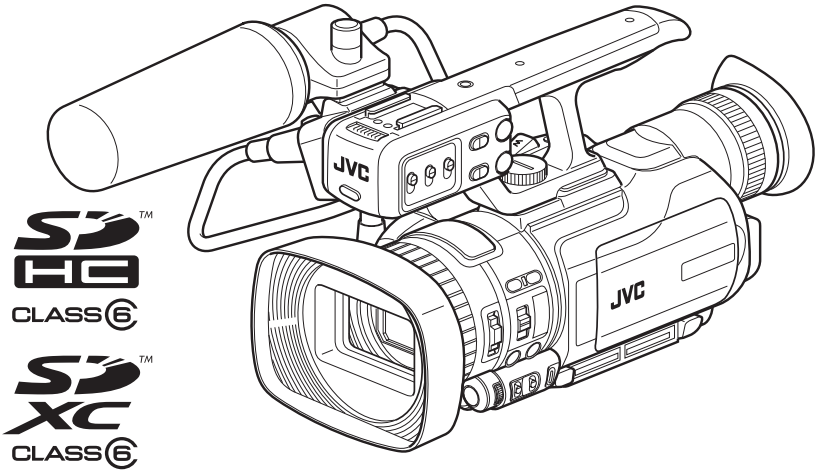
JVC

SERVICE MANUAL

HD MEMORY CARD CAMERA RECORDER

GY-HM150U, GY-HM150E, GY-HM150EC



* The illustration shows the GY-HM150U/GY-HM150E with the supplied microphone attached.

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No.HC044<Rev.001>
2012/4

SPECIFICATION

		GY-HM150U	GY-HM150E	GY-HM150EC
General				
Power		DC 11 V (using AC adapter) DC 7.2 V (using battery)		
Power consumption		Approx. 8.3 W (when backlight is set to [STANDARD] while the LCD monitor or viewfinder is in use)		
Dimensions		366 mm (W) × 179 mm (H) × 138 mm (D)(14-4/8" x 7-1/8" x 5-4/8")		
Mass		Approx. 1190 g (2.7 lbs) Approx. 1320 g (2.9 lbs) (incl. battery BN-VF823U, SD card, micorophone)		
Allowable operating temperature		0 °C to 40 °C (32 °F to 104 °F)		
Allowable operating humidity		35 % RH to 80 % RH		
Allowable storage temperature		-20 °C to 50 °C (-4 °F to 122 °F)		
Image pickup device		1/4", Progressive CCD × 3		
Lens		F1.8 to 2.8 f = 3.7 mm to 37 mm		
Filter diameter	When the hood is detached	46 mm (screw pitch: 0.75 mm) Compatible with filter (external diameter: 50 mm and below),tele-converter, and wide-converter		
	When the hood is attached	72 mm (screw pitch: 0.75 mm) Compatible with filter (external diameter: 75 mm and below) only * When removing the filter, do not press on the top and bottom of the hood. Doing so makes it difficult to remove the filter and may damage the inner surface of the hood.		
Zoom		Up to 10x (optical zoom)		
LCD screen		2.7", 16:9, 230,000 pixels		
Viewfinder		0.24", 16:9, 260,000 pixels		
Video/Audio				
Recording time		Approx. 25 minutes (8 GB SDHC/SDXC card, 35 Mbps, VBR mode)		
Video recording file format		QuickTime File Format(For Final Cut Pro) MP4 File Format (HD only) AVI File Format (SD only)		
	Video signal	HD (HQ mode):MPEG-2 Long GOP VBR, 35 Mbps (Max) MPEG-2		
		HD (SP mode):MPEG-2 Long GOP CBR, 25 Mbps (1440x1080i) /19 Mbps(1280x720p) MPEG-2		
	SD	DV CBR, 25 Mbps (720x480i)	DV CBR, 25 Mbps (720x576i)	
	Audio signal	LPCM 2ch, 48 kHz/16 Bit		
Video format	NTSC setting	HD (HQ mode):1920x1080/59.94i, 29.97p, 23.98p, 1440x1080/59.94i, 1280x720/59.94p, 29.97p, 23.98p		
		HD (SP mode):1440x1080/59.94i, 1280x720/59.94p, 29.97p, 23.98p		
		SD:720x480/59.94i	-	
	PAL setting	HD (HQ mode):1920x1080/50i, 25p, 1440x1080/50i, 1280x720/50p, 25p		
		HD (SP mode):1440x1080/50i, 1280x720/50p, 25p		
		-	SD:720x576/50i	
Terminals				
AV terminal		Video Analog output 1.0 V (p-p), 75 Ω Audio Analog output (stereo) -8 dBu, 1 k Ω (when reference level -12 dB is selected) -16 dBu, 1 k Ω (when reference level -20 dB is selected)		
Component terminal		Y, P_B, P_R component output Y: 1.0 V (p-p), 75 Ω P_B, P_R: 700 mV (p-p), 75 Ω		
HDMI terminal		HDMI™ Connector		
USB terminal		Mini USB-B type, USB 2.0		
Headphone jack		3.5 mm mini jack (stereo)		
Remote terminal		3.5 mm mini jack (4-pin)		
Audio INPUT1/ INPUT2 terminals	MIC	-60 dBu, 3 kΩ, XLR (balanced), +48 V output (phantom power supply)		
	LINE	+4 dBu, 10 k Ω, XLR (balanced)		
Accessories				
		AC adapter, Power cord×2, Battery, Battery charger, Remote control unit, Audio unit,Microphone,AV cord,Component cable,CD-ROM,Instruction manual,Warranty card	AC adapter, Power cord×4, Battery, Battery charger, Remote control unit, Audio unit,Microphone,AV cord,Component cable,CD-ROM,Instruction manual	AC adapter, Power cord, Remote control unit, Audio unit,Microphone,AV cord,Component cable,CD-ROM,Instruction manual,Warranty card
AC Adapter				
Power		AC 100 V to 240 V, 50 Hz/60 Hz		
Output		DC 11 V =, 1 A		
Allowable operating temperature		0 °C to 40 °C (32 °F to 104 °F)		
Dimensions		49 mm (W) × 26 mm (H) × 64 mm (D)(1-15/16" × 1-1/ 8" × 2-7/8") (excluding cord and AC plug)		47 mm (W) × 28 mm (H) × 72 mm (D) (excluding cord and AC plug)
Mass		Approx. 86 g (0.19 lbs)		
Remote Control Unit				
Type		DC 3 V (button battery CR2025)		
Battery life		Approx. 1 year (varies according to frequency of use)		
Operating distance		Approx. 5 m (16.4 ft) (along front axis)		
Allowable operating temperature		0 °C to 40 °C (32 °F to 104 °F)		
Dimensions		42 mm (W) × 14.5 mm (H) × 91 mm (D)(1-6/8" × 9/16" × 3-5/ 8")		
Mass		Approx. 30 g (0.07 lbs)(including button battery)		

SECTION 1
PRECAUTION

1.1 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.

1.1.1 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 ⚠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:
- Wires covered with PVC tubing
- Double insulated wires
- High voltage leads

(5) Use specified insulating materials for hazardous live parts. Note especially:
- Insulation Tape
- PVC tubing
- Spacers
- Insulation sheets for transistors
- Barrier

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

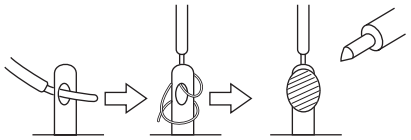


Fig.1-1-1

(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.

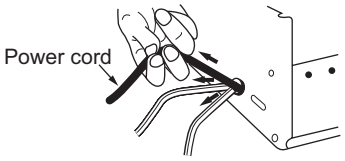


Fig.1-1-2

(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 trans former 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.
- **Connector part number** :E03830-001
- **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
- **Replacement procedure**

a) Remove the old connector by cutting the wires at a point close to the connector.Important : Do not reuse a connector (discard it).

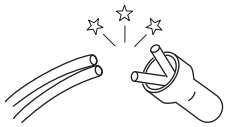


Fig.1-1-3

b) 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.

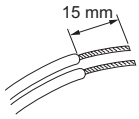


Fig.1-1-4

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

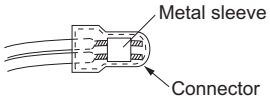


Fig.1-1-5

d) As shown in Fig.1-1-6, 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.

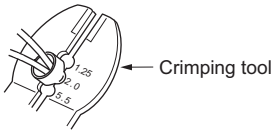


Fig.1-1-6

e) Check the four points noted in Fig.1-1-7.

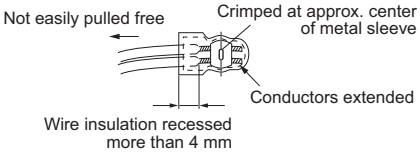


Fig.1-1-7

(13) **Battery replacement caution notice.**
CAUTION RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

1.1.2 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 Fig.1-1-11 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 Fig.1-1-11 below.

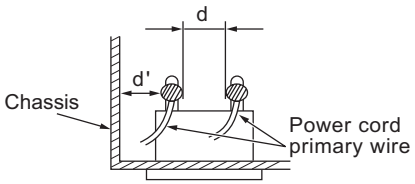


Fig.1-1-8

(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 Fig.1-1-9 and following Fig.1-1-12.

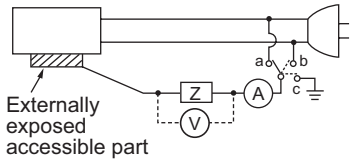
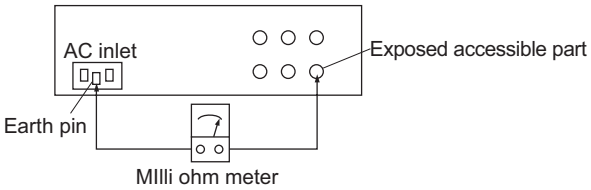


Fig.1-1-9

(5) Grounding (Class 1 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 Fig.1-1-10 and grounding specifications.



Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

Fig.1-1-10

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	1 MΩ ≦R≦ 12 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R≧ 10 MΩ/500 V DC	AC 3 kV 1 minute (Class Ⅱ) AC 1.5 kV 1 minute (Class Ⅰ)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Fig.1-1-11

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Fig.1-1-12

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

SECTION 2
SPECIFIC SERVICE INSTRUCTIONS

This service manual does not describe SPECIFIC SERVICE INSTRUCTIONS.

SECTION 3
DISASSEMBLY

3.1 Removing the bottom cover assembly (See Figure 1)

(1) Remove the seven screws **A** attaching the bottom cover assembly.
- The screws indicated with the ▲ marks need not be removed.

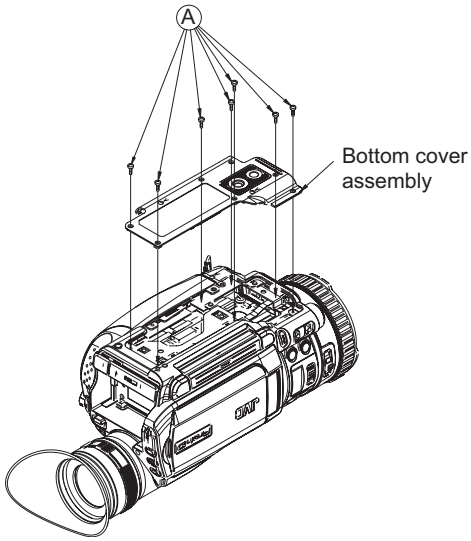


Fig.1

3.2 Removing the upper assembly (See Figure 2, Figure 3, Figure 4, Figure 5, Figure 6, Figure 7, Figure 8)

(1) Remove the four screws **A** attaching the shoe assembly, then remove the shoe assembly.

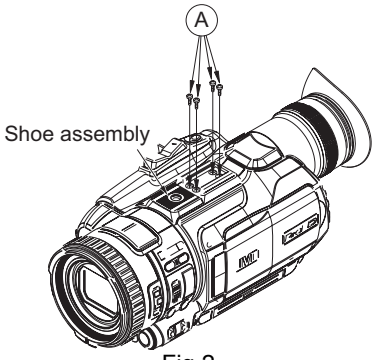


Fig.2

(2) Remove the four screws **B** attaching the grip cover, then remove the grip cover.
- Before attaching the grip cover, attach the three tabs on the grip cover first.

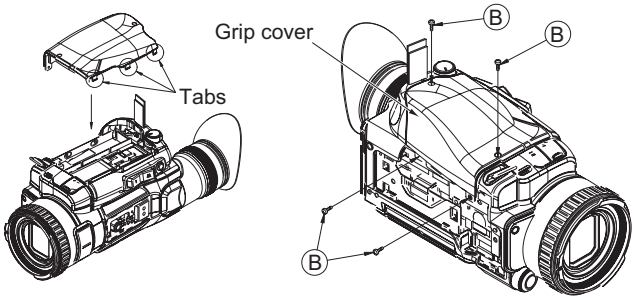


Fig.3

(3) Remove the two screws **C** and the two screws **D** attaching the jack cover, then remove the jack cover.
Screw **C**: Short Screw **D**: Long

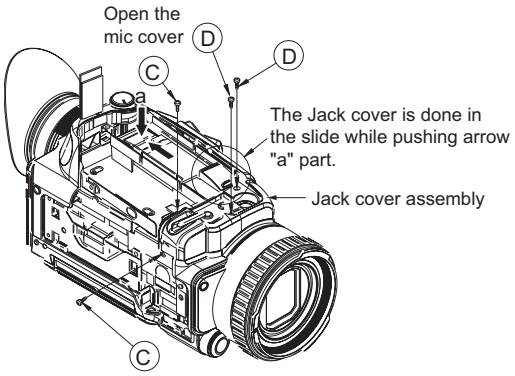


Fig.4

(4) Remove the three screws **E** and the one screw **F** attaching the upper cover assembly, then remove the upper cover assembly.
Screw **E**: Short Screw **F**: Long

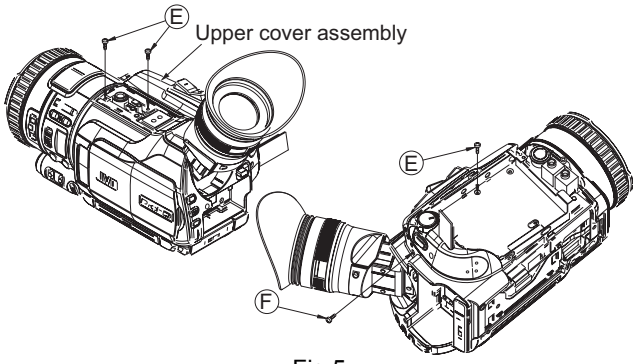


Fig.5

(5) Remove the four screws **G** and the one screw **H** attaching the case (HDD), then remove the case (HDD).
Screw **G**: Short Screw **H**: Long

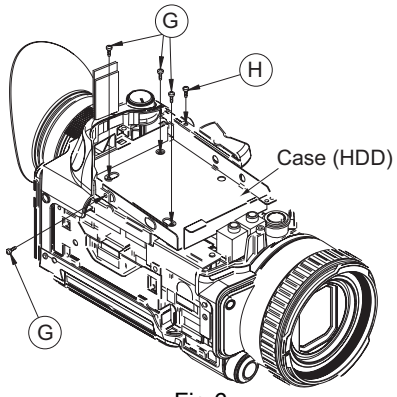


Fig.6

(6) Remove the one screw **J** and the one screw **K** attaching the OPE unit.
Screw **J**: Short Screw **K**: Long
(7) Pull out the wire from the connector CN204 on the ANALOG board, then remove the OPE unit.

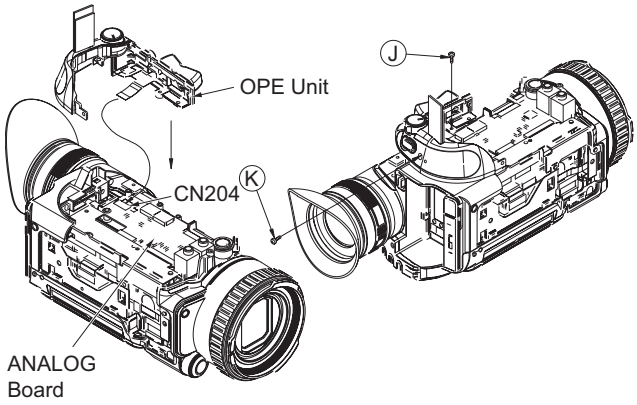


Fig.7

(8) Remove the six screws **L** and the one screw **M** attaching the upper assembly.
Screw **L**: Short Screw **M**: Long
(9) Pull out the wire from the connector CN107 on the MAIN board, then remove the upper assembly.
- When attaching the upper assembly, be sure to set the two tabs firmly.

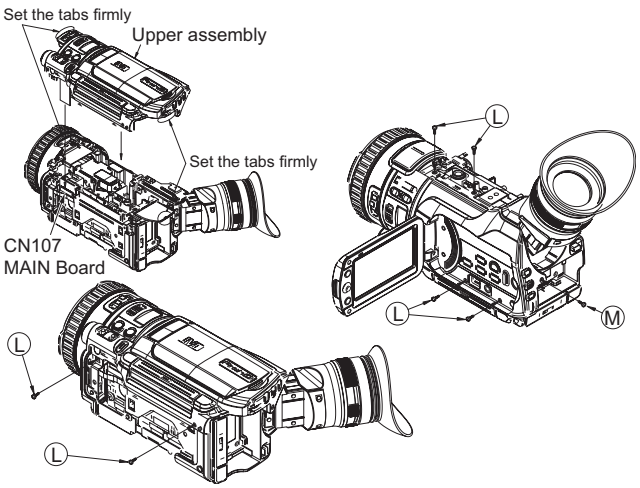


Fig.8

3.3 Removing the view finder assembly (See Figure 9, Figure 10, Figure 11)

(1) Remove the four screws **A** attaching the rear cover assembly, then remove the rear cover assembly.

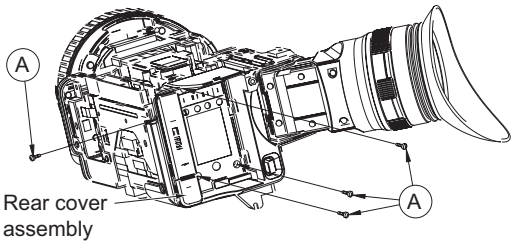


Fig.9

(2) Remove the one screw **B** attaching the REAR board.
(3) Pull out the wire from the connector CN6001 on the MAIN board, then remove the REAR board.

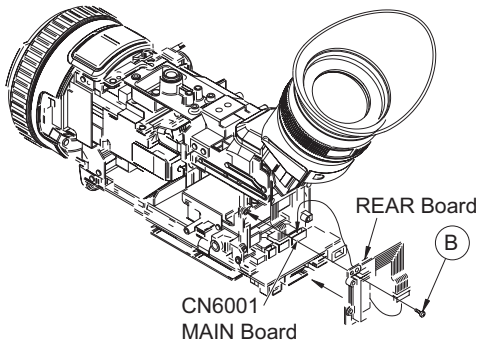


Fig.10

(4) Pull out the wire from the connector CN205 on the ANALOG board.
(5) Remove the five screws **C** attaching the view finder assembly, then remove the view finder assembly.

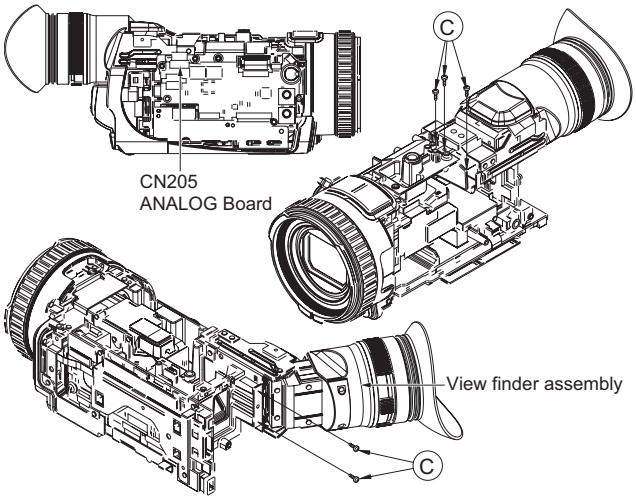


Fig.11

3.4 Removing the boards and the OP block assembly (See Figure 12, Figure 13, Figure14, Figure 15, Figure 16, Figure 17, Figure 18, Figure 19, Figure 20)

(1) Pull out the wire from the connector CN108 on the MAIN board.
(2) Remove the three screws **A** attaching the focus ring assembly, then remove the focus ring assembly.

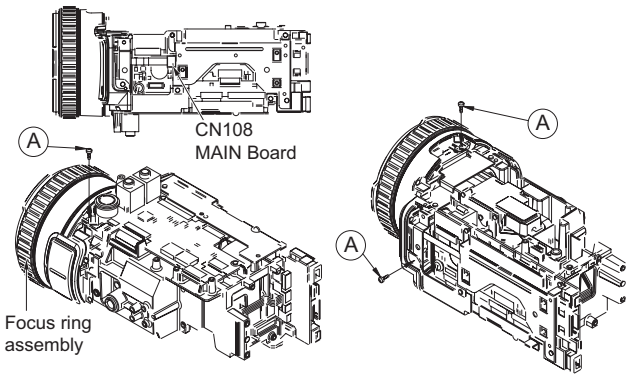


Fig.12

(3) Remove the two screws **B** attaching the MIC assembly.
(4) Pull out the wire from the connector CN206 on the ANALOG board, then remove the MIC assembly.

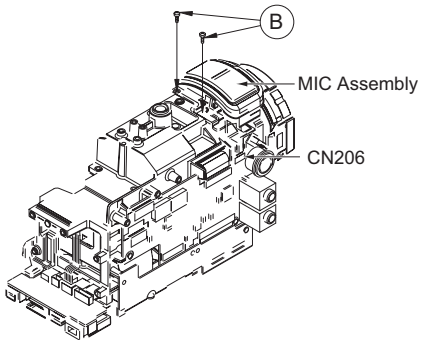


Fig.13

(5) Remove the four screws **C** attaching the bracket (bottom) and the bracket (frame), then remove each bracket.

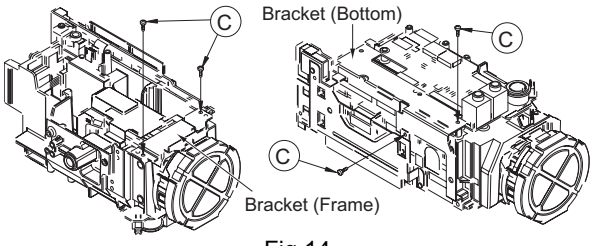


Fig.14

(6) Pull out the wires from the connectors CN201, CN202, and CN203 on the ANALOG board.
(7) Remove the two screws **D** attaching the ANALOG board, then remove the ANALOG board.

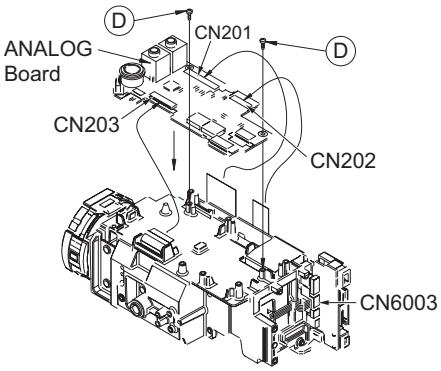


Fig.15

(8) Remove the three screws **E** attaching the bracket (MAIN).
(9) Pull out the wire from the connector CN901 on the SD board, then remove the bracket (MAIN) and the SD board.
(10) Pull out the wires from the connectors CN103, CN6003, and CN110 on the MAIN board, then remove the MAIN board.

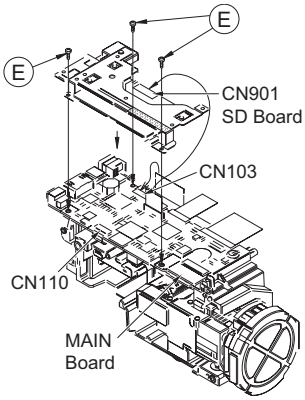


Fig.16

(11) Remove the three screws **F** attaching the heat sink (MAIN), then remove the heat sink (MAIN).

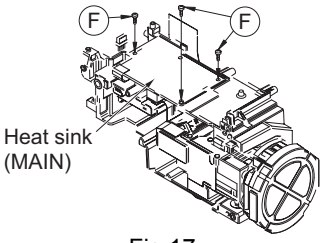


Fig.17

(12) Disconnect the B to B connector from the connector CN5001 on the CDS board.
(13) Remove the three screws **G** attaching the OP block assembly, then remove the OP block assembly.

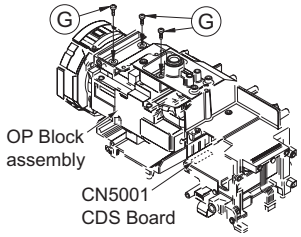


Fig.18

(14) Remove the two screws **H** attaching the JACK board, then remove the JACK board.

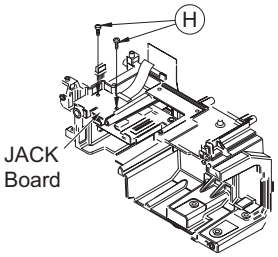


Fig.19

(15) Remove the two screws **J** attaching the CDS board and the bracket (CDS), then remove the CDS board and the bracket (CDS).

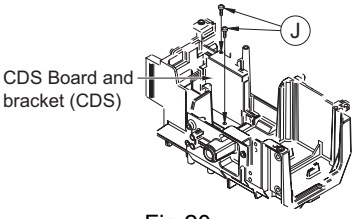


Fig.20

3.5 Removing the upper assembly (See Figure 21, Figure 22, Figure 23, Figure 24, Figure 25)

- Remove the upper assembly from the main unit.

(1) Remove the two screws **A** attaching the CU sheet, then remove the CU sheet.
(2) Pull out the wire from the connector CN623 on the OPE4 board.
(3) Remove the one screw **B** attaching the speaker, then remove the speaker and the bracket (SPK).

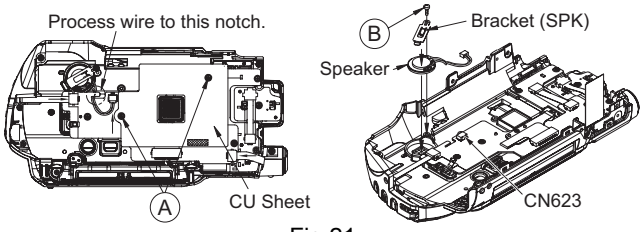


Fig.21

(4) Pull out the wires from the connectors CN621, CN624, CN622 and CN626 on the OPE4 board.
(5) Remove the one screw **C** and the two screws **D** attaching the OPE4 board, then remove the OPE4 board.
Screw **C**: Silver Screw **D**: Black

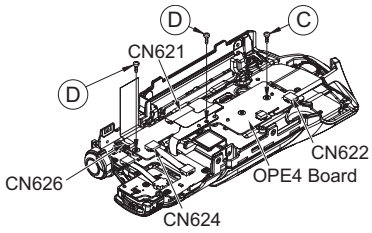


Fig.22

(6) Remove the two screws **E** attaching the cover (upper), then remove the cover (upper).
(7) Remove the two screws **F** attaching the monitor assembly, then remove the monitor assembly.

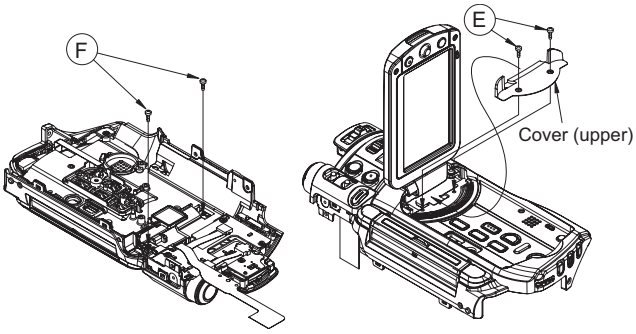
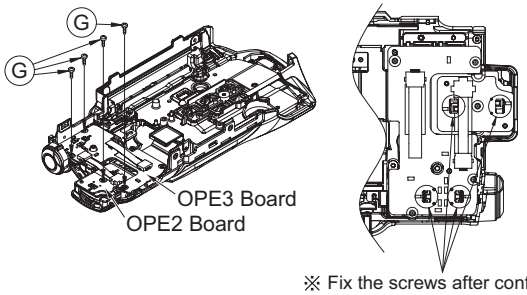


Fig.23

(8) Remove the four screws **G** attaching the OPE2 board and the OPE3 board, then remove each board.
- When attaching the OPE2 board and OPE3 board, make sure that each pair of switches and knobs aligns at four positions.



※ Fix the screws after confirming the position of switch and knob.
Fig.24

(9) Remove the two screws **H** and the one screw **J** attaching the frame (upper).
(10) Remove the four tabs, then remove the frame (upper).
(11) Remove the one screw **K** attaching the OPE1 board assembly, then remove the OPE1 board assembly.

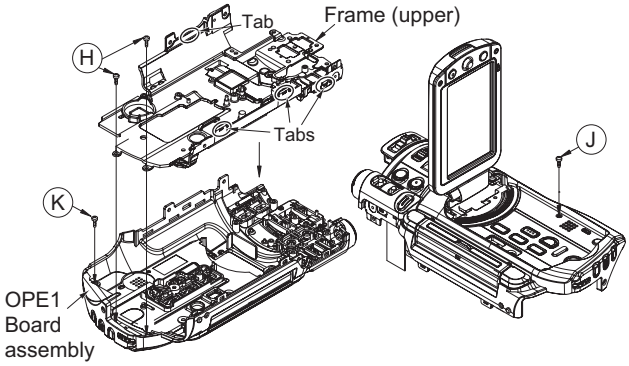


Fig.25

3.6 Removing the monitor assembly (See Figure 26, Figure 27)

- Removing the monitor assembly from the upper assembly.
  (1) Remove the two screws **A** and the two screws **B** attaching the monitor cover assembly, then remove the monitor cover assembly.
  Screw **A**: Narrow Screw **B**: Thick
  (2) Pull out the wires from the connectors CN701, and CN703 on the MONI board, then remove the hinge unit assembly.

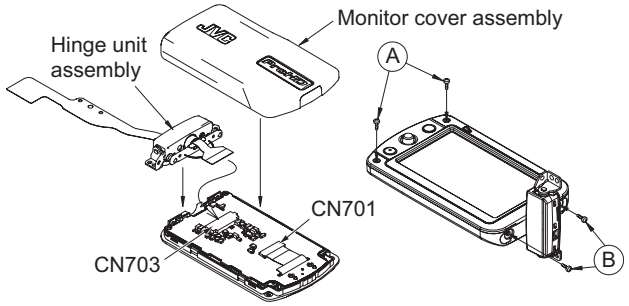


Fig.26

(3) Removing the four screws **C** attaching the bracket (LCD) enables to release each part.
- When assembling the parts, be careful with the assembling order and direction of each part.
- Do not push the LCD surface as it may be damaged.
- Be careful in handling the surface of the LCD and the monitor, and do not damage, soil, or leave fingerprints. If the surfaces are soiled, gently wipe them off with soft cloth.

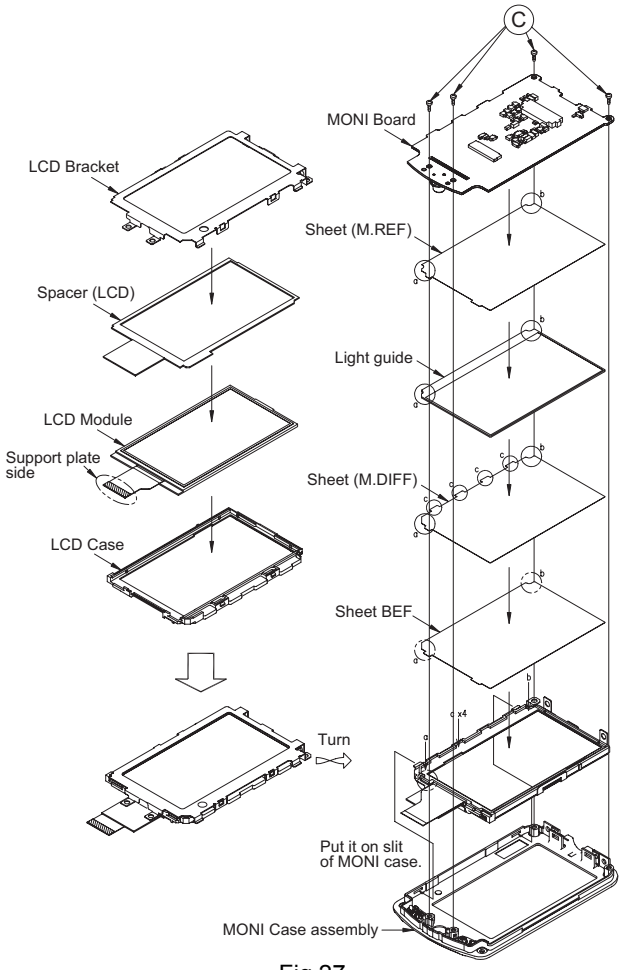


Fig.27

3.7 Removing the view finder assembly (See Figure 28, Figure 29, Figure 30, Figure 31, Figure 32, Figure 33)

- Remove the view finder assembly from the main unit.
  (1) Remove the eye cap.
  - When attaching the eye cap, align the positions as shown in the figure.

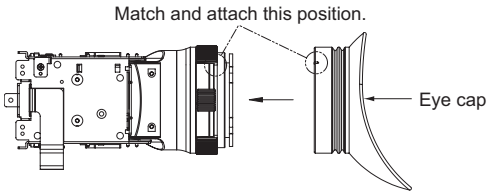


Fig.28

(2) Remove the two screws **A** attaching the upper cover (VF), then remove the upper cover (VF).

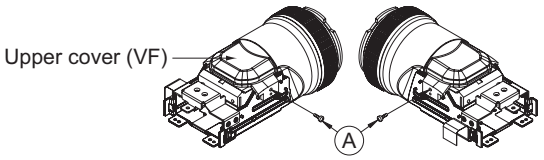


Fig.29

(3) Remove the one screw **B** attaching the wire.
(4) Remove the two screws **C** and the two screws **D** attaching the holder (VF) assembly, then remove the holder (VF) assembly.
Screw **C**: Short Screw **D**: Long

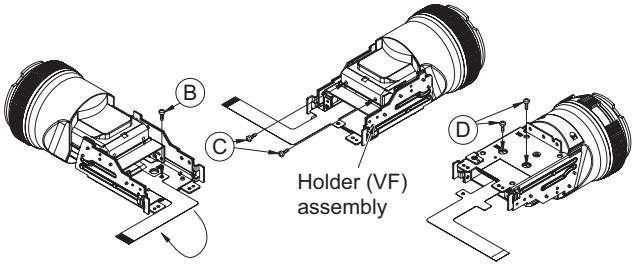


Fig.30

(5) Remove the four screws **E** attaching the bottom case (VF), then remove the bottom case (VF).
(6) Remove the two screws **F** attaching the LCD module assembly, then remove the LCD module assembly.

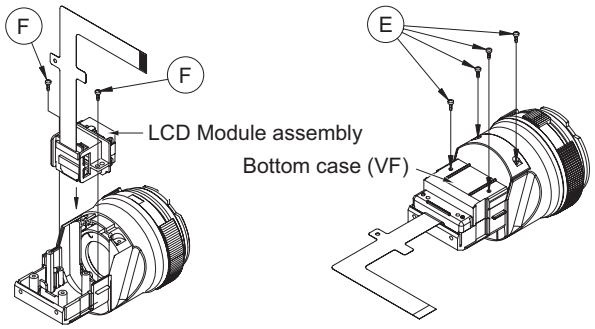


Fig.31

(7) Remove the two tabs, then remove the front cover (VF).
• Removing the front cover (VF) enables to release the lens and other parts.

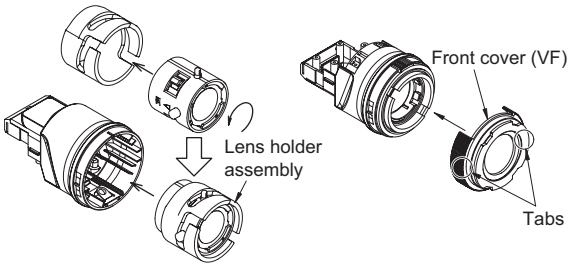


Fig.32

(8) The parts on the LCD module assembly are fixed only with the tabs. When assembling the parts, be careful with the attaching order and direction of each part.

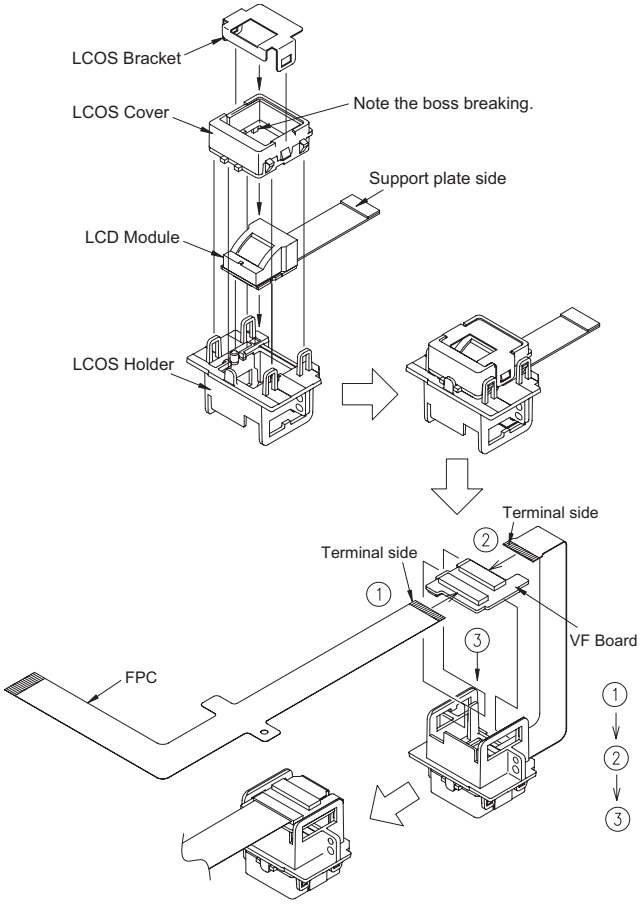


Fig.33

3.8 Removing the OP block assembly (See Figure 34, Figure 35, Figure 36, Figure 37)

- Remove the OP block from the main unit.
  (1) Pull out the wire connected to the ROIS unit.
  (2) Remove the two screws **A** attaching the ROIS unit, then remove the ROIS unit.
    - **Do not blow the lens inside the ROIS (on the OP block) with air. Never touch the lens.**

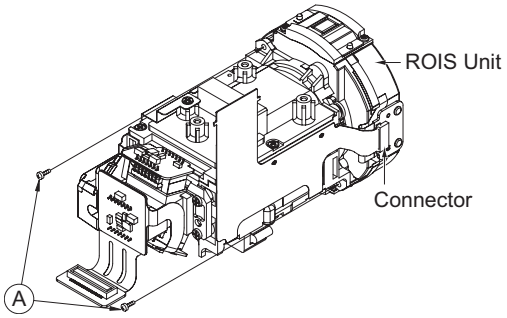


Fig.34

  (3) Unsolder the soldered points on the CCD board, then remove the CCD board.
  (4) Remove the one screw **B** attaching the heat sink (CCD) assembly, then remove the heat sink (CCD) assembly.

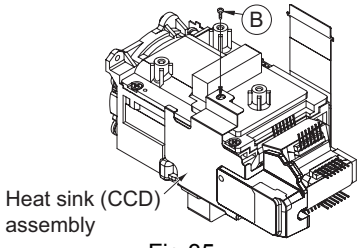


Fig.35

  (5) Remove the three screws **C** attaching the prism assembly, then remove the prism assembly.

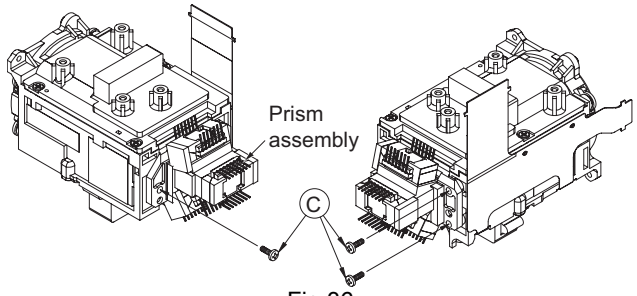


Fig.36

  (6) Unsolder the soldered points on the zoom motor unit and the focus motor unit.
    - **Be careful not to break or damage the wire by soldering (overheated).**
  (7) Remove the six screws **D** and the one screw **E** attaching the iris motor unit, zoom motor unit, and the focus motor unit, then remove each part.
    - As the spring comes off when the zoom motor unit and the focus motor unit are removed, be careful not to loose the spring.
    - See the figure when attaching the spring.

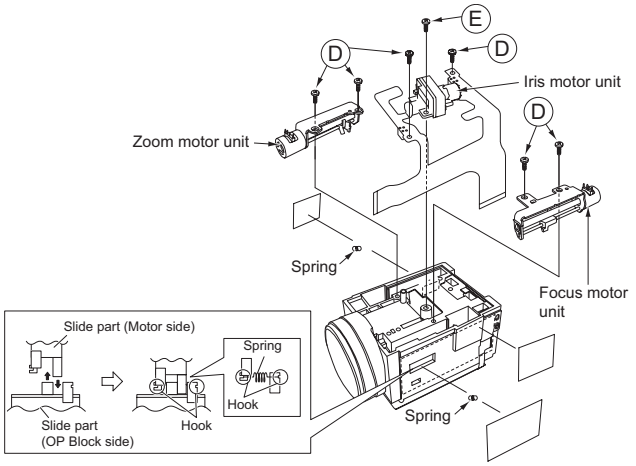


Fig.37

3.9 Removing the audio unit (See Figure 38, Figure 39, Figure 40, Figure 41, Figure 42, Figure 43, Figure 44, Figure 45)

  (1) Remove the four screws **A** attaching the cover (TOP), then remove the cover (TOP).
  (2) Remove the two screws **B** attaching the shoe assembly, then remove the shoe assembly.

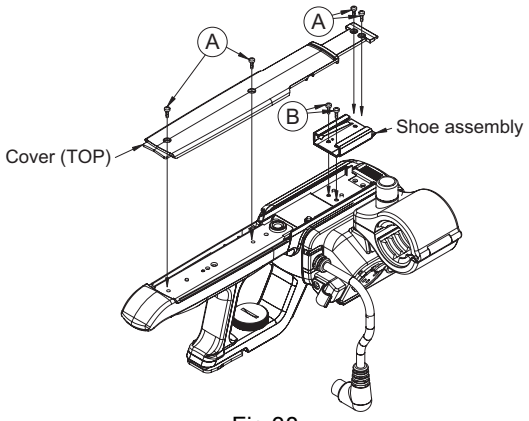


Fig.38

  (3) Remove the one screw **C** attaching the AU cover (FR) assembly, then remove the AU cover (FR) assembly.

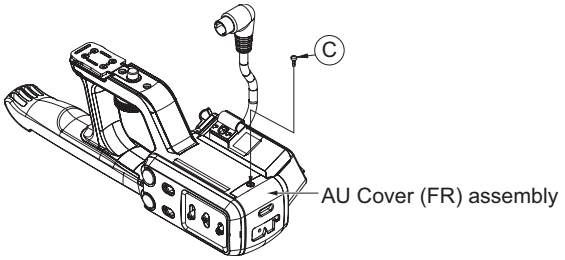


Fig.39

(4) Remove the four screws **D** attaching the XLR board.
(5) Pull out the wire from the connector CN2802 on the XLR board, then remove the XLR board assembly.

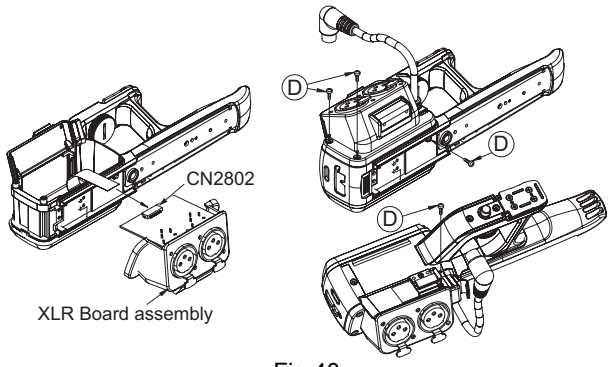


Fig.40

(6) Remove the three screws **E** attaching the AU cover (SW), then remove the AU cover (SW).
- The slide knob comes off at the same time. When attaching the AU cover (SW), be careful with the direction of the slide knob.

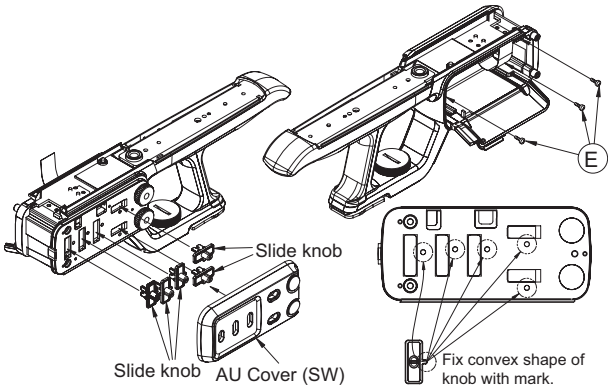


Fig.41

(7) Remove the two screws **F** attaching the audio VR knob, then remove the audio VR knob.

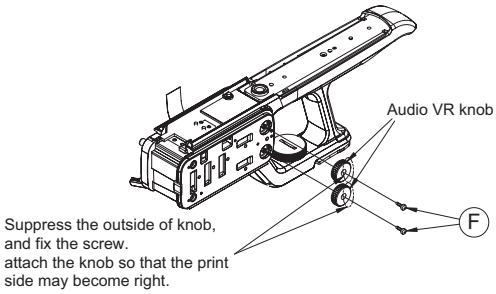


Fig.42

(8) Remove the three screws **G** attaching the XLR2 board, then remove the XLR2 board.

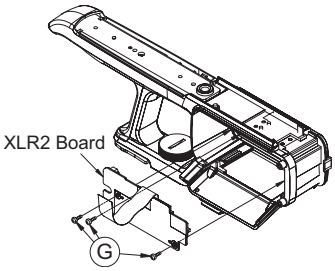


Fig.43

(9) Remove the two screws **H** attaching the AU cover (BTM), then remove the AU cover (BTM).

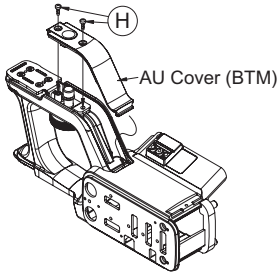


Fig.44

(10) Remove the four screws **J** attaching the shoe plate, then remove the shoe plate, lock screw, and the lock spring.
- See the figure when attaching the shoe plate, the lock screw, and the lock spring.

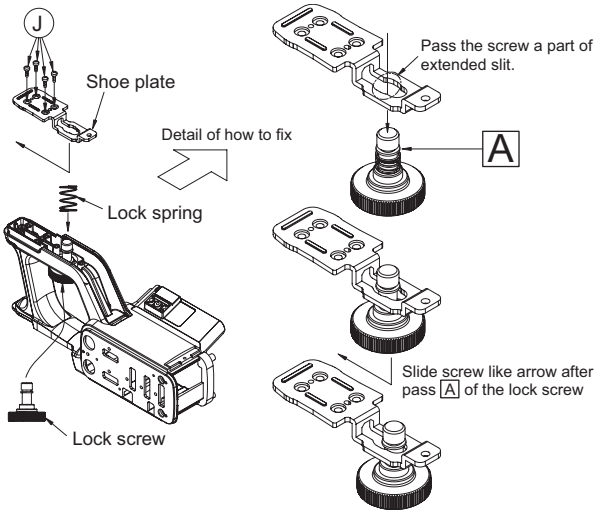


Fig.45

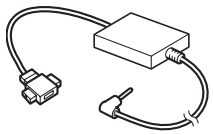
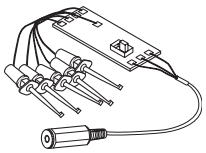
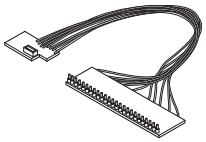
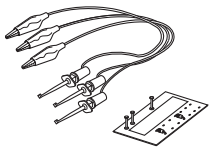
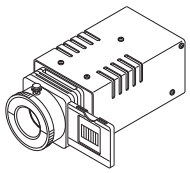
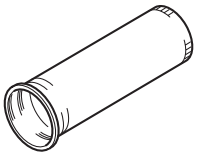
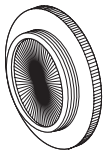
SECTION 4
ADJUSTMENT

4.1 INSTRUMENTS REQUIRED FOR ADJUSTMENT AND THE SETUP

4.1.1 Measuring instruments required for adjustment

Instrument	Condition	Instrument	Condition
PC (Windows)	With an RS-232C compliant serial communication port.	Audio tester	Calibrated instrument.
Color TV monitor	Supporting HD, with an HDMI input.	Speaker	----------
Oscilloscope	100 MHz or higher (300 MHz is recommended), calibrated instrument.	DC power source	12V/1.7A or more, power source for light box.
Frequency counter	With threshold level adjustment. Calibrated instrument.	AC adapter	Used as a power source for the unit. (Accessory : AP-V21)
Digital volt meter	Calibrated instrument.		

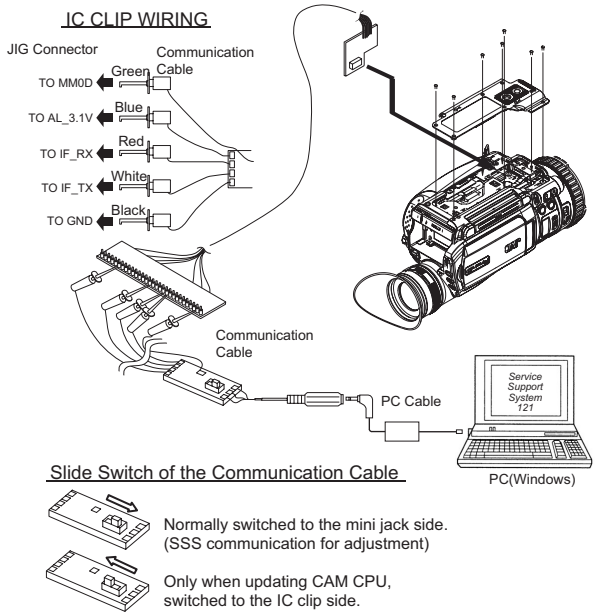
4.1.2 Jigs and tools required for adjustment

Self-diagnostic software (Service Support System)	PC cable	Communication cable	Jig connector cable	Charging battery adjustment jig
YTU94057-121 Download from JS-NET	**QAM0099-002** 	**KSJ1742** 	**KSJ1740** 	**KSJ1741** 
Light box	INF adjustment lens (Collimator)	Focus chart	Step down ring	Filter
YTU93096B 	**YTU92001D** 	**YTU92001-018** 	**YTU92001-102**  Ø46mm→Ø36mm	• Color temperature conversion filter.(LBB12) **YTU94152-LBB12** • ND filter (ND1.5) **YTU94152-ND1.5** • ND filter (ND0.3) **YTU94152-ND0.3**

4.1.3 Jig connector cable connection

(1) Remove the seven screws, then remove the bottom cover.
(2) Connect the jig connector cable to the MAIN board CN111.

CAUTION
Before connecting the jig cable, be sure to turn “OFF” the power.
If the jig connector cable is connected while the power is “ON”, communication error may occur.
When the error occurs, the power supply of unit is turned “OFF”.

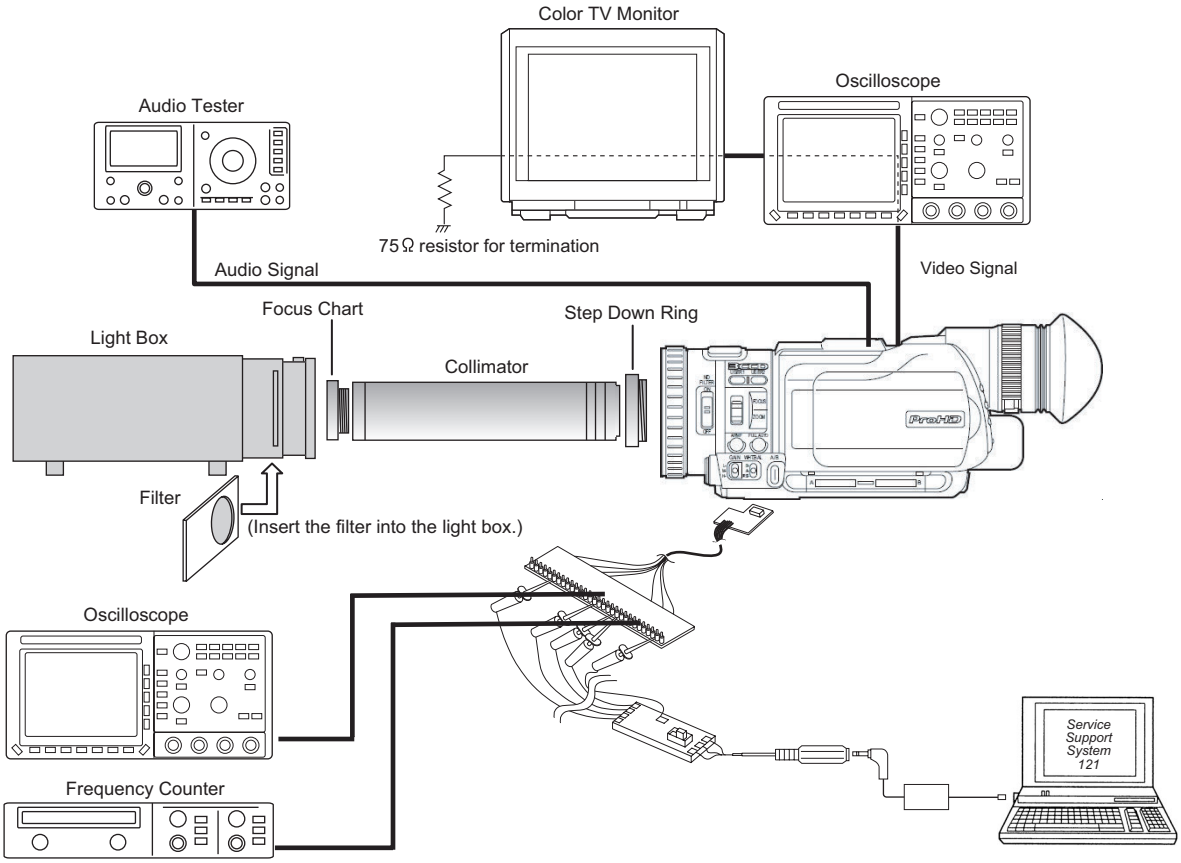


JIG Connector Cable (KSJ1740)

MAIN CN111 (JIG CONN)			JIG CONN BOARD (PIN No.)	
XDSPTRST	1		1	XDSPTRST
XDSPSRST		16	2	VF_R_JIG
VF_R_JIG	2		3	VF_B_JIG
VF_G_JIG		17	4	REG_3.1V
VF_B_JIG	3		5	UA_TXDO
VF_COM_JIG		18	6	IF_TX
REG_3.1V	4		7	DSP_TDI
UA_RXDO		19	8	OCD_SCL
UA_TXDO	5		9	DRV_3.0V
AL_3.1VSYS		20	10	OCD_SDA
IF_TX	6		11	DSP_RTCK
IF_RX		21	12	MVD
DSP_TDI	7		13	DSP_TDO
SYS_RSTL		22	14	DSP_TMS
OCD_SCL	8		15	GND
VF_HD_JIG		23	16	XDSPSRST
DRV_3.0V	9		17	VF_G_JIG
GND		24	18	VF_COM_JIG
OCD_SDA	10		19	UA_RXDO
GND		25	20	AL_3.1VSYS
DSP_RTCK	11		21	IF_RX
IRU		26	22	SYS_RSTL
MVD	12		23	VF_HD_JIG
DSP_TCK		27	24	GND
DSP_TDO	13		25	GND
EXTRGO		28	26	IRU
DSP_TMS	14		27	DSP_TCK
MMOD		29	28	EXTRGO
GND	15		29	MMOD
KENTO		30	30	KENTO

4.1.4 Set up for adjustment

(1) Connect appropriate measuring instruments, jigs, and tools required for the adjustment item.

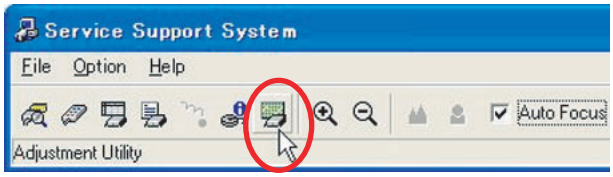


4.2 ADJUSTMENT

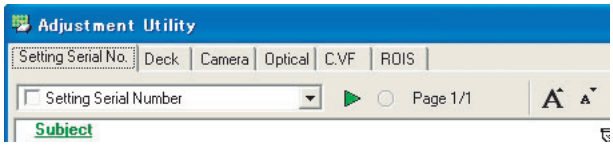
The adjustment for this model is a special adjustment using a PC.
Use the self-diagnostic software SSS (Service Support System) for adjustment.

4.2.1 Basic usage of the SSS for adjustment

(1) Click [Adjustment Utility] on the main screen of the SSS.

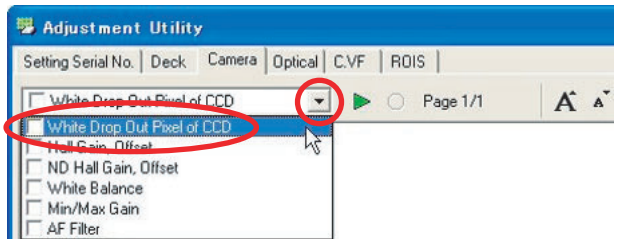


(2) The Adjustment Utility screen is displayed.



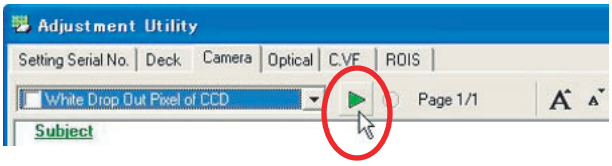
- The adjustment items are categorized into the following six groups.
  Click the tab on the Adjustment Utility screen to select.
  1) Setting Serial No.
  2) Deck Adjustment
  3) Camera Adjustment
  4) Optical Adjustment
  5) Color View Finder (C.VF) Adjustment
  6) ROIS Adjustment

(3) Select the item to adjust.
  a) Click the [Procedure], then select the adjustment item from the pulldown menu.
  b) Click the selected adjustment item.



(The display shows White Drop Out Pixel of CCD is selected)

(4) Click the [Start] button.



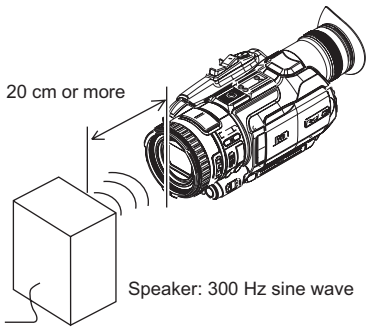
(5) Required procedure for adjustment is displayed on the screen.
  Follow the direction for adjustment.

(6) When the adjustment is completed normally, the box on the left of the adjustment item is checked.

4.2.2 Setting Serial No.

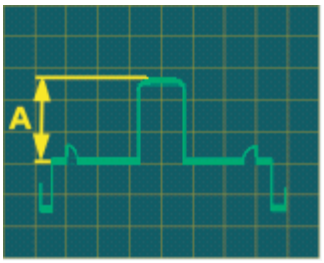
No.	Item	Measuring Instrument & Input Signals	Mode	Measuring Point (A) Adjustment Points (B) Adjustment Level (C)	Adjustment Procedure
1	Setting serial number	---	EE	(A)--- (B)EEPROM Menu (C)Serial number	(1) Input the serial number. Input a number into the item of "Serial No." in EEPROM Menu in SERVICE MENU. (Refer to 5.1.6 EEPROM Menu. A serial number is 8 figures.)

4.2.3 Deck Adjustment

No.	Item	Measuring Instrument & Input Signals	Mode	Measuring Point (A) Adjustment Points (B) Adjustment Level (C)	Adjustment Procedure
1	Built-in MIC L/R level balance	• Audio tester • Speaker	EE/Video mode	(A)A/V OUT (Audio OUT) (B)60 Hz(NTSC):1710h 50 Hz(PAL) :6710h (C)Minimize the level difference between the left and the right sides.(Should be within ±2.5dB)	• Adjust in 60 Hz(NTSC), the value is also written in the 50 Hz(PAL) address. (1) Set the unit 20 cm or more distance from the speaker, facing the built-in MIC straight to the speaker. (2) Output about 300 Hz sine-wave sound. Set the output level so that the audio output of the unit stays 400 to 700mVrms. (3) Adjust to minimize the level difference between Lch and Rch. 

4.2.4 Camera Adjustment

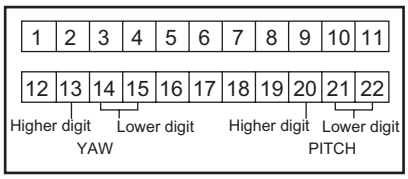
No.	Item	Measuring Instrument & Input Signal	Mode	Measuring Point (A) Adjustment Point (B) Adjustment Level (C)	Adjustment Procedure
1	White Drop Out Pixel of CCD	---	Internal temperature of the unit is 47.5°C or higher (43h or less)	(A)HDMI output (B)2000h to 3FFFh (C)Automatic adjustment	(1) Apply power to the unit for more than 60 minutes, then check the internal temperature is 47.5°C or higher (43h or less) using the SSS. (2) Start the adjustment. (3) When the adjustment is completed, the information screen shows the completion of the adjustment. (4) Before checking the white blemish, unplug the power cord and plug it back in.
	NOTE • For white blemish detection, the CCD must be fully warmed up. - White blemish cannot be detected when the CCD is cold. - Apply power for more than 60 minutes, then check the internal temperature is 47.5°C or higher (EEPROM data : 43h or less) with the SSS main screen [Option]→[About Temperature(OP)]. - When the room temperature is low, the CCD may not be fully warmed up. Warm up the internal temperature by wrapping the unit with antistatic aircap or similar material. • Inserting an SD card to slot A is required. (An SD card is required to temporary store the white blemish data obtained from the CCD. When the adjustment is finished, the data is written in the EEPROM, and the temporary data on the SD card is deleted.) • Before checking the white blemish correction, unplug the power cord and plug it back in. (The adjustment only writes the correction data, and actual correction data reading and correction is performed when the power is turned ON.)				
2	Hall gain, Offset	---	EE/Video mode	(A)--- (B)60 Hz(NTSC) :12C0h,12C1h 136Ah,136Bh 50 Hz(PAL): 62C0h,62C1h 636Ah,636Bh (C)Automatic adjustment	• Adjust in 60 Hz(NTSC), the value is also written in the 50 Hz(PAL) address. (1) Start the adjustment. (2) When the adjustment is normally finished, the information screen shows the completion of the adjustment. The color bar is displayed in the unit.
3	ND Hall gain, Offset	---	EE/Video mode	(A)--- (B)60 Hz(NTSC):1330h,1331h 4102h,4103h 50 Hz(PAL): 6330h,6331h 7102h,7103h (C)Automatic adjustment	• Adjust in 60 Hz(NTSC), the value is also written in the 50 Hz(PAL) address. (1) Start the adjustment. (2) When the adjustment is normally finished, the information screen shows the completion of the adjustment. The color bar is displayed in the unit.
4	White balance	• Light box • Collimator • Filter (Color temperature conversion LBB12)	EE/Video mode	(A)--- (B) 60 Hz(NTSC) :122Ah~1239h 50 Hz(PAL): 622Ah~6239h (C)Automatic adjustment	• Adjust in 60 Hz(NTSC), the value is also written in the 50 Hz(PAL) address. (1) Attach the collimator (without chart) to the camera lens. (2) Shoot the light box. (3) After the start of the adjustment, the adjustment on the low color temperature is completed, and the confirmation screen for the continuing adjustment is displayed. (4) Attach the LBB12 filter, then click OK. (5) Start the adjustment. (Adjustment on high color temperature starts.) (6) When the adjustment is normally finished, the information screen shows the completion of the adjustment. The color bar is displayed in the unit.

No.	Item	Measuring Instrument & Input Signal	Mode	Measuring Point (A) Adjustment Point (B) Adjustment Level (C)	Adjustment Procedure
5	Minimum/ Maximum gain	• Oscilloscope • Light box • Collimator • ND filter (ND0.3 × 2pcs) (or ND0.6 filter)	EE/Video mode	(A)COMPONENT OUT (Y) [Minimum gain] (B) 60 Hz(NTSC) :12C2h,12C3h 50 Hz(PAL): 62C2h,62C3h [Maximum gain] (B) 60 Hz(NTSC) :12C4h,12C5h 50 Hz(PAL): 62C4h,62C5h (C)0.70±0.03Vpp	• Adjust in both 60 Hz(NTSC) and 50 Hz(PAL). • Adjustment is performed only for the minimum gain. The value of the minimum gain+1F6h is written as the maximum gain. [60 Hz(NTSC) adjustment] (1) Attach the collimator (without chart) to the camera lens. (2) Attach the two ND0.3 filters (or one ND0.6 filter), then shoot the light box. (3) The component Y output adjusts to the specified value. [50 Hz(PAL) adjustment] (4) Adjust the component Y output to the specified value in the same way as the procedure (3). 
6	AF filter	• Light box • Collimator • ND filter (ND1.5) • ND filter (ND0.3)	EE/Video mode	(A)--- (B)60 Hz(NTSC): 13A0h to 13A3h (C)Automatic adjustment (B)50 Hz(PAL) :63A0h to 63A3h (C)Automatic adjustment	• Adjust in both 60 Hz(NTSC) and 50 Hz(PAL). [60 Hz(NTSC) adjustment] (1) Attach the collimator (without chart) to the camera lens. (2) Attach the ND1.5 filter, then shoot the light box. (3) After the start of the adjustment, the adjustment on the AGC ON is completed, and the confirmation screen for the continuing adjustment is displayed. (4) Change the filter from ND1.5 to ND0.3, then click OK. (Adjustment of AGC OFF starts.) (5) When the adjustment of AGC OFF is completed, the screen for the continuing adjustment is displayed. [50 Hz(PAL) adjustment] (6) Change the filter from ND0.3 to ND1.5, then, adjust in the same procedure from (2) to (5). (7) When the adjustment is normally finished, the information screen shows the completion of the adjustment. The color bar is displayed in the unit.

4.2.5 OP Adjustment

No.	Item	Measuring Instrument & Input Signals	Mode	Measuring Point (A) Adjustment Points (B) Adjustment Level (C)	Adjustment Procedure
1	OP adjustment	• Light box • Collimator • Focus chart	EE/Video mode	(A)---	• Adjust in 60 Hz(NTSC), the value is also written in the 50 Hz(PAL) address. • Items from a) to h) are automatically adjusted. (1) Attach the collimator + focus chart to the camera lens. (2) Shoot the light box. (3) Start the adjustment. (4) When the adjustment is normally finished, the information screen shows the completion of the adjustment. The color bar is displayed in the unit.
	a)Infinity sensor			(B)60 Hz(NTSC) :14E0h,14E1h 50 Hz(PAL) : 64E0h,64E1h	
	b)Zoom sensor			(B)60 Hz(NTSC) :14E2h,14E3h 50 Hz(PAL) : 64E2h,64E3h	
	c) Multi points adjustment			(B)60 Hz(NTSC) : 14E4h to 14EDh 50 Hz(PAL) : 64E4h to 64EDh	
	d) Backlash (Focus)			(B)60 Hz(NTSC) : 14EEh to 14F0h 50 Hz(PAL) : 64EEh to 64F0h	
	e) Backlash (Zoom)			(B)60 Hz(NTSC) : 14F1h to 14F3h 50 Hz(PAL) : 64F1h to 64F3h	
	f)Tele end adjustment			(B)60 Hz(NTSC) : 14F7h 50 Hz(PAL): 64F7h	
	g)Sensor position focus pulse number			(B)60 Hz(NTSC) : 14F8h 50 Hz(PAL): 64F8h	
	h) Sensor position zoom pulse number			(B)60 Hz(NTSC) : 14F9h 50 Hz(PAL): 64F9h	
				(C)Automatic adjustment	

4.2.6 ROIS Adjustment

No.	Item	Measuring Instrument & Input Signals	Mode	Measuring Point (A) Adjustment Points (B) Adjustment Level (C)	Adjustment Procedure
1	Center position	---	---	(A)Label on the ROIS (B)60 Hz(NTSC) YAW(Lower digit): 16AAh YAW(Higher digit): 16ABh 50 Hz(PAL) YAW(Lower digit): 66AAh YAW(Higher digit): 66ABh (C)Write the value in the label on the ROIS. (B)60 Hz(NTSC) PITCH(Lower digit): 16ACh PITCH(Higher digit):16ADh 50 Hz(PAL) PITCH(Lower digit): 66ACh PITCH(Higher digit):66ADh (C)Write the value in the label on the ROIS.	• Adjust in 60 (NTSC), the value is also written in the 50 Hz(PAL) address. (1) Note down the value in the label attached to the ROIS. (2) Write the 13th, 14th, and the 15th values to each address. (3) Write the 20th, 21st, and the 22nd values in the same way.  The higher digit of YAW and PITCH inputs the value of one digit. The lower digit of YAW and PITCH inputs the value of two digits.
2	YAW Hall gain, Offset	---	EE/Video mode	(A)--- (B)60 Hz(NTSC):1694h, 1695h, 1698h to 169Bh 50 Hz(PAL): 6694h, 6695h, 6698h to 669Bh (C)Automatic adjustment	• Adjust in 60 Hz(NTSC), the value is also written in the 50 Hz(PAL) address. (1) The adjustment is started. (The automatic adjustment is done.)
3	PITCH Hall gain, Offset	---	EE/Video mode	(A)--- (B)60 Hz(NTSC): 1696h, 1697h, 169Ch to 169Fh 50 Hz(PAL): 6696h, 6697h, 669Ch to 669Fh (C)Automatic adjustment	• Adjust in 60 Hz(NTSC), the value is also written in the 50 Hz(PAL) address. (1) The adjustment is started. (The automatic adjustment is done.)
4	ROIS gain	Color TV monitor	EE/Video mode	(A)HDMI (or A/V OUT) [YAW] (B)60 Hz(NTSC) YAW(Lower digit): 1690h YAW(Higher digit): 1691h 50 Hz(PAL) YAW(Lower digit): 6690h YAW(Higher digit): 6691h (C)Minimize lateral image trembles. [PITCH] (B)60 Hz(NTSC) PITCH(Lower digit): 1692h PITCH(Higher digit):1693h 50 Hz(PAL) PITCH(Lower digit): 6692h PITCH(Higher digit):6693h (C)Minimize lengthwise image trembles.	• Adjust in 60 (NTSC), the value is also written in the 50 (PAL) address. (1) While vibrating the unit to the YAW direction, adjust to minimize the tremble of the TV monitor screen. (2) While vibrating the unit to the PITCH direction, adjust to minimize the tremble of the TV monitor screen.

SECTION 5
TROUBLE SHOOTING

5.1 SERVICE MENUS

5.1.1 Modes required serviceing

Press the buttons by the combination of the following table, and press the [MENU] button. Will display the following service menus. The items in the first layer vary according to the specified buttons being held when the [MENU] button is pressed.
(Characters are displayed on LCD monitor screen or view finder.)

MENU Item	Displayed content	Activation method
FIRMWARE	Firmware (Package) version indication	While holding down the [OIS] button and the [MENU] button, turn ON the power.
VERSION CHECK	CPU and Program version indication	Turn ON the power. The following operations are performed while holding down the [OIS] button. • While holding down the [USER1] button and the [USER2] button, press the [MENU] button (less than 1 second). • And the [MENU] button is pressed again.
ADVANCED FUNCTION	White blemish and camera settings	Turn ON the power. The following operations are performed while holding down the [OIS] button. • While holding down the [USER1] button and the [USER2] button, press the [MENU] button (less than 1 second). • And while holding down the [AF/MF] button, press the [MENU] button.
SERVICE FUNCTION	Not used	
DIP SW	Settings of DIP SW	
HOUR METER	Power hour meter and slot eject count	
EEPROM	Serial number input IEEE1394ID input	

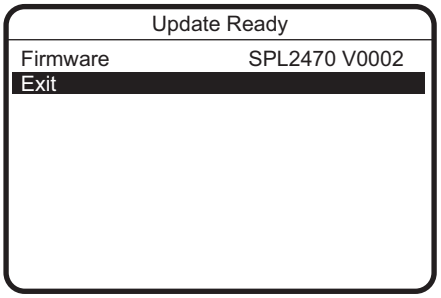
5.1.2 Operation in the first layer of the service menu

(1) While holding down the specified buttons, press the [MENU] button.
(2) The first layer of each service menu is displayed.
(3) Press the [Cross-Shaped] buttons to move the cursor (▸) to the item to be displayed.
(4) Press the [Set] button or the [Cross-Shaped] button (right) to select the item.

NOTE :
- During recording, the service menu does not start up.
- To go back to the upper layer, press the [Cross-Shaped] button (left).
- To cancel the service menu, press the [MENU] button.

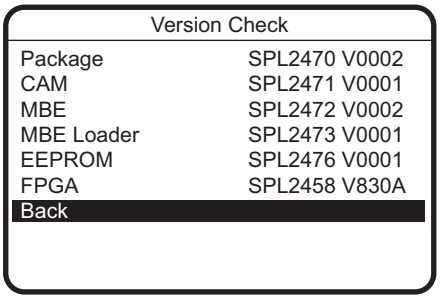
5.1.2.1 FIRM WARE VERSION MENU Display

(1) Turn ON the power. (DC power supply and a battery are necessary.)
(2) While holding down the [OIS] button and the [MENU] button, turn ON the power. Then, the version of firmware is displayed.



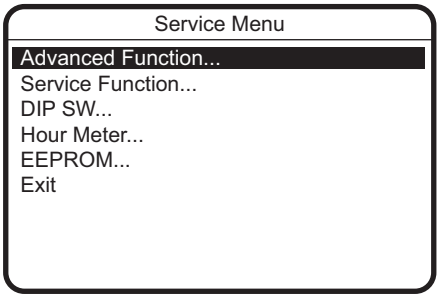
5.1.2.2 Version of CPU and program display

(1) Turn ON the power. (CAM mode, MENU is undisplayed)
(2) The following operations are performed while holding down the [OIS] button.
(3) While holding down the [USER1] button and the [USER2] button, press the [MENU] button (less than 1 second).
(4) While holding down the [OIS] button, the [MENU] button is pressed again.
(5) Move the cursor to [VERSION CHECK], then press the [SET] button. Then the version of each CPU and a program is displayed.



5.1.2.3 SERVICE MENU display

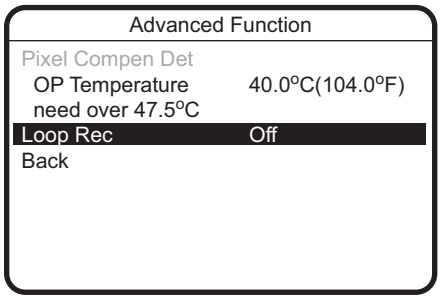
(1) Turn ON the power. (CAM mode, MENU is undisplayed)
(2) The following operations are performed while holding down the [OIS] button.
(3) While holding down the [USER1] button and the [USER2] button, press the [MENU] button (less than 1 second).
(4) While holding down the [OIS] button and the [AF/MF] button, press the [MENU] button.



5.1.3 ADVANCED FUNCTION Menu operation

(1) Refer to 5.1.1 to display the SERVICE MENU.
(2) Move the cursor to [ADVANCED FUNCTION], then press the [Set] button or the [Cross-Shaped] buttons (up/down) to change the parameter.
(3) ADVANCED FUNCTION Menu is displayed.
(4) Move the cursor to the item to be changed, then press the [Set] button or the [Cross-Shaped] button (right).
(5) The parameter blinks. Press the [Cross-Shaped] buttons (up/down) to change the parameter.
(6) Press the [Set] button to set the parameter. The parameter lights up.
(7) Move the cursor to [BACK], then press the [Set] button or the [Cross-Shaped] button (right) to go back to the upper layer and finish the setting.

NOTE :
- To cancel the parameter setting change, press the [Cross-Shaped] button (left) while the item is chosen.

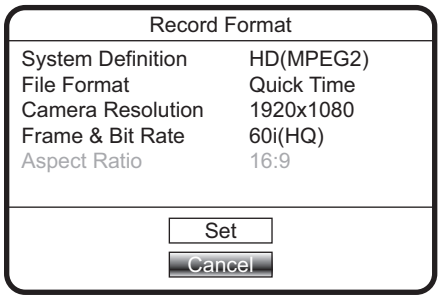


Item	Parameter	
PIXEL COMPEN DET*	OP TEMPERATURE NEED OVER 47.5°C	The temperature information on OP block is displayed. In the case of a white blemish adjustment start, it recommends that it is over this temperature.
LOOP REC	**OFF**	Loop REC is OFF.
	ON	Loop REC is carried out infinitely.

*Available only when the Camera Resolution setting is 1920x1080, and the Frame & Bit Rate setting is 60i(HQ). Otherwise, it becomes a gray display and no selection is available.

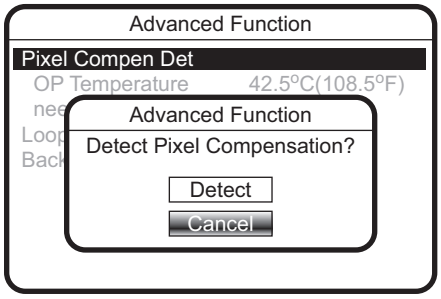
5.1.3.1 White blemish detection

(1) Open the MAIN MENU, then set [Camera Resolution] in [Record Format] to 1920x1080, and [Frame & Bit Rate] to 60i(HQ).

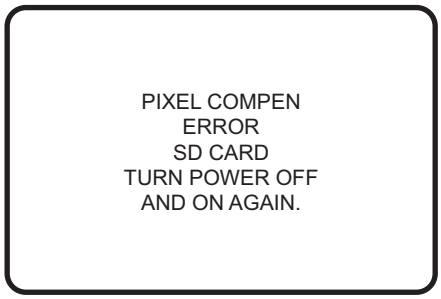


(2) Open the ADVANCED FUNCTION Menu, choose the [PIXEL COMPEN DET], and then press the [Set] button.

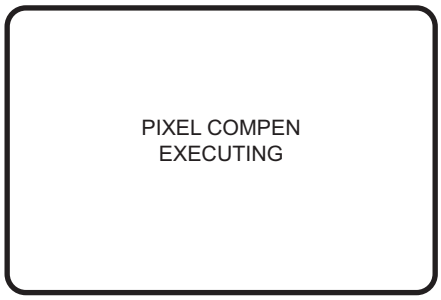
[PIXEL COMPEN DET]
Since it is displayed as Detect Pixel Compensation?, [Detect] is chosen and the [SET] button is pressed.



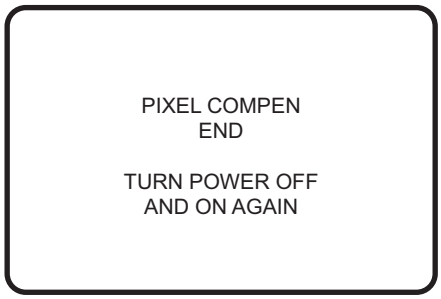
NOTE:
An error is displayed when SD card is not inserted.



(3) [PIXEL COMPEN EXECUTING] is displayed and the detection required for white blemish correction automatically starts.
At this time, the camera lens is closed and the mode changes to the SLOW SHUTTER mode.



(4) When the white blemish detection completes, the result data is stored in the CPU memory, and an end message is displayed as shown below. Turn OFF the power.
(After completing white blemish detection, the "Camera Resolution" and "Frame & Bit Rate" settings return to the original settings.)

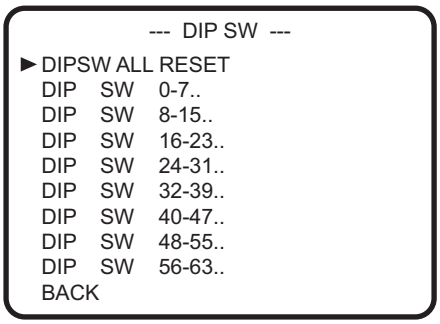


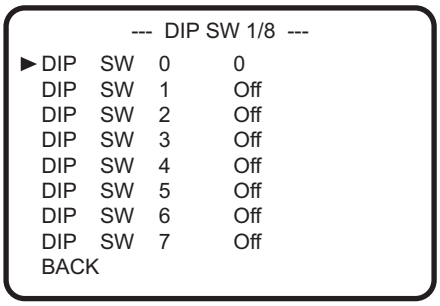
(5) If any errors occur during the detection, an error message is displayed, then the screen returns to the MENU display.

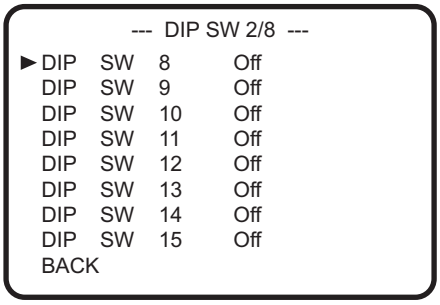
Message	Error details	Operation
LENS NOT CLOSED?	The lens does not close for detection.	No result is stored in the EEPROM.
COUNT OVER	The number exceeds the specified count.	Only the specified count of data is stored in the EEPROM.

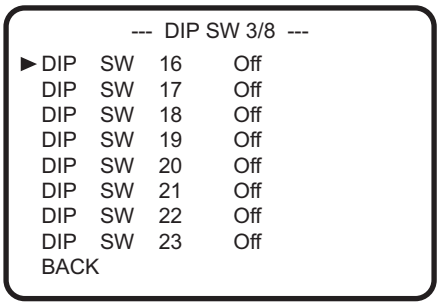
5.1.4 DIP SW Menu Operation

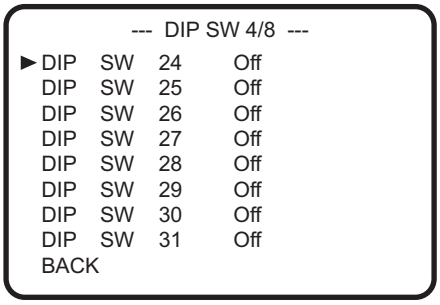
(1) Refer to 5.1.1 to display the SERVICE MENU.
(2) Move the cursor to [DIP SW], then press the [Set] button or the [Cross-Shaped] button (right).
(3) The DIP SW MAIN Menu is displayed.

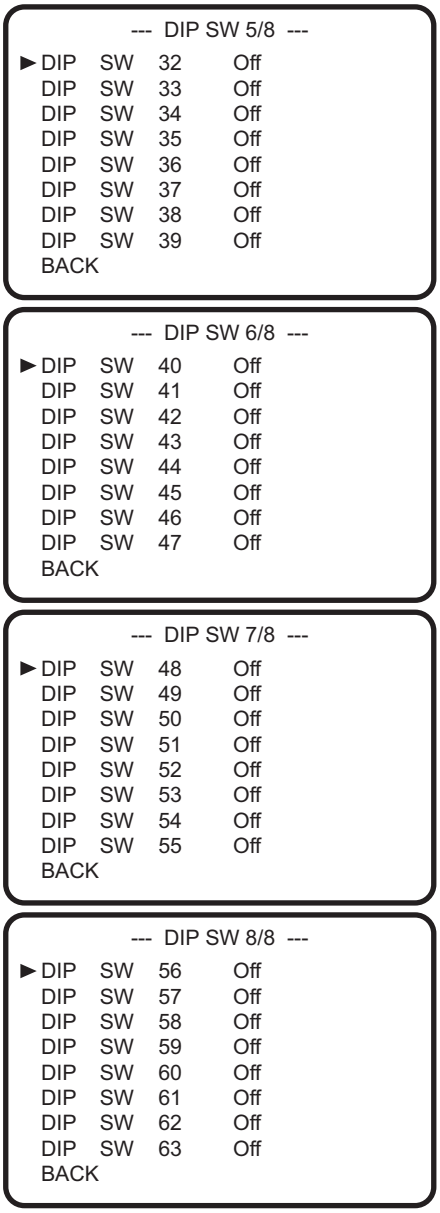












Refer to 5.1.3 ADVANCED FUNCTION Menu because the operations are almost the same.

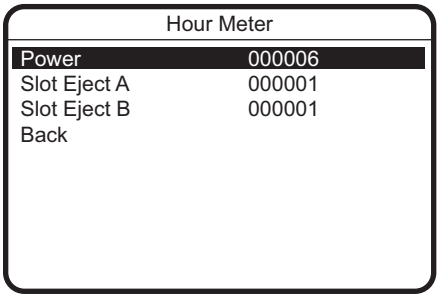
NOTE :
ALL DIP switches are factory use only.
These DIP switches are not used for repair or maintenance. Therefore all DIP Switch settings which are shown below should not be changed. And do not forget to return to the initial position, if setting was changed.

Item	Parameter		
DIP SW ALL RESET	**CANCEL** RESET	Cancel to reset all DIPSW settings. Execute to reset all DIPSW settings.	
DIP SW 1/8	DIP SW 0	**0**	Change prohibited.
	DIP SW 1 to 7	**OFF**	Change prohibited.
DIP SW 2/8	DIP SW 8 to 15	**OFF**	Change prohibited.
DIP SW 3/8	DIP SW 16 to 23	**OFF**	Change prohibited.
DIP SW 4/8	DIP SW 24 to 31	**OFF**	Change prohibited.
DIP SW 5/8	DIP SW 32 to 39	**OFF**	Change prohibited.
DIP SW 6/8	DIP SW 40 to 47	**OFF**	Change prohibited.
DIP SW 7/8	DIP SW 48 to 55	**OFF**	Change prohibited.
DIP SW 8/8	DIP SW 56 to 63	**OFF**	Change prohibited.

(Bold is the factory setting.)

5.1.5 HOUR METER Menu Operation

(1) Refer to 5.1.1 to display the SERVICE MENU.
(2) Move the cursor to [HOUR METER], then press the [Set] button or the [Cross-Shaped] button (right).
(3) The HOUR METER Menu is displayed.



Refer to 5.1.3 ADVANCED FUNCTION Menu because the operations are almost the same.

Item	Parameter	
POWER	000000	Displays the power hour meter.
	RESET	Resets the power hour meter.
SLOT EJECT	000000	Displays the slot A and B eject count.
	RESET	Resets the slot A and B eject count.

5.1.6 EEPROM Menu Operation

(1) Refer to 5.1.1 to display the SERVICE MENU.
(2) Move the cursor to [EEPROM], then press the [Set] button or the [Cross-Shaped] button (right).
(3) The EEPROM Menu is diaplayed.

Item		Parameter	
Model ID	0	**01h**	Factory use.
	1	**4F**	Factory use.
	2	**8B**	Factory use.
Node Uniq	0	**00h**	Not use.
	1	00h to FFh	The left of a serial number to the 1st figure, and the 2nd figures.
	2		The left of a serial number to the 3rd figure.
	3		The left of a serial number to the 4th figure, and the 5th figures.
	4		The left of a serial number to the 7th figure, and the 8th figures.
Serial No.	0	00h to FFh	The left of a serial number to the 1st figure. (*1)
	1		The left of a serial number to the 2nd figure. (*1)
	2		The left of a serial number to the 3rd figure. (*1)
	3		The left of a serial number to the 4th figure. (*1)
	4		The left of a serial number to the 5th figure. (*1)
	5		The left of a serial number to the 6th figure. (*1)
	6		The left of a serial number to the 7th figure. (*1)
	7		The left of a serial number to the 8th figure. (*1)
All Reset		**CANCEL**	Does not reset.
		Reset	* The data of EEP-ROM is returned to a setup at the time of factory shipments. (Adjustment data and hour meter data are excluded.) * A setup at the time of shipment changes with sale areas. (I: Japan, U: America, E: Europe, EC: China)

(*1):It sets to the code changed according to the conversion table of the following table.

Number	Input code
0	30h
1	31h
2	32h
3	33h
4	34h
5	35h
6	36h
7	37h
8	38h
9	39h
G	47h
M	4Dh
V	56h

5.2 HOW TO UPDATE THE FIRMWARE

NOTE:
- When replacing MAIN board, the firmware update is required to maintain combination with other CPU versions.
- Do not turn OFF the power during the update, Otherwise the CPU may be destroyed and replacement of IC or board may be required.
- Use both an AC adapter and a battery during update. (Do not connect the USB cable.)
- When update is failed, it is displayed on LCD as "UPDATE ERROR!" and LED of SLOT A and SLOT B blinks simultaneously. If write protected of SD card is opened at this time (write-in permission), the log file "UPDLOG.TXT" will be written out. Therefore, it understands which device was NG.
- Remove the IEEE1394 cable, or it may cause troubles on the GY-HM150.
- Do not format the SD memory card by PC.
  The SD memory card formatted on the PC may not work correctly. Format the SD memory card on the GY-HM150 if formatting is required.
- You can also use the SD memory cards formatted with digital still cameras, or formatted using formatting software supplied from SD memory card manufacturer such as Panasonic.

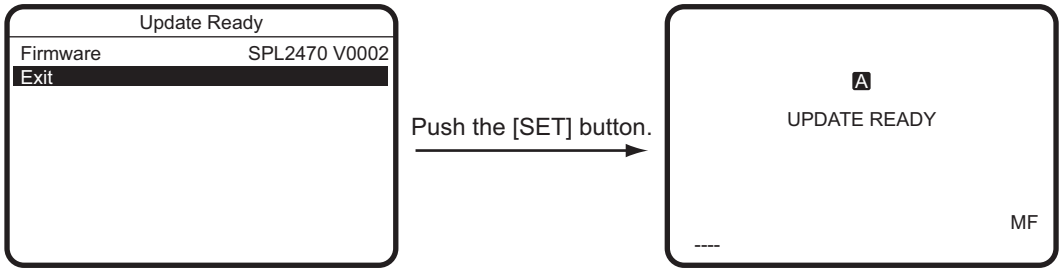
5.2.1 Preparation (Copy the firmware to SD memory card)

NOTE:
- The update file is named as "GY-HM150.UPD".
- The update file should be put on the directory "//PRIVATE/JVC/GY-HM150", otherwise the update is not executed.

(1) Download the update file from JS-NET SMIS and unzip it to a PC.
(2) Insert the SD memory card to the PC and confirm that no file is in the SD memory card. If there are some files, delete them.
(3) Below the "PRIVATE" folder of an update file is copied to SD memory card.

5.2.2 Update procedure

(1) A battery (10-minute or more use is possible) and an AC adaptor are connected to a main unit.
(2) While pressing the [MENU] and [OIS] buttons, turn ON the power. The UPDATE READY menu is displayed and version of firmware is displayed.

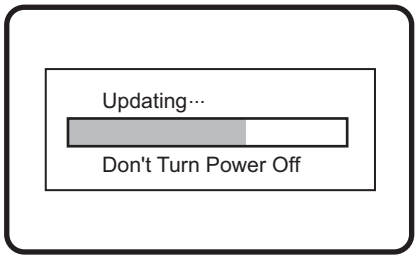


(3) Insert the SD memory card into the card slot B.

Note:
Can not be updated with slot A.

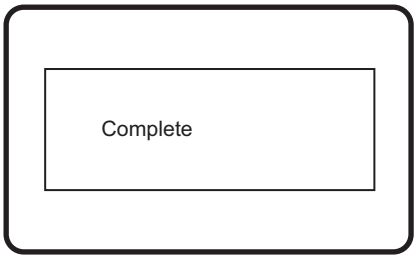
(4) The updating is started automatically, after the SD memory card was inserted.
Progress bar is displayed on the LCD display while updating.
The LED of SD card slot B blinks and LED of the slot A turned off.

LCD display



(5) When the update is completed, LEDs of SD card slot A and slot B blink slowly. It takes about 3 minutes to complete the update. Complete is displayed on the LCD display.

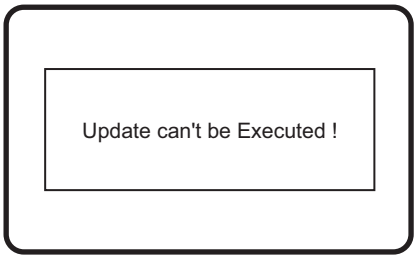
LCD display



(6) After complete the updating, remove the SD memory card.
(7) Turn OFF the power and an AC adapter and a battery are removed.
(8) Connect a battery and an AC adapter again and check the CPU version.

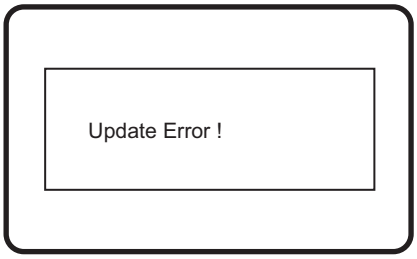
Note :
Confirm the firmware in the SD card if the "update can't be Executed !" was displayed on the LCD display.
(The LEDs of SD card slot A and slot B blink alternately, when update can not be executed.)

LCD display



Note:
Check the defect of board or the connection of each board, if the "update error !" was displayed.

LCD display



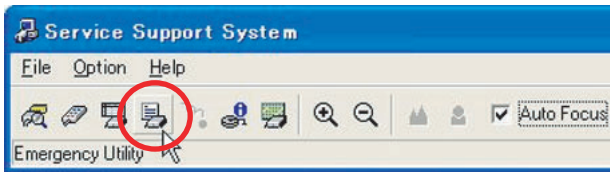
5.3 PRECAUTIONS WHEN CHANGING BOARDS

After changing the board in service, firmware version update and adjustment may be required.
Make sure to perform version update after changing the MAIN board.

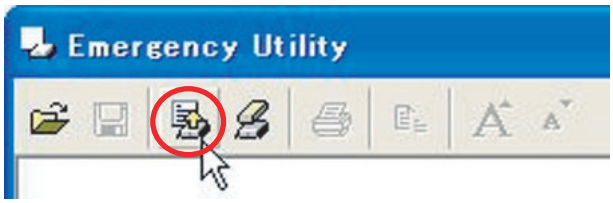
5.4 Checking emergency history with SSS

Emergency history can be checked using SSS.

(1) On the SSS main screen, click [Emergency Utility].



(2) Click [Read] on the Emergency Utility screen.



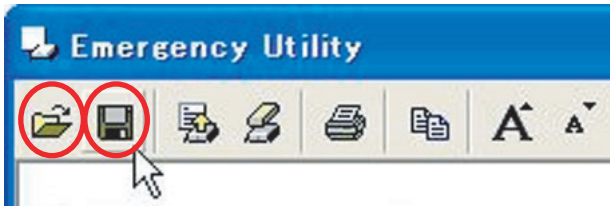
(3) Emergency history is displayed.

5.4.1 Saving emergency history

(1) Click [Save] on the SSS main screen.

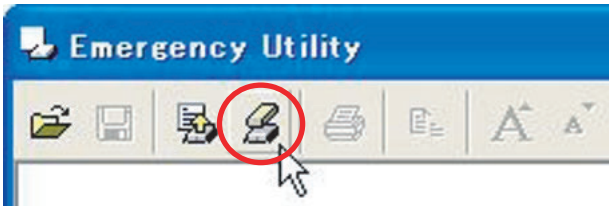
(2) Save the file with a proper name in a proper location.

(3) To open the saved file, [OPEN] is clicked.



5.4.2 Deleting emergency history

(1) Click [Erase All] on the Emergency Utility screen to delete emergency history.



NOTE

- Emergency history is recorded in HISTORY-1 to HISTORY-4 in the occurrence order. After the 5th error, HISTORY-4 is overwritten.
- Emergency history is recorded in the EEPROM data. When all relevant repair work is completed, delete the ERROR HISTORY.

5.4.3 Emergency display detail

Emergency detail	Cause
V INFO ERROR (Video management file error) →When data recovery is possible, recovery screen is displayed. Press [OK] to execute the recovery. If recovery is impossible, formatting is required.	(1)During video recording: •SD card is removed. •Power is disconnected or interrupted. (2)During video editing (Delete/OK mark/Copy): •SD card is removed. •Power is disconnected or interrupted. (3)Data failure in the card due to other cause.
MEDIA ERROR (Media initialization error)	• SD card failure. • SD card terminal connection failure. • Card removal right after insertion.
Buffer over flow • Only the number. • Can be checked with SSS (No display on the unit).	• Due to fragmentation of the SD card, writing speed deteriorates. • Copy the necessary data, then format the SD card.

5.4.4 Countermeasure on emergency

If the above emergencies occur, check the SD card or the handling of the SD card.

(1) Check if the SD card terminal is dirty or there is any foreign material.

(2) After copying the necessary data, format the SD card.

(3) Use recommended SD cards.
(Panasonic, TOSHIBA, or SanDisk)
Using cards other than those specified above may prevent data from being recorded correctly or result in loss of data.

(4) Do not remove the SD card until card recognition is completed. (The SD card is not extracted until changing lighting the access lamp of the card slot.)

(5) While the access lamp is blinking, do not remove the SD card. Data could be broken.

***If the error is not corrected after checking/replacing (using normal SD card), or properly handling the SD card, failure in the main unit is considered.**

5.5 EEPROM

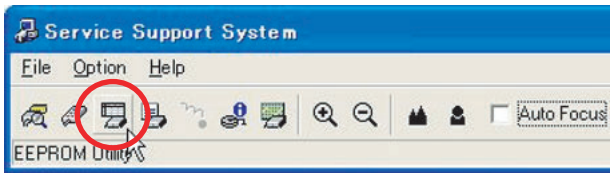
GY-HM150 has an EEPROM (MAIN board IC1005) for data storage.
When the MAIN board or the EEPROM is replaced, initial value data writing is required. Readjustment is also required because the adjustment data is reset.
Using SSS (Service Support System) enables writing, reading (backup), and changing EEPROM data.

Fixed data	Data that not change by CPU. (Model code, etc.)
Adjusting data	Data that is changed by adjustment. (Adjustment data)
No Fixed data	Data that may be changed by CPU. (Focus/Zoom position memory, etc.)
Default setting data	Data that is changed by usage (Menu setting, emergency data, etc.)
Doctor data	Doctor program (Data that not change.)
PE data	Data that is used during production.

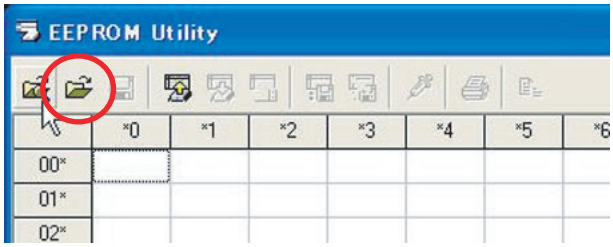
5.5.1 EEPROM initial data writing

Caution
- Before starting EEPROM data writing, be sure to turn OFF the power dial of the unit.
- The initial value data is reset, except the fixed value and the doctor program. Therefore, it is necessary to readjust SECTION 4.
- When the backup data writing of EEPROM, the initial value data need not be written.

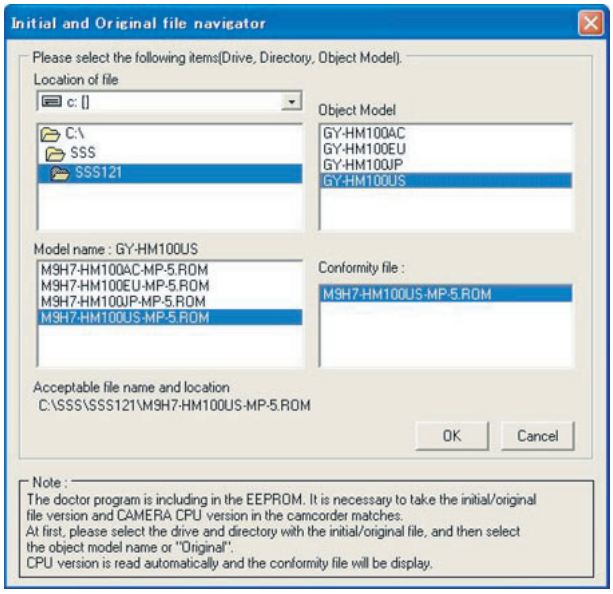
(1) Click [EEPROM Utility] on the SSS main screen.



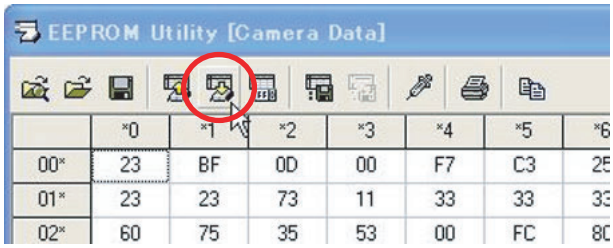
(2) Click [Open].



(3) When the Initial and Original file navigator screen appears, select the SSS folder. Selecting an Object Model automatically displays files that conform to each CPU version.
(4) Click the Conformity file [M9H7-HM100**-MP-*.ROM].
(5) Click [OK].



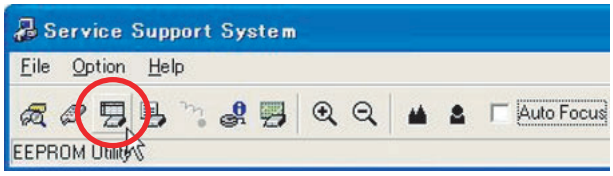
(6) “Initial data for "GY-HM150**" was loaded on the map.” is displayed. Click [OK].
(7) The initial data is displayed on the EEPROM Utility screen. Make sure that the power dial of the unit is turned OFF, then click [Write].



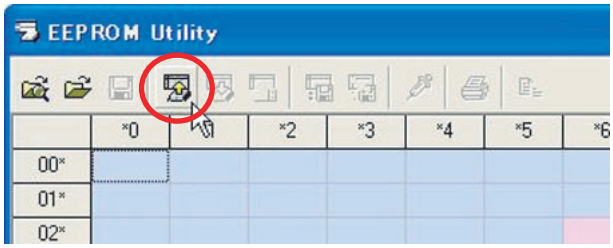
(8) Although the initial data is written, the adjustment data is reset. Readjust the unit.

5.5.2 EEPROM data backup

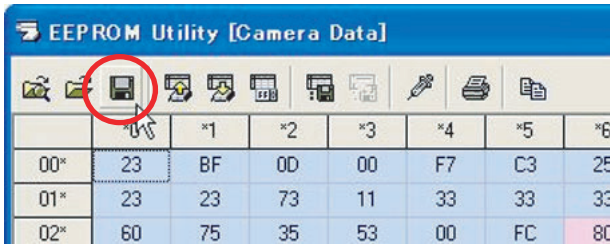
EEPROM data can be backed up using SSS. The backed up EEPROM data can be rewritten in the unit.
(1) Click [EEPROM Utility] on the SSS main screen.



(2) When the EEPROM Utility screen appears, click [Read].



(3) After reading the EEPROM data, click [Save].



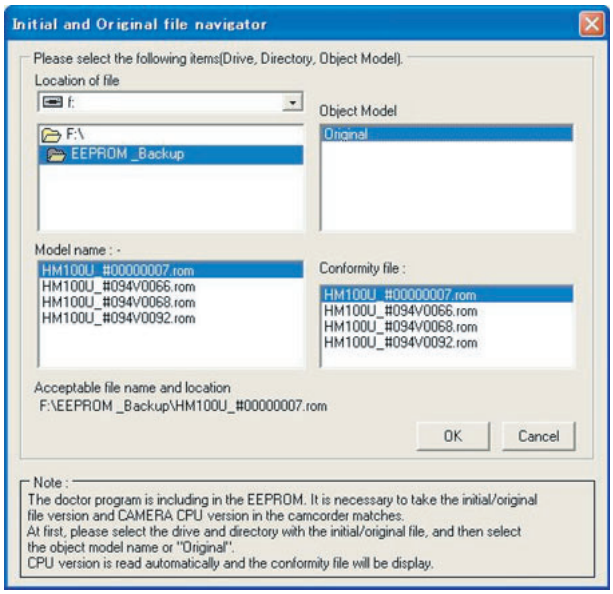
(4) Save the file as a proper name with a serial number in a proper location. (Extension is XXXXXX.rom)

5.5.3 EEPROM backup data (original file) writing

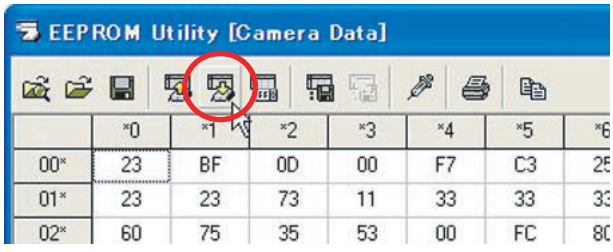
Caution

- Before starting EEPROM data writing, be sure to turn OFF the unit.
- The EEPROM data is the one at the time of the backup. The adjustment data and the EEPROM version are also the ones at the time of backup. It is likely to differ from an original version, Adjust the unit or update the EEPROM version as required.

(1) Specify the location of the backup file saved in 5.2.1 EEPROM initial value data writing procedure (3) on the Initial and Original file navigator screen.
(2) Click Original in Object Model.
(3) Find the target file by the file name from among the displayed files.
Select the Conformity file, then click [OK].

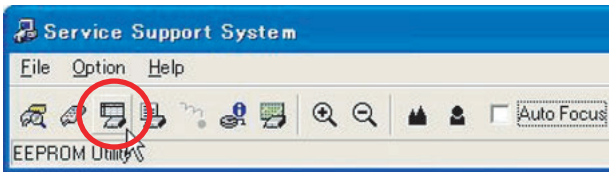


(4) The backup data is displayed in the EEPROM Utility screen. Make sure that the power dial of the unit is turned OFF, then click [Write].

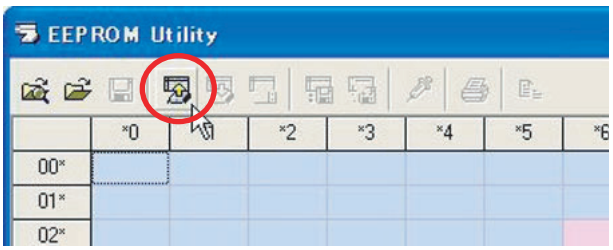


5.5.4 EEPROM version check

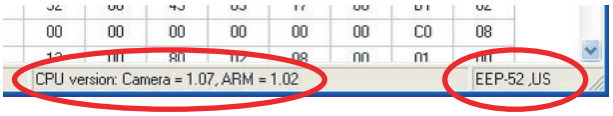
(1) On the SSS main screen, click [EEPROM Utility].



(2) When the EEPROM Utility screen appears, click [Read].



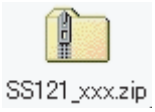
(3) The EEPROM data is read, and the EEPROM version is displayed in the right bottom of the screen. (CAM and ARM versions are also displayed.)



5.6 SSS (Service Support System)

5.6.1 Installation

(1) Download SSS (Service Support System) from JS-NET.
(2) As the downloaded file is a Zip file, extract the file on the PC.

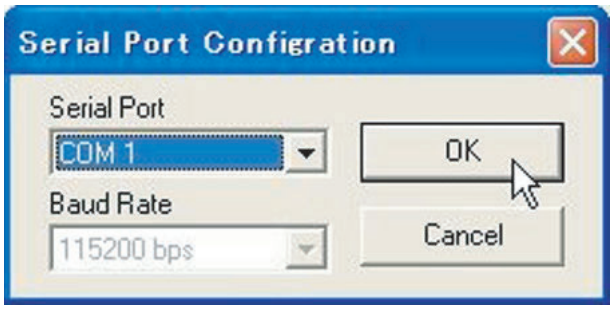


(3) SS121_*** folder is created. Double click the SETUP.EXE in the SS121_*** folder.

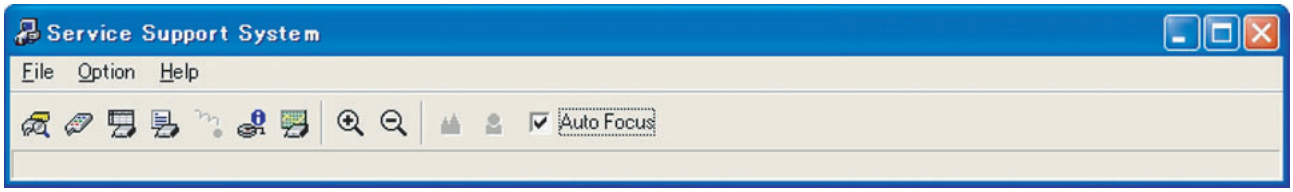
(4) Follow the instruction to install the SSS.

5.6.2 Start up

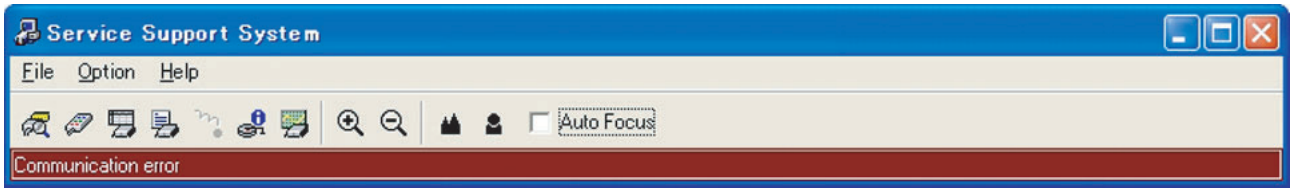
(1) Connect the unit and a PC. (For the connection, refer to 4.1.3 JIG connector cable connection.)
(2) Select [Start]-[All Programs]-[Service Support System]-[SSS121 GY-HM100].
(3) Select the COM port, then click [OK].



(4) The SSS main screen appears.

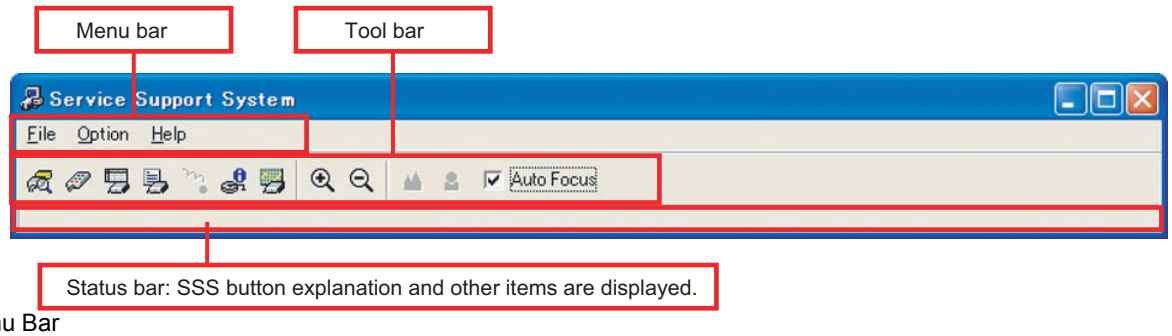


(5) If there is an error in the communication with the unit, a “Communication error” message is displayed at the bottom of the screen (status bar).
Recheck the connection between the unit and the PC.

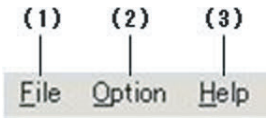


5.6.3 Main screen structure and functions

(1) The main screen consists of Menu bar, Tool bar, and Status bar.

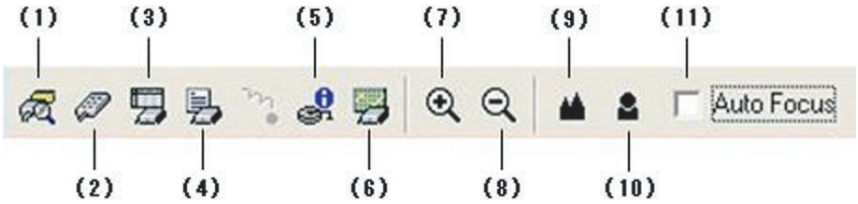


(2) Menu Bar



(1)File		
Inspector	Opens the Inspector screen.	Views internal information of the unit.
Controller	DSP (Opens the DSP controller screen).	Switches ON/OFF the built-in color bar, grayscale.
Information	Emergency Utility.	Opens the emergency utility screen.
	Total Time Information.	Checks/Deletes the media access total time, power on total time.
	OP information.	
EEPROM Utility	Opens the EEPROM Utility screen.	
Adjustment Utility	Opens the Adjustment Utility screen.	
Exit	Exits the SSS.	
(2)Option		
Set Clock	Sets the clock of the unit.	Sets the time of the connected PC to the unit.
About CPU	Checks the CPU version.	Checks the versions of camera CPU and ARM CPU.
About Temperature(OP)	Checks the internal temperature of the unit.	
About Frame No	Checks the frame No.	Checks the model name, frame No.
(3)Help	Checks the SSS version.	

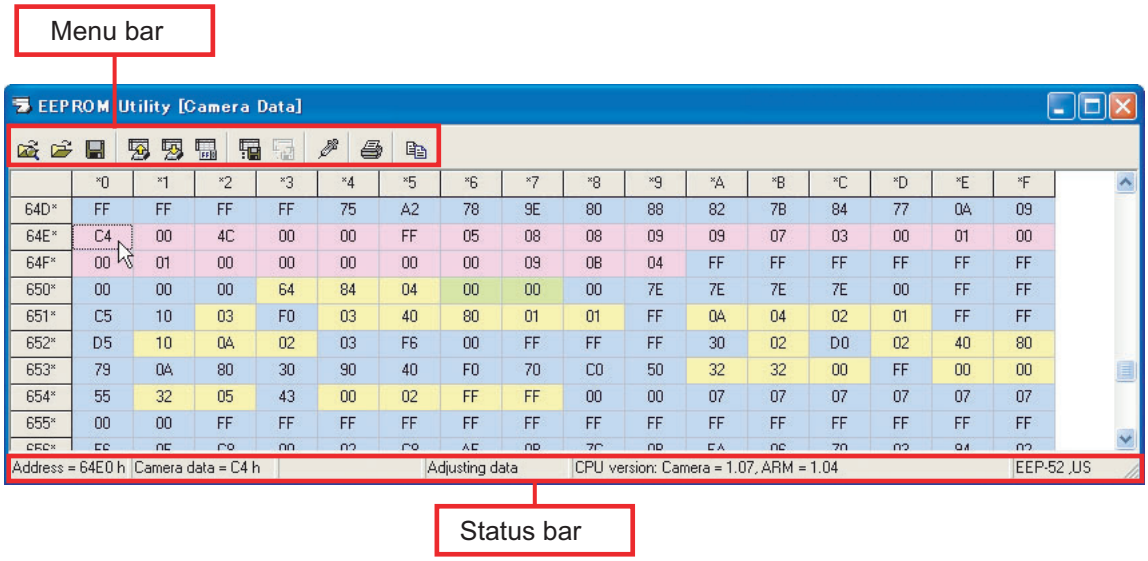
(3) Tool bar



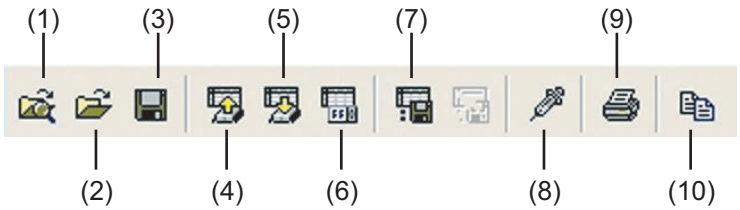
(1) Inspector	Rx : Received data.	Checks the zoom/focus operations. communication condition.
	Rxd120 : Received data (120).	Displays area level of the screen divided into 120.
	Z.Track.	Checks zoom tracking (The left side is a curve of infinity.).
(2) DSP Controller	Switches ON/OFF the built-in color bar, grayscale.	
(3) EEPROM Utility	Opens the EEPROM Utility screen.	
(4) Emergency Utility	Opens the Emergency Utility screen.	
(5) Total Time Information	Checks/Deletes media access (record & playback) total time, power on total time.	
(6) Adjustment Utility	Opens the Adjustment Utility screen.	
(7) Zoom Control (Tele)	Moves zoom to Tele end.	Using both [CTRL] & [SHIFT] enables variable speed zoom. Simultaneous clicking the left & right enables move to the Wide end.
(8) Zoom Control (Wide)	Moves zoom to Wide end.	
(9) Focus Control (Far)	Moves the focus to the Far end.	Using both [CTRL] & [SHIFT] enables variable focus. Simultaneous clicking the left & right enables move to the Far end.
(10)Focus Control (Near)	Moves the focus to the Near end.	
(11)Auto Focus	Giving check in Auto Focus enables auto focus.	

5.6.4 EEPROM Utility

(1) EEPROM Utility screen structure and functions.



(2) Menu bar



(1) Initial Rom Data Navigator Open	Opens data saved in the disk.	* For details refer to 5.5 EEPROM.
(2) Open	Opens data saved in the disk.	
(3) Save	Saves data to the disk.	* For details refer to 5.5 EEPROM.
(4) Read	Reads data from the EEPROM of the unit.	* For details refer to 5.5 EEPROM.
(5) Write	Writes data to the EEPROM of the unit.	* For details refer to 5.5 EEPROM.
(6) Edit	Edits the EEPROM data.	
(7) Comparison	Compares with the data saved in the disk.	Difference is displayed in dark color.
(8) Load Doctor Date	Downloads only the doctor data from the saved data in the disk.	
(9) Print	Prints data.	
(10)Copy	Copies data to the clipboard.	

(3) Status bar

(1) Address	Displays the selected address value.
(2) Data	Displays the data value written in the selected address.
(3) Kind of data	Six types of data: Fixed value, adjustment value, variable value, factory setting value, doctor program, factory data value.
(4) CPU version (CAM CPU, ARM CPU)	Displays the CPU versions of camera, ARM. • [Read] enables to display the CPU version of the connected unit. • [Open] enables to display the version written in the file.
(5) EEPROM version	Only when performs [Read], displays the EEPROM version of the connected unit.

(4) Data

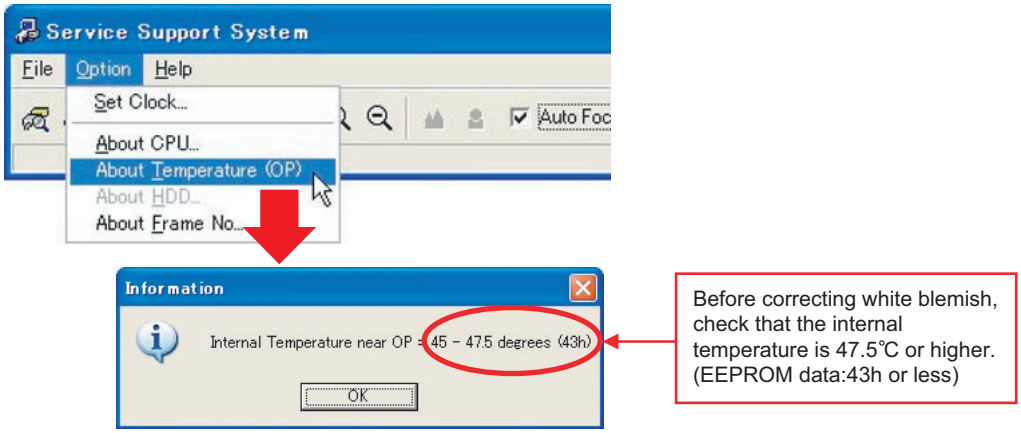
There are six types of EEPROM data. Each data is displayed in different color on the EEPROM Utility screen.

Color	Type	Description	Details
Light blue	Fixed data	Data that not change by CPU.	Model code, etc.
Pink	Adjusting data	Data that is changed by adjustment.	Adjustment data.
Light green	No Fixed data	Data that may be changed by CPU.	Focus/Zoom position memory, etc.
Orange	Default setting data	Data that is changed by usage.	Menu setting, emergency, etc.
Dark magenta	Doctor data	Data that not change.	Doctor program.
Yellow	PE data	Data that not change.	Data that is used during production.

5.6.5 Temperature information

(1) On the SSS main screen, click [Option]-[About Temperature (OP)] to check the internal temperature (internal temperature near OP).

- The CCD needs to be fully warmed up for white blemish correction. The internal temperature of the unit (the temperature near OP) must be 47.5°C or higher (43h or less).
  Check the internal temperature in About Temperature (OP).

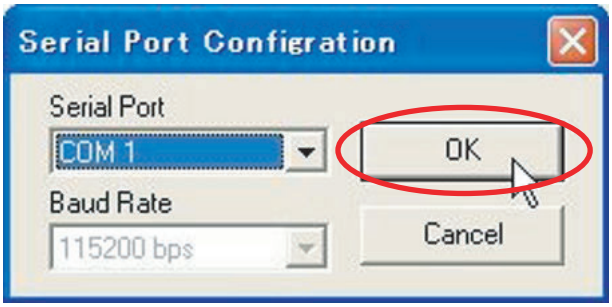


5.6.6 Non-communication mode

In the non-communication mode, The SSS can be used without connecting the unit. The EEPROM saved in the disk can be checked.

(1) On the “Serial Port Configuration” screen in starting the SSS, press and hold the “L” key on the keyboard, then click [OK].

Press and hold, then click



(2) A warning screen appears, click [OK].

5.6.7 File structure

In the directory where the SSS is installed, there are following two files: “SSS121.STT”, and “SSS121.INI”

(1) SSS121.STT

This file is required to enable the EEPROM Utility color display. If this file is deleted, the EEPROM Utility screen changes to all white.

(2) SSS121.INI

Each screen size and position used in the SSS is written when the SSS is finished. When starting the next time, the SSS is in the latest settings.

To return all items to the initial settings, delete this file. (Even if this file is deleted, the file will be recreated when the SSS is finished.)

JVC

JVC KENWOOD Corporation
Professional Systems Business Group, Business Solution Div.

(No.HC044<Rev.001>)

Printed in Japan
VSE