

JVC

SERVICE MANUAL

DIGITAL VIEWER

AV-P950U/E



SPECIFICATIONS

GENERAL

Power requirements : AC 100 V to 120 V, 50 Hz/60 Hz(U)
AC 220 V to 240 V, 50 Hz/60 Hz (E)
Power consumption : 40 W(U) 0.36A(E)
Dimensions (WHD) : 775 mm x 700 mm x 670 mm (open)
(30-9/16" x 27-9/16" x 26-7/16")
(Width: when the lights are moved to the outside maximum)
450 mm x 230 mm x 765 mm (closed)
(17-3/4" x 9-1/16" x 30-1/8")
Mass : 9 kg (19.8 lbs.)

OPTICAL

Lens : F2.9 to F3.1, f = 6.4 mm to 32 mm (5 times)
Shooting area : Max.: 350 mm x 260 mm (13-13/16" x 10-1/4")
(B4 size horizontal)
: Min.: 80 mm x 60 mm (2-3/16" x 2-3/8")
(with digital zoom OFF)
Focal distance adjustable range: From the stage surface to a height of 100 mm
(3-15/16") from the stage surface (the camera directed downward, with close-up lens)
∞ to 0.8 m (2.6 ft) (the camera directed to the side, without close-up lens)
Zoom : Motorized x5 (optical), x4 (digital)
Focus : Auto/manual
Brightness : Auto/manual

LIGHTING

Side illumination : 2 x 6 W (inverter lighting)
Back illumination : 2 x 6 W (inverter lighting, area size is A4 horizontal)

CAMERA HEAD

Output operation mode : Progressive mode, 3-mode switching
1024 dots x 768 dots
H : 48.4 kHz/V: 60.0 Hz
800 dots x 600 dots
H : 37.9 kHz/V: 60.3 Hz
640 dots x 480 dots
H : 31.5 kHz/V: 59.9 Hz

Interlace mode

NTSC H : 15.734 kHz/V: 59.95 Hz (U)
PAL H : 15.75 kHz/V: 50 Hz (E)

Image pickup device : 1/3" CCD
Number of pixels (total) : 850,000 (H1077 x V788)
Frame rate : 15 fps
Synchronization system : Internal
White balance : Auto/manual
Input select : Camera/External input

INPUT/OUTPUT

Input connector : External input (D-sub 15-pin, female) x 1
Output connectors : RGB (D-sub 15-pin, 0.7 V(p-p), 75 Ω, female) x 2
S-video (Mini DIN 4-pin, 1 V (p-p), 75 Ω) x 1
Video (RCA pin, 1 V (p-p), 75 Ω) x 1
USB (series B) x 1
DC 12 V (DC jack) x 1 (Used exclusively with the LCD monitor TA-AV-Z7U)
Control connector : Remote input (D-sub 9-pin, RS-232C, male) x 1

ENVIRONMENTAL CONDITIONS

Operating temperature : 5°C to 40°C (41°F to 104°F)
Humidity : 30% to 85%

ACCESSORIES

Provided accessories : Instruction manual (this booklet and Application software instructions) x 2, video cable (5 m) x 1, power cord x 1, remote control unit x 1, battery (AA) x 2, floppy disk (application software) x 3

OPTIONS

LCD monitor (TA-AV-Z7U)
Book holder
Book holder (JVC Part No. SS22717-001) x 2
Catcher (JVC Part No. SS411744-003) x 4

Design and specifications subject to change without notice.
● To save electricity, turn the power off when not in use.

TABLE OF CONTENTS

■ IMPORTANT SAFETY PRECAUTIONS

■ INSTRUCTIONS

■ APPLICATION SOFTWARE INSTRUCTIONS

- 1. SERVICE CAUTIONS AND DISASSEMBLY 1-1
- 2. ELECTRICAL ADJUSTMENTS 2-1
- 3. DIAGRAMS AND CIRCUIT BOARDS 3-1
- 4. EXPLODED VIEWS AND PARTS LIST 4-1
- 5. ELECTRICAL PARTS LIST 5-1
- 6. PACKING 6-1

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

●Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the \triangle symbol and shaded (■) parts are critical for safety.
Replace only with specified part numbers.
Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
1) Wires covered with PVC tubing
2) Double insulated wires
3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
1) Insulation Tape 3) Spacers 5) Barrier
2) PVC tubing 4) Insulation sheets for transistors

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

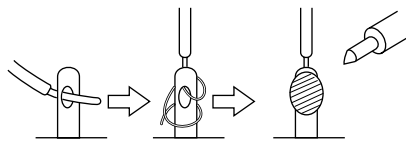


Fig.1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

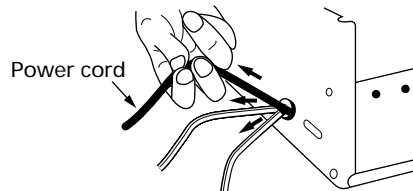


Fig.2

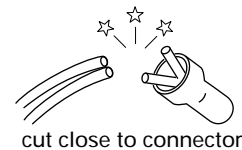
10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

- 1) **Connector part number** : E03830-001
- 2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
- 3) **Replacement procedure**
 - (1) Remove the old connector by cutting the wires at a point close to the connector.
Important : Do not reuse a connector (discard it).



cut close to connector

Fig.3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

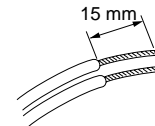


Fig.4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

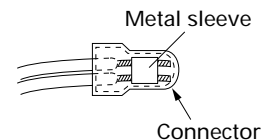


Fig.5

(4) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.



Fig.6

(5) Check the four points noted in Fig.7.

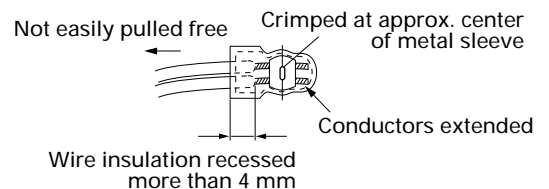


Fig.7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

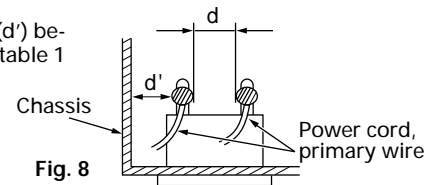
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

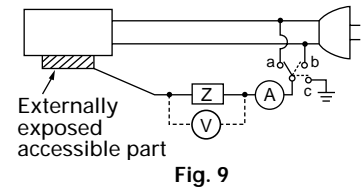


4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method : (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

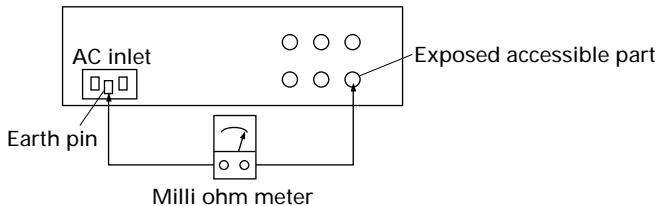


5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.



Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega/500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	-	AC 900 V 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V	Europe & Australia	$R \geq 10 \text{ M}\Omega/500 \text{ V DC}$	AC 3 kV 1 minute (Class II)	$d \geq 4 \text{ mm}$
200 to 240 V			AC 1.5 kV 1 minute (Class I)	$d' \geq 8 \text{ mm}$ (Power cord) $d' \geq 6 \text{ mm}$ (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	$1 \text{ k}\Omega$	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada	$0.15 \mu\text{F}$ and $1.5 \text{ k}\Omega$	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	$2 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
		$50 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SECTION 1

SERVICE CAUTIONS AND DISASSEMBLY

1.1 REPLACING THE FUSE

If it is required to replace the fuse, first investigate the cause of the fuse failure and repair it, this will prevent the problem spreading. To protect the equipment and ensure safety, be sure to replace the fuse with one that has a specified JVC part number.

1. Unplug the power cord from the power outlet.
2. Remove the twelve screws ①, loosen the two screws ② and remove the cover.

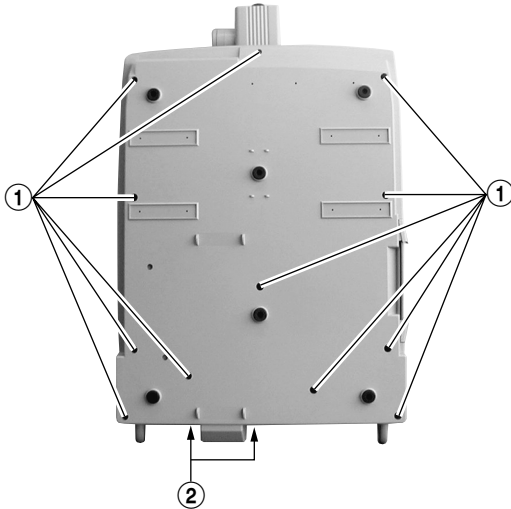


Fig. 1-1

3. The fuse (F1) is located on the Power Board.

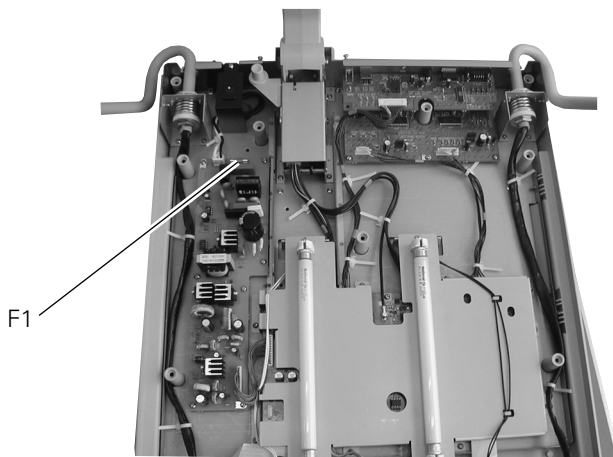


Fig. 1-2

Part number of the fuse

- F1 (U) : QMF51U1-1R6-S (1.6 A)
- (E) : QMF51E2-1R25-S (T1.25 A)

1.2 REMOVING THE DSP BOARD

1. Remove the cover.
2. Remove the four screws ③ and the nine screws ④, and remove the Back Light Ass'y A.

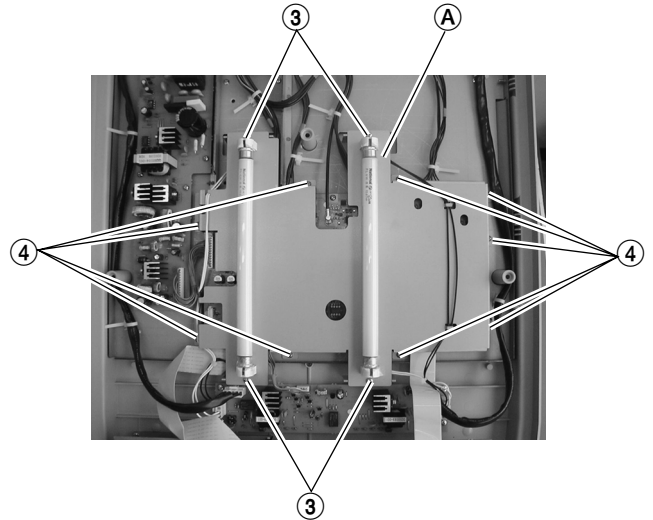


Fig. 1-3

3. Remove the six screws ⑤ to remove the DSP Board B.

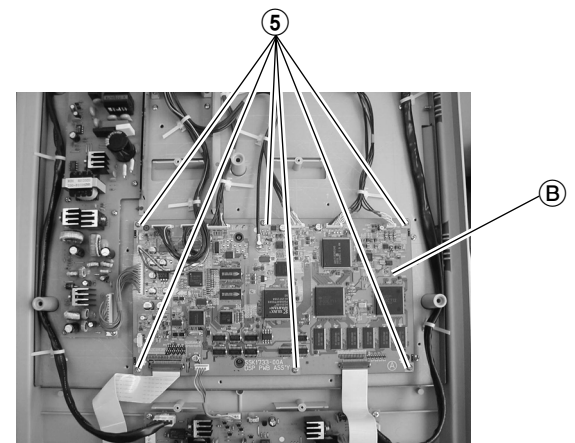


Fig. 1-4

1.3 REMOVING THE JK1 AND JK2 BOARDS

1. Remove the screw ⑥ and the two studs ⑦ to remove the JK1 Board.

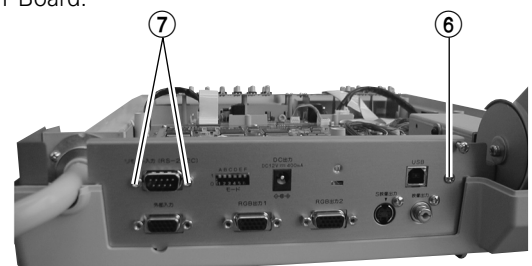


Fig. 1-5

- Remove the two screws ⑧ and the six studs ⑨.

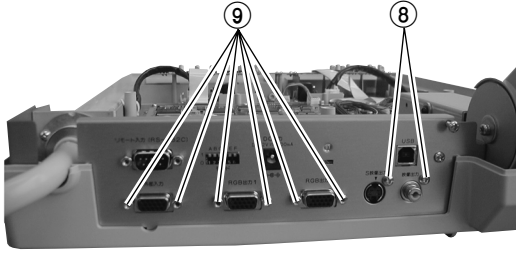


Fig. 1-6

- Remove the three screws ⑩ to remove the JK2 Board ③.

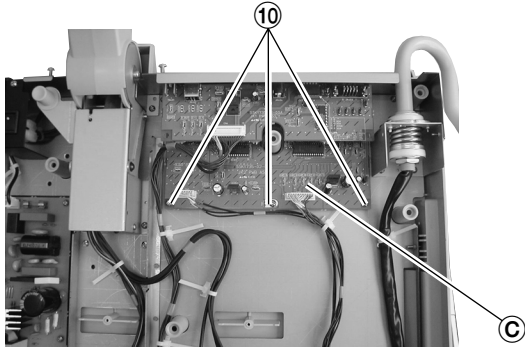


Fig. 1-7

1.4 REMOVING THE CAMERA BLOCK

- Remove the three screws ⑪ and remove the camera cases (R)/(F).

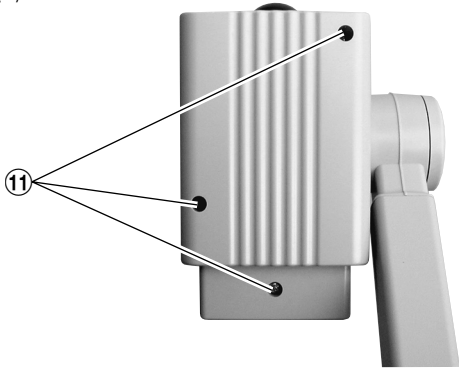


Fig. 1-8

- Remove the four screws ⑫ to remove the IF2 Board ④. (Remove the shield cover.)

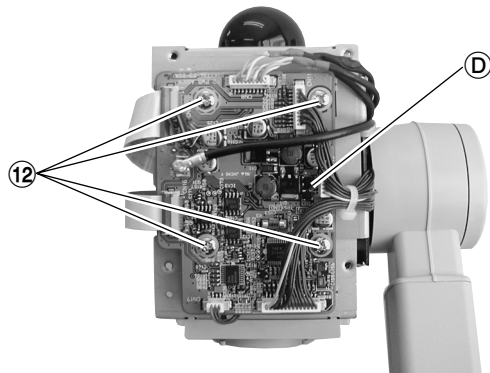


Fig. 1-9

- Remove the three screws ⑬ and remove the filter ⑤ and REMOTE Board ⑥.

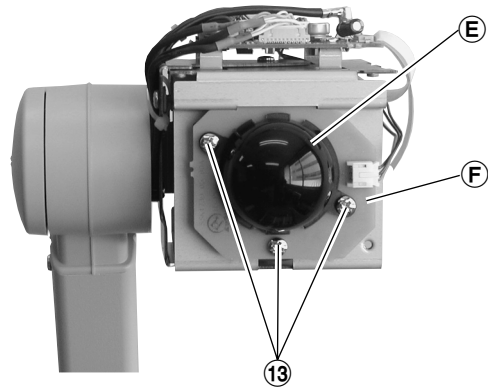


Fig. 1-10

- Remove the three screws ⑭. (Rotation of these screws is required when re-attaching them.)

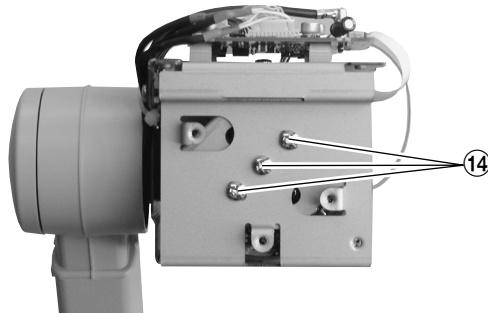


Fig. 1-11

- Remove three screws ⑮ and then remove the lens panel ⑦ to remove the OP Block Ass'y.

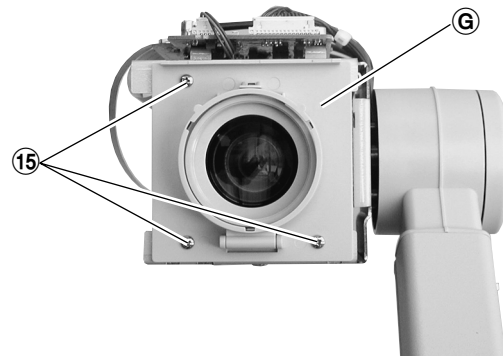


Fig. 1-12

1.5 REPLACING THE CCD ASS'Y

- Note:**
- Take special care not to leave stains, dirt or scratches on the glass surfaces of the CCD Ass'y, the optical LPF or the Optical Block Ass'y. Should these be contaminated by fingerprints, etc., wipe with a piece of silicon paper or a clean chamois.
 - The CCD Ass'y may have been shipped with protective sheets attached to its glass surfaces. Do not peel off these sheets until immediately before the CCD Ass'y is mounted in the Optical Block Ass'y.

1.5.1 Disassembly

1. Remove the two screws (A) clamping the CCD base and remove the CCD base. While taking care not to drop the CCD Ass'y, remove the optical LPF holder. Then remove the optical LPF, spacer rubber and CCD Ass'y.

1.5.2 Assembly

1. Peel off the protective sheet from the CCD Ass'y, stack the spacer rubbers on the optical LPF, then put them in the optical LPF holder and place it on top of the Optical Block Ass'y.
2. Tighten the two screws (A) in order to clamp the CCD base.
3. After replacing the CCD Ass'y, mount the PC boards and perform test shooting. The assembly is complete when the image is not obscured or cut off at the wide-angle end of zooming.

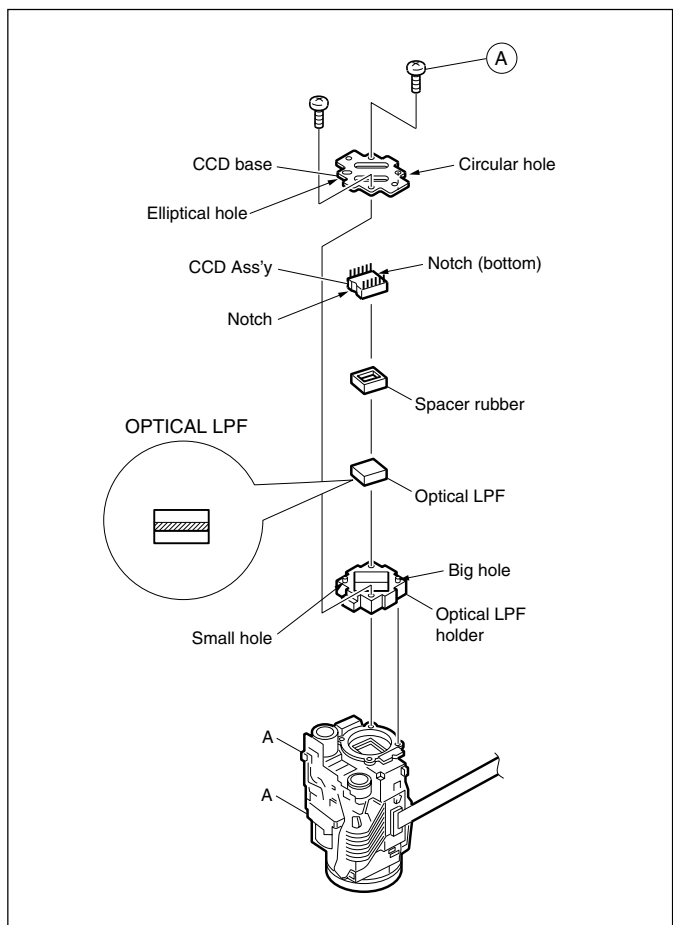


Fig. 1-13

1.6 REMOVING THE FFC CABLE

1. Pull the two ends of the connector to unlock it, and then unplug the flat cable. Take special care when unlocking the connector because it is fragile.

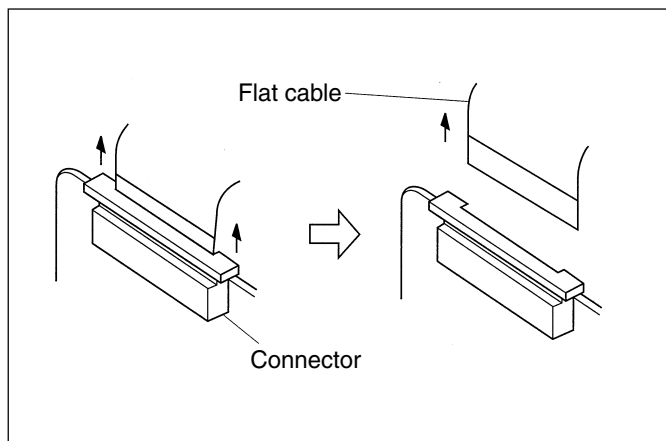


Fig. 1-14

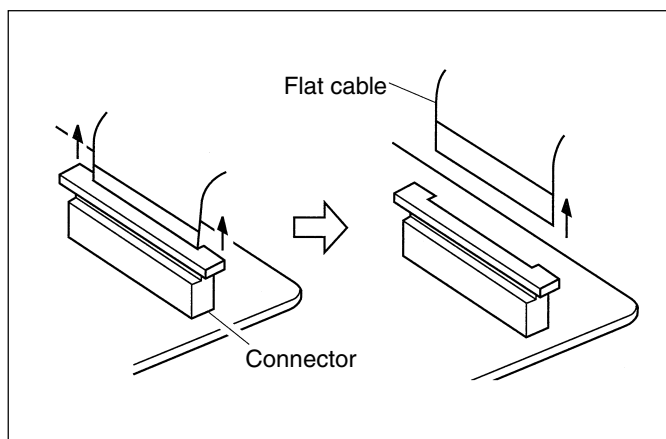
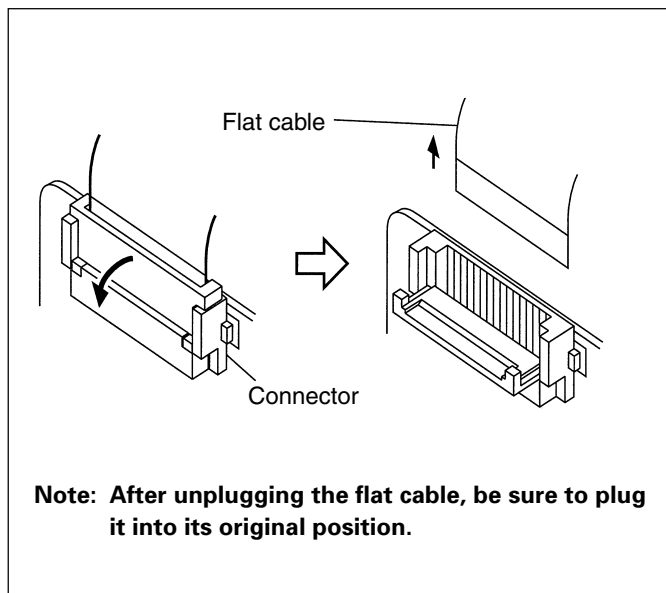


Fig. 1-15



Note: After unplugging the flat cable, be sure to plug it into its original position.

Fig. 1-16

SECTION 2 ELECTRICAL ADJUSTMENTS

2.1 BEFORE ADJUSTMENTS

The camera block can be adjusted by adjusting the internal DSP Board and varying the EVRs (Electric Variable Resistors). It is therefore required to use adjustment software, a PC and special optical tools and jigs in the adjustments.

- 1) After replacement of the CCD, a lens (OP Block) or the EEPROM, adjustments using the following menu commands are necessary:

“Adjust lens”, “Test of Tracking”, “Adjust Light Distance”, “Adjust Camera”

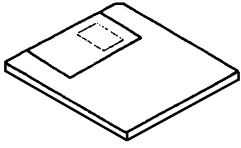
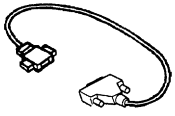
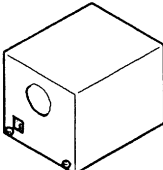
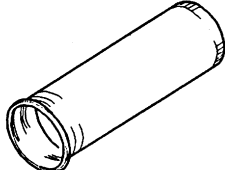
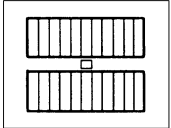
In case of a malfunction in the electrical circuitry, perform troubleshooting and repair any discovered defect before proceeding to adjustments. During this operation, take care of the following points.

- 1) When observing the TP of a chip, use an IC clip, etc. to avoid applying stress to the part.
- 2) Be careful when plugging or unplugging connectors because they are fragile.

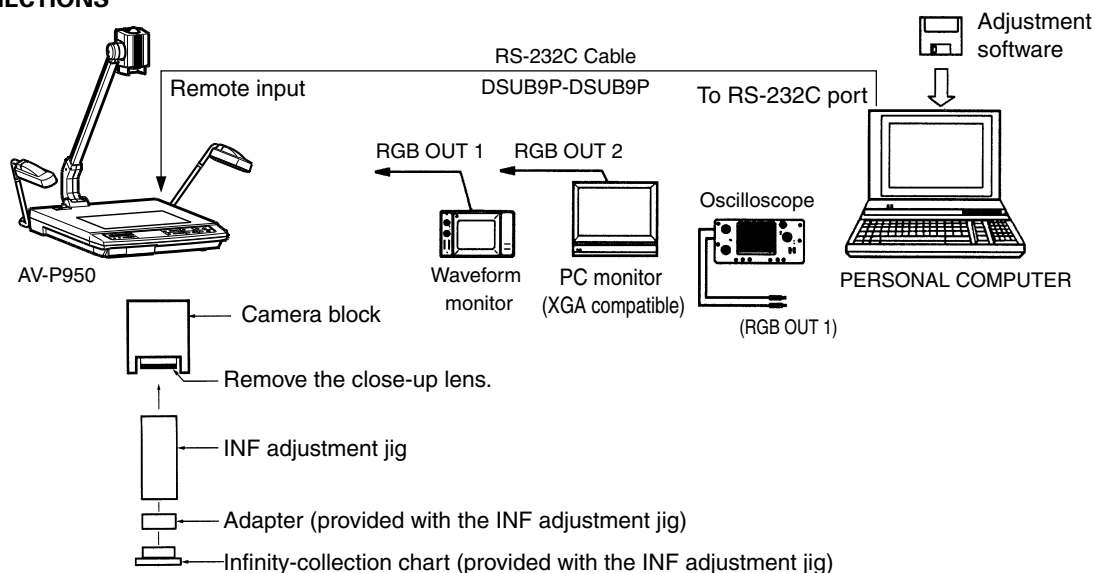
2.2 MEASURING INSTRUMENTS USED

- Oscilloscope (40 MHz, 5 mV or better)
- Monitor (XGA compatible)
- Waveform monitor

2.3 TOOLS AND JIGS USED (Special tools and jigs for use in computer adjustment)

Adjustment software (2-disc set) PLSS1751(English)/PLSS1752(Chinese)	RS-232C cable>Note 1) C232N-9FF (manufactured by Elecom)	Light box>Note 2) YTU93072	INF adjustment jig YTU92001B
	 DSUB9P-DSUB9P		
Gray scale chart GS2L	<p>Note 1) To prevent lamp burn, do not apply a voltage higher than 6 V.</p> <p>Note 2) For use in field adjustment.</p>		
			

2.4 CONNECTIONS



2.5 INSTALLATION OF ADJUSTMENT SOFTWARE, ADJUSTMENT PROCEDURE

2.5.1 Installing the Adjustment Software

- Use a DOS/V compatible PC and Windows 95 or Windows 98 as the OS.
- Insert disc No. 1 and run "SETUP.EXE". After this, perform installation by following the displayed instructions.

2.5.2 Connecting the PC

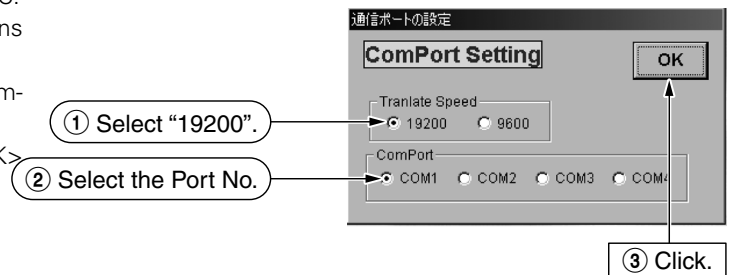
- Connect the PC to the AV-P950 through an RS232C straight cable.

2.5.3 Before Adjustments

- (1) While holding the "Camera" and "Image Memory 1" buttons on the AV-P950 depressed, switch on the AV-P950. (Hold by depressing the buttons for 5 seconds after the power is switched ON and then release them.)
- (2) Run the adjustment software (AVP950) installed in the PC.
- (3) Select the rate and port No. of the serial communications with the PC.

- ① In the [Communication Port Setting] window, select communication rate "19200".
- ② Select the serial port number of the PC and click the <OK> button.

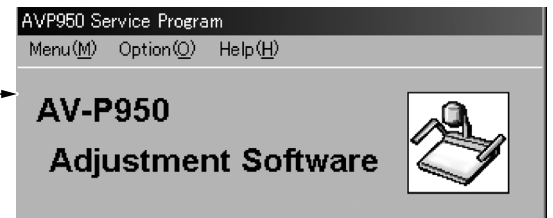
Note) If the cursor is displayed as a sandglass, communication is abnormal. Check the cable connection and PC's serial port number again.



2.5.4 Adjustment Procedure

Note) If the cursor is displayed as a sandglass, communication is abnormal. Check the cable connection and the PC's serial port number again.

Adjustment window

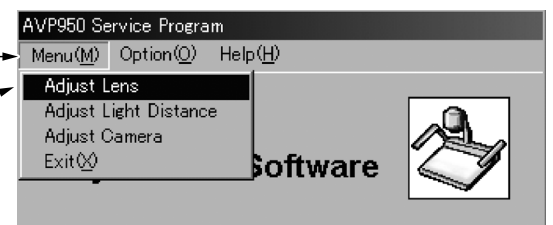


1. Perform the lens adjustments.

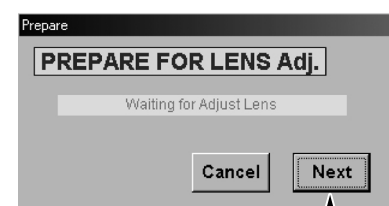
(1) Display the [Adjust for Lens] window.

- ① In the [AVP950 Service Program] window, click [Menu] and select "Adjust Lens".

- ① Click.
- ② Select "Adjust Lens".



- ② When the message "PREPARE FOR LENS Adj." is displayed, attach the infinite focusing lens jig onto the AVP950.
- ③ After completing the above operation, click the <Next> button.



Click after completion.

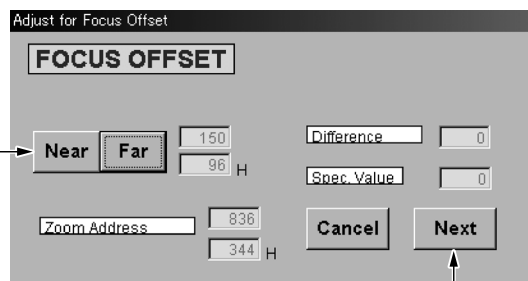
(2) Adjust "Focus Offset".

- ① With the [Adjust for Focus Offset] window displayed, observe the monitor and adjust the [Near] and [Far] buttons for accurate focusing.

Adjustment points : [Near] button (software)

[Far] button (software)

[Near], [Far]



Click after completion.

- ② After completing the above adjustment, click the <Next> button.

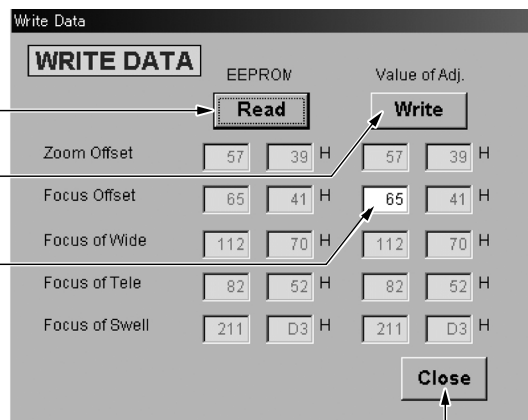
(3) Adjust "Write Data".

- ① In the [Write Data] window, click the [Write] button to write setting data.

Read "EEPROM data".

Writes "adjustment data".

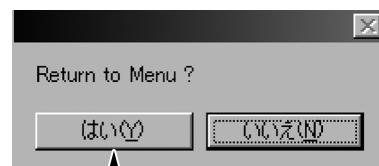
With the AV-P950, adjust "Focus Offset" only.



Click after completion.

- ② After completing the above operation, click the <Close> button.

- ③ When message [Return to Menu?] is displayed, click the <Yes> button.



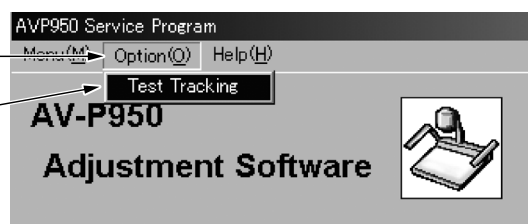
Click.

(4) Display the "Test of Tracking" window.

- ① In the [AVP950 Service Program] window, click [Option] and select "Test Tracking".

① Click.

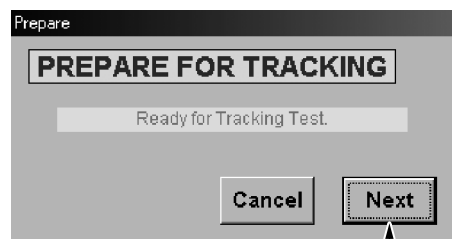
② Select "Test Tracking".



- ② When the message "PREPARE FOR TRACKING" is displayed, remove the infinite focusing lens jig from the AV-P950 and place the close-up lens in its original position.

- ③ Press the "Light" button of the AV-P950 to turn off the sidelight.

- ④ After completing the above operation, click the <Next> button.



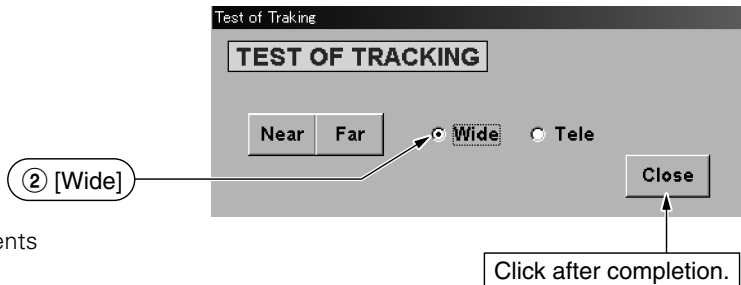
Click after completion.

(5) Start “Test of Tracking”.

- ① With the [Test of Tracking] window displayed, place an object on the stage and, while observing the monitor, adjust the [Near] and [Far] buttons for accurate focusing.
Adjustment points : [Near] button (software)
[Far] button (software)



- ② After completing the above adjustment, click the [Wide] button.

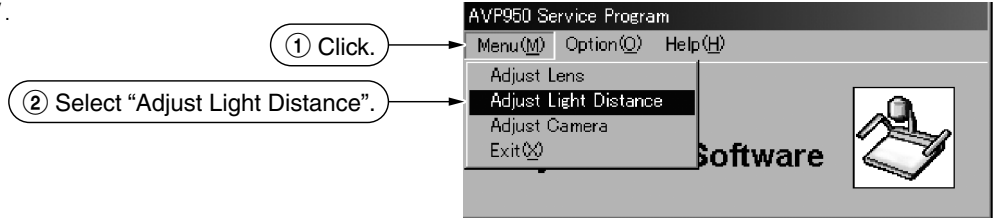


- ③ When the object is in accurate focus, the lens adjustments are complete.
If the object is out of focus, restart the lens adjustments from the beginning.
- ④ After completing the above operations, click the <Close> button.

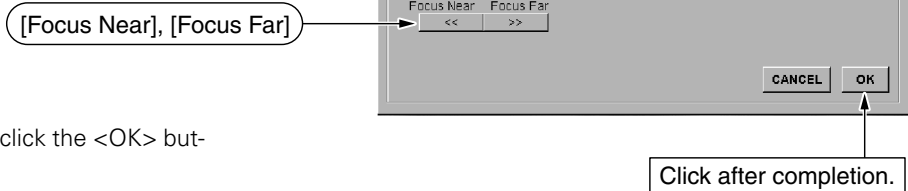
2. Perform the light path length adjustment.

(1) Display the [Adjust for Light Distance] window.,

- ① In the [AVP950 Service Program] window, click [Menu] and select “Adjust Light Distance”.



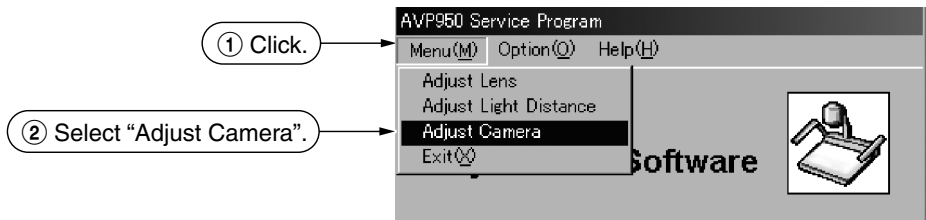
- ② When the message “Gray scale or Lattice chart. Set Focus-lens position” is displayed, adjust the focus with the [Focus Near] or [Focus Far] buttons by shooting the gray scale or lattice charts.



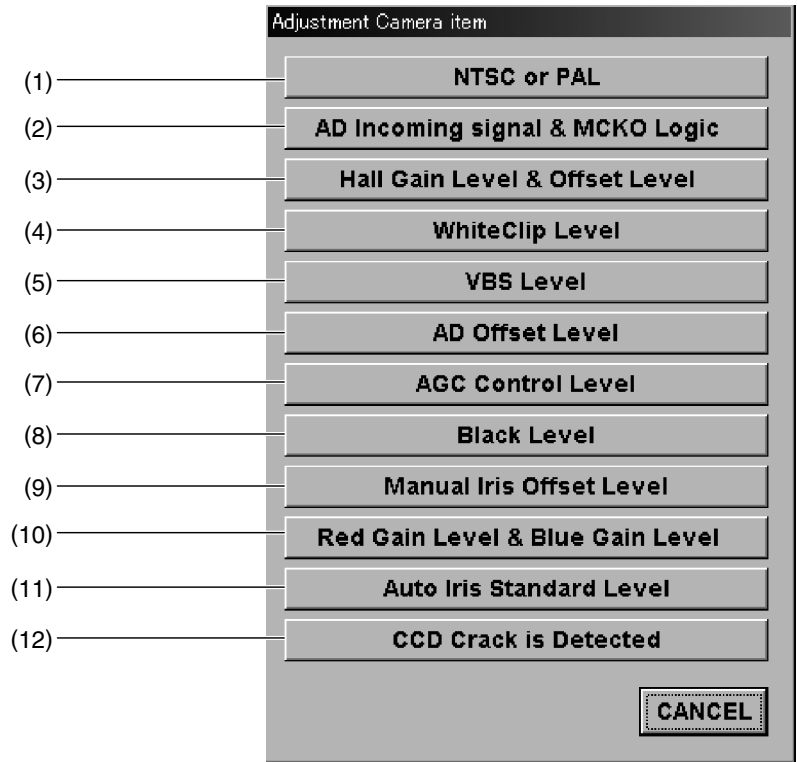
- ③ After completing the above operation, click the <OK> button.

3. Perform the camera adjustments.

- ① In the [AVP950 Service Program] window, click [Menu] and select “Adjust Camera”.



② Display the [Adjustment Camera item] window.



(1) Perform the “NTSC/PAL setting”.

① In the [Adjustment Camera item] window, click the [NTSC] or [PAL] button.

Adjustment points : [NTSC] button (software)
 : [PAL] button (software)
 AV-P950U : NTSC
 AV-P950E : PAL

[NTSC] or [PAL]



Click after completion.

② After completing the above operations, click the <OK> button.

(2) Perform the “AD signal input timing adjustment” and “MCKO logic setting”.

① In the [Adjustment Camera item] window, click the [AD Incoming signal & MCKO Logic] button.

② When the [CAM Adjustment] window is displayed, click the <Next> button.

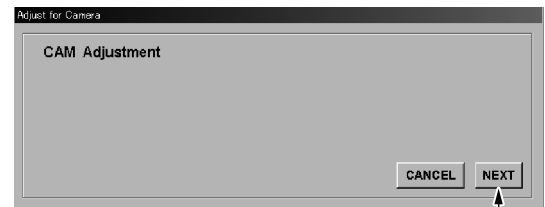
③ With the [AD Incoming signal] button, set to obtain normal video.

④ With the [MCKO Logic] button, set to obtain normal video. If the color tints are normal regardless of the settings, set it to the initial setting.

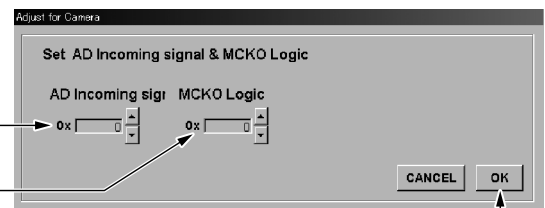
Adjustment points : [AD Incoming signal] button (software)
 [MCKO Logic] button (software)

① [AD Incoming signal]

② [MCKO Logic]



Click.



Click after completion.

⑤ After completing the above settings, click the <OK> button.

(3) Adjust the “Hall device”.

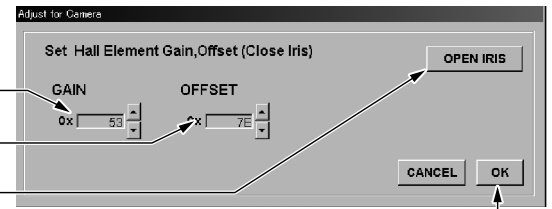
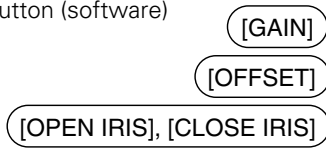
- ① In the [Adjustment Camera item] window, click the [Hall Gain Level & Offset Level] button.
- ② When the [CAM Adjustment] window is displayed, click the <Next> button.



Click.

- ③ Perform any necessary additional adjustments so that the voltage at TP101 of the IF2 Board is 2.5 V when the iris is closed and 0.5 V when the iris is open. (The IF2 Board is located inside the camera case.)

Adjustment points : [GAIN] button (software)
 [OFFSET] button (software)

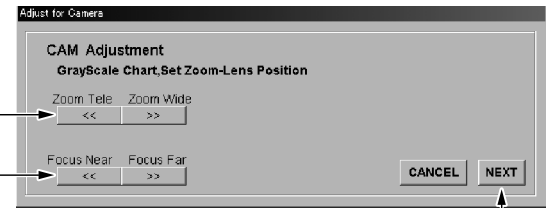
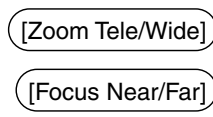


Click after completion.

- ④ After completing the above adjustments, click the <OK> button.

(4) Adjust the “white clip level”.

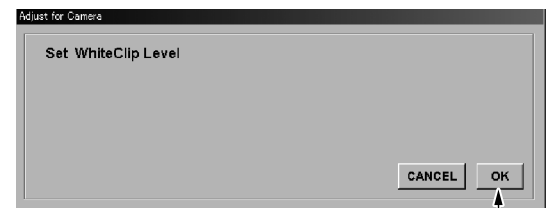
- ① In the [Adjustment Camera item] window, click the [White Clip Level] button.
- ② When the [CAM Adjustment] window is displayed, pick up the image of the gray scale chart, adjust the lens (using [Zoom Tele/Wide] and [Focus Near/Far]) and click the <Next> button.



Click.

- ③ With the [Set White Clip Level] window displayed, adjust VR5 of the DSP Board so that the G clip level at RGB-OUT meets the following condition.

Adjustment point : DSP Board – VR5 (Inside the main unit)
 Condition : $0.80\text{ V} \leq \text{G clip level} \leq 0.82\text{ V}$

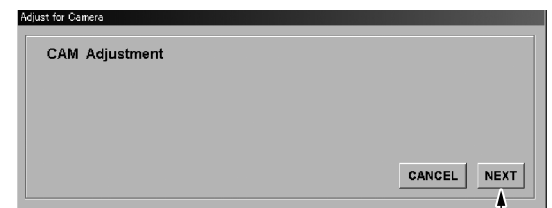


Click after completion.

- ④ After completing the above adjustments, click the <OK> button.

(5) Adjust the “VBS output level”.

- ① In the [Adjustment Camera item] window, click the [VBS Level] button.
- ② When the [CAM Adjustment] button is displayed, click the <Next> button.



Click.

- ③ With the [Set VBS Level] window displayed, adjust VR6 of the DSP Board so that the video sync satisfies the following conditions.

Adjustment point : DSP Board – VR6 (Inside the main unit)
 Condition : NTSC 286 mV ± 15 mV
 : PAL 300 mV ± 15 mV

- ④ After completing the above adjustments, click the <OK> button.



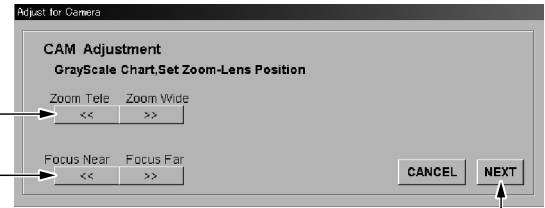
Click after completion.

(6) Proceed to the “AD offset adjustment”.

- ① In the [Adjustment Camera item] window, click the [AD Offset Level] button.
- ② When the [CAM Adjustment] window is displayed, pick up the image of the gray scale chart, adjust the lens (using [Zoom Tele/Wide] and [Focus Near/Far]) and click the <Next> button.

[Zoom Tele/Wide]

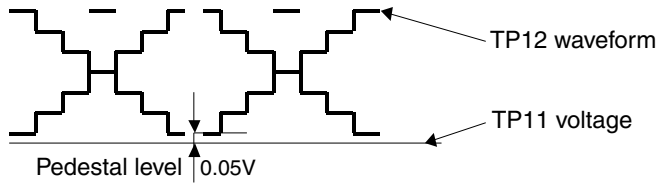
[Focus Near/Far]



Click after completion.

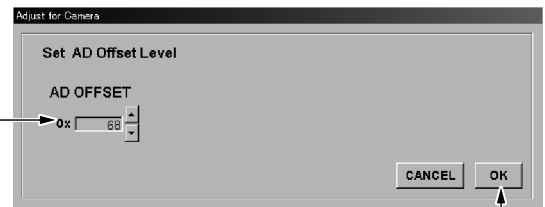
- ③ With the [Set AD Offset Level] window displayed, adjust the [AD OFFSET] button so that the pedestal level of the video signal at TP12 with respect to the voltage at TP11 (approx. 2 V) meets the following condition.

TP11 voltage £ Pedestal level £ TP11 voltage + 0.05 V



- * Connect CH1 of the oscilloscope to TP12 of the DSP Board and CH2 to TP11 of the DSP Board.
 Adjustment point : [AD OFFSET] button (software)

[AD OFFSET]



Click after completion.

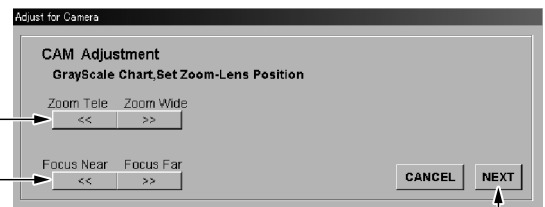
- ④ After completing the above operations, click the <OK> button.

(7) Proceed to the “CCD output saturation level adjustment”.

- ① In the [Adjustment Camera item] window, click the [AGC Control Level] button.
- ② When the [CAM Adjustment] window is displayed, pick up the image of the gray scale chart, adjust the lens (using [Zoom Tele/Wide] and [Focus Near/Far]) and click the <Next> button.

[Zoom Tele/Wide]

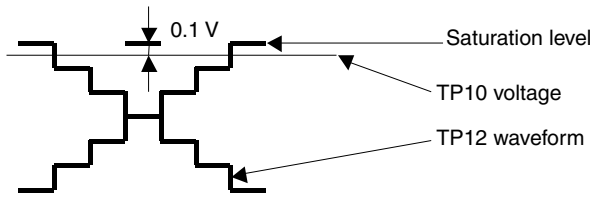
[Focus Near/Far]



Click after completion.

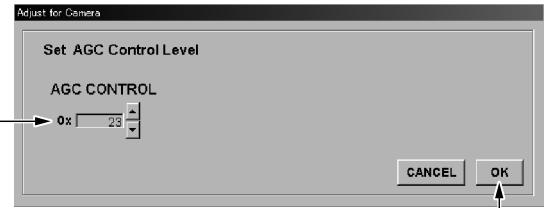
- With the [Set AGC Control Level] window displayed, adjust the [AGC CONTROL] button so that the saturation level of the video signal at TP12 with respect to the voltage at TP10 (approx. 4 V) meets the following conditions.

$$\text{TP10 voltage} \leq \text{Saturation level} \leq \text{TP10 voltage} + 0.1 \text{ V}$$



- * Connect CH1 of the oscilloscope to TP12 of the DSP Board and CH2 to TP10 of the DSP Board.
Adjustment point : [AGC CONTROL] button (software)

[AGC CONTROL]



Click after completion.

- After completing the above operations, click the <OK> button.

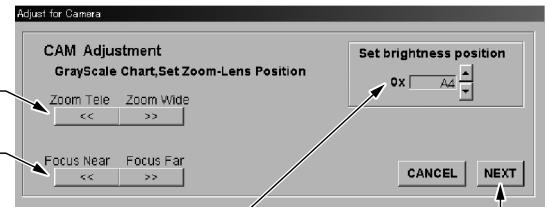
(8) Adjust the "black level".

- In the [Adjustment Camera item] window, click the [Black Level] button.
- When the [CAM Adjustment] window is displayed, pick up the image of the gray scale chart, adjust the lens (using [Zoom Tele/Wide], [Focus Near/Far] and [Set brightness position]) and click the <Next> button.

[Zoom Tele/Wide]

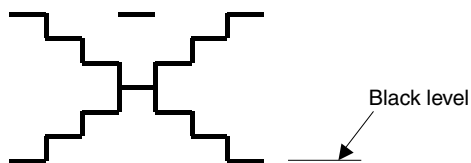
[Focus Near/Far]

[Set brightness position]



Click.

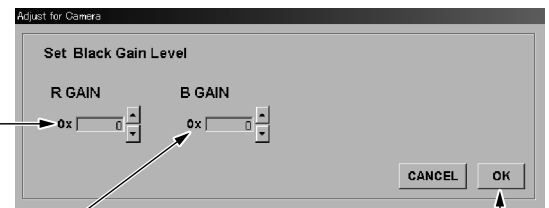
- With the [Set Black Gain Level] window displayed, adjust the [R GAIN] and [B GAIN] buttons so that the black levels of R and B at RGB-OUT of the main unit are almost identical to the black level of G (or $\pm 0.01 \text{ V}$ of the G black level).



Adjustment points : [R GAIN] button (software)
[B GAIN] button (software)

[R GAIN]

[B GAIN]

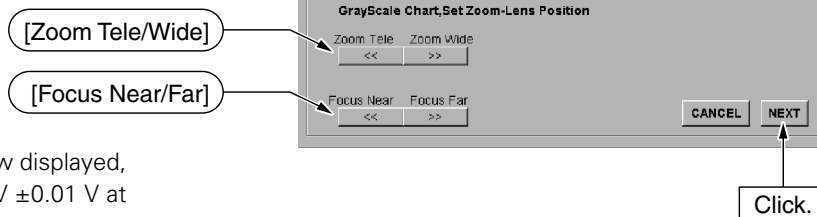


Click after completion.

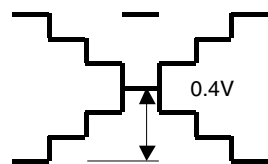
- After completing the above operations, click the <OK> button.

(9) Adjust the “manual iris offset level”.

- ① In the [Adjustment Camera item] window, click the [Manual Iris Offset Level] button.
- ② When the [CAM Adjustment] window is displayed, pick up the image of the gray scale chart, adjust the lens (using [Zoom Tele/Wide] and [Focus Near/Far]) and click the <Next> button.



- ③ With the [Set Manual Iris Offset Level] window displayed, adjust the G output level at RGB-OUT to 0.4 V ±0.01 V at the cross-point.



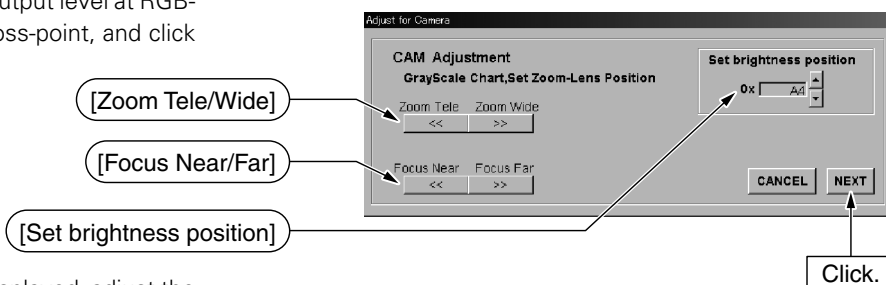
Adjustment point : [MANUAL IRIS] button (software)



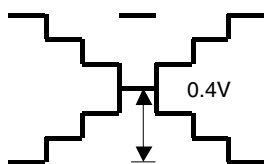
- ④ After completing the above adjustment, click the <OK> button.

(10) Adjust the “RB gain”.

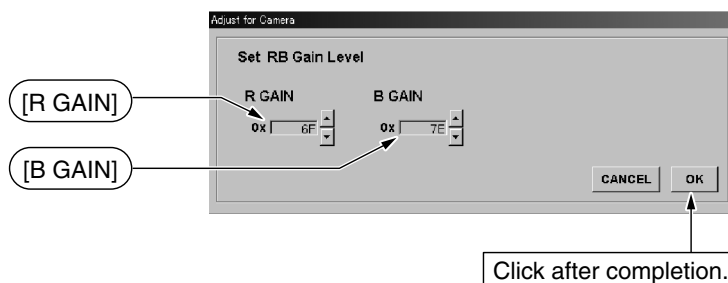
- ① In the [Adjustment Camera item] window, click the [Red Gain Level & Blue Gain Level] button.
- ② When the [CAM Adjustment] window is displayed, pick up the image of the gray scale chart, adjust the lens (using [Zoom Tele/Wide] and [Focus Near/Far]). Also adjust the [Set brightness position] so that the G output level at RGB-OUT of the main unit is 0.4 V at the cross-point, and click the <Next> button.



- ③ With the [Set RB Gain Level] window displayed, adjust the [R GAIN] and [B GAIN] buttons so that the output levels of R and B at RGB-OUT of the main unit are 0.4 V ±0.01 V at the cross-point.



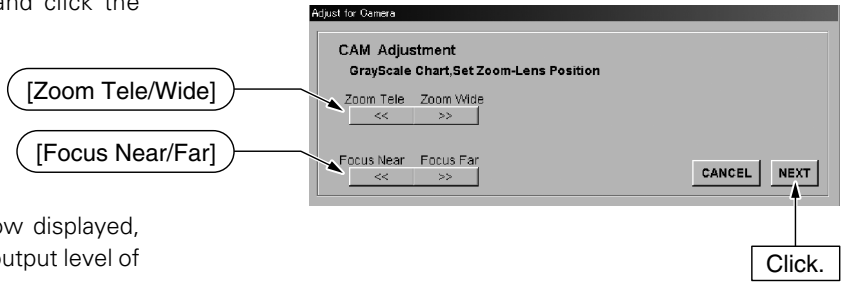
Adjustment points : [R GAIN] button (software)
[B GAIN] button (software)



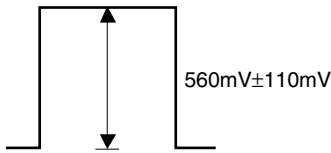
- ④ After completing the above adjustments, click the <OK> button.

(11) Adjust the “AE standard level”.

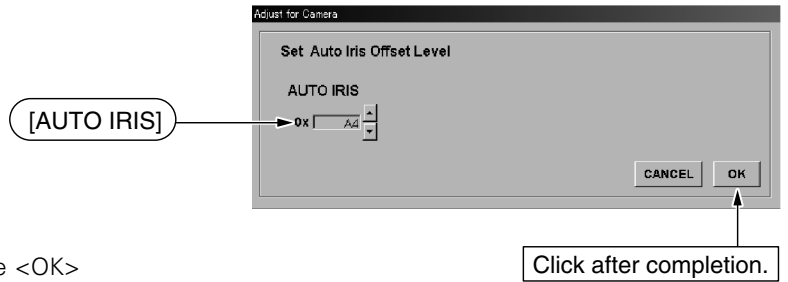
- ① In the [Adjustment Camera item] window, click the [Auto Iris Standard Level] button.
- ② When the [CAM Adjustment] window is displayed, pick up the image of the gray scale chart, adjust the lens (using [Zoom Tele/Wide] and [Focus Near/Far]) and click the <Next> button.



- ③ With the [Set Auto Iris Offset Level] window displayed, adjust the [AUTO IRIS] button so that the G output level of white is 560 mV±110mV.



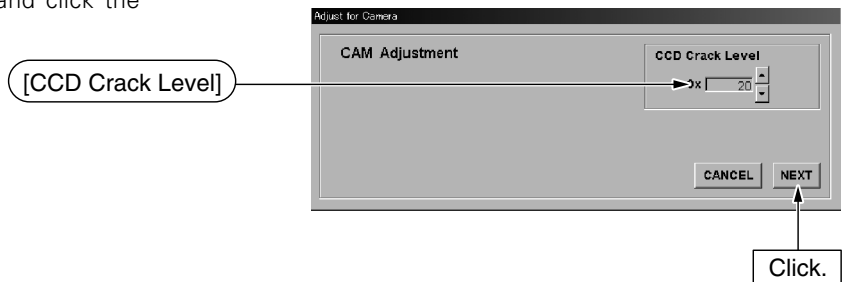
Adjustment points: [AUTO IRIS] button (software)



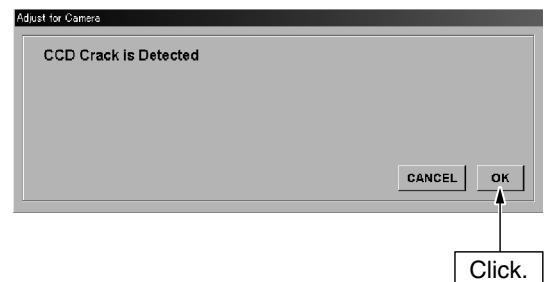
- ④ After completing the above adjustments, click the <OK> button.

(12) Perform “CCD crack detection”.

- ① In the [Adjustment Camera item] window, click the [CCD Crack is Detected] button.
- ② When the [CAM Adjustment] window is displayed, set the CCD crack detection level (usually 0x20) and click the <Next> button.

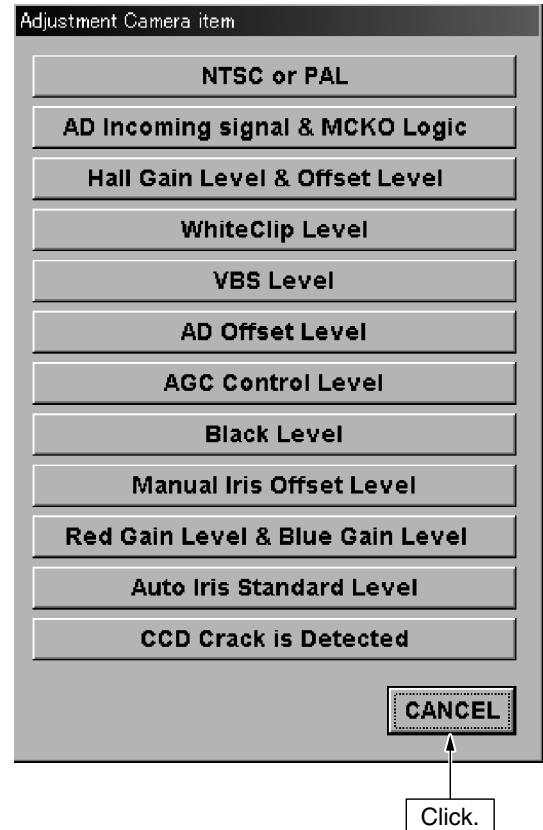


- ③ Click the <OK> button in the [CCD Crack is Detected] window.



(13) Exit from camera adjustments.

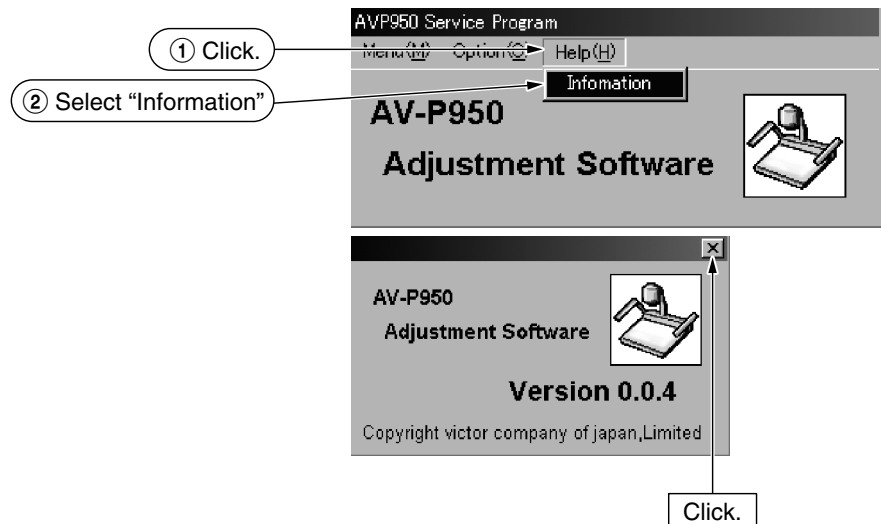
- ① Click the <CANCEL> button in the [Adjustment Camera lens] window.



4. Other

(1) Help menu

- ① Click [Help] in the [AVP950 Service Program] window and then select "Information" to view the version of the adjustment software.



(2) Exiting from the adjustment software

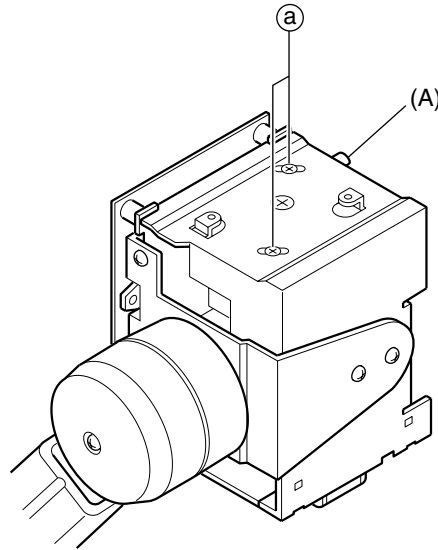
- ① Click [Menu] in the [AVP950 Service Program] window and select "Exit" to exit from the adjustment software.



2.6 MECHANICAL ADJUSTMENTS

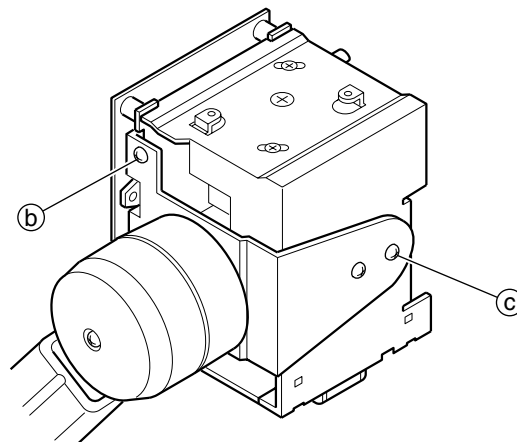
2.6.1 Rotation Adjustment (Alignment)

- ① Set the zooming control to the super wide-angle position.
- ② Adjust control (A) so that the back light diffuser stays horizontal.
- ③ While holding control (A), tighten the two screws (a).



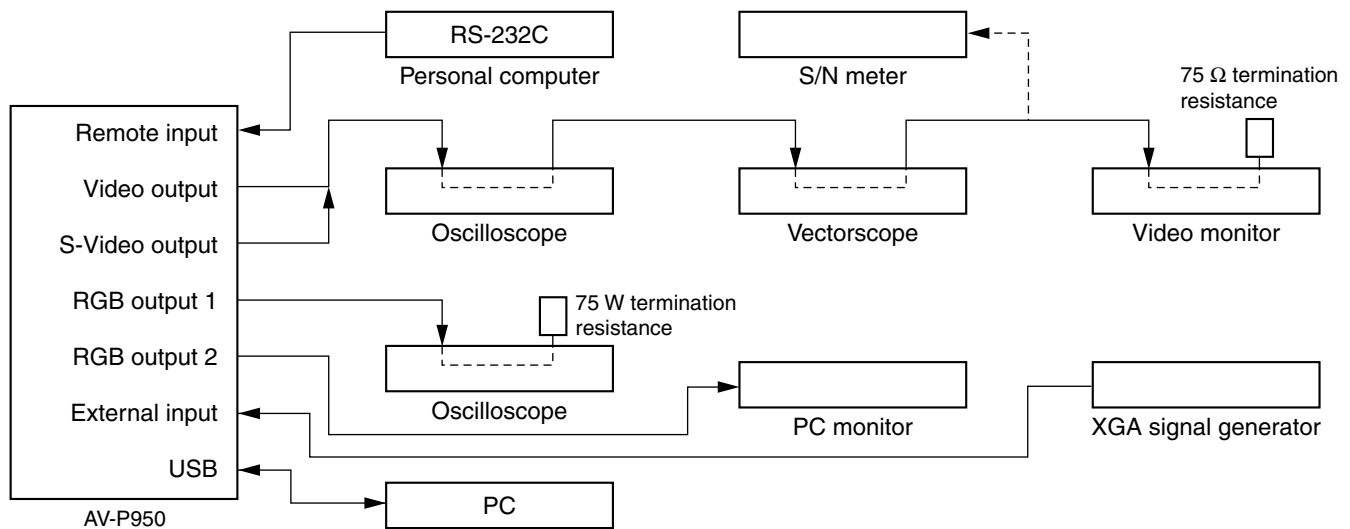
2.6.2 Optical Axis Center Adjustment (Alignment)

- ① Set the zoom control to the super wide-angle position.
- ② Adjust the screw (b) so that the width at the left and right edges of the monitor screen image is identical to those of the back light diffuser. (Check by under-scanning on a 5-inch monitor screen.)
- ③ After adjustment, tighten the screw (c).



2.7 OPERATION CHECK

2.7.1 Standard Connection



2.7.2 Check Conditions (Standard Status)

Check conditions (Standard status)

Ambient temperature	: 23 to 28°C
Illumination	: Side light ON
Imaged chart	: Gray scale chart
Iris control	: Manual
White balance	: R = G = B (cross-point)

* Check under the above conditions unless otherwise specified.

* Check in the VGA mode (XGA) unless otherwise specified.

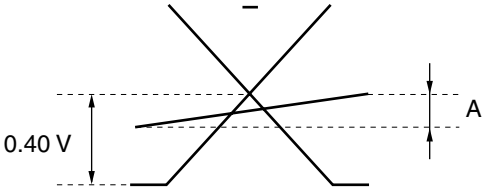
- Pattern viewer : DNP standard color viewer (Dai Nippon Printing Co., Ltd.)
- Transmitting pattern viewer : Resolution 1000 lines or more, gray scale ($\gamma = 0.45$), color bar chart
- Other pattern charts : Gray scale ($\gamma = 0.45$), color bar chart, focusing, daisy chain chart, image angle chart, white chart, lattice chart.
- Optical filter : C4, ND13, ND25
- RS-232C cable : C232N-9FF by Elecom or equivalent

2.7.3 Optical Adjustments

No.	Item	Specification	Procedure
1	Lens operation	There should be no abnormality.	<ul style="list-style-type: none"> • Vary the size and focusing and ensure that there is no image lacking or noise. • Check the operation in both the optical zoom and electronic zoom areas.
2	Auto focusing	Focusing should be possible.	<ul style="list-style-type: none"> • Image the focusing chart, set the zoom at the intermediate position and bring the chart out of focus. • Then press the Auto Focus button.
3	Zoom tracking	The waveform level should be maximized at the focusing position when the zooming is at the wide-angle end.	<ol style="list-style-type: none"> ① Set the zoom to the tele end, open the iris and turn the lighting off. ② Image the lattice chart and adjust focus so that the G waveform level is maximized. ③ Set zoom to the wide-angle end and observe the waveform level.
4	Infinity setting	Focusing should be possible. A slight blur should be observed. There should be no abnormality.	<ul style="list-style-type: none"> • Image the focusing chart by zooming in. • Then press the distance focusing button.
5	Iris operation	There should be a position where white becomes 100%.	<ul style="list-style-type: none"> • Control the brightness under the standard condition and ensure that the brightness varies without unnatural feeling. • Move the side-light and ensure that there is a position where white is 100%.
6	Auto iris control	G:560mV±70mV	<ul style="list-style-type: none"> • Shoot an image of the white chart under standard conditions. Move the sidelight and ensure that there is a position where the blurs in G intensify of RGB output is less than 35 mV. • Then press the Auto brightness button.
7	Peripheral image cut-off	The image at the peripheral area should not be cut off or obscured.	<ul style="list-style-type: none"> • Set the zoom lens to the tele end and the focusing lens to the nearest position, and ensure that the image is not cut off.
8	Peripheral image blur	There should be no abnormality.	<ul style="list-style-type: none"> • Shoot an image of the daisy chain chart under the standard condition and check the image peripheries.

2.7.4. Electrical Adjustments

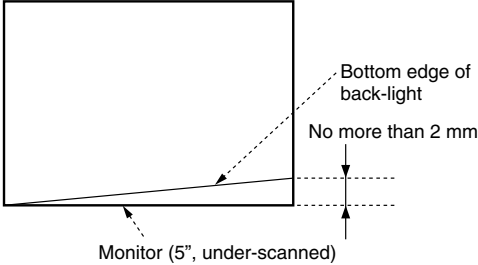
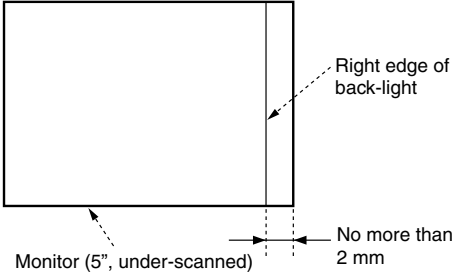
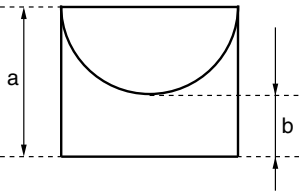
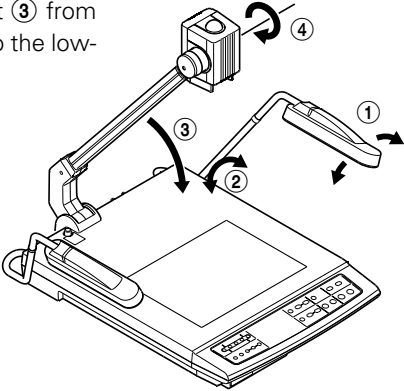
No.	Item	Specification	Procedure
1	Voltage measurement Secondary side	3.3 V \pm 0.3 V 6.3 V \pm 0.3 V 12.2 V \pm 0.5 V	<ul style="list-style-type: none"> • Turn the sidelight to ON. • Measure the voltage at TP3 (Power Board). • Measure the voltage at TP2 (Power Board). • Measure the voltage at TP1 (Power Board). <p>(Under the condition that the side lamps are ON.)</p>
2	Video signal level	R: 0.40 V \pm 0.02 V G: 0.40 V \pm 0.02 V B: 0.40 V \pm 0.02 V 0.61 \pm 0.07 V (NTSC) 0.60 \pm 0.07 V (PAL)	<ul style="list-style-type: none"> • Under the standard condition, measure the white 50% levels of the RGB outputs at RGB-OUT 1 and RGB-OUT 2. • Under the standard conditions, set the cross-point of the G output to 0.40 V and measure the white peak center level of the video output.
3	Sync level	Hs, Cs, Vs: 3.0 V to 5.25 V (C 0 for Cs) VBS : 0.286 \pm 0.03 V (NTSC) 0.3 V \pm 0.03 V (PAL)	<ul style="list-style-type: none"> • Under the standard condition, measure the sync levels at RGB-OUT 1 and RGB-OUT 2 (without the 75 Ω termination). • Under the standard condition, measure the sync levels of the video and S-video outputs.
4	Burst level	VBS, C : 0.286 V \pm 0.03 V (NTSC) 0.3 V \pm 0.03 V (PAL)	<ul style="list-style-type: none"> • Under the standard conditions, measure the burst levels of the video and S-video outputs.
5	Aperture control	Ensure edge enhancement.	<ul style="list-style-type: none"> • Under the standard conditions, observe the H and V parts of the G waveform.
6	Color reproducibility	Vectors should be within standard. Vectorscope dots should not be split into two.	<ul style="list-style-type: none"> • With lighting off, image a 7-color chart with color pure. • Adjust the iris so that the video output is white 75%. • Press the Auto White Set button and compare the dots on the vectorscope with the figure in 2.9, "Attached Figure (Color Reproducibility)".
7	Resolution	H 600 lines or more. V 600 lines or more	<ul style="list-style-type: none"> • Image the resolution chart and measure the resolution of the RGB outputs. (Measure at the center of the screen.)
8	Noise level	No more than 50 mV	<ul style="list-style-type: none"> • Close the iris and measure the noise level at RGB-OUT (G output) with the oscilloscope. Condition: BPF 20 MHz ON.
9	Low-light S/N	There should be no abnormality.	<ul style="list-style-type: none"> • Image the gray scale chart, set the iris so that the G output is 0.40 V, and observe the RGB outputs on the monitor.
10	Sensitivity	0.2 V or more	<ul style="list-style-type: none"> • Open the iris. • Shoot an image of the gray scale chart with A5 size using a pattern viewer. • Measure the G level of the RGB output using an ND38 filter.
11	White clip	0.8 \pm 0.04 V	<ul style="list-style-type: none"> • Clip the three top stages of the gray scale and measure the white peak level of the G output.

No.	Item	Specification	Procedure
12	Highlight carrier leak	No more than 0.15 V	<ul style="list-style-type: none"> Clip the three top stages of the gray scale and measure the carrier leak level of the video output.
13	Shading	No more than 60 mV	<ul style="list-style-type: none"> Under the standard condition, set the cross-point of the G output to 0.40 V and measure the difference between the left and right levels "A" of the RGB outputs. 
14	White blemish	No more than 0.1 V	<ul style="list-style-type: none"> Close the iris and measure the white blemish level of the G output. If any white blemishes are found, correct them by using the PLSS1751 or PLSS1752.
15	Black blemish, dust	No more than 0.1 V	<ul style="list-style-type: none"> Image a white chart, set the G output level to about $500\text{ mV} \pm 20\text{ mV}$ and measure the black blemish level of the G output.
16	Auto White setting	No more than 40 mV	<ol style="list-style-type: none"> Under the standard conditions, use the C4 filter and set the cross-point of the video output to 0.40 V. Activate Auto White Set and measure the carrier leak at the cross-point.
17	Manual white balance	No more than 40 mV	<ol style="list-style-type: none"> Under the standard conditions, use the C4 filter and set the cross-point of the video output to 0.40 V. Activate Manual White Balance to minimize the carrier leak value at the cross-point and measure the value.
18	close-fit size	The selected size should be imaged.	<ul style="list-style-type: none"> Under the standard condition, switch the A5 button to ON and check the image size. Similarly, set the A4 button to ON and check the image size.
19	Still image mode	The image should be frozen without abnormality in the image quality	<ul style="list-style-type: none"> Under the standard conditions, set the still image button to ON.
20	Clear character mode	The image contrast should be enhanced.	<ul style="list-style-type: none"> Under the standard conditions, set the clear character mode to ON.
21	Negative/positive	The image brightness and colors should be reversed.	<ul style="list-style-type: none"> Under the standard conditions, image the color bar chart and switch to the negative mode.
22	BW/COLOR	The image should become monochrome.	<ul style="list-style-type: none"> Under the standard condition, image the color bar chart and switch to the BW mode.
23	Image memory	The image should be able to be stored without any abnormality the image quality.	<ul style="list-style-type: none"> Under the standard condition, store images in image memory 1, 2 and 3, and read them out.

No.	Item	Standard	Procedure
24	External input characteristics	<p>There should be no abnormality in the image quality</p> <p>0.70 V \pm0.07 V</p> <p>3.0 to 5.25 V</p> <p>There should be no large undulations/</p>	<ul style="list-style-type: none"> • Press the Aux input button to select the Aux input. Apply the color bar signal as the Aux input and check the signals at RGB-OUT 1 and RGB-OUT 2. • Measure the voltages across the peaks of the R, G and B outputs. • Measure the voltages across the peaks of the Hs, Cs and Vs outputs (without the 75 Ω termination resistance). • Apply the sweeper signal and measure the frequency response (up to 50 MHz).
25	Illumination	<p>Two side-lights should light up.</p> <p>The back-light should light uniformly.</p>	<ul style="list-style-type: none"> • With the side-lights lit, press the Lighting button. • With the back-light lit, press the Lighting button. • With the lights off, press the Lighting button.
[On-Screen Menu]			
26	LOAD/SAVE	The operation should be normal.	<ol style="list-style-type: none"> ① Turn the lighting off and perform save. ② Switch the unit off then on again, and ensure that the lighting is off. ③ Load the default value. ④ Ensure that the sidelights are on.
27	USB	<p>The image frozen by the Still Image button should be output at the PC monitor screen.</p> <p>The image on the PC screen should be normal.</p>	<ul style="list-style-type: none"> • Under the standard condition, press the Still Image button. • Connect the USB cable to the main unit. • Open the PC's Explorer and ensure that the removable disk is displayed. • Double-click the removable disc and ensure that the AV-P950 folder is displayed. • Double-click the AV-P950 folder and ensure that the Still file is displayed. • Double-click the Still file and ensure that the image frozen by the Still Image is displayed on the PC monitor screen.
28	LED	The LED adjacent to each button should light up.	<ul style="list-style-type: none"> • Focusing Auto, Brightness Auto, Auto White Set. During operation : Blinking. After operation : Off. • Still image, moving image When selected : On. • Lighting When lit : On. • Camera, Aux input, Image memory 1, 2, 3 Selected : On. • Image memory 1, 2, 3 During write : Blinking. After write : On. • Nega/Posi Positive : Off. Negative : On. • BW/COLOR Color : Off. BW : On. • Clear Character ON : On.

No.	Item	Standard	Procedure
[DIP Switch]			
29	On-screen display/ Do not display	The on-screen display should not be displayed (E = 0 for no display).	<ul style="list-style-type: none"> Under the standard condition, set the rear-panel DIP switch for no on-screen display.
30	Green On Sync	Sync should be added to the G signal. (D = 0 for add sync)	<ul style="list-style-type: none"> Under the standard condition, set the rear-panel DIP switch for Green On Sync mode.
31	Hs/Cs	Hd in the RGB output should change to Cs. (C = 0 for Cs)	<ul style="list-style-type: none"> Under the standard condition, set the rear-panel DIP switch for Cs mode.
32	Preview mode	The video and S-video outputs should enter the preview mode. (F = 0 for mode ON)	<ul style="list-style-type: none"> Under the standard conditions, set the rear-panel DIP switch for the preview mode. Press the Still Image button and ensure that the RGB outputs displays a still image and that the video and S-video outputs show the video from the camera.
33	RGB output video mode	XGA, SVGA and VGA should be output. XGA : A = B = 1 SVGA : A = 0, B = 1 VGA : A = B = 0	<ul style="list-style-type: none"> Under the standard condition, set the rear-panel DIP switch for each of these video modes. Using the oscilloscope, observe the frequency of the sync signal of each video signal. XGA : HD 48.4 ±1 kHz, VD 60.0 Hz ±1 Hz SVGA : HD 37.9 ±1 kHz, VD 60.3 Hz ±1 Hz VGA : HD 31.5 ±1 kHz, VD 59.9 Hz ±1 Hz
[Camera Block]			
34	IR light reception	Operation should occur.	<ul style="list-style-type: none"> Press the Zoom button on the remote (SSV3933).
35	DC output	12.0 V ± 1.0 V	<ul style="list-style-type: none"> Measure the voltage of the DC output. (Under the condition that the side lamps are ON.)
36	Picture quality	There should be no abnormality.	<ul style="list-style-type: none"> Under the standard conditions, image the gray scale chart and color bar chart and ensure that the images are normal without noise or beats. (Check for each of the XGA, SVGA, XGA, video and S-video outputs.)

2.7.5 Mechanical Adjustments

No.	Item	Specification	Procedure
1	Image rotation	No more than 2 mm No more than 2 mm	<ul style="list-style-type: none"> Display an image in the positive orientation, align the bottom left or right corner of the stage back-light with a bottom corner of the image, and measure the height at the opposite corner.  <ul style="list-style-type: none"> Display an image in the positive orientation, align the left (right) edge of the image with the left (right) edge of the stage back-light and measure the distance between the edges of the image and back-light at the opposite edge. 
2	Imaging range	The outer frame should be included in the image. The inner frame should be included in the image.	<ul style="list-style-type: none"> Observe the image angle chart (350 x 260) with zooming at the wide-angle end. Observe the image angle chart (80 x 60) by zooming at the tele end.
3	Operation buttons	The touch should be identical.	<ul style="list-style-type: none"> Press every button on the control panel.
4	LEDs	$b \leq a/2$	<ul style="list-style-type: none"> Check the positioning errors of the LEDs. 
5	Mobile parts	The operation should be smooth, without noise. There should be five steps.	<ul style="list-style-type: none"> Move the mobile parts ① ② ③ ④ across both ends. Move the mobile part ③ from the highest position to the lowest position. 

2.8 SERVICE MODE

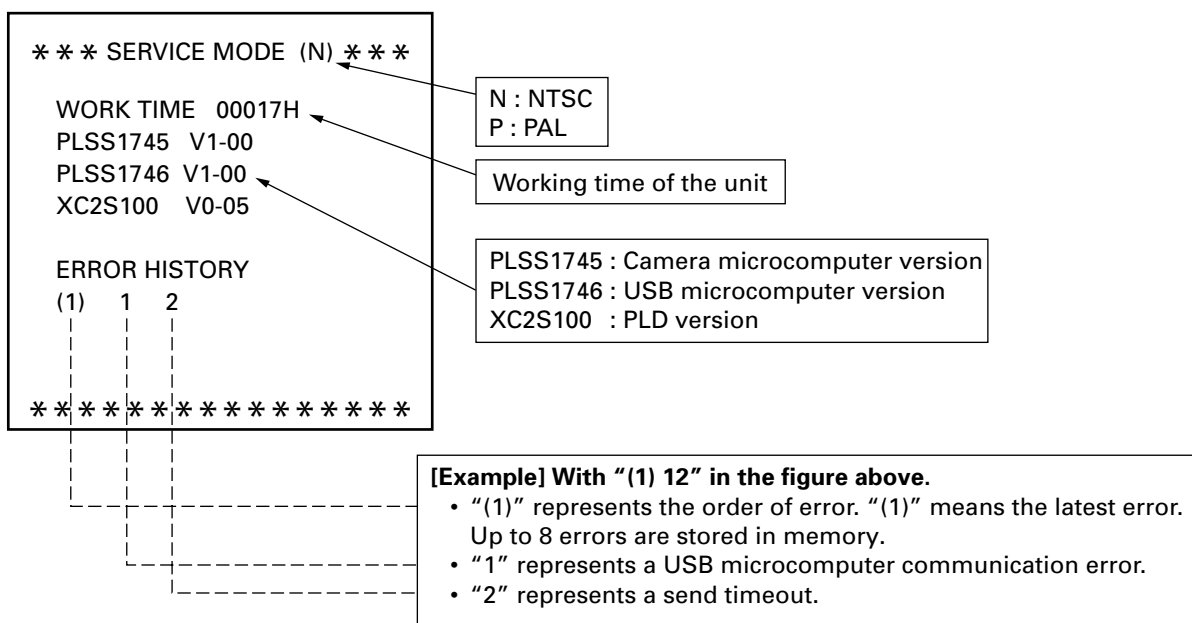
2.8.1 Checked Items

- In the service mode, the following information related to the main unit can be displayed on the monitor screen.
 - Camera microcomputer software version number
 - USB microcomputer software version number
 - PLD version number
 - Error history
 - Working time of the unit
 - NTSC/PAL output

2.8.2 Initiating the Service Mode

- While holding the "Camera" and "Image Memory 3" buttons on the AV-P950 depressed, turn it on to enter the service mode. The Service Mode screen will be display.

2.8.3 Display in the Service Mode



2.8.4 Details of Error History

Error No.	Description
1	USB microcomputer communication error
Detail No.	Description
1	Receive timeout
2	Send timeout

Error No.	Description
2	Sensor error
Detail No.	Description
1	Zoom sensor error
2	Focusing sensor error

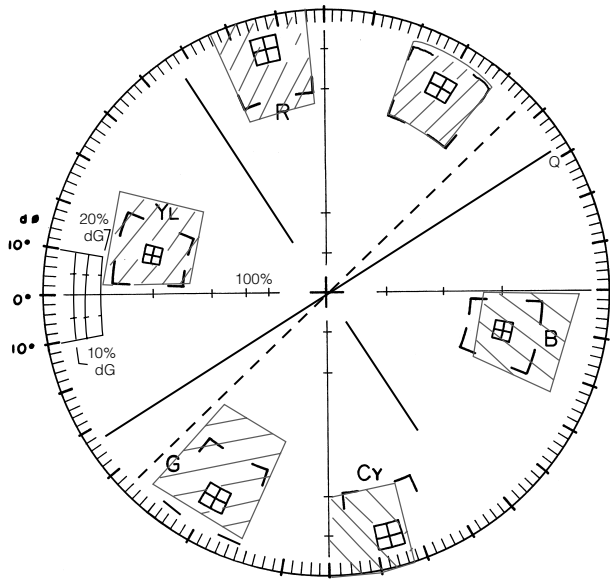
Error No.	Description
3	EEPROM error
Detail No.	Description
1	Write error
2	Read error

2.8.5 How to Clear the Error History

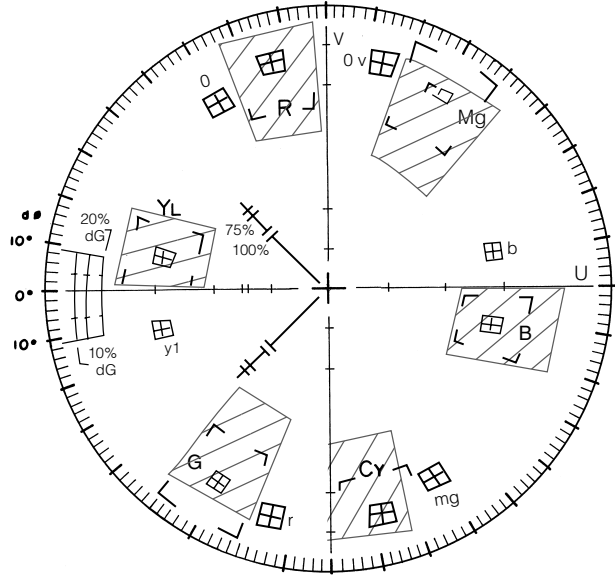
- Press the Lighting button in the service mode.
 - Switch the "BW/COLOR" to ON to clear the error history.
 - Switch the "CHARACTER" to ON to exit without clearing the error history.

2.9 ATTACHED FIGURE (Color Reproducibility)

Illumination : Color Viewer by Dai Nippon Printing Co., Ltd.
Chart : Color bar chart
Brightness : White 75%
Color temperature : 3100K



NTSC



PAL

JVC

VICTOR COMPANY OF JAPAN, LIMITED



Printed in Japan
(S)