data: 01.
3) Save the data.
4) Wait for 3 sec.
The above procedure will enable the power (STILL mode) to be turned on with POWER switch (Control switch block) disconnected. After completing adjustments, be sure to exit the "Forced Power ON Mode".

Note2: Setting the "Forced Power ON Mode (Forced PLAY Mode)"
1) Select page: 00, address: 01, and set data: 01.
2) Select page: 2F, address: 23, and write data: 02.
3) Save the data.
4) Wait for 3 sec.
The above procedure will enable the power (PALY mode) to be turned on with POWER switch (Control switch block) disconnected. After completing adjustments, be sure to exit the "Forced Power ON Mode".

Note3: Exiting the "Forced Power ON Mode"
1) Select page: 00, address: 01, and set data: 01.
2) Select page: 2F, address: 23, and write data: 80.
3) Save the data.
4) Wait for 3 sec.
5) Select page: 00, address: 01, and set data: 00.

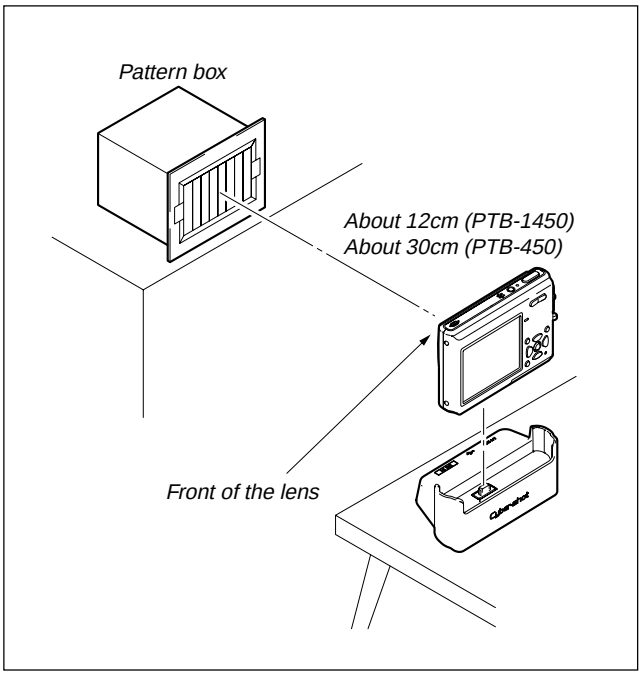


Fig. 6-1-2.

1-1-3. Discharging of the flashlight power supply

The capacitor which is used as power supply of flashlight is charged with 200V to 300V voltage. When disassembling the unit, discharge this voltage in order to protect service engineers from electric shock.

Discharge procedure

1. Remove the power supply (AC power adaptor or battery).
2. Fabricate the discharging jig as shown in Fig. 6-1-3 locally by yourself. Connect the discharging jig to the positive (+) and negative (-) terminal of the flash voltage charge capacitor. Allow ten seconds to discharge the voltage.

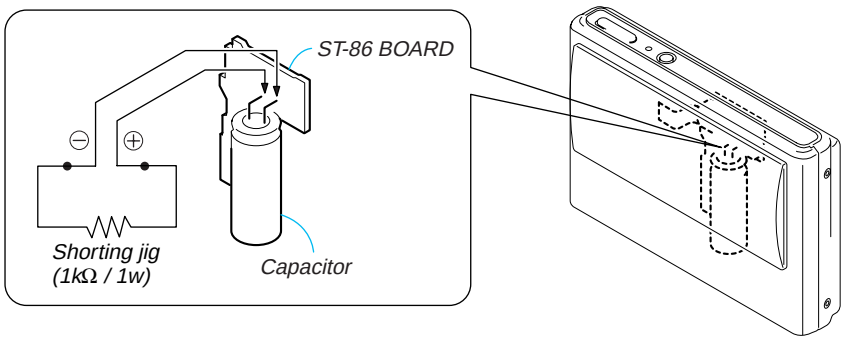
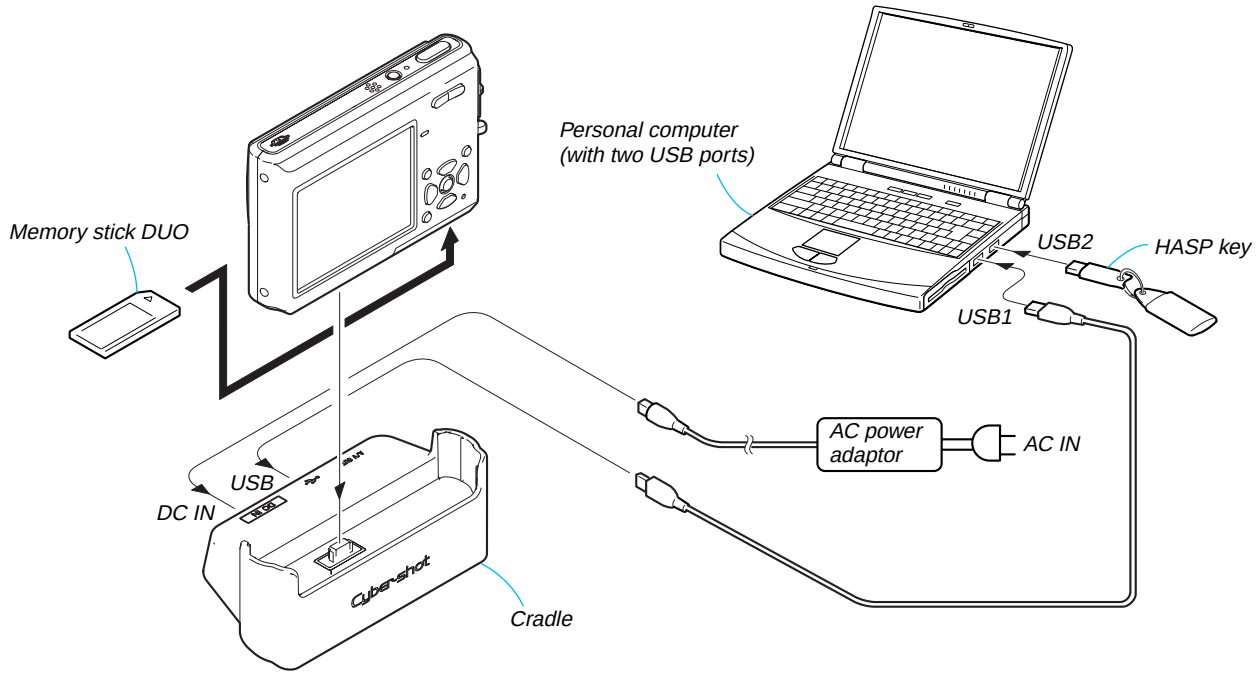


Fig. 6-1-3.

[CONNECTION OF EQUIPMENT]



Note: When performing "Flange Back Adjustment", connect the cables after disassembling the cradle. Unless the cradle is disassembled, the USB cable and the power cable will interfere with the flange back adjustment jig or mini pattern box, and thus the subject cannot be set correctly.

Fig. 6-1-4

1-1-4. Precaution

1. Setting the Switch

Unless otherwise specified, set the switches as follows and perform adjustments.

Switch settings

1. Mode switch ..... STILL ( )
2. Lens cover ..... Open
3. ZOOM ..... WIDE end
3. MACRO ( ) ..... ON
4. SCENE (Menu) ..... Auto
5. VIDEO OUT (SET UP of Menu) ..... NTSC

2. Order of Adjustments

Basically carry out adjustments in the order given.

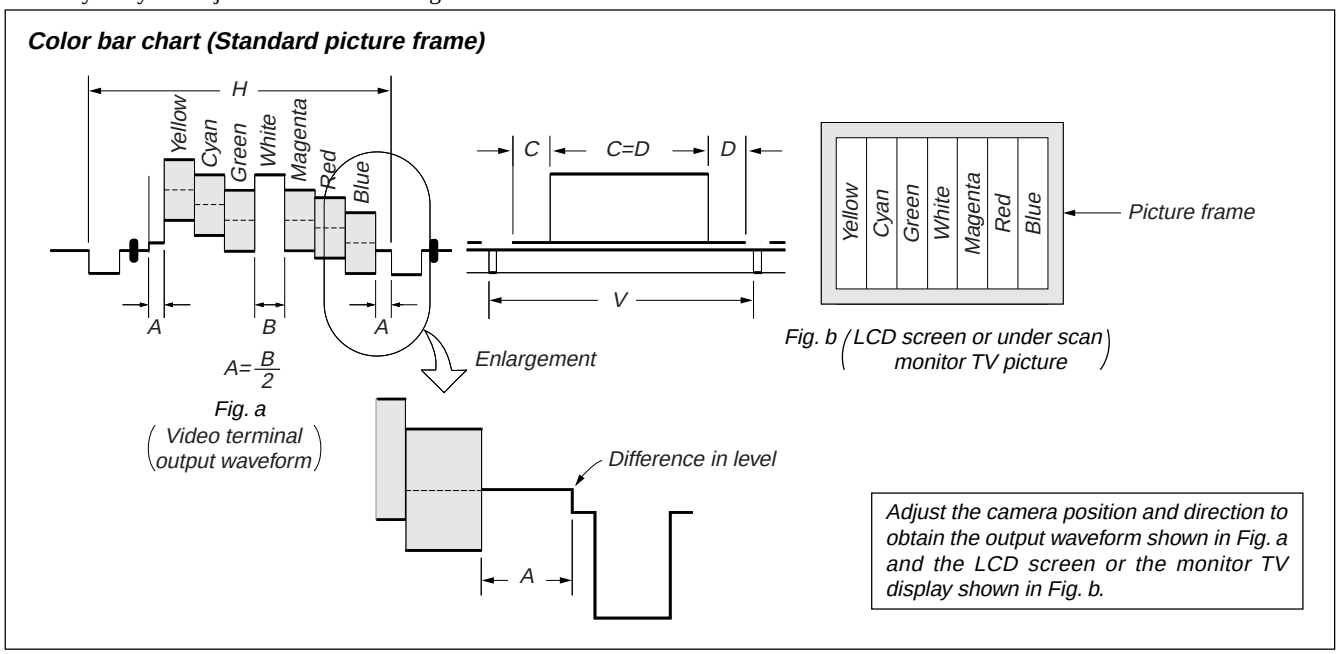


Fig.6-1-5.

3. Subjects

1) Color bar chart (Standard picture frame)
   When performing adjustments using the color bar chart, adjust the picture frame as shown in Fig. 6-1-5. (Standard picture frame)
2) Clear chart (Color reproduction adjustment frame)
   Remove the color bar chart from the pattern box and insert a clear chart in its place. (Do not perform zoom operations during this time.)

4. Preparing the Flash Adjustment Box

A dark room is required to provide an accurate strobe adjustment.
If it is not available, prepare the flash adjustment box as given below;

1) Provide woody board A, B and C of 15 mm thickness.

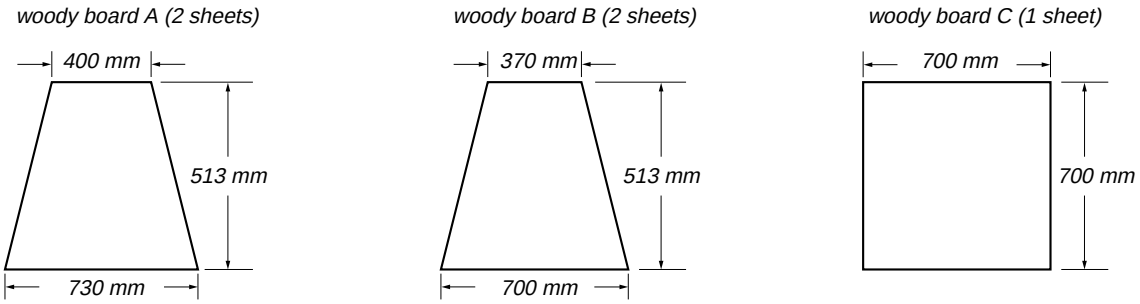


Fig. 6-1-6.

2) Apply black mat paint to one side of woody board A and B.
3) Attach background paper (J-2501-130-A) to woody board C.
4) Assemble so that the black sides and the background paper side of woody board A, B and C are internal. (Fig. 6-1-7.)

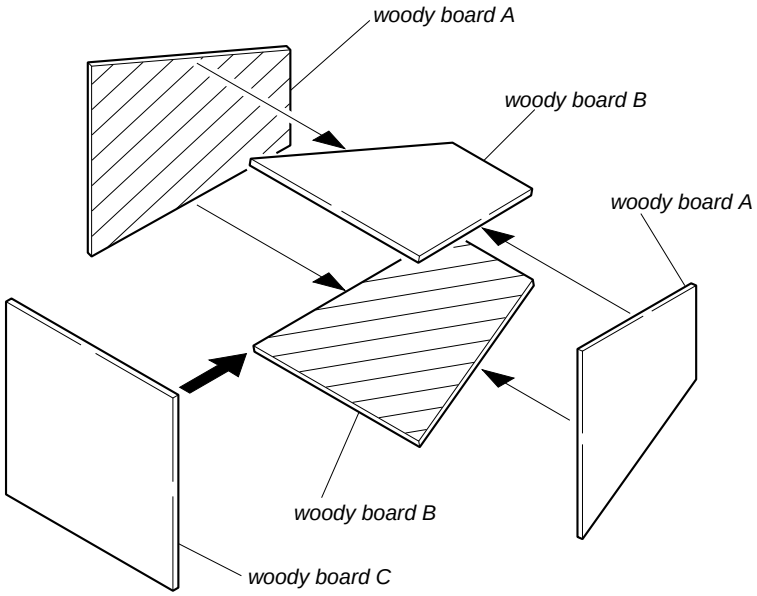


Fig. 6-1-7.

1-2. INITIALIZATION OF DATA

1-2-1. INITIALIZATION OF DATA

1. Initializing All Pages Data

By performing the following procedure, data of all the pages will be initialized.

Initializing Method:

1) Select page: 00, address: 01, and set data: 01.
2) Click [Sector Write] on the SEUS screen to display the SEUS SECTOR WRITE screen.
3) Check that the SET ID is “04”.
4) Click [All] of the ALL SELECT buttons to select all pages. (Fig. 6-1-8. Ⓐ)
5) Click [Write] to write the initializing data to the EEPROM of the camera.
6) Wait for 3 sec.
7) Click [Close] to close the SEUS PAGE EDIT screen.

Modification of 4F, 8E Page Data

If all page data have been initialized, change the data of the “Fixed data-2” address shown in the following tables by manual input.

1) Select page: 00, address: 01, and set data: 01.
2) Click [Page] on the SEUS screen, and input “4F” or “8E”.
3) Click [Address], and input the “Fixed data-2” address.
4) Click [Set], and input the new data.
   Note: New data for changing are not shown in the table because they are different in destination. When changing the data, copy the data built in the same model. If copy the data built in the different model, the camera may not operate.
5) Repeat steps 2 to 4 until all data of the “Fixed data-2” addresses are changed.
6) Click [Save] to write the changed data to the EEPROM of the camera.
7) Wait for 3 sec.

Processing after Completing Initializing of data

Order	Page	Address	Data	Procedure
1	20	00	29	Set the data.
2	20	01	29	Set the data.
3				Check “Receive Paket Error” is displayed on the SEUS screen.
4				Turn on the power of the camera.
5				Click [Connect] on the SEUS screen.

2. Initializing Single Page Data

By performing the following procedure, data of the page that you want to initialize will be initialized.

Initializing Method:

1) Select page: 00, address: 01, and set data: 01.
2) Click [Sector Write] on the SEUS screen to display the SEUS SECTOR WRITE screen.
3) Check that the SET ID is “04”.
4) Click [All] of the option buttons of the target page. (Fig. 6-1-8. Ⓑ)
5) Click [Write] to write the initializing data to the EEPROM of the camera.
6) Wait for 3 sec.
7) Click [Close] to close the SEUS PAGE EDIT screen.

Note: When 4F page or 8E page is initialized, perform “Modification of 4F, 8E Page Data”. (Refer to “1. Initializing All Pages Data”.)

Processing after Completing Initializing of data

Order	Page	Address	Data	Procedure
1	20	00	29	Set the data.
2	20	01	29	Set the data.
3				Check “Receive Paket Error” is displayed on the SEUS screen.
4				Turn on the power of the camera.
5				Click [Connect] on the SEUS screen.

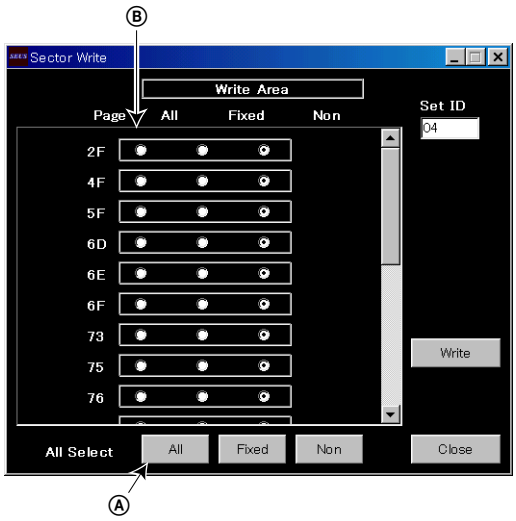


Fig. 6-1-8.

3. 2F Page Adjustment Address

Address	Initial value	Remark
23	80	Test mode

Table. 6-1-2.

4. 4F Page Adjustment Address

Address	Initial value	Remark
46		Fixed data-2
47		Fixed data-2
88		Fixed data-2
94	00	Recording counter
95	00	(Refer to “Record of Use check” of
96	00	“SERVICE MODE”.)
97	00	
A1		Fixed data-2

Table. 6-1-3.

5. 6E Page Adjustment Address

Address	Initial value	Remark
00	00	AWB 5800K standard data input
01	00	
02	00	
03	00	
04	21	AWB 3200K standard data input
05	00	
06	0C	
07	00	
08	20	
09	00	
0A	0D	
0B	00	
0C	21	
0D	00	
0E	0C	
0F	00	
10	20	
11	00	
12	0D	
13	00	
14	21	
15	00	
16	0C	
17	00	
18	20	
19	00	
1A	0D	
1B	00	
1C	00	
1D	00	
1E	00	
1F	00	
20	00	
21	00	
24	13	AWB 5800K standard data input
25	00	
26	13	
27	00	
28	13	
29	00	
2A	15	
2B	00	
2C	13	
2D	00	
2E	13	
2F	00	
30	13	
31	00	
32	15	
33	00	
34	13	
35	00	
36	13	
37	00	
38	13	
39	00	
3A	15	
3B	00	
3C	00	
3D	00	
3E	00	
3F	00	
40	00	
41	00	
60	F1	Color reproduction adj.
61	FB	
62	5E	
63	65	
64	F8	
65	06	
66	69	
67	5C	
72	12	Strobe adj.
73	00	
74	18	
75	00	

Table. 6-1-4.

6. 6F Page Adjustment Address

Address	Initial value	Remark
10	FF	AF illumination check
11	FF	
12	FF	
13	FF	
14	FF	
15	FF	
16	FF	
17	FF	
18	1C	Wide limit adj./Flange back adj.
19	E8	
1A	20	Flange back adj.
1B	A8	
1C	1D	
1D	88	
1E	00	
1F	00	
20	00	
21	00	
22	00	
23	00	
24	20	
25	20	
26	80	
27	46	
28	0A	
29	00	
2A	00	
2B	00	
2C	00	
2D	00	
2E	00	
2F	00	
30	00	
31	00	
32	00	
33	00	
34	00	
35	00	
36	00	
37	00	
38	00	
39	00	
3A	00	
3B	00	
3C	00	
3D	00	
3E	FF	Wide limit adj/
3F	FF	Flange back adj
40	00	Flange back adj.
41	00	
42	00	
43	00	
44	00	
45	00	
46	00	
47	00	Flange back adj.
48	00	
49	00	
4A	00	
4B	00	
4C	00	
4D	00	
4E	00	
4F	00	
50	00	
51	00	
52	00	
53	00	
60	00	F No. standard data input
61	00	
62	00	
63	00	
64	00	
65	30	Light value adj.
66	FE	
67	6D	
6B	FF	F No. standard data input/
6C	00	Mechanical shutter adj.
6D	00	
B8	10	Mechanical shutter adj.
B9	6B	
BA	0F	
BB	F6	
BC	0F	
BD	F7	
BE	0F	
BF	F2	
C0	0F	
C1	F7	
C2	00	
C3	00	
C4	00	
C5	00	
C6	00	
C7	30	
C8	1B	
C9	12	
CA	0D	
CB	08	
CC	80	
CD	88	
CE	98	
CF	90	
D0	88	
D1	00	
D2	00	
D3	00	
D4	00	
D5	00	
D6	00	
D7	14	

6F page

Address	Initial value	Remark
D8	FF	Strobe adj.
D9	FF	
DA	FF	
DB	00	
DC	00	
DD	00	
DE	00	
DF	00	
E0	00	
E1	00	
E2	00	
E3	00	
E4	00	
E5	00	
E6	00	
E7	00	
E8	00	
E9	00	
EA	00	
EB	00	
EC	00	
ED	00	
EE	00	
EF	00	

Table. 6-1-5.

7. 8E Page Adjustment Address

Address	Remark
C8	Fixed data-2

Table. 6-1-6.

8. 8F Page Adjustment Address

Address	Initial value	Remark
23	80	VCO adj. (LCD)
24	A2	V COM adj. (LCD)
25	91	Bright adj. (LCD)
28	80	White balance adj.(1) (LCD)
29	80	White balance adj.(2) (LCD)
2A	80	White balance adj.(1) (LCD)
2B	80	White balance adj.(2) (LCD)
2C	45	Contrast adj. (LCD)
D0	80	Video output level adj.

Table. 6-1-7.

1-3. VIDEO SYSTEM ADJUSTMENTS

1. Video Output Level Adjustment (SY-95 board)

Adjust the sync level of the composite video signal output.

Mode	PLAY (▶)
Signal	No signal
Measurement Point	Video terminal of AV OUT jack of the cradle (75Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	8F
Adjustment Address	D0
Specified Value	Sync level: A=286 ± 5mV (NTSC mode) A=300 ± 5mV (PAL mode) Burst level: B=286 ± 30mV (NTSC mode) B=300 ± 30mV (PAL mode)

Switch setting:

VIDEO OUT (SETUP 2)..... (NTSC mode)
..... (PAL mode)

Adjusting method:

Order	Page	Address	Data	Procedure
1	00	01	01	Set the data.
2	60	C1		Read the data, and check it is “01”.
3	80	70	01	Set the data.
4	8F	D0		Change the data and set the sync level (A) to the specified value.
5				Check that the burst level (B) satisfies the specified value.
6	80	70	00	Write the data.
7				Save the data.
8				Wait for 3 sec.
9	00	01	00	Set the data.

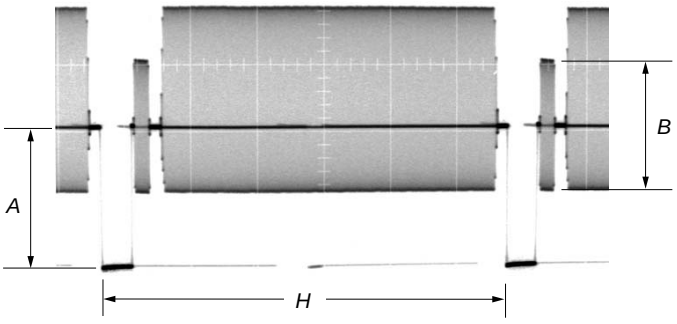


Fig. 6-1-8.

1-4. CAMERA SYSTEM ADJUSTMENTS

Before perform the camera system adjustments, check that the specified values of “VIDEO SYSTEM ADJUSTMENT” are satisfied.

1. Data Setting during Camera System Adjustments

Perform the following data setting before the camera system adjustments.

Note: When the power is turned off, some data settings will be released. So perform this data setting again when the power is turned off.

Order	Page	Address	Data	Procedure
1	00	01	01	Set the data.
2	4F	B7	01	Set the data.
3	2F	23	01	Set the data.
4	60	C1		Read the data, and check it is “02”.
5	80	70	01	Set the data.
6	60	6C	01	Set the data.
7	60	2C	01	Set the data.

After completing the camera system adjustments, release the data setting.

Order	Page	Address	Data	Procedure
1	00	01	01	Set the data.
2	4F	B7	00	Set the data.
3	2F	23	80	Set the data.
4				Save the data.
5				Wait for 3 sec.
6	00	01	00	Set the data.

2. Wide Limit Adjustment

Adjusted the dispersion of the wide-end of the inner focus lens.

Adjustment Page	6F
Adjustment Address	18, 19

2-1. Adjusting method when the lens device is replaced:

Adjusting method:

Order	Page	Address	Data	Procedure
1	00	01	01	Set the data.
2	6F	18		Set the data. (Note)
3	6F	19		Set the data. (Note)
4	7C	16	00	Set the data.
5				Save the data.
6				Wait for 3 sec.
7				Perform “Flange Back Adjustment”.

Note: The data of the addresses 18 and 19, which must be set at Steps 2 and 3, are written on the lens device for service replacement. Four digits hexadecimal number is written on the lens. Please set the upper 2 digits of the number to the address 18, and set the lower 2 digits to the address 19.

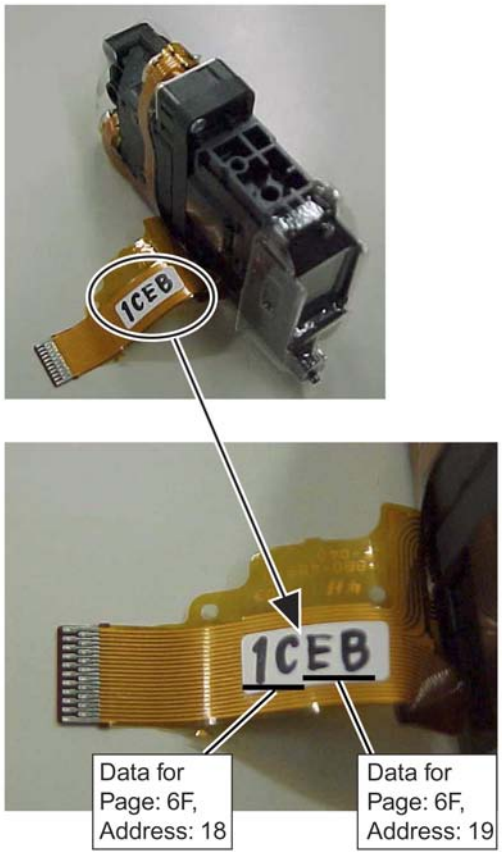


Fig.6-1-10.

2-2. Adjusting method when it is not necessary to replace the lens device and when the SY-95 board is replaced:

When the data of page: 6F, address: 18 and 19 can be read from the defective board before replacing it. And when both of the data are not “00”.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	00	01	01	Set the data.
2	6F	18		Set the read data.
3	6F	19		Set the read data.
4	7C	16	00	Set the data.
5				Save the data.
6				Wait for 3 sec.
7				Perform “Flange Back Adjustment”.

When the data of page: 6F, address: 18 and 19 can be read from the defective board before replacing it. And when both of the data are “00”.

1) Replace the lens device and perform “2-1. Adjusting method when the lens device is replaced.”

When the data of page: 6F, address: 18 and 19 cannot be read from the defective board.

1) Replace the lens device and perform “2-1. Adjusting method when the lens device is replaced.”

Note: The data of address 16 of page 7C, set at Step 4 of the adjustment method of 2-1 and 2-2, is “01” in the state of shipment of the factory. However, it is “00” when it is adjusted according to the service manual.

3. Flange Back Adjustment

The inner focus lens flange back adjustment is carried out automatically. In whichever case, the focus will be deviated during auto focusing/manual focusing.

Mode	STILL (📷)
Subject	Flange back adjustment jig or minipattern box (Siemens star chart with ND filter (Note1))
Measurement Point	Data of page: 6F, address: 24, 3E, 3F
Measuring Instrument	
Adjustment Page	6F
Adjustment Address	18 to 53
Specified value1	00
Specified value2	0A to 40

Note1: Dark siemens star chart.
Note2: If the data of page: 60, address: 02 is "01", select page: 60, address: 01, and set data: 00.
Note3: When performing "Flange Back Adjustment", connect the cables after disassembling the cradle. Unless the cradle is disassembled, the USB cable and the power cable will interfere with the flange back adjustment jig or mini pattern box, and thus the subject cannot be set correctly.

Preparations for the minipattern box:

1) The minipattern box is installed as shown in the following figure.
   Note: The attachment lenses are not used.
2) Install the minipattern box so that the distance between it and the front of the lens of the camera is less than 3cm.
3) Make the height of the minipattern box and the camera equal.
4) Check that the output voltage of the regulated power supply is the specified voltage.
5) Check that at both the zoom lens TELE end and WIDE end, the center of the siemens star chart and center of the exposure screen coincide.

Specified voltage:

The specified voltage varies according to the minipattern box, so adjust the power supply output voltage to the specified voltage written on the sheet which is supplied with the minipattern box.

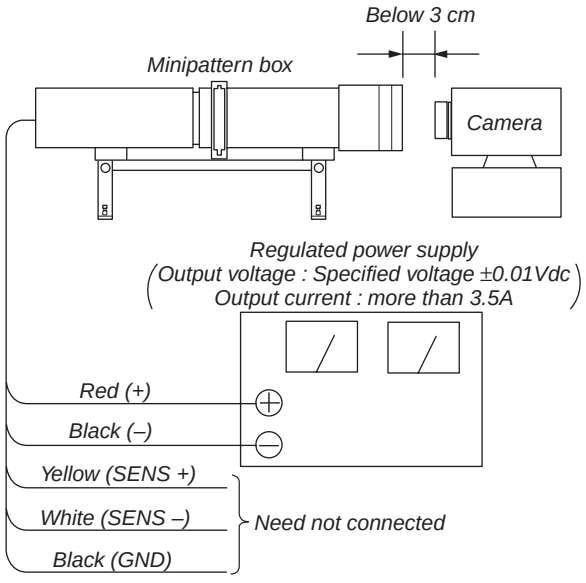


Fig.6-1-11.

Preparations for the flange back adjustment jig:

1) Install the flange back adjustment jig so that the distance between it and the front of the lens of the camera is less than 3cm.
2) Adjust the illumination intensity to the chart of the flange back adjustment jig. (300 to 400 lux)

Data setting when the lens device is replaced:

Note4: Perform this data setting only when the lens device is replaced.

Order	Page	Address	Data	Procedure
1	00	01	01	Set the data.
2	6F	3E	FF	Set the data.

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during Camera System Adjustments" is performed.
2	60	01	13	Set the data.
3				Wait for 1sec. When the flange back adjustment jig is used, check that optimum image is obtained.
4	60	01	27	Set the data.
5				Wait until the movement of the lens stops.
6	60	02		Read the data, and check it is "01". (Note5)
7	6F	3E		Read the data, and check it satisfies the specified value 1.
8	6F	3F		Read the data, and check it satisfies the specified value 1.
9	6F	24		Read the data, and check it satisfies the specified value 2.

Note5: The adjustment data will be automatically input to page: 6F, address: 18 to 53

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2				Turn off the power and turn on again.
3				Perform "Flange Back Check".
4				If finish the camera system adjustments, release the data setting. (See "1. Data Setting during Camera System Adjustments".)

4. Flange Back Check

Mode	STILL (📷)
Subject	Siemens star (1.0 m from the front of the lens) (Luminance : 200 to 400 lux)
Measurement Point	Check operation on TV monitor (under scan mode)
Measuring Instrument	
Specified Value	The lens is focused.

Switch setting:

ZOOM ..... TELE end

MACRO (🌷) ..... OFF

Checking method:

Order	Page	Address	Data	Procedure
1				Turn off the power and turn on again
2				Place the siemens star 1.0 m from the front of the lens.
3				Shoot the siemens star with the zoom TELE end.
4	60	8C	30	Set the data.
5				Observe the TV monitor and check that the lens is focused.
6	60	2C	01	Set the data.
7				Press the ZOOM WIDE button and check that zoom operation is normal.
8				Shoot the Siemens star with the zoom WIDE end.
9				Observe the TV monitor and check that the lens is focused.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	8C	00	Set the data.

5. Picture Frame Setting

Mode	STILL (📷)
Subject	Color bar chart and clear chart (Standard picture frame) About 30cm (PTB-450) or 12cm (PTB-1450) from the front of the lens
Measurement Point	Video terminal of A/V OUT jack of the cradle
Measuring Instrument	Oscilloscope and TV monitor
Specified Value	A=C=B/2, E=F

Switch setting:

ZOOM ..... WIDE end
MACRO (🌷) ..... ON
SCENE (Menu setting) ..... AUTO

Setting method:

Order	Page	Address	Data	Procedure
1				Turn off the power and turn on again
2				Shoot the color bar chart with the zoom WIDE end.
3				Adjust the direction and distance between the pattern box and camera, and set the picture frame to the specified position.
4				Perform “1. Data Setting during Camera System Adjustments”.
5				Remove the color bar chart and set the clear chart.
6				Check that the whole of the screen is white. If not, adjust the direction and distance slightly.
7	10	44		Read the data, and this data named YH.
8	10	45		Read the data, and this data named YL.
9				Perform the following adjustments.

How to reset the zoom and focus when they deviated:

If the zoom and focus deviated due to some reason reset them in the following method.

Order	Page	Address	Data	Procedure
1	60	90	00	Set the data.
2	60	91	00	Set the data.
3	60	92	YL	Set the data. Note
4	60	93	YH	Set the data. Note
5	60	01	79	Set the data.
6				Wait until the movement of the lens stops.
7	60	07		Read the data, and check it is “01”.
8	60	01	00	Set the data.

Note: YH and YL are the data read in the “Setting method”.

Check on an oscilloscope

1. Horizontal period

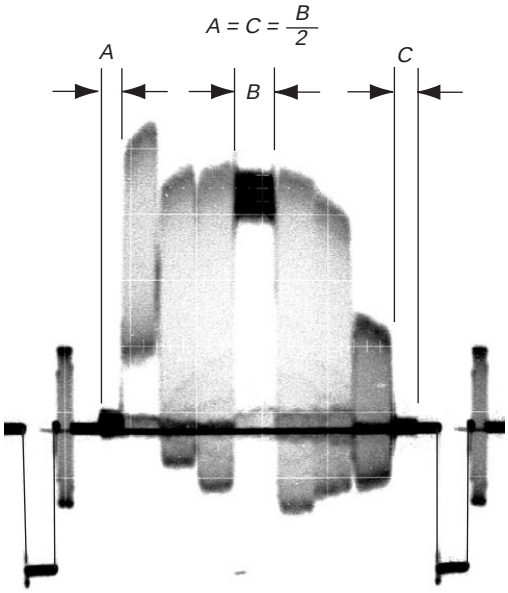


Fig. 6-1-12.

2. Vertical period

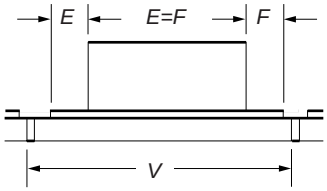


Fig. 6-1-13.

Check on the monitor TV (Underscanned mode)

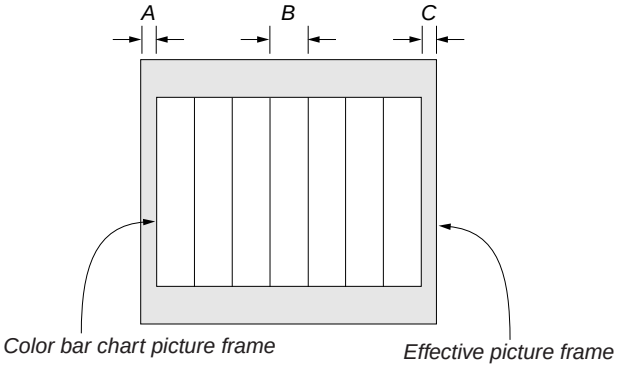


Fig. 6-1-14.

6. F No. Compensation

Adjusted the dispersion of the iris to every to every F number, and compensate the exposure.

Mode	STILL (📷)
Subject	Clear chart (Standard picture frame)
Measurement Point	Data of page: 6F, address: 6B
Measuring Instrument	
Adjustment Page	6F
Adjustment Address	60 to 64, 6B to 6D
Specified value	00

Note1: If the data of page: 60, address: 02 is "01", select page: 60, address: 01, and set data: 00.

Switch setting:

ZOOM ..... WIDE end

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during Camera System Adjustments" is performed.
2				Check the picture frame. If deviated, perform "5. Picture Frame Setting".
3	60	01	BB	Set the data.
4				Wait for 15 sec.
5	60	02		Read the data, and check it is "01". (Note2)
6	6F	6B		Read the data, and check it satisfies the specified value.

Note2: The adjustment data will be automatically input to page: 6F, address: 60 to 64, 6B to 6D.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2				If finish the camera system adjustments, release the data setting. (See "1. Data Setting during Camera System Adjustments".)

7. Mechanical Shutter Adjustment

Adjust the dispersion of the opening/closing time and the closing loss rate of the mechanical shutter. and compensate the exposure.

Mode	STILL (📷)
Subject	Clear chart (Standard picture frame)
Measurement Point	Data of page: 6F, address: 6B
Measuring Instrument	
Adjustment Page	6F
Adjustment Address	6B to 6D, B8 to D7
Specified value	00

Note1: If the data of page: 60, address: 02 is "01", select page: 60, address: 01, and set data: 00.

Switch setting:

ZOOM ..... WIDE end

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during Camera System Adjustments" is performed.
2				Check the picture frame. If deviated, perform "5. Picture Frame Setting".
3	60	01	AD	Set the data.
4				Wait until the movement of the shutter stops.
5	60	02		Read the data, and check it is "01". (Note2)
6	6F	6B		Read the data, and check it satisfies the specified value.

Note2: The adjustment data will be automatically input to page: 6F, address: 6B to 6D, B8 to D7.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2				If finish the camera system adjustments, release the data setting. (See "1. Data Setting during Camera System Adjustments".)

8. Light Value Adjustment

Adjust the standard LV value.

Mode	STILL (📷)
Subject	Clear chart (Standard picture frame)
Measurement Point	Data of page: 10, address: 0C, 0D
Measuring Instrument	Data of page: 6F, address: 65
Adjustment Page	6F
Adjustment Address	65 to 67
Specified value1	0FE0 to 1020
Specified value2	30 to 60
Specified value3	00 to 26

Note1: If the data of page: 60, address: 02 is "01", select page: 60, address: 01, and set data: 00.

Switch setting:

ZOOM ..... WIDE end

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during Camera System Adjustments" is performed.
2				Check the picture frame. If deviated, perform "5. Picture Frame Setting".
3	60	01	0D	Set the data.
4				Wait for 2 sec.
5	60	02		Read the data, and check it is "01". (Note2)
6	10	0C		Read the data, and this data is named D_{0C}.
7	10	0D		Read the data, and this data is named D_{0D}.
8				Calculate D_{LV} using the following equation (Hexadecimal calculation) $D_{LV} = D_{0C} \times 100 + D_{0D}$
9				Check that D_{LV} satisfies the specified value1.
10	6F	65		Read the data, and check it satisfies the specified value2.
11	60	01	00	Set the data.
12				Wait for 1 sec.
13	60	12	A2	Set the data.
14	60	13	A8	Set the data.
15	60	14	8A	Set the data.
16				Wait for 1 sec.
17	10	0C		Read the data, and this data is named D_{0C}.
18	10	0D		Read the data, and this data is named D_{0D}.
19				Calculate D_{AE} using the following equation (Hexadecimal calculation) $D_{AE} = D_{0C} \times 100 + D_{0D}$
20	77	5E	00	Set the data.
21				Wait for 1 sec.
22	10	0C		Read the data, and this data is named D_{0C}.
23	10	0D		Read the data, and this data is named D_{0D}.
24				Calculate D_{AE100} using the following equation (Hexadecimal calculation) $D_{AE100} = D_{0C} \times 100 + D_{0D}$
25				Check that the difference of D_{AE} and D_{AE100} satisfies the specified value3. (Hexadecimal).

Note2: The adjustment data will be automatically input to page: 6F, address: 65 to 67.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2	60	12	00	Set the data.
3	60	13	00	Set the data.
4	60	14	00	Set the data.
5	77	5E	1E	Set the data.
6				Save the data.
7				Wait for 3 sec.
8				Perform next adjustment. If finish the camera system adjustments, release the data setting. (See "1. Data Setting during Camera System Adjustments".)

9. Auto White Balance 3200K Standard Data Input

Adjust the white balance standard data at 3200K.

Mode	STILL (📷)
Subject	Clear chart (Standard picture frame)
Measurement Point	Data of page: 6E, address: 4F
Measuring Instrument	
Adjustment Page	6E
Adjustment Address	04 to 21
Specified value	00

Note1: If the data of page: 60, address: 02 is "01", select page: 60, address: 01, and set data: 00.

Switch setting:

ZOOM ..... WIDE end

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during Camera System Adjustments" is performed.
2				Check the picture frame. If deviated, perform "5. Picture Frame Setting".
3	6E	4F	FF	Set the data.
4	60	36	01	Set the data.
5	60	01	0B	Set the data.
6				Wait for 5 sec.
7	60	02		Read the data, and check it is "01". (Note2)
8	6E	4F		Read the data, and check it satisfies the specified value.

Note2: The adjustment data will be automatically input to page: 6E, address: 04 to 21.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2	60	36	00	Set the data.
3				Wait for 1 sec.
4	60	37		Read the data, and check it is "00".
5				Perform "Auto White Balance 5800K Standard Data Input". If finish the camera system adjustments, release the data setting. (See "1. Data Setting during Camera System Adjustments".)

10. Auto White Balance 5800K Standard Data Input

Adjust the white balance standard data at 5800K.

Mode	STILL (📷)
Subject	Clear chart (Standard picture frame)
Filter	Filter C14 for color temperature correction
Measurement Point	Data of page: 6E, address: 4F
Measuring Instrument	
Adjustment Page	6E
Adjustment Address	00 to 03, 24 to 41
Specified value	00

Note1: Before perform this adjustment, perform "Auto White Balance 3200K Standard Data Input".

Note2: If the data of page: 60, address: 02 is "01", select page: 60, address: 01, and set data: 00.

Switch setting:

ZOOM ..... WIDE end

Adjusting method:

Order	Page	Address	Data	Procedure
1				Place the C14 filter for color temperature correction on the lens.
2				Check that "1. Data Setting during Camera System Adjustments" is performed.
3				Check the picture frame. If deviated, perform "5. Picture Frame Setting".
4	6E	00	00	Set the data.
5	6E	01	00	Set the data.
6	6E	02	00	Set the data.
7	6E	03	00	Set the data.
8	6E	4F	FF	Set the data.
9	60	36	02	Set the data.
10	60	01	A5	Set the data.
11				Wait for 5 sec.
12	60	02		Read the data, and check it is "01". (Note3)
13	6E	4F		Read the data, and check it satisfies the specified value.

Note3: The adjustment data will be automatically input to page: 6E, address: 24 to 41.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2	60	36	00	Set the data.
3				Wait for 1 sec.
4	60	37		Read the data, and check it is "00".
5				Perform "Auto White Balance 5800K Check". If finish the camera system adjustments, release the data setting. (See "1. Data Setting during Camera System Adjustments".)

11. Auto White Balance 5800K Check

Check that the white balance standard data at 5800K are inputted properly.

Mode	STILL (📷)
Subject	Clear chart (Standard picture frame)
Filter	Filter C14 for color temperature correction
Measurement Point	Data of page: 6E, address: 4F
Measuring Instrument	
Specified value	00

Note1: Before perform this adjustment, perform "Auto White Balance 5800K Standard Data Input".
Note2: If the data of page: 60, address: 02 is "01", select page: 60, address: 01, and set data: 00.

Switch setting:
ZOOM ..... WIDE end

Adjusting method:

Order	Page	Address	Data	Procedure
1				Place the C14 filter for color temperature correction on the lens.
2				Check that "1. Data Setting during Camera System Adjustments" is performed.
3				Check the picture frame. If deviated, perform "5. Picture Frame Setting".
4	6E	4F	FF	Set the data.
5	60	36	04	Set the data.
6	60	01	3F	Set the data.
7				Wait for 10 sec.
8	60	02		Read the data, and check it is "01".
9	6E	4F		Read the data, and check it satisfies the specified value.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2	60	36	00	Set the data.
3				Wait for 1 sec.
4	60	37		Read the data, and check it is "00".
5				Remove the C14 filter.
6				Perform next adjustments. If finish the camera system adjustments, release the data setting. (See "1. Data Setting during Camera System Adjustments".)

12. Auto White Balance 3200K Check

Check that the white balance standard data at 3200K are inputted properly.

Mode	STILL (📷)
Subject	Clear chart (Standard picture frame)
Measurement Point	Data of page: 6E, address: 4F
Measuring Instrument	
Specified value	00

Note1: Before perform this adjustment, perform "Auto White Balance 3200K Standard Data Input".
Note2: If the data of page: 60, address: 02 is "01", select page: 60, address: 01, and set data: 00.

Switch setting:
ZOOM ..... WIDE end

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during Camera System Adjustments" is performed.
2				Check the picture frame. If deviated, perform "5. Picture Frame Setting".
3	6E	4F	FF	Set the data.
4	60	36	03	Set the data.
5	60	01	0F	Set the data.
6				Wait for 10 sec.
7	60	02		Read the data, and check it is "01".
8	6E	4F		Read the data, and check it satisfies the specified value.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2	60	36	00	Set the data.
3				Wait for 1 sec.
4	60	37		Check the data, and check it is "00".
5				Perform next adjustments. If finish the camera system adjustments, release the data setting. (See "1. Data Setting during Camera System Adjustments".)

13. CCD Linearity Check

Data picking is done to keep output linearity of the CCD imager, even if the input level of CCD imager changes.

Mode	STILL (📷)
Subject	Clear chart (Standard picture frame)
Measurement Point	Data of page: 10, address: 80, 81, 82, 83
Measuring Instrument	
Specified value1	97 to 103 (Note1)
Specified value2	94 to 106 (Note1)
Specified value3	92 to 108 (Note1)

Note1: Decimal number.
Note2: If the data of page: 60, address: 02 is "01", select page: 60, address: 01, and set data: 00.
Note3: For the bit values, refer to "6-2. SERVICE MODE", "2-2. 2. Bit value discrimination".

Switch setting:

ZOOM ..... WIDE end

Preparation:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during Camera System Adjustments" is performed.
2				Check the picture frame. If deviated, perform "5. Picture Frame Setting".
3	75	09		Read the data, and memorize it.
4	75	09	04	Set the data.
5	77	F6		Read the data, and memorize it.
6	77	F6		Set Bit2 of the data to "0". (Note3)
7	77	F7		Read the data, and memorize it.
8	77	F7		Set Bit6 of the data to "1". (Note3)
9	77	F2		Read the data, and memorize it.
10	77	F2		Set Bit6 of the data to "0". (Note3)
11	77	F2		Set Bit0 of the data to "0". (Note3)
12	77	72		Read the data, and memorize it.
13	60	14	90	Set the data.
14	60	12	9F	Set the data.
15	60	05	16	Set the data.
16	75	17		Read the data, and memorize it.
17	75	17	50	Set the data.
18	75	18		Read the data, and memorize it.
19	75	18	00	Set the data.
20	75	19		Read the data, and memorize it.
21	75	19	EC	Set the data.
22	75	1A		Read the data, and memorize it.
23	75	1A	27	Set the data.
24	75	1B		Read the data, and memorize it.
25	75	1B	53	Set the data.
26				Wait for 2 sec.

Checking method:

Order	Page	Address	Data	Procedure
1				Perform "Preparation" before this adjustment.
2	60	01	F9	Set the data.
3				Wait for 3 sec.
4	60	E1		Read the data, and check it is "08".
5	10	80		Read the data, and this data is named D_{80}.
6	10	81		Read the data, and this data is named D_{81}.
7				Calculate D_{RG0} using the following equation (Hexadecimal calculation) $D_{RG0} = D_{80} \times 100 + D_{81}$
8	10	82		Read the data, and this data is named D_{82}.
9	10	83		Read the data, and this data is named D_{83}.
10				Calculate D_{BG0} using the following equation (Hexadecimal calculation) $D_{BG0} = D_{82} \times 100 + D_{83}$
11	60	01	00	Set the data.
12	60	E1	00	Set the data.
13	77	72	54	Set the data.
14				Wait for 2 sec.
15	60	01	F9	Set the data.
16				Wait for 3 sec.
17	60	E1		Read the data, and check it is "08".
18	10	80		Read the data, and this data is named D_{80}.
19	10	81		Read the data, and this data is named D_{81}.
20				Calculate D_{RG1} using the following equation (Hexadecimal calculation) $D_{RG1} = D_{80} \times 100 + D_{81}$
21	10	82		Read the data, and this data is named D_{82}.
22	10	83		Read the data, and this data is named D_{83}.
23				Calculate D_{BG1} using the following equation (Hexadecimal calculation) $D_{BG1} = D_{82} \times 100 + D_{83}$
24	60	01	00	Set the data.
25	60	E1	00	Set the data.
26	77	72	0A	Set the data.
27	60	12	A2	Set the data.
28				Wait for 2 sec.
29	60	01	F9	Set the data.
30				Wait for 3 sec.
31	60	E1		Read the data, and check it is "08".
32	10	80		Read the data, and this data is named D_{80}.
33	10	81		Read the data, and this data is named D_{81}.

Order	Page	Address	Data	Procedure
34				Calculate D_{RG2} using the following equation (Hexadecimal calculation) $D_{RG2} = D_{80} \times 100 + D_{81}$
35	10	82		Read the data, and this data is named D_{82}.
36	10	83		Read the data, and this data is named D_{83}.
37				Calculate D_{BG2} using the following equation (Hexadecimal calculation) $D_{BG2} = D_{82} \times 100 + D_{83}$
38	60	01	00	Set the data.
39	60	E1	00	Set the data.
40	77	72	0A	Set the data.
41				Wait for 2 sec.
42	60	01	F9	Set the data.
43				Wait for 3 sec.
44	60	E1		Read the data, and check it is “08”.
45	10	80		Read the data, and this data is named D_{80}.
46	10	81		Read the data, and this data is named D_{81}.
47				Calculate D_{RG3} using the following equation (Hexadecimal calculation) $D_{RG3} = D_{80} \times 100 + D_{81}$
48	10	82		Read the data, and this data is named D_{82}.
49	10	83		Read the data, and this data is named D_{83}.
50				Calculate D_{BG3} using the following equation (Hexadecimal calculation) $D_{BG3} = D_{82} \times 100 + D_{83}$
51				Convert D_{RG0}, D_{BG0}, D_{RG1}, D_{BG1}, D_{RG2}, D_{BG2}, D_{RG3} and D_{BG3} to decimal number, and obtain D_{RG0}', D_{BG0}', D_{RG1}', D_{BG1}', D_{RG2}', D_{BG2}', D_{RG3}' and D_{BG3}'.
52				Calculate R/G ratio (1), B/G ratio (1), R/G ratio (2), B/G ratio (2), R/G ratio (3) and B/G ratio (3), using the following equations (Decimal calculation) $R/G\ ratio\ (1) = (D_{RG1}' / D_{RG0}') \times 100$ $B/G\ ratio\ (1) = (D_{BG1}' / D_{BG0}') \times 100$ $R/G\ ratio\ (2) = (D_{RG2}' / D_{RG0}') \times 100$ $B/G\ ratio\ (2) = (D_{BG2}' / D_{BG0}') \times 100$ $R/G\ ratio\ (3) = (D_{RG3}' / D_{RG0}') \times 100$ $B/G\ ratio\ (3) = (D_{BG3}' / D_{BG0}') \times 100$
53				Check that R/G ratio (1) satisfies the specified value 1. (Decimal number)
54				Check that B/G ratio (1) satisfies the specified value 1. (Decimal number)
55				Check that R/G ratio (2) satisfies the specified value 2. (Decimal number)
56				Check that B/G ratio (2) satisfies the specified value 2. (Decimal number)
				Linearity check of very low luminance
57				Check that R/G ratio (3) satisfies the specified value 3. (Decimal number)
58				Check that B/G ratio (3) satisfies the specified value 3. (Decimal number)

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2	60	E1	00	Set the data.
3	60	12	00	Set the data.
4	60	14	00	Set the data.
5	75	09		Set the data memorized at “Preparation”.
6	77	F6		Set the data memorized at “Preparation”.
7	77	F7		Set the data memorized at “Preparation”.
8	77	F2		Set the data memorized at “Preparation”.
9	77	72		Set the data memorized at “Preparation”.
10	60	05	00	Set the data.
11	75	17		Set the data memorized at “Preparation”.
12	75	18		Set the data memorized at “Preparation”.
13	75	19		Set the data memorized at “Preparation”.
14	75	1A		Set the data memorized at “Preparation”.
15	75	1B		Set the data memorized at “Preparation”.
16				Save the data.
17				Wait for 3 sec.
18				Perform next adjustments. If finish the camera system adjustments, release the data setting. (See “1. Data Setting during Camera System Adjustments”.)

14. Color Reproduction Adjustment

Adjust the color reproduction of yellow, red, blue and cyan so that proper color reproduction is produced.

Mode	STILL (📷)
Subject	Color bar chart (Standard picture frame)
Measurement Point	Video terminal of A/V OUT jack of the cradle
Measuring Instrument	NTSC vectorscope
Adjustment Page	6E
Adjustment Address	60 to 67
Specified value 1	Data of page: 6E, address: 4F is “00”
Specified value 2	Each center of all color luminance points should settle within each color reproduction frame.

Note1: If the data of page: 60, address: 02 is “01”, select page: 60, address: 01, and set data: 00.

Switch setting:

ZOOM ..... WIDE end
VIDEO OUT (SET UP of Menu) ..... NTSC

Adjusting method:

Order	Page	Address	Data	Procedure
1				Install the color bar chart.
2				Check that “1. Data Setting during Camera System Adjustments” is performed.
3				Check the picture frame. If deviated, perform “5. Picture Frame Setting”.
4	7A	00		Read the data, and this data is named D_{00}.
5	7A	00	00	Set the data.
6	6E	4F	FF	Set the data.
7	60	01	AB	Set the data.
8				Wait for 1 sec.
9	60	01	A9	Set the data.
10				Wait until the color of the screen stops changing.
11	60	02		Read the data, and check it is “01”. (Note2)
12	6E	4F		Read the data, and check it satisfies the specified value 1.
13				Adjust the GAIN and PHASE of the vectorscope so that the burst luminance point is set at the specified position.
14				Check that each center of all color luminance points is set in each color reproduction frame.

Note2: The adjustment data will be automatically input to page: 6E, address: 60 to 67.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2	7A	00		Set the data memorized at “Adjusting method”.
3				Save the data.
4				Wait for 3 sec.
5				Perform “Color Reproduction Check”. If finish the camera system adjustments, release the data setting. (See “1. Data Setting during Camera System Adjustments”.)

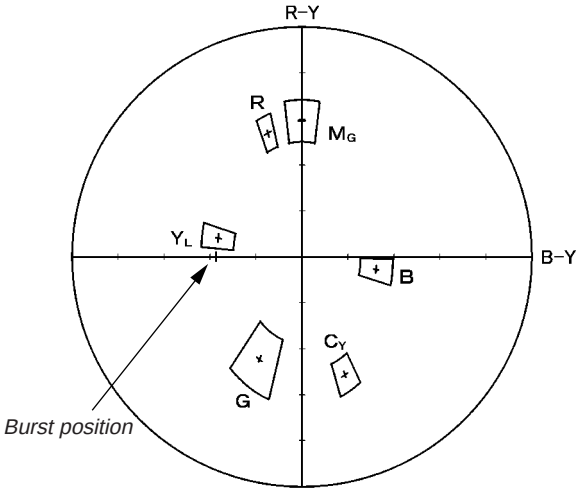


Fig. 6-1-15.

15. CCD White Defect Compensation Check

The positions of the white defective pixel are detected, and check that the pixels can be corrected.

Mode	STILL (📷)
Subject	Clear chart (Standard picture frame)
Measurement Point	Data of page: 60, address: 55
Measuring Instrument	
Specified value 1	00 to 40
Specified value 2	00

Note: If the data of page: 60, address: 02 is "01", select page: 60, address: 01, and set data: 00.

Switch setting:

ZOOM ..... WIDE end

Adjusting method:

Order	Page	Address	Data	Procedure
1				Install the clear chart.
2				Check that "1. Data Setting during Camera System Adjustments" is performed.
3				Check the picture frame. If deviated, perform "5. Picture Frame Setting".
4	7D	64		Read the data, and memorize the data.
5	7D	64	1E	Set the data.
6	7D	69		Read the data, and memorize the data.
7	7D	69	28	Set the data.
8	60	01	8B	Set the data.
9				Wait for 30sec.
10	60	02		Read the data, and check it is "01".
11	60	55		Read the data, and check it satisfies the specified value 1.
12	60	01	00	Set the data.
13				Wait for 1sec.
14	7D	64	0F	Set the data.
15	7D	69	C0	Set the data.
16	60	01	87	Set the data.
17				Wait for 30sec.
18	60	02		Read the data, and check it is "01".
19	60	55		Read the data, and check it satisfies the specified value 2.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2	7D	64		Set the data memorized at "Adjusting method".
3	7D	69		Set the data memorized at "Adjusting method".
4				Save the data.
5				Wait for 3 sec.
6				Perform next adjustments. If finish the camera system adjustments, release the data setting. (See "1. Data Setting during Camera System Adjustments".)

16. CCD Black Defect Compensation Check

The positions of the black defective pixel are detected, and check that the pixels can be corrected. And confirms that there is no trash in the surface of the CCD imager, the optical filter and the inside of the lens.

Mode	STILL (📷)
Subject	Clear chart (Standard picture frame)
Measurement Point	Data of page: 60, address: 55
Measuring Instrument	
Specified value 1	00 to 30
Specified value 2	00

Note1: Check that there are no dust, no dirt and no reflection on the clear chart.

Note2: If the data of page: 60, address: 02 is "01", select page: 60, address: 01, and set data: 00.

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during Camera System Adjustments" is performed.
2				Check the picture frame. If deviated, perform "5. Picture Frame Setting".
3	7D	65		Read the data, and memorize the data.
4	7D	65	0A	Set the data.
5	60	90	00	Set the data.
6	60	91	03	Set the data.
7	60	92	00	Set the data.
8	60	93	00	Set the data.
9	60	01	79	Set the data.
10	60	30	08	Set the data.
11	60	07		Read the data, and check it is "01".
12				Check that the whole of the screen is white.
13	60	01	8D	Set the data.
14				Wait for 30 sec.
15	60	02		Read the data, and check it is "01".
16	60	55		Read the data, and check it satisfies the specified value 1. If the data is "00", proceed to "Processing after Completing Adjustments"
17	60	01	00	Set the data.
18				Wait for 1 sec.
19	7D	65	0E	Set the data.
20	60	01	89	Set the data.
21				Wait for 30 sec.
22	60	02		Read the data, and check it is "01".
23	60	55		Read the data, and check it satisfies the specified value 2.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2				Wait for 1 sec.
3	60	2C	00	Set the data.
4	60	30	00	Set the data.
5	60	91	00	Set the data.
6	7D	65		Set the data memorized at "Adjusting method".
7				Save the data.
8				Wait for 3 sec.
9				Perform next adjustments. If finish the camera system adjustments, release the data setting. (See "1. Data Setting during Camera System Adjustments".)

17. Strobe Adjustment

Adjust the light level and white balance when the strobe light flashes.

Mode	STILL (📷)	
Subject	Background paper (J-2501-130-A) (50cm from the front of the lens)	
Measurement Point	Data of page 6F, address: DC	
Measuring Instrument	Data of page 6E, address: 4F	
Adjustment Page	6F	6E
Adjustment Address	D8 to EF	72 to 75
Specified Value1	03 to 09	
Specified Value2	00	

Note1: Perform this adjustment in the dark room or use the flash adjustment box.
Note2: Any light other than the strobe light should not light up the plate.
Note3: After the power is turned on, this adjustment can be done only once.
Note4: If the data of page: 60, address: 02 is "01", select page: 60, address: 01, and set data: 00.

Switch setting:

ZOOM ..... WIDE end

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during Camera System Adjustments" is performed.
2	60	2C	01	Set the data.
3	60	90	00	Set the data.
4	60	91	00	Set the data.
5	60	92	FF	Set the data.
6	60	93	FF	Set the data.
7	60	6C	01	Set the data.
8	60	01	79	Set the data.
9				Wait for 5 sec.
10	60	07		Read the data, and check it is "01".
11	6E	4F	FF	Set the data.
12	60	01	B9	Set the data.
13				Check the flashing.
14	60	02		Read the data, and check it is "01". (Note5)
15	6F	D8		Read the data, and check it is "00".
16	60	01	00	Set the data.
17				Wait for 5 sec.
18	60	ED		Read the data, and check it is "02".
19				Wait for 1 sec.
20	60	01	E7	Set the data.
21				Check the flashing.
22	60	02		Read the data, and check it is "01".
23	6F	D8		Read the data, and check it is "00".
24	6F	DC		Read the data, and check it satisfies the specified value 1.
25	6E	4F		Read the data, and check it satisfies the specified value 2.

Note5: The adjustment data will be automatically input to page: 6F, address: D8 to EF and to page: 6E, address: 72 to 75.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2	60	2C	00	Set the data.
3	60	6C	00	Set the data.
4	60	90	00	Set the data.
5	60	91	00	Set the data.
6	60	92	00	Set the data.
7	60	93	00	Set the data.
8				If finish the camera system adjustments, release the data setting. (See "1. Data Setting during Camera System Adjustments".)

18. Auto Focus Illumination Check

Check the auto focus illumination optical axis.

Mode	STILL (📷)
Subject	Background paper (J-2501-130-A). (50cm from the front of the lens)
Measurement Point	Monitor TV (under scan mode)
Measuring Instrument	
Adjustment Page	6F
Adjustment Address	10 to 17
Specified Value 1	Center of luminance point should settle within the specified frame.
Specified Value 2	Data of page: 6F, address: 10 is “00”.

Note1: Perform this adjustment in the dark room or use the flash adjustment box.
Note2: Any light other than the strobe light should not light up the plate.
Note3: If the data of page: 60, address: 02 is “01”, select page: 60, address: 01, and write data: 00.

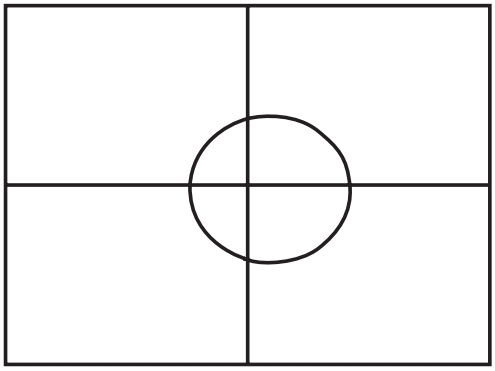


Fig. 6-1-16.

Switch setting:

SCENE (Menu) ..... AUTO

Preparations:

1) Take a copy of the AF illumination axis frame with a clear sheet. (Enlarge the frame in same size as the effective picture frame of the monitor TV.)

Adjusting method:

Order	Page	Address	Data	Procedure
1				Turn off the power and turn on again
2	00	01	01	Set the data.
3	AF	90		Read the data, and memorize it.
4	AF	90		Decrease the data from “5F”, and stop it when the black frame just appears on the monitor TV screen.
5				Attach the copied AF illumination axis frame (transparent) on the monitor TV screen. (The frame of the AF illumination axis frame and the gray frame of the monitor TV screen must be agree.)
6	7B	A9	06	Set the data.
7	60	01	EF	Set the data.
8				Check that the AF illumination is lit.
9	60	02		Read the data, and check it is “01”. (Note4)
10				Check that center of the luminance spot is set in the specified frame of the AF illumination axis frame.
11	6F	10		Read the data, and check it satisfies the specified value 2.

Note4: The adjustment data will be automatically input to page: 6F, address: 10 to 17.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	60	01	00	Set the data.
2	AF	90		Set the data memorized at “Adjusting method”.
3				Save the data.
4				Wait for 3 sec.
5				If finish the camera system adjustments, release the data setting. (See “1. Data Setting during Camera System Adjustments”.)

1-5. LCD SYSTEM ADJUSTMENT

Note: When replacing the LCD unit, be careful to prevent damages caused by static electricity.

Switch setting:
LCD ON/OFF ..... ON

1. Data Setting during LCD System Adjustments

Perform the following data setting before the LCD system adjustments.

Note: When the power is turned off, some data settings will be released. So perform this data setting again when the power is turned off.

Order	Page	Address	Data	Procedure
1	00	01	01	Set the data.
2	80	70	01	Set the data.

After completing the LCD system adjustments, release the data setting.

Order	Page	Address	Data	Procedure
1	80	70	00	Set the data.
2				Save the data.
3				Wait for 3 sec.
4	00	01	00	Set the data.

2. LCD Initial Data Input (1)

Mode	PLAY (▶)
Signal	Arbitrary
Adjustment Page	8F
Adjustment Address	20, 21, 23 to 2C

Adjusting method:

1) Select page: 00, address: 01, and set data: 01.
2) Select page: 8F, and set the data in the following table.
3) Save the data.
4) Wait for 3 sec.
5) Select page: 00, address: 01, and set data: 00.

Address	Data	Remark
20	89	Fixed data
21	B8	Fixed data
23	B0	VCO adj.
24	A2	Fixed data
25	91	Bright adj.
26	3F	Fixed data
27	41	Fixed data
28	80	White balance adj. (1)
29	95	White balance adj. (2)
2A	80	White balance adj. (1)
2B	95	White balance adj. (2)
2C	60	Contrast adj.

3. VCO Adjustment (SY-95 board)

Set the VCO free-run frequency. If deviated, the LCD screen will be blurred.

Mode	PLAY (▶)
Subject	Arbitrary
Measurement Point	Data of page: 80, address: 02
Measuring Instrument	
Adjustment Page	8F
Adjustment Address	23
Specified Value	01

Note1: A memory stick DUO must be inserted.

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during LCD System Adjustments" is performed.
2	8F	34	32	Set the data.
3	80	00	00	Set the data.
4	80	01	00	Set the data.
5	80	00	01	Set the data.
6				Wait for 1 sec.
7	80	02		Read the data, and check it is "01". (Note2)
8				Wait for 1 sec.
9				If finish the LCD system adjustments, release the data setting. (See "1. Data Setting during LCD System Adjustments".)

Note2: If the data is other than "01", adjustment has errors. See the following table.

Data of page: 80, address: 02	Contents of adjustment error
01	Normally finished
10	Reached an upper limit
20	Reached a lower limit
30	Time out
40	Out of adjustment range
50	Adjustment is impossible

4. Bright Adjustment (SY-95 board)

Set the level of the VIDEO signal for driving the LCD to the specified value. If deviated, the screen image will be blackish or saturated (whitish).

Mode	PLAY (▶)
Subject	Arbitrary
Measurement Point	Data of page: 80, address: 02
Measuring Instrument	
Adjustment Page	8F
Adjustment Address	25
Specified Value	01

Note1: A memory stick DUO must be inserted.

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during LCD System Adjustments" is performed.
2	8F	38	A8	Set the data.
3	80	00	00	Set the data.
4	80	01	00	Set the data.
5	80	00	03	Set the data.
6				Wait for 1 sec.
7	80	02		Read the data, and check it is "01". (Note2)
8				Wait for 1 sec.
9				If finish the LCD system adjustments, release the data setting. (See "1. Data Setting during LCD System Adjustments".)

Note2: If the data is other than "01", adjustment has errors. See the following table.

Data of page: 80, address: 02	Contents of adjustment error
01	Normally finished
10	Reached an upper limit
20	Reached a lower limit
30	Time out
40	Out of adjustment range
50	Adjustment is impossible

5. Contrast Adjustment (SY-95 board)

Set the level of the VIDEO signal for driving the LCD to the specified value. If deviated, the screen image will be blackish or saturated (whitish).

Mode	PLAY (▶)
Subject	Arbitrary
Measurement Point	Data of page: 80, address: 02
Measuring Instrument	
Adjustment Page	8F
Adjustment Address	2C
Specified Value	01

Note1: A memory stick DUO must be inserted.

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during LCD System Adjustments" is performed.
2	8F	39	28	Set the data.
3	80	00	00	Set the data.
4	80	01	00	Set the data.
5	80	00	05	Set the data.
6				Wait for 1 sec.
7	80	02		Read the data, and check it is "01". (Note2)
8				Wait for 1 sec.
9				If finish the LCD system adjustments, release the data setting. (See "1. Data Setting during LCD System Adjustments".)

Note2: If the data is other than "01", adjustment has errors. See the following table.

Data of page: 80, address: 02	Contents of adjustment error
01	Normally finished
10	Reached an upper limit
20	Reached a lower limit
30	Time out
40	Out of adjustment range
50	Adjustment is impossible

6. V COM Adjustment (SY-95 board)

Set the DC bias of the common electrode drive signal of LCD to the specified value.
If deviated, the LCD display will move, producing flicker and conspicuous vertical lines.

Mode	PLAY (▶)
Subject	Arbitrary
Measurement Point	Check on LCD display
Measuring Instrument	
Adjustment Page	8F
Adjustment Address	24
Specified Value	The brightness difference between the section A and section B is minimum.

Note: A memory stick DUO must be inserted.

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during LCD System Adjustments" is performed.
2	80	71	76	Set the data.
3	8F	41	23	Set the data.
4	8F	24		Change the data so that the brightness of the section A and that of the section B is equal.
5	80	71	FF	Set the data.
6	8F	41	21	Set the data.
7				Save the data.
8				Wait for 3 sec.
9				If finish the LCD system adjustments, release the data setting. (See "1. Data Setting during LCD System Adjustments".)

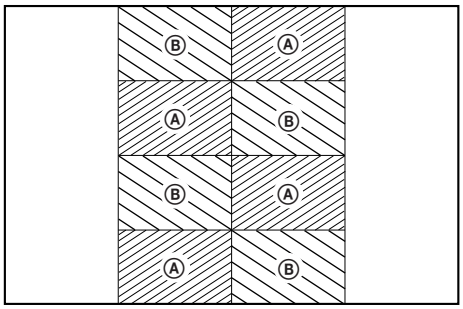


Fig. 6-1-17.

7. White Balance Adjustment (1) (SY-95 board)

Correct the white balance of the transmissive mode.
If deviated, the LCD screen color cannot be reproduced.

Mode	PLAY (▶)
Subject	Arbitrary
Measurement Point	Check on LCD display
Measuring Instrument	
Adjustment Page	8F
Adjustment Address	28, 2A
Specified Value	The LCD screen should not be colored.

Note1: A memory stick DUO must be inserted.
Note2: Check the white balance only when replacing the following parts. If necessary, adjust them.
1. LCD panel
2. Light induction plate
3. IC803 of MS-148 board.

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during LCD System Adjustments" is performed.
2	80	71	52	Set the data.
3	80	84	02	Set the data.
4	8F	28	80	Set the data.
5	8F	2A	80	Set the data.
6	8F	28		Check that the LCD screen is not colored. If not colored, proceed to step 10.
7	8F	28		Change the data so that the LCD screen is not colored.
8	8F	2A		Change the data so that the LCD screen is not colored.
9	8F	2A		If the LCD screen is colored, repeat steps 7 to 9.
10	80	71	FF	Set the data.
11				Save the data.
12				Wait for 3 sec.
13				If finish the LCD system adjustments, release the data setting. (See "1. Data Setting during LCD System Adjustments".)

8. White Balance Adjustment (2) (SY-95 board)

Correct the white balance of the reflective mode.
If deviated, the LCD screen color cannot be reproduced.

Mode	PLAY (▶)
Subject	Arbitrary
Measurement Point	Data of page: 80, address: 02
Measuring Instrument	
Adjustment Page	8F
Adjustment Address	29, 2B
Specified Value	01

Note1: A memory stick DUO must be inserted.

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that "1. Data Setting during LCD System Adjustments" is performed.
2	80	83	00	Set the data.
3	80	71	43	Set the data.
4	8F	3A	6C	Set the data.
5	80	00	00	Set the data.
6	80	01	00	Set the data.
7	80	00	09	Set the data.
8				Wait for 1 sec.
9	80	02		Read the data, and check it is "01". (Note2)
10				Wait for 1 sec.
11	8F	3B	71	Set the data.
12	80	00	00	Set the data.
13	80	01	01	Set the data.
14	80	00	09	Set the data.
15				Wait for 1 sec.
16	80	02		Read the data, and check it is "01". (Note2)
17				Wait for 1 sec.
18	80	83	01	Set the data.
19	80	71	FF	Set the data.
20				If finish the LCD system adjustments, release the data setting. (See "1. Data Setting during LCD System Adjustments".)

Note2: If the data is other than "01", adjustment has errors. See the following table.

Data of page: 80, address: 02	Contents of adjustment error
01	Normally finished
10	Reached an upper limit
20	Reached a lower limit
30	Time out
40	Out of adjustment range
50	Adjustment is impossible

6-2. SERVICE MODE

2-1. APPLICATION FOR ADJUSTMENT (SEUS)

The application for adjustment (SEUS) is used for changing the calculation coefficient in signal processing, EVR data, etc. The SEUS performs bi-directional communication between the personal computer (PC) and the unit using the USB signal. The resultant data of this bi-directional communication is written in the non-volatile memory.

2-1-1. Using Method of SEUS

1. Connection

1) Connect the HASP key to the USB port of the PC.
2) Connect the camera to another USB port of the PC.
3) Insert a memory stick DUO to the camera.
4) Confirm that the camera starts in the USB mode.
5) Start the SEUS on the PC.
6) Click [Connect] on the SEUS screen. If the connection is normal, the SEUS screen will be as shown in Fig. 6-2-1, indicating the "connected" state.

Note: The SEUS will go in "disconnect" state, if the camera is turned off (for instance, by resetting the unit). In such a case, click [Connect] on the SEUS screen to restore the "connected" state.

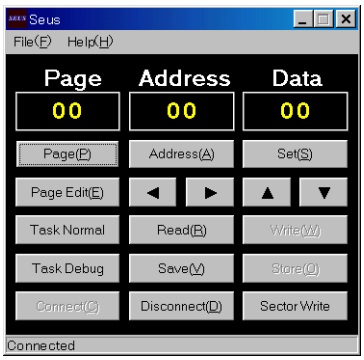


Fig. 6-2-1.

2. Operation

- Page change
  To change the page, click [Page] on the SEUS screen and enter the page to be changed. The page is displayed in hexadecimal notation.

- Address change
  To change the address, click [Address] on the SEUS screen and enter the address to be changed. Or click [▶] to increase the address, click [◀] to decrease the address. The address is displayed in hexadecimal notation.

- Data change
  To change the data, click [Set] on the SEUS screen and enter the data. Or click [▲] to increase the data, click [▼] to decrease the data. The data is displayed in hexadecimal notation.
  This operation does not write the data to the nonvolatile memory. If you want to write the changed data, click [Save] to write it.

- Data saving
  To write the all changed data to the nonvolatile memory, click [Save] on the SEUS screen and wait for 3 sec.

- Data reading
  The data displayed on the SEUS screen are the data values at the time when the pages and addresses were set, and they are not updated automatically. To check the data change, click [Read] on the SEUS screen and update the displayed data.

2-1-2. Precaution on Use of SEUS

Mishandling of the SEUS may erase the correct adjustment data at times. To prevent this, it is recommended that all adjustment data be saved before beginning adjustments.

1) Click [Page Edit] on the SEUS screen.
2) Click [Page], and enter the page number to be saved.
3) Click [Read] to read the data to be saved from the camera.
4) Click [File] and save the data to the PC.

2-2. SERVICE MODE

1. Setting the Test Mode

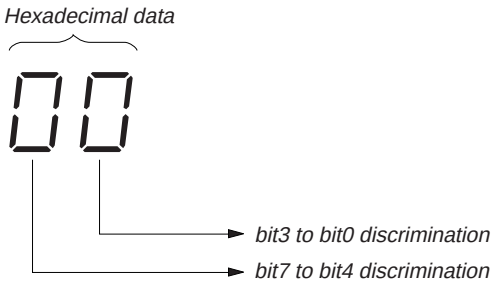
Page 2F	Address 23

Data	Function
80	Normal
01	Forced STILL mode power ON
02	Forced PLAY mode power ON
00	Forced MOVIE mode power ON

- Before setting the data, select page: 00, address: 01, and set data: 01.
- For page 2F, the data set is recorded in the non-volatile memory by saving data. In this case, take note that the test mode will not be exited even when the main power is turned off.
- After completing adjustments/repairs, release the data setting .
  1) Select page: 00, address: 01, and set data: 01.
  2) Select page: 2F, address: 23, and set data: 80.
  3) Save the data.
  4) Wait for 3 sec.
  5) Select page: 00, address: 01, and set data: 00.

2. Bit value discrimination

Bit values must be discriminated using the hexadecimal data for following items. Use the table below to discriminate if the bit value is “1” or “0”.



	Display on the adjustment remote commander	Bit values			
		bit3 or bit7	bit2 or bit6	bit1 or bit5	bit0 or bit4
	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
Ⓐ	8	1	0	0	0
	9	1	0	0	1
	A (A)	1	0	1	0
	B (b)	1	0	1	1
	C (c)	1	1	0	0
	D (d)	1	1	0	1
Ⓑ	E (E)	1	1	1	0
	F (F)	1	1	1	1

Examples: If the hexadecimal data is “8E”, the bit values for bit7 to bit4 are shown in the Ⓐ column, and the bit values for bit3 to bit0 are shown in the Ⓑ column.

3. Switch check (1)

Page 20	Address 80

Bit	Function	When bit value=1	When bit value=0
0	POWER switch (XPWER ON) (Control switch block S001)	OFF	ON
2	Lens cover open switch (XLENS CAP ON) (SY-95 board S401)	Closed	Open

Using method:

1) Select page: 20, address: 80.
2) Read the data. By discriminating the bit value of the data, the state of the switches can be discriminated.

4. Switch check (2)

Page 20	Address 90 to 92, 95

Using method:

1) Select page: 20, address: 90 to 92, 95.
2) Read the data. By discriminating the data, the pressed key can be discriminated.

Address	Data				
	00 to 0B	0C to 26	27 to 47	48 to 72	73 to FF
90 (MODE AD0) (IC491Ⓙ6)	MENU (Control switch block) (S007)	Control button LEFT (Control switch block) (S005)	DISPLAY/LCD BACK LIGHT (Control switch block) (S013)	Control button DOWN (Control switch block) (S011)	No key input
91 (KEY AD1) (IC491Ⓗ6)	Control button UP (Control switch block) (S006)	IMAGE SIZE/DELETE (Control switch block) (S009)	Control button RIGHT (Control switch block) (S010)	Control button SET (Control switch block) (S008)	No key input
92 (KEY AD2) (IC491Ⓖ6)	WIDE (Control switch block) (S003)	TELE (Control switch block) (S004)			No key input
95 (MODE DIAL0) (IC491Ⓙ8)	Mode switch MOVIE (MS-148 board) (S101)	Mode switch STILL (MS-148 board) (S101)	Mode switch PLAY (MS-148 board) (S101)		

5. Switch check (3)

Page 80	Address 13

Function	When data = 00	When data = 01	When data = 02
Shutter button (XAE LOCK SW) (Control switch block S002)	Off	On	On
Shutter button (XSHTR ON SW) (Control switch block S002)	Off	Off	On

Using method:

1) Select page: 80, address: 13.
2) Read the data. By discriminating the data, the state of the switches can be discriminated.

6. LED check

Page 20	Address 04
Page 80	Address 12
Page 8E	Address FE

Using method:

1) Select page: 00, address: 01, set data: 01.
2) Select page: 8E, address: FE, set data: 20.
3) Select page: 80, address: 12, set data: 01.
4) Select page: 20, address: 04, set data: 02.
5) Check that all LED (Power, Flash/Charge, MS access, AF illmination) are lit.
6) Select page: 20, address: 04, set data: 00.
7) Select page: 80, address: 12, set data: 00.
8) Select page: 8E, address: FE, set data: 00.
9) Select page: 00, address: 01, set data: 00.

7. Record of Use check

Page 4F	Address 94 to 97

Address	Function	Remarks
94	Recording counter (Hexadecimal)	1000000-digit and 1000000-digit
95		1000000-digit and 10000-digit
96		1000-digit and 100-digit
97		10-digit and 1-digit

Using method:

1) The recording counter data is displayed at page: 4F, addresses: 94 to 97. These data are named D_{94}, D_{95}, D_{96} and D_{97} respectively.
2) Calculate the recording counter (N) using following equation. (Hexadecimal calculation)
   $N = D_{97} + D_{96} \times 100 + D_{95} \times 10000 + D_{94} \times 1000000$

8. Self Diagnostics Log check

Page 20	Address B0 to B8

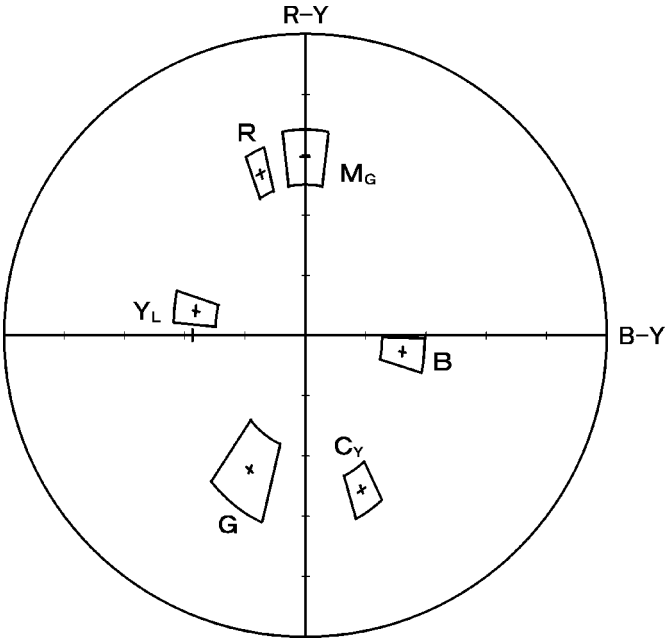
Address	Initial value	Function
B0	00	“Repaired by” code (Occurred 1st time) *1
B1	00	“Block function” code (Occurred 1st time)
B2	00	“Detailed” code (Occurred 1st time)
B3	00	“Repaired by” code (Occurred 2nd time) *1
B4	00	“Block function” code (Occurred 2nd time)
B5	00	“Detailed” code (Occurred 2nd time)
B6	00	“Repaired by” code (Occurred 3rd time) *1
B7	00	“Block function” code (Occurred 3rd time)
B8	00	“Detailed” code (Occurred 3rd time)

*1: “C” → “01”, “E” → “03”

Using method:

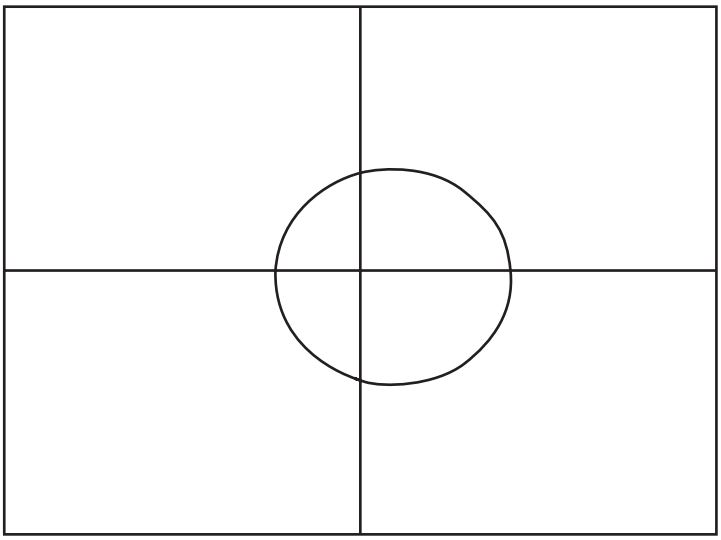
1) The self diagnostics log is displayed at page: 20, addresses: B0 to B5.
   Note: These data will be erased when the lithium battery (CN-198 board) is removed.

⟨FOR CAMERA COLOR REPRODUCTION ADJUSTMENT⟩



Take a copy of CAMERA COLOR REPRODUCTION FRAME with a clear sheet for use.

⟨AF ILLUMINATION FRAME⟩



SECTION 6
ADJUSTMENTS

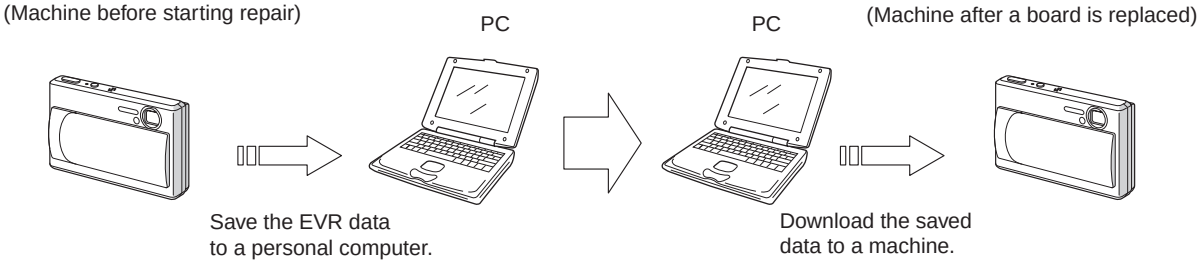
1. Before starting adjustment

EVR Data Re-writing Procedure When Replacing Board

The data that is stored in the repair board, is not necessarily correct.
Perform either procedure 1 or procedure 2 or procedure 3 when replacing board.

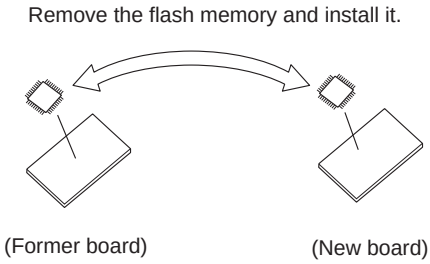
Procedure 1

Save the EVR data of the machine in which a board is going to be replaced. Download the saved data after a board is replaced.



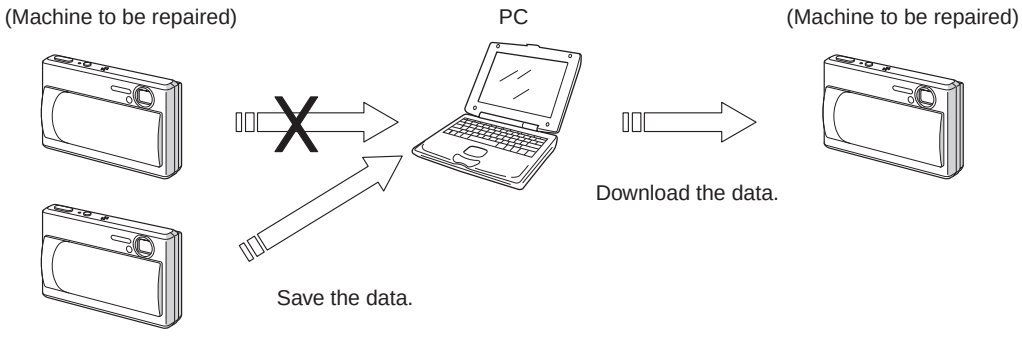
Procedure 2

Remove the flash memory from the board of the machine that is going to be repaired. Install the removed flash memory to the replaced board.



Procedure 3

When the data cannot be saved due to defective flash memory, or when the flash memory cannot be removed or installed, save the data from the same model of the same destination, and download it.



After the EVR data is saved and downloaded, check the respective items of the EVR data.
(Refer to page 6-2 for the items to be checked.)

1-1. Adjusting items when replacing main parts and boards

When replacing main parts and boards, adjust the items indicated by ● in the following table.

Note: The automatic Adjustment Program does not support the "Initialization of data" and "Wide Limit Adjustment". Perform them manually.

Adjusting item	Adjustment	Replaced parts														
		Block replacement					Mounted parts replacement					Board replacement			Flash memory replacement	
		CCD block	Lens device	Xenon tube	LCD block	LCD block	MS-148 board IC803 (RGB drive, Timing gen.) (LCD)	ST-86 board D003 (AF illmination LED)	SY-95 board IC151 (Timing gen., S/H, AGC, A/D conv.)	SY-95 board IC301 (Camera DSP)	SY-95 board IC302 (Video amp.)	MS-148 board (COMPLETE)	ST-86 board (COMPLETE)	SY-95 board (COMPLETE)	SY-95 board IC501 (Camera system control) (With built-in flash memory)	
					LCD901 LCD unit	Back light unit										
(Note)	Initialization of data													●	●	
VIDEO adjustment	Video output level adj.									●	●			●	●	
(Note)	Wide limit adj.		●											●	●	
CAMERA adjustment 1	Flange back adj.	●	●											●	●	
CAMERA adjustment 2	Flange back check	●	●											●	●	
CAMERA adjustment 3	F No. compensation	●	●						●					●	●	
	Mechanical shutter adj.															
	Light value adj.															
	AWB 3200K standard data input															
	AWB 5800K standard data input															
	AWB 5800K check															
	AWB 3200K check															
	CCD linearity check															
	Color reproduction adj.															
	CCD white defect compensation check															
	CCD black defect compensation check															
CAMERA adjustment 4	Strobe adj.	●	●	●				●	●				●	●	●	
	Auto focus illumination check															
LCD adjustment	LCD initial data input															
	VCO adj.															
	Bright adj.															
	Contrast adj.				●	●	●			●		●		●	●	
	V-COM adj.															
	White Balance adj. (1)															
	White Balance adj. (2)															

Table 6-1-1

6-1. ADJUSTMENT

1-1. PREPARATIONS BEFORE ADJUSTMENT

1-1-1. List of Service Tools

• Oscilloscope • Color monitor • Vectorscope • AC power adapter
• Calculator which can hexadecimal calculation.

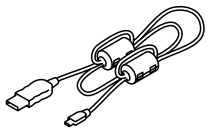
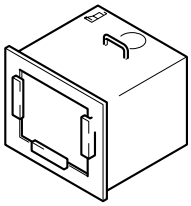
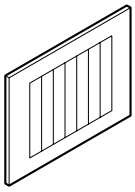
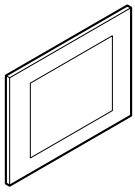
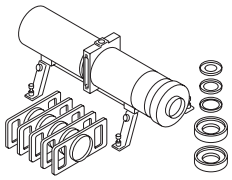
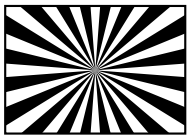
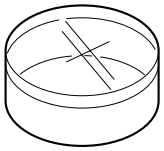
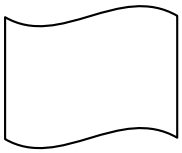
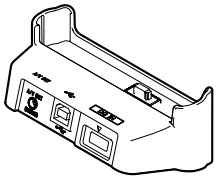
J-1  Personal computer OS: Windows98/98SE/ Me/2000/ XP Home/XP Pro USB connector × 2	J-2  HASP key and application for adjustment (SEUS) Contact our service headquater of each area how to get the application for adjustment (SEUS) and HASP key.	J-3  USB cable 1-828-073-11
J-4  Pattern box PTB-450 J-6082-200-A or Small pattern box PTB-1450 J-6082-557-A	J-5  Color bar chart For PTB-450: J-6020-250-A For PTB-1450: J-6082-559-A	J-6  Clear chart For PTB-450: J-6080-621-A For PTB-1450: J-6082-560-A
J-7  Minipattern box J-6082-353-B	J-8  Siemens star chart J-6080-875-A	J-9  Filter for color temperature correction (C14) J-6080-058-A
J-10  Back ground paper J-2501-130-A	J-11  Cradle 1-817-742-11	

Fig. 6-1-1

1-1-2. Preparations

1) Connect the equipment for adjustments according to Fig. 6-1-3.
2) Start up the application for adjustment (SEUS).

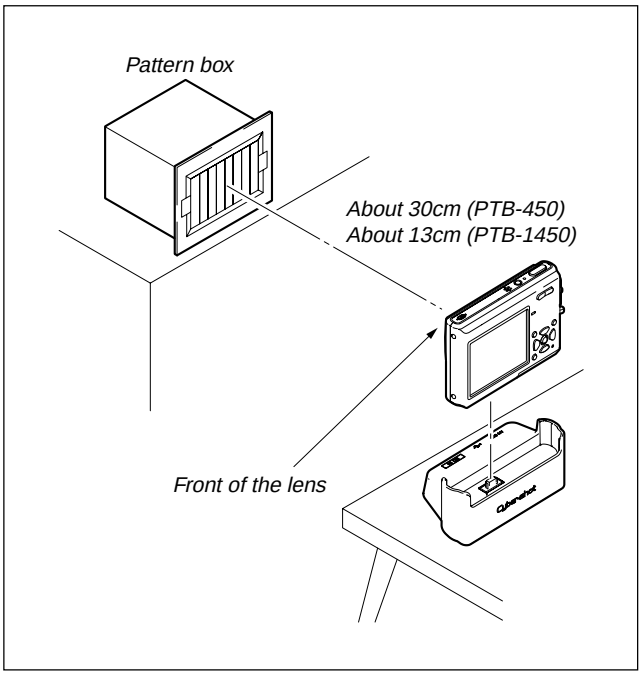
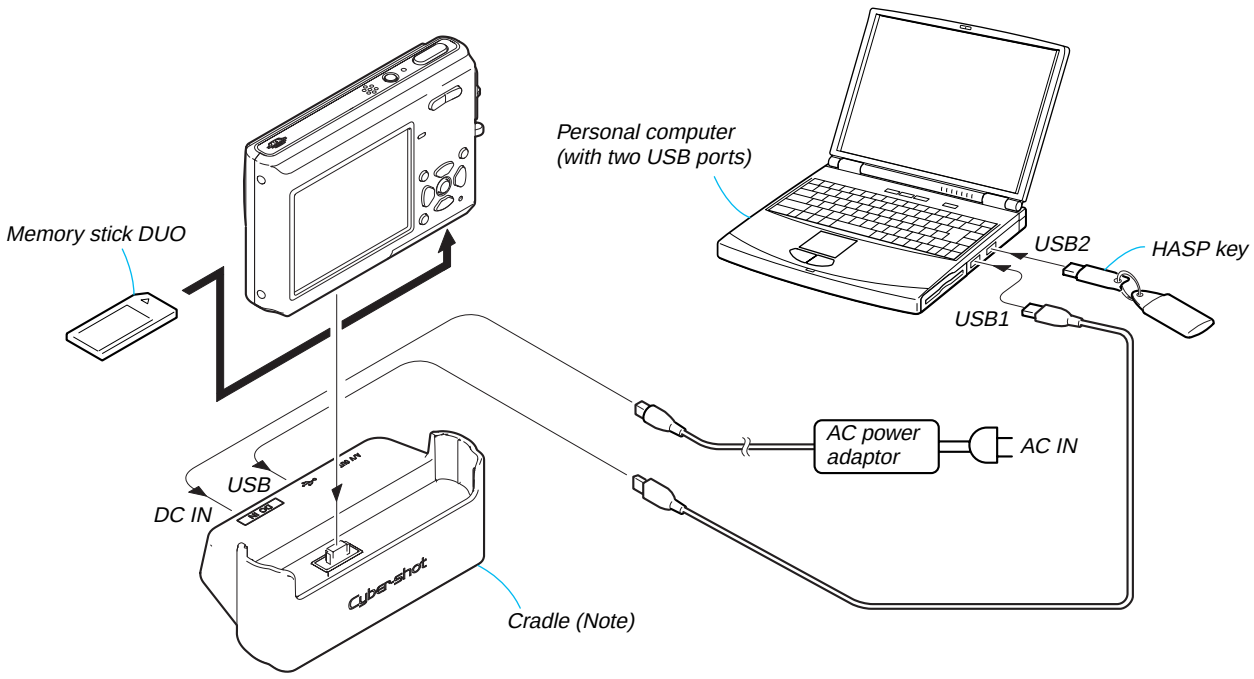


Fig. 6-1-2

[CONNECTION OF EQUIPMENT]



Note: When performing "CAMERA Adjustment 1", connect the cables after disassembling the cradle.
Unless the cradle is disassembled, the USB cable and the power cable will interfere with the mini pattern box, and thus the subject cannot be set correctly.

Fig. 6-1-3

1-1-3. Precaution

1. Setting the Switch

Unless otherwise specified, set the switches as follows and perform adjustments.

Switch settings

1. Mode switch ..... STILL ( )
2. Lens cover ..... Open
3. ZOOM ..... WIDE end
3. MACRO ( ) ..... ON
4. SCENE (Menu) ..... Auto
5. VIDEO OUT (SET UP of Menu) ..... NTSC

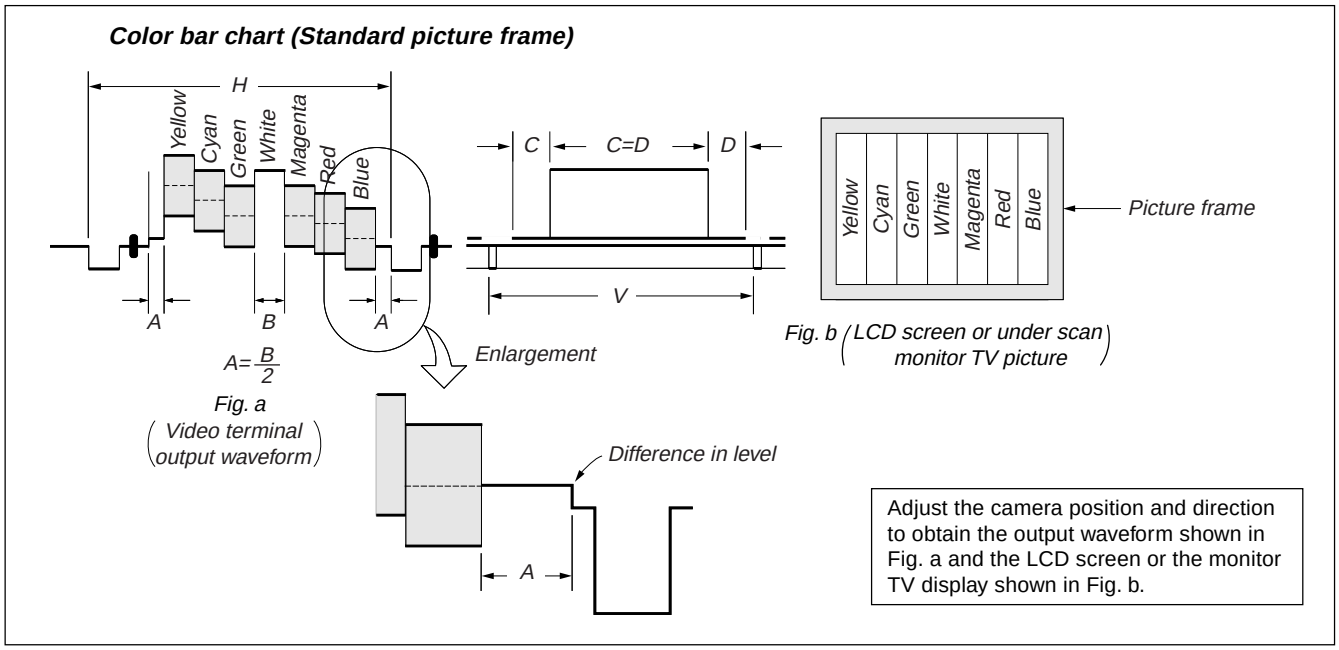


Fig.6-1-4

2. Subjects

1) Color bar chart (Standard picture frame)
   When performing adjustments using the color bar chart, adjust the picture frame as shown in Fig. 6-1-4. (Standard picture frame)
2) Clear chart (Color reproduction adjustment frame)
   Remove the color bar chart from the pattern box and insert a clear chart in its place. (Do not perform zoom operations during this time.)

3. Preparing the Flash Adjustment Box

A dark room is required to provide an accurate strobe adjustment. If it is not available, prepare the flash adjustment box as given below;

1) Provide woody board A, B and C of 15 mm thickness.

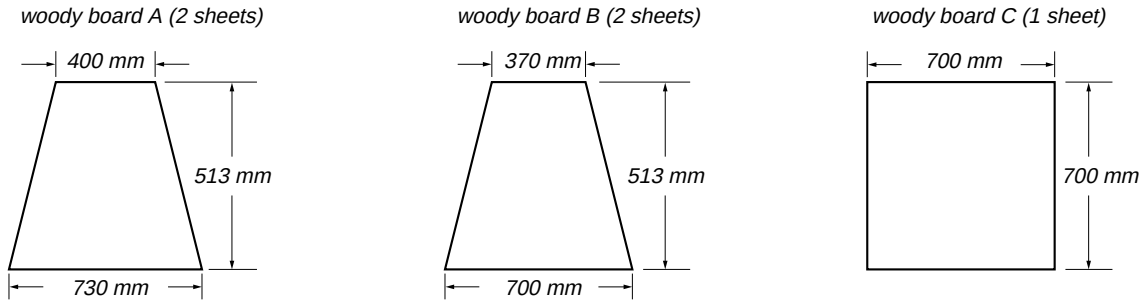


Fig. 6-1-5

2) Apply black mat paint to one side of woody board A and B.
3) Attach background paper (J-2501-130-A) to woody board C.
4) Assemble so that the black sides and the background paper side of woody board A, B and C are internal. (Fig. 6-1-6)

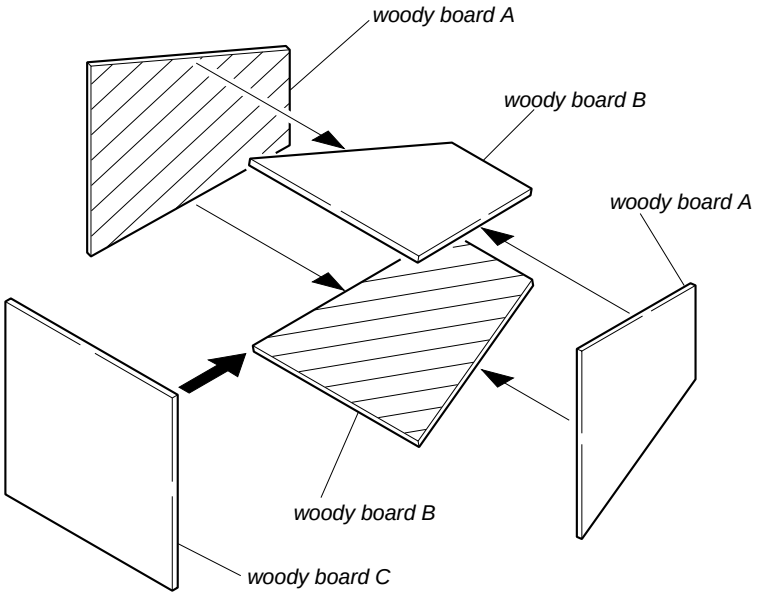


Fig. 6-1-6

1-1-4. Using Method of SEUS

The application for adjustment (SEUS) is used to change the coefficient for calculating the signal processing or EVR data. The SEUS performs two-way communication between PC and set through the USB terminal. The two-way communication result data can be written to the nonvolatile memory.

1. Connection

1) Connect the HASP key to the USB terminal of the PC.
2) Connect the PC and set with the USB cable.
3) Confirm that the set starts in the USB mode.
4) Start the SEUS on the PC.
5) Click [Connect] on the SEUS screen. If the connection is normal, the SEUS screen will be as shown in Fig. 6-1-7, indicating the “connected” state.

   Note: The SEUS will go in “disconnect" state, if the set is turned off (for instance, by resetting the set). In such a case, click [Connect] on the SEUS screen to restore the “connected” state.

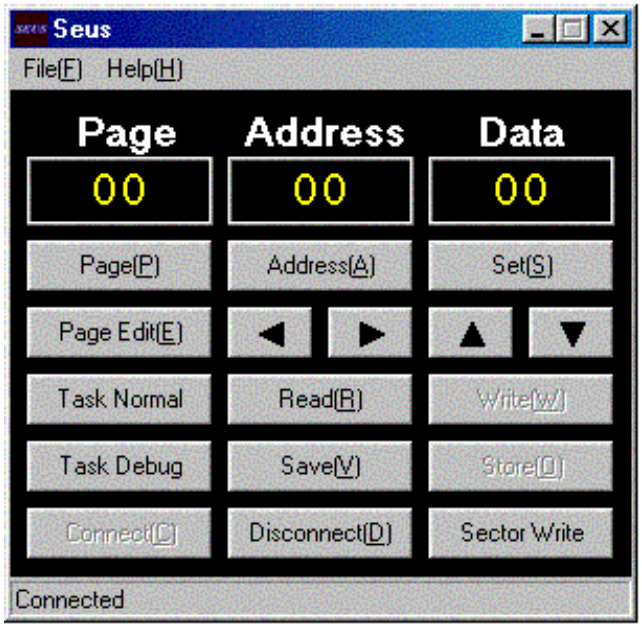


Fig. 6-1-7

2. Operation

- Page change
  To change the page, click [Page] on the SEUS screen and enter the page to be changed. The page is displayed in hexadecimal notation.

- Address change
  To change the address, click [Address] on the SEUS screen and enter the address to be changed. The address is displayed in hexadecimal notation.

- Data change
  To change the data, click [Set] on the SEUS screen and enter the data. The data is displayed in hexadecimal notation.
  This operation does not write the data to the nonvolatile memory.

- Data saving
  To write the all changed data to the nonvolatile memory, click [Save] on the SEUS screen and wait for 3 sec.

- Data reading
  The data displayed on the SEUS screen are the data values at the time when the pages and addresses were set, and they are not updated automatically. To check the data change, click [Read] on the SEUS screen and update the displayed data.

1-1-5. Precaution on Use of SEUS

Wrong SEUS operation could clear correct adjustment data. To prevent the data clear by mistake, it is recommended to save all adjustment data by clicking [Page Edit] on the SEUS screen before starting the adjustment.

Saving Method:

1) Click [Page Edit] on the SEUS screen to display the SEUS PAGE EDIT screen.
2) Click [Page], and enter the page number to be saved.
3) Click [Page] to read the data to be saved from the camera.
4) Click [File] and save the data to PC.

Loading Method:

1) Select page: 00, address: 01 and set data: 01.
2) Click [Page Edit] on the SEUS screen to display the SEUS PAGE EDIT screen.
3) Click [File] and load the data from PC.
4) Click [Write] on the SEUS PAGE EDIT screen.
5) Click [Close] to close the SEUS PAGE EDIT screen.
6) Click [Save] on the SEUS screen.
7) Wait for 3 sec.
8) Select page: 00, address: 01 and set data: 00.

1-2. AUTOMATIC ADJUSTMENT

The DSC-T1 is adjusted with the Automatic Adjustment Program. The Automatic Adjustment Program controls automatically the adjustment operations that conventionally were entered manually on the operation screen (however, partially some adjustments will require manual operation on the SEUS operation screen).

1-2-1. Precautions When Using Automatic Adjustment Program

1) The Automatic Adjustment Program writes the adjustment results such as EVR data to the set through two-way communication with the camera via the SEUS. Accordingly, the Automatic Adjustment Program must be used in the environment where the SEUS operates.
2) The program run time may vary depending on the environment of the personal computer used.
3) Even if the Automatic Adjustment Program is used without starting the SEUS, the SEUS will start automatically when the adjustment is executed. However, it may take time for the SEUS to start, and therefore the Automatic Adjustment Program should be used with the SEUS started in order to reduce the program run time.

1-2-2. Start of Automatic Adjustment Program

Double-click the application file (DSC-T1 Auto-Adj Ver_1.□r□□.exe), and the Automatic Adjustment Program will start.

Note: □ (numeric value) of the file name varies depending on the version of Automatic Adjustment Program.

1-2-3. Function of Each Button on Main Menu Screen

When the Automatic Adjustment Program started, the Main Menu screen in Fig. 6-1-8 will appear. On this screen, select each adjustment section.

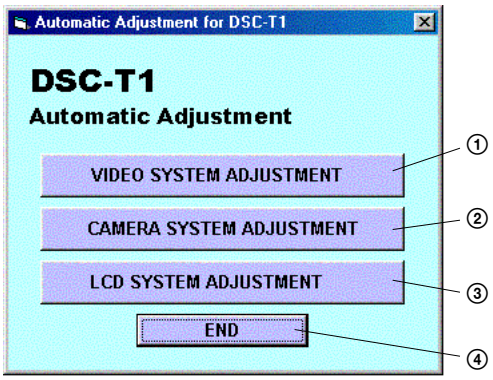


Fig. 6-1-8

① VIDEO SYSTEM ADJUSTMENT button
The "VIDEO SYSTEM ADJUSTMENT" screen appears.

② CAMERA SYSTEM ADJUSTMENT button
The "CAMERA SYSTEM ADJUSTMENT" screen appears.

③ LCD SYSTEM ADJUSTMENT button
The "LCD SYSTEM ADJUSTMENT" screen appears.

④ END button
The Automatic Adjustment Program finishes.

1-3. VIDEO SYSTEM ADJUSTMENTS

1-3-1. Function of Each Button on Video System Adjustment Screen

Click the VIDEO SYSTEM ADJUSTMENT button on the Main Menu screen, and the "VIDEO SYSTEM ADJUSTMENT" screen in Fig. 6-1-9 will appear.

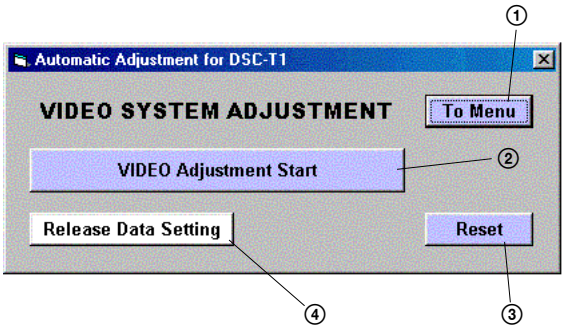


Fig. 6-1-9

① To Menu button
The Main Menu screen comes back.

② VIDEO Adjustment Start button
"Video Adjustment" starts.

③ Reset button
This button functions same as the Reset button of the camera.

④ Release Data Setting button
The data setting at the adjustment is cancelled.
During the data setting, the button color changes from "white" to "red". When the data setting is cancelled, the button color returns to "white".
(Use this button when an error occurred in the video adjustment. If the adjustment completed successfully, the data setting is automatically cancelled and the button color returns to "white".)

1-3-2. Adjustment Items of VIDEO System Adjustment

The adjustment items of video system adjustment are as listed in Table 6-1-2. The Automatic Adjustment Program executes the adjustment items if the VIDEO Adjustment Start button is clicked.

Button Name	Adjustment	Signal	Page	Address
VIDEO Adjustment	VIDEO Output Level Adj.	Arbitrary	8F	D0

Table 6-1-2

1-3-3. Adjusting Method

[Automatic Adjustment Program execution items and sequence]

1. Data Setting during Video Adj.
2. Video Output Level Adj.
3. Release of Data Setting during Video Adj.

[Specified value of video output level adj.]

Measurement Point	Video terminal of AV OUT jack of the cradle (75Ω terminated)
Measuring Instrument	Oscilloscope
Specified Value	Sync level: A = 286 ± 5 mV (NTSC mode) A = 300 ± 5 mV (PAL mode) Burst level: B = 286 ± 30 mV (NTSC mode) B = 300 ± 30 mV (PAL mode)

[Adjusting method]

1) Click the VIDEO Adjustment Start button.
2) The Automatic Adjustment Program executes the "1. Data Setting during Video Adj.".
3) If "1. Data Setting during Video Adj." completed successfully, the next message is displayed during the execution of "2. Video Output Level Adj.". Using the UP/DOWN key on the SEUS Operation screen, adjust so that the sync level of the video signals satisfies the specified value. After the adjustment, check that the burst level of the video signals satisfies the specified value, and click the OK button in the message.

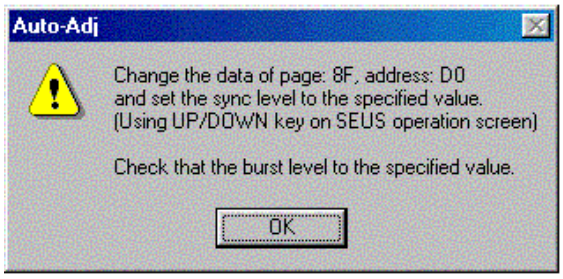


Fig. 6-1-10

4) If the OK button button is clicked, "3. Release of Data Setting during Video Adj." will be executed.
5) Upon successful completion of all items of the VIDEO adjustment, the following message is displayed. Click the OK button.

Fig. 6-1-11

SEUS operation screen

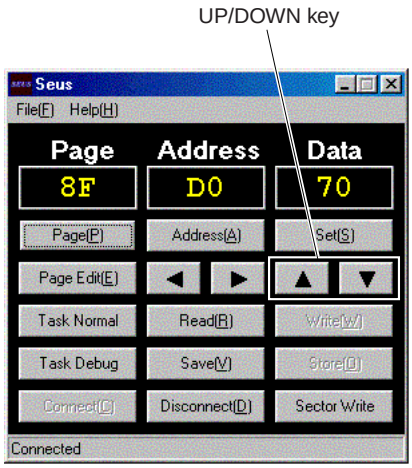


Fig. 6-1-12

Check on the osilloscope

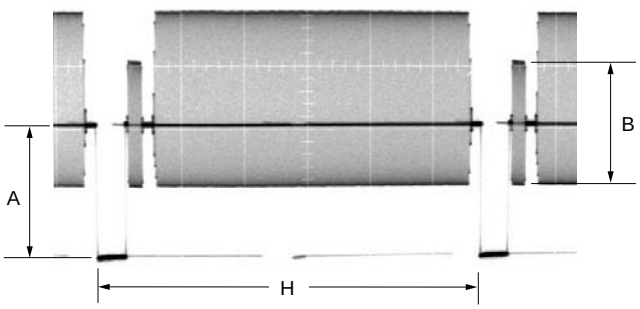


Fig. 6-1-13

1-4. CAMERA SYSTEM ADJUSTMENTS

1-4-1. Function of Each Button on Camera System Adjustment Screen

Click the CAMERA SYSTEM ADJUSTMENT button on the Main Menu screen, and the "CAMERA SYSTEM ADJUSTMENT" screen in Fig. 6-1-14 will appear.

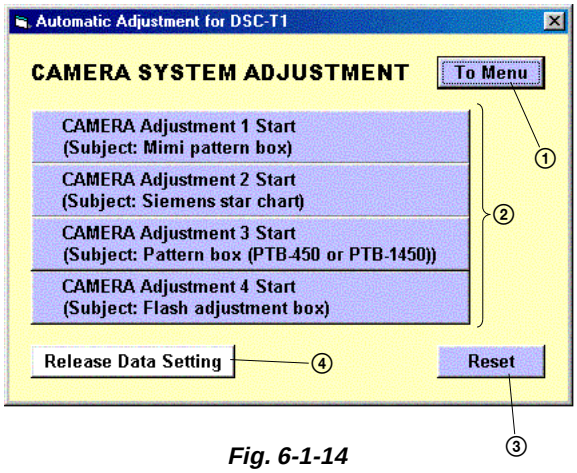


Fig. 6-1-14

① To Menu button
The Main Menu screen comes back.

② Adjustment start buttons
- CAMERA Adjustment 1 Start button
  "Camera Adjustment 1" starts.
- CAMERA Adjustment 2 Start button
  "Camera Adjustment 2" starts.
- CAMERA Adjustment 3 Start button
  "Camera Adjustment 3" starts.
- CAMERA Adjustment 4 Start button
  "Camera Adjustment 4" starts.

③ Reset button
This button functions same as the Reset button of the camera.

④ Release Data Setting button
The data setting at the adjustment is cancelled.
During the data setting, the button color changes from "white" to "red". When the data setting is cancelled, the button color returns to "white".
(Use this button when an error occurred in the camera adjustment 1-4. If the adjustment completed successfully, the data setting is automatically cancelled and the button color returns to "white".)

1-4-2. Adjustment Items of Camera System Adjustment

The adjustment items of camera system adjustment are as listed in Table 6-1-3. The Automatic Adjustment Program divides the adjustment items into four, camera adjustment 1-4. Clicking either CAMERA Adjustment Start button allows the adjustment item which corresponds to that button to be executed.
The adjustment conditions of the subject and filter vary depending on which item is adjusted. The Adjustment Program displays an instruction for the subject and filter as a message during the adjustment.

Button Name	Adjustment	Subject	Adjustment Page	Adjustment Address
(Note 1)	Wide Limit Adj.	Not required	6F	18, 19
CAMERA Adjustment 1	Flange Back Adj.	Siemens star chart with ND filter for minipattern box (Note 2)	6F	18 to 53
CAMERA Adjustment 2	Flange Back Check.	Siemens star chart with ND filter (1.0m from front the lens) (Luminance: 200 to 400 lux)		
CAMERA Adjustment 3	F No. Compensation	Clear chart (Standard picture frame)	6F	60 to 64, 6B to 6D
	Mechanical Shutter Adj.		6F	6B to 6D, B8 to D7
	Light Value Adj.		6F	65 to 67
	AWB 3200K Data Input		6E	04 to 21
	AWB 5800K Data Input	Clear chart (Standard picture frame)	6E	00 to 03, 24 to 41
	AWB 5800K Check	Filter C14 for color temperature correction		
	AWB 3200K Check	Clear chart (Standard picture frame)		
	CCD Linearity Check			
	Color Reproduction Adj.	Color ber chart (Standard picture frame)	6E	60 to 67
	CCD White Defect Compensation Check	Clear chart (Standard picture frame)		
	CCD Black Defect Compensation Check			
CAMERA Adjustment 4	Strobe Adj.	Flash adjustment box	6E	72 to 75
			6F	D8 to EF
	Auto Focus Illumination Check		6F	10 to 17

Note 1: The Automatic Adjustment Program does not support "Wide Limit Adjustment".
Note 2: Dark Siemens star chart.

Table 6-1-3

1-4-3. Adjusting Method

1. Wide Limit Adjustment

Adjustment to remove variations at the wide end of the inner focus lens.

Adjustment Page	6F
Adjustment Address	18, 19

1-1. Adjusting method when the lens is replaced:

Adjusting method:

Order	Page	Address	Data	Procedure
1	00	01	01	Set the data.
2	6F	18		Set the data. (Note)
3	6F	19		Set the data. (Note)
4	7C	16	01 → 00	Change the data. (The data is OK if it is "00".)
5				Save the data.
6				Wait for 2 sec.
7				Perform "Flange Back Adjustment".

Note: The data of page: 6F, address: 18 and 19, that are set in the Orders 2 and 3 as described above, are shown on the data sheet supplied with the replacement lens for repair.
Set the upper single byte of the 2-byte data shown on the sheet to address: 18, and the lower byte of the data to the address: 19.

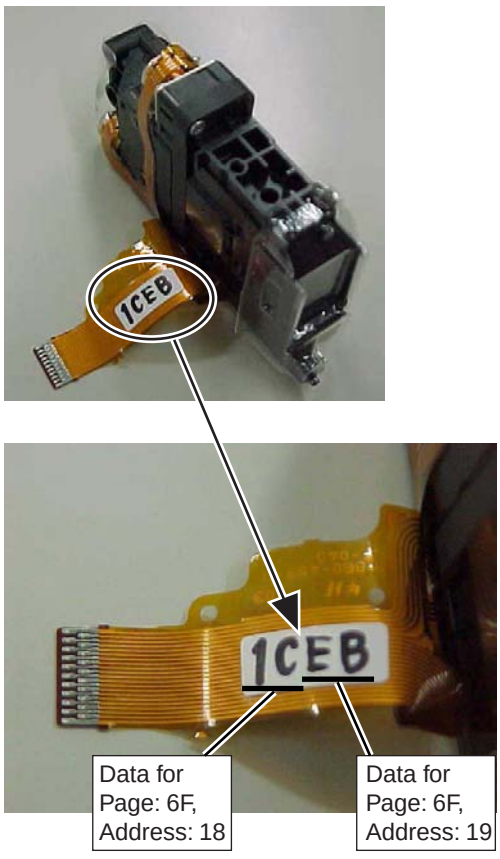


Fig. 6-1-15

1-2. Adjusting method when replacement of lens is not required and the SY-95 board is replaced:

When the data of page: 6F, address: 18 and 19 can be read from the defective SY-95 board before replacement, and both of the data are not "00":

Adjusting method:

Order	Page	Address	Data	Procedure
1	00	01	01	Set the data.
2	6F	18		Set the previous data
3	6F	19		Set the previous data
4	7C	16	01 → 00	Change the data. (The data is OK if it is "00".)
5				Save the data.
6				Wait for 2 sec.
7				Perform "Flange Back Adjustment".

When the data of the page: 6F, address: 18 and 19 can be read out from the defective SY-95 board before replacing it, and both of the data are "00":

1) Replace the lens with the replacement lens and perform "1-1. Adjusting method when the lens is replaced".

When the data of page: 6F, address: 18 and 19 cannot be read from the defective SY-95 board:

1) Replace the lens with the replacement lens and perform "1-1. Adjusting method when the lens is replaced".

Note: The data of page: 7C, address: 16, that is set in the Order 4 of the adjusting method of 1-1 or 1-2, is "01" when shipped from the factory. Let the data remain "00" after completion of the service adjustment.

2. CAMERA Adjustment 1

Note: When performing "CAMERA Adjustment 1", connect the cables after disassembling the cradle.
Unless the cradle is disassembled, the USB cable and the power cable will interfere with the mini pattern box, and thus the subject cannot be set correctly.

[Automatic Adjustment Program execution items and sequence]

1. Data Setting during Camera Adj.
2. Flange Back Adj.
3. Release of Data Setting during Camera Adj.

[Adjusting method]

1) If the CAMERA Adjustment 1 Start button is clicked, the following message is displayed.
If "Wide Limit Adjustment" is necessary, click the Cancel button to interrupt the Adjustment Program, and perform "1. Wide Limit Adjustment".

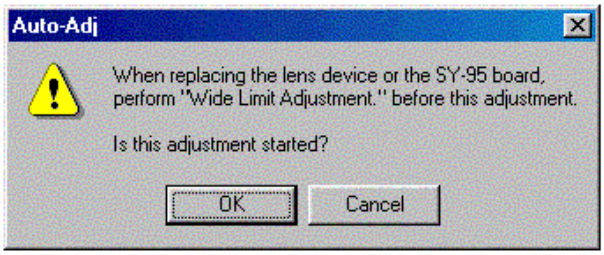


Fig. 6-1-16

2) If the OK button is clicked, the Automatic Adjustment Program executes "1. Data Setting during Camera Adj.".
3) Upon successful completion of the "1. Data Setting during Camera Adj.", the following message is displayed. Set the subject by referring to "Preparation of Flange Back Adj.".

Fig. 6-1-17

4) If the OK button is clicked, "2. Flange Back Adj." and "3. Release of Data Setting during Camera Adj." will be executed.
5) Upon successful completion of all items of the CAMERA Adjustment 1, the following message is displayed. Click the OK button.

Fig. 6-1-18

Preparation of Flange Back Adj.

1) The minipattern box is installed as shown in the following figure.
Note: The attachment lenses are not used.
2) Install the minipattern box so that the distance between it and the front of lens of camera is less than 3 cm.
3) Make the height of minipattern box and the camera equal.
4) Check the output voltage of the regulated power supply is the specified voltage ± 0.01 Vdc.
5) Check that the center of Siemens star chart meets the center of shot image screen with the zoom lens at TELE end and WIDE end respectively.

Specified voltage: The specified voltage varies according to the minipattern box, so adjustment the power supply output voltage to the specified voltage written on the sheet which is supplied with the minipattern box.

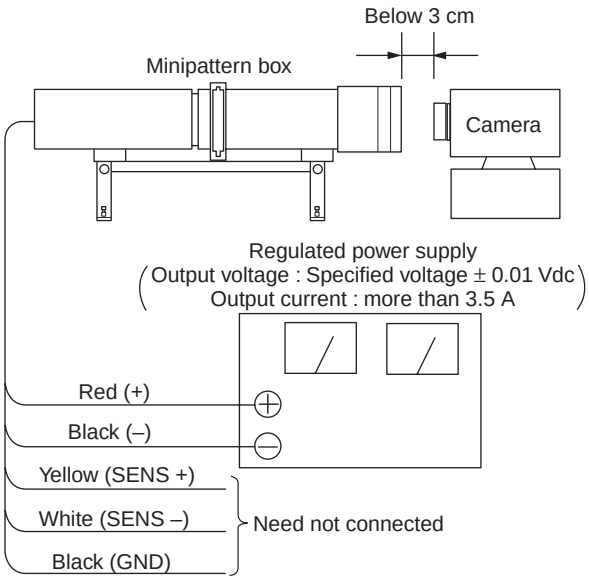


Fig. 6-1-19

3. CAMERA Adjustment 2

[Automatic Adjustment Program execution items and sequence]

1. Data Setting during Camera Adj.
2. Flange Back Check
3. Release of Data Setting during Camera Adj.

[Adjusting method]

1) Click the CAMERA Adjustment 2 Start button.
2) The Automatic Adjustment Program executes "1. Data Setting during Camera Adj.".
3) Upon successful completion of the "1. Data Setting during Camera Adj.", the following message is displayed. Set the subject in accordance with the message.

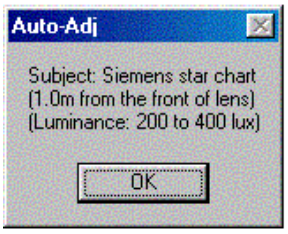


Fig. 6-1-20

4) Click the OK button is clicked, "2. Flange Back Check" is executed. The following messages are displayed, and then operate the cameral to make a check in accordance with the messages.

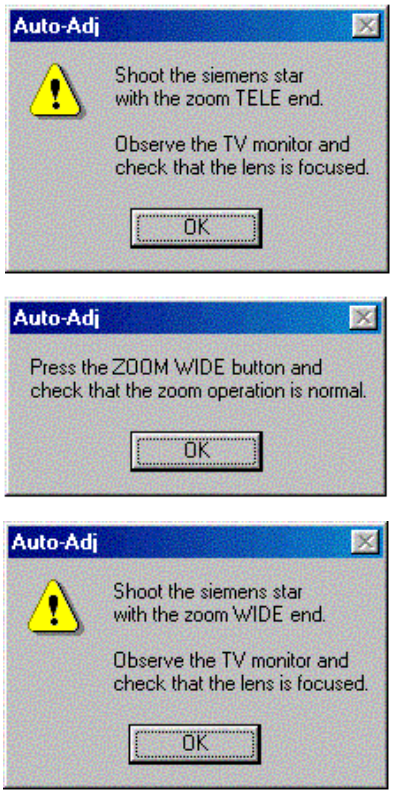


Fig. 6-1-21

5) Upon completion of "2. Flange Back Check", "3. Release of Data Setting during Camera Adj." is executed.

6) Upon successful completion of all items of the CAMERA Adjustment 2, the following message is displayed. Click the OK button.

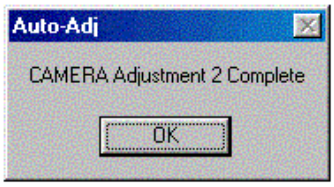


Fig. 6-1-22

4. CAMERA Adjustment 3

[Automatic Adjustment Program execution items and sequence]

1. Data Setting during Camera Adj.
2. Picture Frame Setting
3. F No. Compensation
4. Mechanical Shutter Adj.
5. Light Value Adj.
6. AWB 3200K Standard Data Input
7. AWB 5800K Standard Data Input
8. AWB 5800K Check
9. AWB 3200K Check
10. CCD Linearity Check
11. Color Reproduction Adj.
12. CCD White Defect Compensation Check
13. CCD Black Defect Compensation Check
14. Release of Data Setting during Camera Adj.

[Adjusting method]

1) Click the CAMERA Adjustment 3 Start button.
2) The Automatic Adjustment Program executes the "1. Data Setting during Camera Adj.".
3) Upon successful completion of "1. Data Setting during Camera Adj.", "2. Picture Frame Setting" is executed. The following message is displayed, and then referring to Fig. 6-1-25 to Fig. 6-1-27, set the subject and click the OK button.

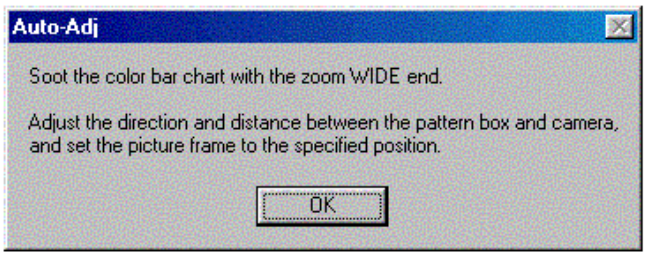


Fig. 6-1-23

After that, the next message is displayed. Then, change the chart in accordance with the message.

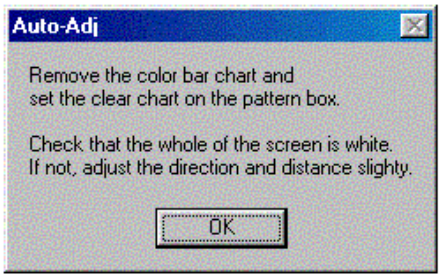


Fig. 6-1-24

4) Click the OK button, and the items from "3. F No. Compensation" to "6. AWB 3200K Standard Data Input" will be executed.

Check on the oscilloscope

Measurement Point: Video terminal of A/V OUT jack (75Ω terminated)

1. Horizontal period

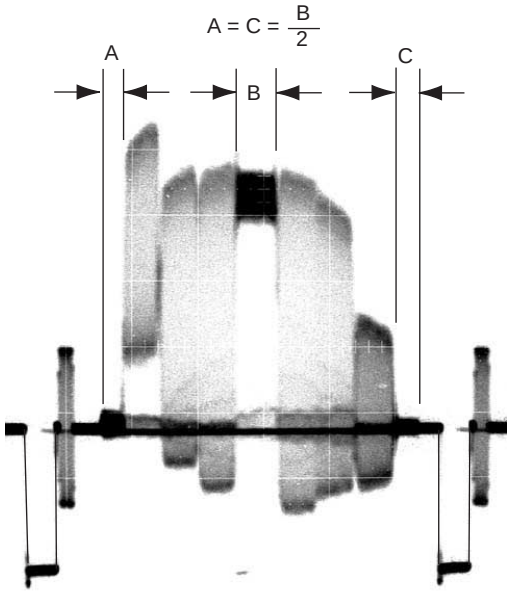


Fig. 6-1-25

2. Vertical period

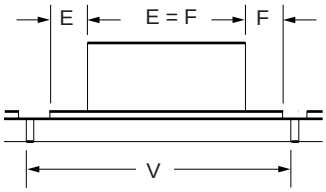


Fig. 6-1-26

Check on the monitor TV

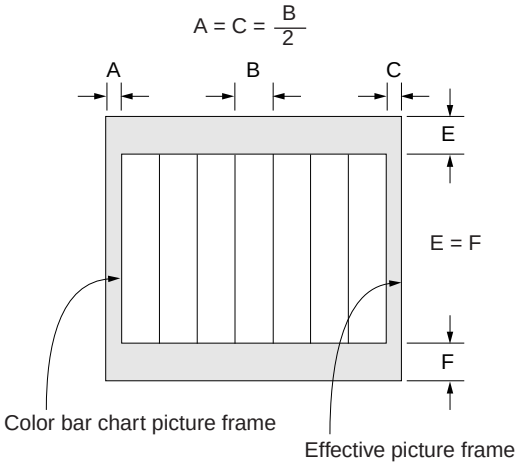


Fig. 6-1-27

5) Upon successful completion of the “AWB 3200K Check”, the following message is displayed. Set the filter in accordance with the message.

Fig. 6-1-28

6) Click the OK button, and the “7. AWB 5800K Standard Data Input” and “8. AWB 5800K Check” will be executed.
7) Upon successful completion of the “AWB 5800K Check”, the following message is displayed. Set the filter in accordance with the message.

Fig. 6-1-29

8) Click the OK button, and the “9. AWB 3200K Check” and “10. CCD Linearity Check” will be executed.
9) Upon successful completion of “10. CCD Linearity Check”, the following message is displayed. Change the chart in accordance with the message.

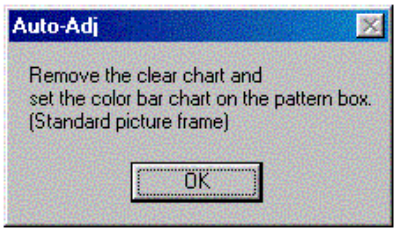


Fig. 6-1-30

10) Click the OK button, and “11. Color Reproduction Adj.” will be executed. The following messages are displayed in order, and then operate the vectorscope to make a check with the color reproduction frame in accordance with the message.

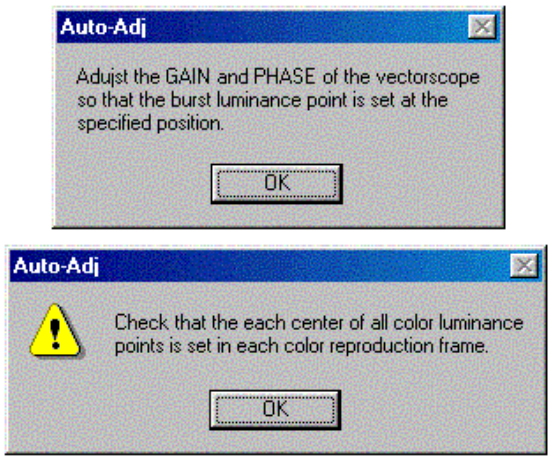


Fig. 6-1-31

11) Upon successful completion of “11. Color Reproduction Adj.”, the following message is displayed. Change the chart in accordance with the message.

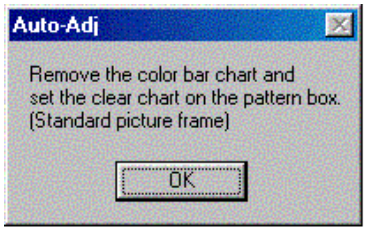


Fig. 6-1-32

12) Click the OK button, and the “12. CCD White Defect Compensation Check”, “13. CCD Black Defect Compensation Check” and “14. Release of Data Setting during Camera Adj.” will be executed.
13) Upon successful completion of all items of the CAMERA Adjustment 3, the following message is displayed. Click the OK button.

Fig. 6-1-33

Check on the vectorscope

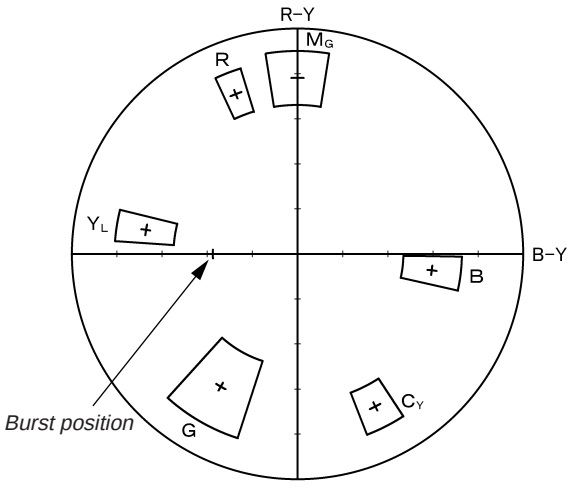


Fig 6-1-34

5. CAMERA Adjustment 4

Note: "CAMERA Adjustment 4" is available only once after the power is turned on. If the adjustment is retried, turn off the power and turn on again.

[Automatic Adjustment Program execution items and sequence]

1. Data Setting during Camera Adj.
2. Strobe Adj.
3. Auto Focus Illumination Check
4. Release of Data Setting during Camera Adj.

[Adjusting method]

1) Click the CAMERA Adjustment 4 Start button.
2) The Automatic Adjustment Program executes the "1. Data Setting during Camera Adj.".
3) Upon successful completion of the "1. Data Setting during Camera Adj.", the following message is displayed. Set the subject in accordance with the message.
   (For the Flash adjustment box, refer to "3. Preparing the Flash Adjustment Box" (see page 6-6).)

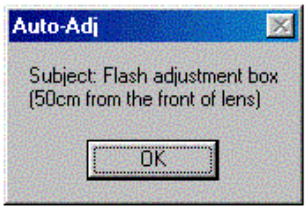


Fig. 6-1-35

4) Press the OK button, and the "2. Strobe Adj." will be executed.
5) During execution of "2. Strobe Adj.", the following message is displayed. After checking the flashing of strobe light, click the OK button. (This message is displayed 2 times during execution of adjustment.)

Fig. 6-1-36

6) Upon successful completion of "2. Strobe Adj.", "3. Auto Focus Illumination Check" is executed. The following messages are displayed, and then attach the AF illumination axis frame to the monitor TV screen to make a check in accordance with the messages.

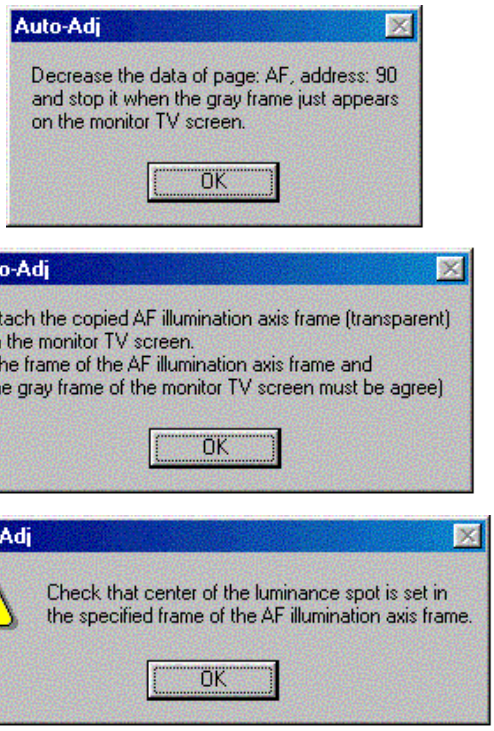


Fig. 6-1-37

7) Upon successful completion of the "3. Auto Focus Illumination Check", the "4. Release of Data Setting during Camera Adj." will be executed successively.
8) Upon successful completion of all items of the CAMERA Adjustment 4, the following message is displayed. Click the OK button.

Fig. 6-1-38

Check on the monitor TV

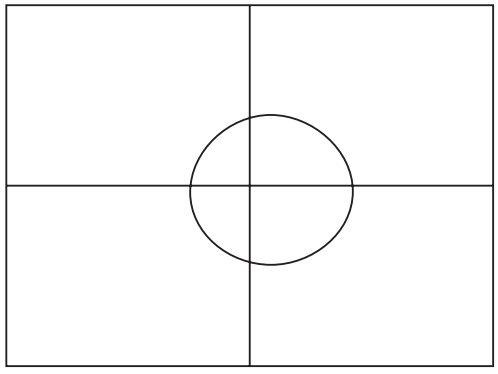


Fig. 6-1-39

1-5. LCD SYSTEM ADJUSTMENTS

1-5-1. Function of Each Button on LCD System Adjustment Screen

Click the LCD SYSTEM ADJUSTMENT button on the Main Menu screen, and the "LCD SYSTEM ADJUSTMENT" screen in Fig. 6-1-40 will appear.

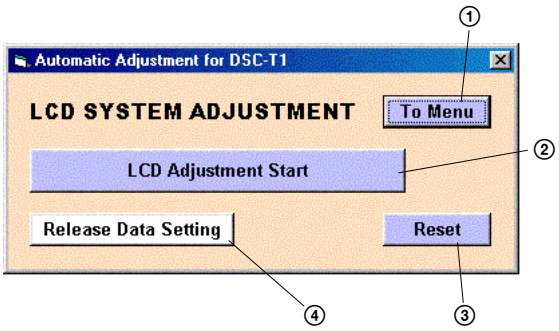


Fig. 6-1-40

① To Menu button
The Main Menu screen comes back.

② LCD Adjustment Start button
"LCD Adjustment" starts.

③ Reset button
This button functions same as the Reset button of the camera.

④ Release Data Setting button
The data setting at the adjustment is cancelled.
During the data setting, the button color changes from "white" to "red". When the data setting is cancelled, the button color returns to "white".
(Use this button when an error occurred in the LCD adjustment. If the adjustment completed successfully, the data setting is automatically cancelled and the button color returns to "white".)

1-5-2. Adjustment Items of LCD System Adjustment

The adjustment items of LCD system adjustment are as listed in Table 6-1-4. The Automatic Adjustment Program executes the adjustment items if the LCD Adjustment Start button is clicked.

Button Name	Adjustment	Signal	Page	Address
LCD Adjustment	LCD Initial Data Input	Arbitrary	8F	20, 21, 23 to 2C
	VCO adj.		8F	23
	Bright adj.		8F	25
	Contrast adj.		8F	2C
	V-COM adj.		8F	24
	White Balance adj. (1)		8F	28, 2A
	White Balance adj. (2)		8F	29, 2B

Table 6-1-4

1-5-3. Adjusting Method

[Automatic Adjustment Program execution items and sequence]

1. LCD Initial Data Input
2. Data Setting during LCD Adj.
3. VCO Adj.
4. Bright Adj.
5. Contrast Adj.
6. V-COM Adj.
7. White Balance Adj. (1)
8. White Balance Adj. (2)
9. Release of Data Setting during LCD Adj.

[Adjusting method]

1) Click the LCD Adjustment Start button.
2) The Automatic Adjustment Program executes the items from "1. LCD Initial Data Input" to "5. Contrast Adj.".
3) Upon successful completion of the "5. Contrast Adj.", the following message is displayed during execution in "6. V-COM Adj.". On the SEUS screen, operate the UP/DOWN key so that the brightness of portions A and B on the LCD panel is equal. After the adjustment, click the OK button.

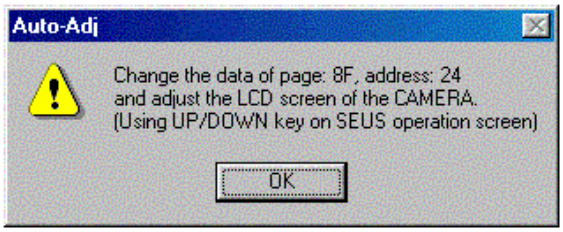


Fig. 6-1-41

4) Upon completion of "6. V-COM Adj.", "7. White Balance Adj. (1)" is executed. The following message is displayed, and then check that LCD screen is not colored.
If colored, change the data of page: 8F, address: 28 and 2A on the SEUS Operation screen to adjust so that the LCD screen is not colored.

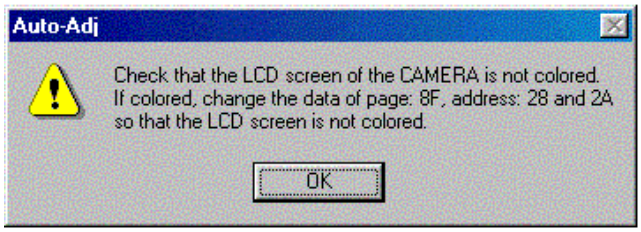


Fig. 6-1-42

5) If the OK button is clicked, "8. White Balance Adj. (2)" and "9. Release of Data Setting during LCD Adj." will be executed.

Fig. 6-1-43

SEUS operation screen

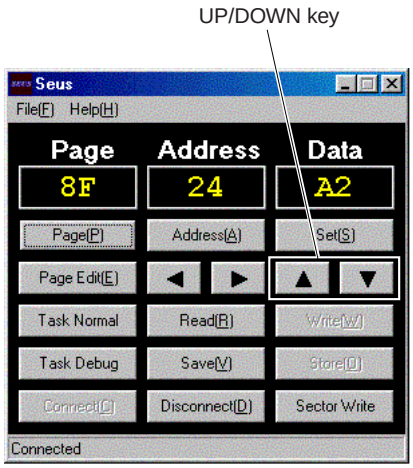


Fig. 6-1-44

Check on the LCD screen (V-COM Adj.)

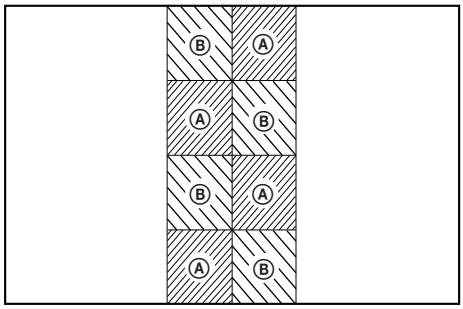


Fig. 6-1-45

1-6. ERROR

In case of an error during the execution of adjustment, the Automatic Adjustment Program interrupts the processing at that point, and displays an error message, and then terminates the program execution there.

1-6-1. Error Message

When an error message is displayed, perform the remedy given below, and then retry adjustment. If the error message is displayed though the remedy was performed, the circuits will be faulty.

1. Connect Error

Fig. 6-1-46

Symptom	USB communication with the set is abnormal.
Cause	• USB cable is not inserted tightly. • Power supply is not installed correctly. • Communication with SEUS is abnormal.
Remedy	• Disconnect the USB cable once, and then reconnect it tightly and check that the set is in "USB Mode". • Install the power supply correctly. • Start the SEUS and click the Connect to check that the connection state is established.

2. RESET the CAMERA and Try Again

Fig. 6-1-47

Symptom	The camera is not ready for adjustment.
Cause	• Data error exists in the camera.
Remedy	• Reset the camera.

3. Adjustment Time Out

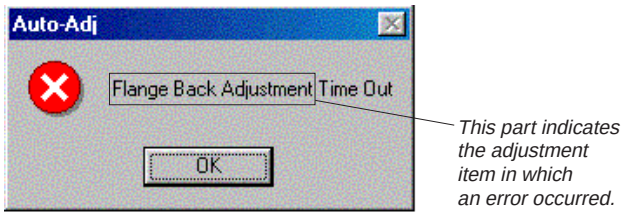


Fig. 6-1-48

Symptom	Adjustment does not finish within the specified time.
Cause	• Adjustment conditions are wrong. • Data error exists in the camera.
Remedy	• Check that the conditions such as a subject are correct. • Reset the camera.

4. Adjustment NG

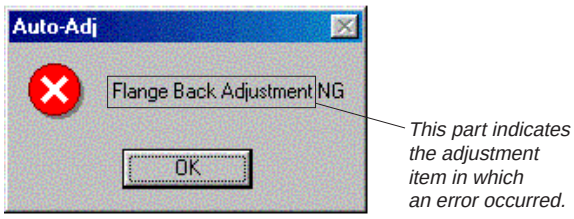


Fig. 6-1-49

Symptom	The adjusted data does not become the specified value.
Cause	• Adjustment conditions are wrong. • Data error exists in the camera.
Remedy	• Check that the conditions such as a subject are correct. • Reset the camera.

5. Data Save Error

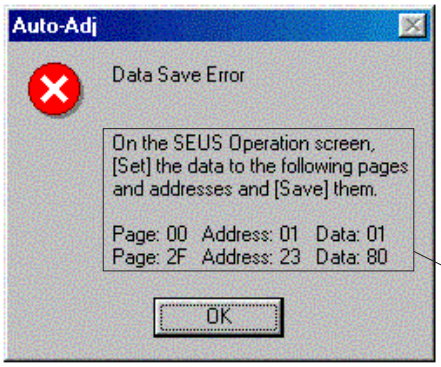


Fig. 6-1-50

Symptom	data cannot be saved normally. (The data setting during adjustment cannot be cancelled)
Cause	• Data writing to the flash memory failed. • Connection is faulty. • Power supply is not installed correctly.
Remedy	• On the SEUS Operation screen, Set the data to the pages and addresses displayed in the message, and Save them. (Cancel manually the data setting during adjustment.) • Check the connection. • Install the power supply correctly.

1-6-2. Precautions When an Error Occurred

The Automatic Adjustment Program sets the data for adjustment before the adjustment starts. Accordingly, if the adjustment terminates by an error, the data during the adjustment may be left in the camera.

Note 1: With this data left in the camera, the camera will not operate normally.

In this case, the Release Data Setting button is displayed in "red" on the screen as shown in Fig. 6-1-51, 52 and 53. Click the Release Data Setting button to cancel the data setting. When the data setting is cancelled, the button color becomes "white".

Note 2: When "Data Save Error" occurred, the Release Data Setting button is displayed in "white".
To cancel the data setting, perform it on the SEUS Operation screen. How to cancel the data setting is displayed in the error message.

Video System Adjustment screen

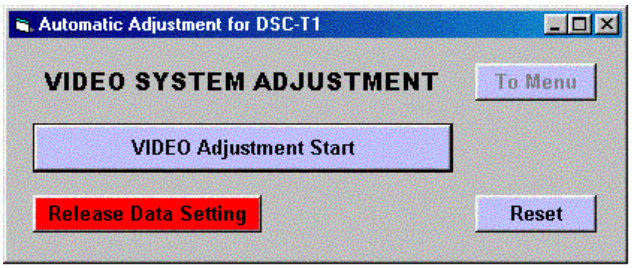


Fig. 6-1-51

Camera System Adjustment screen

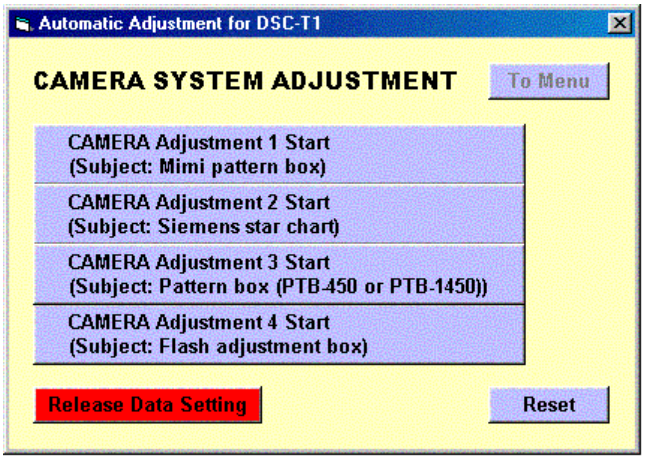


Fig. 6-1-52

LCD System Adjustment screen

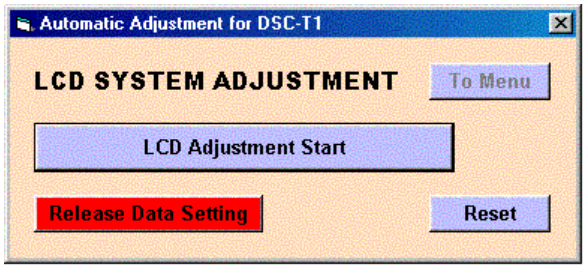


Fig. 6-1-53

1-7. INITIALIZATION OF DATA

1-7-1. INITIALIZATION OF DATA

1. Initializing All Pages Data

By performing the following procedure, data of all the pages will be initialized.

Initializing Method:

1) Select page: 00, address: 01, and set data: 01.
2) Click [Sector Write] on the SEUS screen to display the SEUS SECTOR WRITE screen.
3) Check that the SET ID is "04".
4) Click [All] of the ALL SELECT buttons to select all pages. (Fig. 6-1-54. Ⓐ)
5) Click [Write] to write the initializing data to the flash memory of the camera.
6) Wait for 3 sec.
7) Click [Close] to close the SEUS PAGE EDIT screen.

Processing after Completing Initializing of data

Order	Page	Address	Data	Procedure
1	20	00	29	Set the data.
2	20	01	29	Set the data.
3				Check "Receive Paket Error" is displayed on the SEUS screen.
4				Turn on the power of the camera.
5				Click [Connect] on the SEUS screen.

2. Initializing Single Page Data

By performing the following procedure, data of the page that you want to initialize will be initialized.

Initializing Method:

1) Select page: 00, address: 01, and set data: 01.
2) Click [Sector Write] on the SEUS screen to display the SEUS SECTOR WRITE screen.
3) Check that the SET ID is "04".
4) Click "All" of the option buttons of the target page. (Fig. 6-1-54. Ⓑ)
5) Click [Write] to write the initializing data to the flash memory of the camera.
6) Wait for 3 sec.
7) Click [Close] to close the SEUS PAGE EDIT screen.

Processing after Completing Initializing of data

Order	Page	Address	Data	Procedure
1	20	00	29	Set the data.
2	20	01	29	Set the data.
3				Check "Receive Paket Error" is displayed on the SEUS screen.
4				Turn on the power of the camera.
5				Click [Connect] on the SEUS screen.

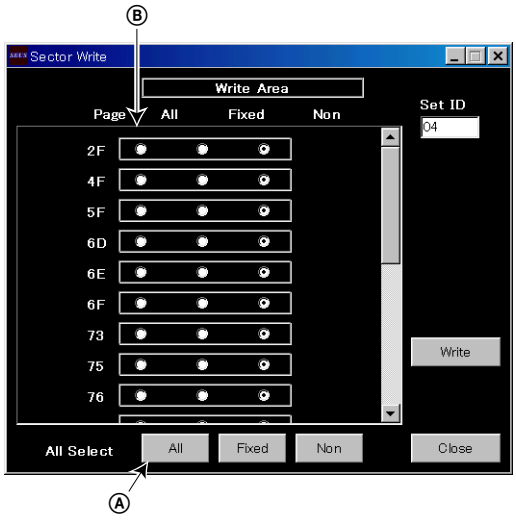


Fig. 6-1-54

6-2. SERVICE MODE

1. Setting the Test Mode

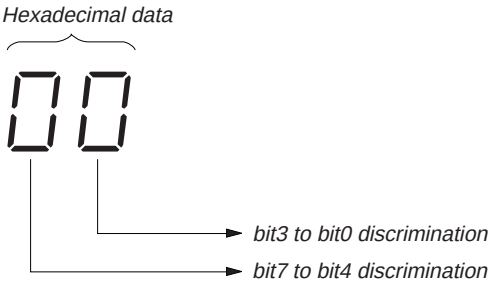
Page 2F	Address 23

Data	Function
80	Normal
01	Forced STILL mode power ON
02	Forced PLAY mode power ON
00	Forced MOVIE mode power ON

- Before setting the data, select page: 00, address: 01, and set data: 01.
- For page 2F, the data set is recorded in the non-volatile memory by saving data. In this case, take note that the test mode will not be exited even when the main power is turned off.
- After completing adjustments/repairs, release the data setting .
  1) Select page: 00, address: 01, and set data: 01.
  2) Select page: 2F, address: 23, and set data: 80.
  3) Save the data.
  4) Wait for 3 sec.
  5) Select page: 00, address: 01, and set data: 00.

2. Bit value discrimination

Bit values must be discriminated using the hexadecimal data for following items. Use the table below to discriminate if the bit value is “1” or “0”.



	Display on the adjustment remote commander	Bit values			
		bit3 or bit7	bit2 or bit6	bit1 or bit5	bit0 or bit4
	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
Ⓐ	8	1	0	0	0
	9	1	0	0	1
	A (R)	1	0	1	0
	B (b)	1	0	1	1
	C (c)	1	1	0	0
	D (d)	1	1	0	1
Ⓑ	E (E)	1	1	1	0
	F (F)	1	1	1	1

Examples: If the hexadecimal data is “8E”, the bit values for bit7 to bit4 are shown in the Ⓐ column, and the bit values for bit3 to bit0 are shown in the Ⓑ column.

3. Switch check (1)

Page 20	Address 80

Bit	Function	When bit value=1	When bit value=0
0	POWER switch (XPWER ON) (Control switch block S001)	OFF	ON
2	Lens cover open switch (XLENS CAP ON) (SY-95 board S401)	Closed	Open

Using method:

1) Select page: 20, address: 80.
2) Read the data. By discriminating the bit value of the data, the state of the switches can be discriminated.

4. Switch check (2)

Page 20	Address 90 to 92, 95

Using method:

1) Select page: 20, address: 90 to 92, 95.
2) Read the data. By discriminating the data, the pressed key can be discriminated.

Address	Data				
	00 to 0B	0C to 26	27 to 47	48 to 72	73 to FF
90 (MODE AD0) (IC491Ⓙ6)	MENU (Control switch block) (S007)	Control button LEFT (Control switch block) (S005)	DISPLAY/LCD BACK LIGHT (Control switch block) (S013)	Control button DOWN (Control switch block) (S011)	No key input
91 (KEY AD1) (IC491Ⓗ6)	Control button UP (Control switch block) (S006)	IMAGE SIZE/DELETE (Control switch block) (S009)	Control button RIGHT (Control switch block) (S010)	Control button SET (Control switch block) (S008)	No key input
92 (KEY AD2) (IC491Ⓖ6)	WIDE (Control switch block) (S003)	TELE (Control switch block) (S004)			No key input
94 (MODE DIAL0) (IC491Ⓙ8)	Mode switch MOVIE (MS-148 board) (S101)	Mode switch STILL (MS-148 board) (S101)	Mode switch PLAY (MS-148 board) (S101)		

5. Switch check (3)

Page 80	Address 13

Function	When data = 00	When data = 01	When data = 02
Shutter button (XAE LOCK SW) (Control switch block S002)	Off	On	On
Shutter button (XSHTR ON SW) (Control switch block S002)	Off	Off	On

Using method:

1) Select page: 80, address: 13.
2) Read the data. By discriminating the data, the state of the switches can be discriminated.

6. LED check

Page 20	Address 04
Page 80	Address 12
Page 8E	Address FE

Using method:

1) Select page: 00, address: 01, set data: 01.
2) Select page: 8E, address: FE, set data: 20.
3) Select page: 80, address: 12, set data: 01.
4) Select page: 20, address: 04, set data: 02.
5) Check that all LED (Power, Flash/Charge, MS access, AF illmination) are lit.
6) Select page: 20, address: 04, set data: 00.
7) Select page: 80, address: 12, set data: 00.
8) Select page: 8E, address: FE, set data: 00.
9) Select page: 00, address: 01, set data: 00.

7. Record of Use check

Page 4F	Address 94 to 97

Address	Function	Remarks
94	Recording counter (Hexadecimal)	1000000-digit and 1000000-digit
95		1000000-digit and 10000-digit
96		1000-digit and 100-digit
97		10-digit and 1-digit

Using method:

1) The recording counter data is displayed at page: 4F, addresses: 94 to 97. These data are named D_{94}, D_{95}, D_{96} and D_{97} respectively.
2) Calculate the recording counter (N) using following equation. (Hexadecimal calculation)
   $N = D_{97} + D_{96} \times 100 + D_{95} \times 10000 + D_{94} \times 1000000$

8. Self Diagnostics Log check

Page 20	Address B0 to B8

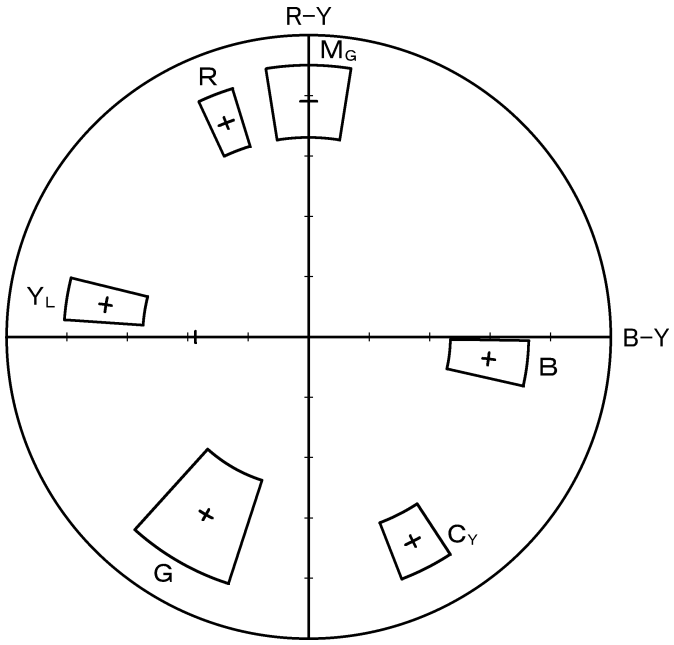
Address	Initial value	Function
B0	00	“Repaired by” code (Occurred 1st time) *1
B1	00	“Block function” code (Occurred 1st time)
B2	00	“Detailed” code (Occurred 1st time)
B3	00	“Repaired by” code (Occurred 2nd time) *1
B4	00	“Block function” code (Occurred 2nd time)
B5	00	“Detailed” code (Occurred 2nd time)
B6	00	“Repaired by” code (Occurred 3rd time) *1
B7	00	“Block function” code (Occurred 3rd time)
B8	00	“Detailed” code (Occurred 3rd time)

*1: “C” → “01”, “E” → “03”

Using method:

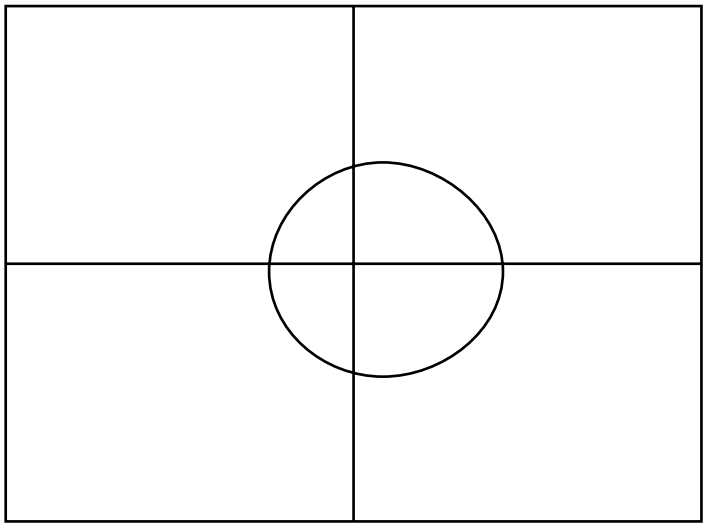
1) The self diagnostics log is displayed at page: 20, addresses: B0 to B5.
   Note: These data will be erased when the lithium battery (CN-198 board) is removed.

⟨FOR CAMERA COLOR REPRODUCTION ADJUSTMENT⟩

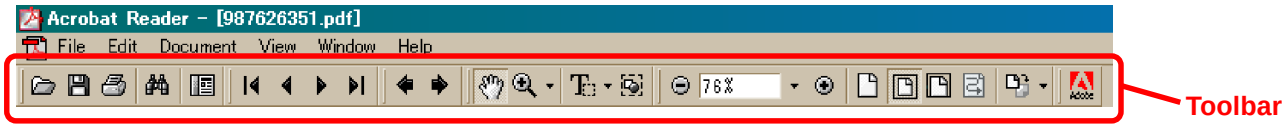


Take a copy of CAMERA COLOR REPRODUCTION FRAME with a clear sheet for use.

⟨AF ILLUMINATION FRAME⟩



[Description of main button functions on toolbar of the Adobe Acrobat Reader Ver5.0 (for Windows)]



Printing a text

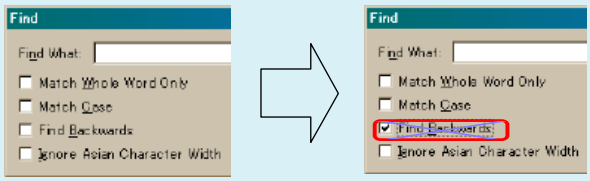
1. Click the Print button .
2. Specify a printer, print range, number of copies, and other options, and then click [OK].

Application of printing:
To set a range to be printed within a page, select the graphic selection tool and drag on the page to enclose a range to be printed, and then click the Print button.

Finding a text

1. Click the Find button .
2. Enter a character string to be found into a text box, and click the [Find]. (Specify the find options as necessary)

Application to the Service Manual:
To execute "find" from current page toward the previous pages, select the check box "Find Backward" and then click the "Find".



3. Open the find dialog box again, and click the [Find Again] and you can find the matched character strings displayed next. (Character strings entered previously are displayed as they are in the text box.)

Application to the Service Manual:
The parts on the drawing pages (block diagrams, circuit diagrams, printed circuit boards) and parts list pages in a text can be found using this find function. For example, find a Ref. No. of IC on the block diagram, and click the [Find Again] continuously, so that you can move to the Ref. No. of IC on the circuit diagram or printed circuit board diagram successively.
Note: The find function may not be applied to the Service Manual depending on the date of issue.

Switching a page

- To move to the first page, click the .
- To move to the last page, click the .
- To move to the previous page, click the .
- To move to the next page, click the .

Reversing the screens displayed once

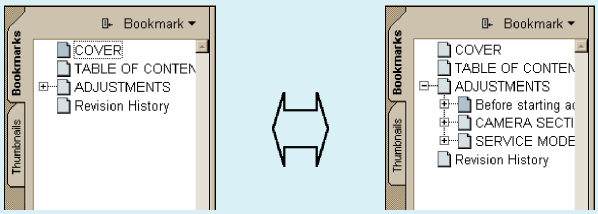
- To reverse the previous screens (operation) one by one, click the .
- To advance the reversed screens (operation) one by one, click the .

Application to the Service Manual:
This function allows you to go and back between circuit diagram and printed circuit board diagram, and accordingly it will be convenient for the voltage check.

Moving with link

1. Select either palm tool , zoom tool , text selection tool , or graphic selection tool .
2. Place the pointer in the position in a text where the link exists (such as a button on cover and the table of contents page, or blue characters on the removal flowchart page or drawing page), and the pointer will change to the forefinger form .
3. Then, click the link. (You will go to the link destination.)

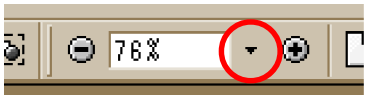
Moving with bookmark:
Click an item (text) on the bookmark pallet, and you can move to the link destination. Also, clicking can display the hidden items.
(To go back to original state, click)



Zooming or rotating the screen display

"Zoom in/out"

- Click the triangle button in the zoom control box to select the display magnification. Or, you may click or for zooming in or out.



"Rotate"

- Click rotate tool , and the page then rotates 90 degrees each.

Application to the Service Manual:
The printed circuit board diagram you see now can be changed to the same direction as the set.