

EVI-D30/D31

SERVICE MANUAL

REVISED

*EVI-D30 (NTSC)
EVI-D31 (PAL)*

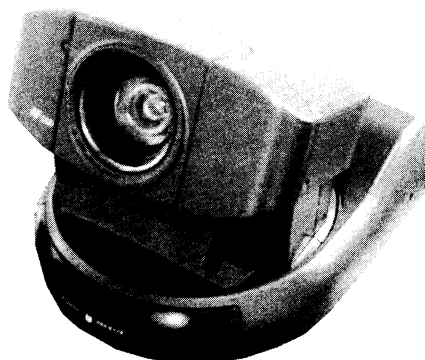


Photo:EVI-D30

Keep the old service manual (9-923-017-11).

SPECIFICATIONS

System

Video signal	EVI-D30: NTSC Color, EIAJ standards EVI-D31: PAL Color, CCIR standards
Picture element	1/3 inch color CCD (Total picture element number: EVI-D30: Approx 410,000 EVI-D31: Approx 470,000) (Effective picture element number: EVI-D30: Approx 380,000 EVI-D31: Approx 440,000)
Lens	Electromotion twelve fold zoom lens f=5.4 to 64.8mm, F1.8 to F2.7 Horizontal angle: 4.4° to 48.8°
Point-blank range	WIDE end : 10mm TELE end : 800mm
Minimum illumination	7 lux (F1.8)/with 50IRE
Illumination range	7 to 100,000 lux
Shutter speed	EVI-D30: 1/50 to 1/10,000 (VISCA control) EVI-D31: 1/50 to 1/10,000 (VISCA control)
Gain selector	Automatic/manual
Horizontal resolution	NTSC : 460 TV PAL : 450 TV
Video S/N	48 dB
Pan/tilt action	Horizontal: 100°; Vertical: 25°

Input/output terminals

Video output	RCA pin jack (1), 1Vpp, 75 ohm unbalanced Synchronization: negative
S video output	4 pin mini DIN (1)
Audio output	RCA pin jack, monaural (1) Rated output: 327 mV Output impedance: less than 2.2 kilohms
Input/output control terminals	RS232C (input: 1, output: 1), 8 pin mini DIN, 9600bps Data: 8 bit Stop bit: 1
Microphone input terminal	Mini jack (monaural) (1) (ø 3.5) Rated input 0.775 mV DC 3V for low impedance microphone Input impedance: more than 10 kilohms
Power terminal	EIAJ type4

General

Input voltage	DC 12 to 14 V
Power consumption	11 W
Operating temperature	0° to 40° (32° to 104°F)
Storage temperature	-20° to 60° (-4° to 140°F)
Dimensions	Video camera: Approx 142 × 109 × 164 mm (5 5/8 × 4 3/8 × 6 1/2 in) (w/h/d) Remote commander: Approx 56 × 26 × 210 mm (2 1/4 × 1 1/16 × 8 3/8 in) (w/h/d)
Mass	Video camera: Approx 1,200 g (42.3 oz) Remote commander: Approx 109 g (3.8 oz)

Supplied accessories

AC power adaptor (1)
Audio/video cable (1)
Remote commander (1)
Velcro tape (3 sets)

NOTE : The block diagrams/schematic diagrams are provided in the separate manual (9-923-017-42).

COLOR VIDEO CAMERA

SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

- 1 Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are “pinched” or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer
- 6 Flexible Circuit Board Repairing
 - Keep the temperature of the soldering iron around 270°C during repairing
 - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times)
 - Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK $\triangle$ OR DOTTED LINE WITH MARK $\triangle$ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

TABLE OF CONTENTS

1. GENERAL

• Locations of Controls	1-1
• Precautions	1-2
• Connections	1-3
• Turning on the Power	1-4
• Setting the Clock	1-4
• Pan/Tilt Operation	1-5
• Adjusting the Camera	1-5
• Having the Camera Memorize the Setting	1-6
• Tracking a Subject Automatically	1-7
• Detecting the Change Taking Place in the Picture	1-9

2. DISASSEMBLY

2-1. Camera Cabinet (Upper)	2-1
2-2. Bottom Plate Assy	2-1
2-3. Main Block	2-2
2-4. ID-11 (A)/11 (B) Board	2-2
2-5. Pan Base Assy	2-3
2-6. LI-55 (A)/55 (B) Board	2-3
2-7. Pan Cabinet	2-4
2-8. CCD Lens Assy	2-4
2-9. Camera Cabinet (Lower)	2-5
2-10. Stepping Motor	2-5
2-11. LI-59 (A)/59 (B) Board	2-6
2-12. LD-84 (A)/84 (B) Board	2-6
2-13. VC-179 (A)/179 (B) Board	2-7
2-14. RS-67 (A)/67 (B) and LB-47 (A)/47 (B) Boards	2-7
2-15. MD-68 (A) Board	2-8E
2-16. Lens Block	2-8E
2-17. CD-154 (A)/154 (B) Board	2-8E
2-18. CCD Fitting Adaptor (H)	2-8E

3. BLOCK DIAGRAMS/SCHEMATIC DIAGRAMS

(Extra number : 9-923-017-42)

3-1. Overall Block Diagram	3-1
3-2. Schematic Diagram	
• This Note is Common for Schematic Diagrams	3-5
• CD-154 (A)/154 (B) Board	3-5
• VC-179 (A)/179 (B) Board (1/4)	3-7
• VC-179 (A)/179 (B) Board (2/4)	3-9
• VC-179 (A)/179 (B) Board (3/4)	3-11
• VC-179 (A)/179 (B) Board (4/4)	3-13
• RS-67 (A)/67 (B) and LB47 (A)/47 (B) Boards	3-17
• MD-68 (A) Board	3-18
• PS-398 (A)/398 (B) Board	3-21
• ID-11 (A)/11 (B) Board	3-22
• AT-21 (A)/21 (B) Board	3-25
• LI-52 (A)/52 (B), LI-59 (A)/59 (B) and RM77 (A)/77 (B) Boards	3-29
• LI-55 (A)/55 (B) and SW-279 (A)/279 (B) Boards	3-30
• LD-84 (A)/84 (B)	3-31

4. PRINTED WIRING BOARDS

4-1. Circuit Boards Location	4-1
4-2. Printed Wiring Boards	
• This Note is Common for Printed Wiring Boards	4-2
• CD-154 (A)/154 (B) Board	4-2
• VC-179 (A)/179 (B) Board	4-3
• MD-68 (A) Board	4-5
• RS-67 (A)/67 (B) Board	4-6
• PS-398 (A)/398 (B) and LB47 (A)/47 (B) Boards	4-7
• ID-11 (A)/11 (B) Board	4-8
• AT-21 (A)/21 (B) Board	4-10
• LI-52 (A)/52 (B) and LI-59 (A)/59 (B) Boards	4-11
• LI-55 (A)/55 (B) Board	4-12
• RM-77 (A)/77 (B) Board	4-13
• SW-279 (A)/279 (B) Board	4-15
• LD-84 (A)/84 (B) Board	4-16

5. ADJUSTMENTS

5-1. Preparation for Adjustment	5-1
5-1-1. List of Servicing Jigs	5-1
5-1-2. Preparations	5-2
5-1-3. Precautions	5-5
5-1-4. Adjusting Remote Commander	5-6
5-1-5. Page D Address List	5-7
5-1-6. Page F Address List	5-9
5-1-7. Page 5 Address List	5-12
5-1-8. Data Processing	5-14
5-2. Camera System Adjustment	
5-2-1. Power Supply Voltage Check	5-15
5-2-2. Page D Data Initialization	5-15
5-2-3. Page D Data Modification 1	5-15
5-2-4. Page F Data Initialization	5-15
5-2-5. Page F Data Modification	5-15
5-2-6. 28 MHz Original Oscillation Adjustment	5-16
5-2-7. V SUB Adjustment	5-16
5-2-8. VRG Adjustment	5-16
5-2-9. Flange Back Adjustment	5-17
5-2-10. Flange Back Check	5-17
5-2-11. Hall Adjustment	5-18
5-2-12. Picture Frame Setting	5-19
5-2-13. Color Reproduction Adjustment	5-20
5-2-14. Iris IN/OUT Adjustment	5-21
5-2-15. Max Gain Adjustment	5-21
5-2-16. Auto White Balance Standard Data Input	5-22
5-2-17. Auto White Balance Adjustment	5-22
5-2-18. White Balance Check	5-23
5-2-19. VIDEO OUT Level Check	5-23
5-2-20. Page D Data Modification 2	5-24E
5-2-21. Page 5 Data Initialization	5-24E
5-2-22. Home Position Adjustment	5-24E
5-3. Electrical Block Check	
5-3-1. MIC IN/AUDIO OUT Check	5-24E
5-3-2. Pan Tilter Operation Check	5-24E
5-3-3. DATE and TIME Switch Check	5-24E
5-3-4. Camera No Switch Check	5-24E

6. VISCA COMMAND LIST

6-1. VISCA Summary	6-1
6-2. EVI-D30/D31-VISCA Connection	6-2
6-3. VISCA Communication Formats	
6-3-1. VISCA Packet Structure	6-3
6-3-2. Commands and Inquiries	6-3
6-3-3. Responses to Commands and Inquiries	6-3
6-3-4. Socket Number	6-4
6-3-5. Command Execution Stop	6-4
6-4. EVI-D30/D31 Setting Commands (Network setting)	
6-4-1. VISCA Network Management Commands	6-4
6-4-2. VISCA Interface Commands	6-4
6-5. EVI-D30/D31 Functions	6-5
6-6. EVI-D30/D31 Commands	6-7
6-7. EVI-D30/D31 Inquiry Commands	6-10
6-8. Code List	6-12
6-9. VISCA Communications Examples	6-14E

7. REPAIR PARTS LIST

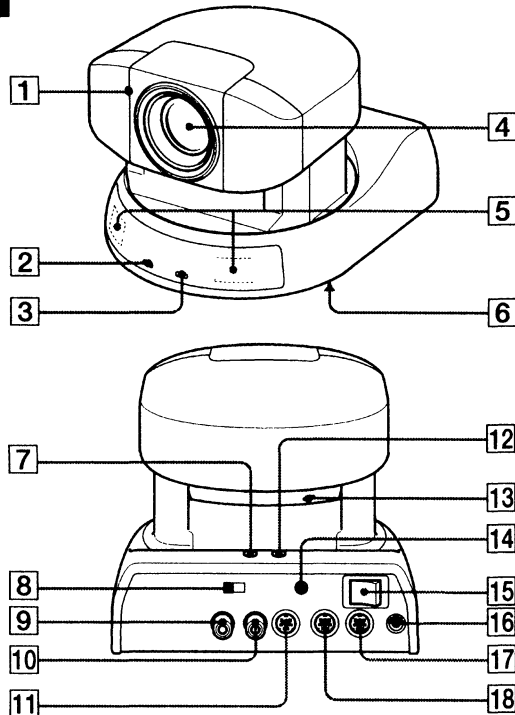
7-1. EXPLODED VIEWS	
7-1-1. Camera Cabinet Section	7-1
7-1-2. Pan Base Section	7-2
7-1-3. Tilt Base Section	7-4
7-1-4. Lens Section	7-5
7-2. ELECTRICAL PARTS LIST	
• AT-21 (A)/21 (B) Board	7-6
• CD-154 (A)/154 (B) Board	7-6
• ID-11 (A)/11 (B) Board	7-7
• LB-47 (A)/47 (B) Board	7-9
• LD-84 (A)/84 (B) Board	7-9
• LI-52 (A)/52 (B) Board	7-10
• LI-55 (A)/55 (B) Board	7-10
• LI-59 (A)/59 (B) Board	7-10
• MD-68 (A) Board	7-10
• PS-398 (A)/398 (B) Board	7-11
• RM-77 (A)/77 (B) Board	7-11
• RS-67 (A)/67 (B) Board	7-12
• SW-279 (A)/279 (B) Board	7-12
• VC-179 (A)/179 (B) Board	7-12
• Accessories	7-15E
• For Camera Color Reproduction Adjustment	92

General

Locations of Controls

For details, see the pages indicated in ●

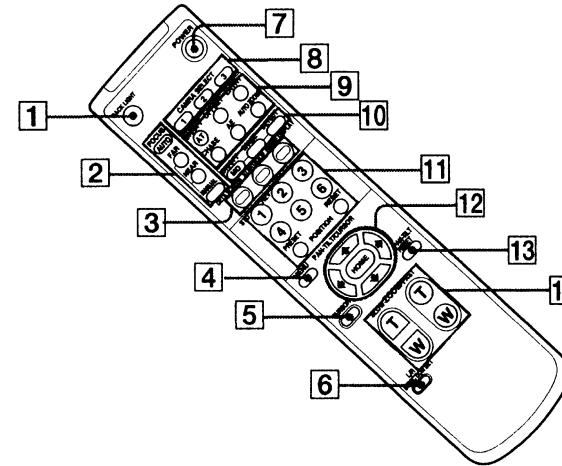
Main unit



- 1 Caution lamp 10 15
- 2 POWER lamp 9
- 3 RECEIVE lamp
- 4 Lens
- 5 Receptor for remote commander 11
- 6 IR OUT switch
Use when equipment such as a VTR and personal computer, and/or another Color Video Camera are connected with a VISCA cable.
- 7 TIME button 8
- 8 CAMERA NO. switch 7 11

- 9 VIDEO OUT jack 6
- 10 AUDIO OUT jack 6
- 11 S VIDEO OUT jack 6
- 12 DATE button 8
- 13 BACK UP switch 25
- 14 MIC jack 6
- 15 POWER switch 8
- 16 DC IN 13.5V jack 6
- 17 VISCA OUT jack 6
- 18 VISCA IN jack 6

Remote commander



- 1 BACK LIGHT button 11
- 2 FOCUS buttons 11
AUTO button
FAR button
NEAR button
MANUAL button
- 3 DATA SCREEN button 15
START/STOP button 14 19
FRAME DISPLAY button 15
- 4 MENU button 20
- 5 CURSOR button 24
- 6 L/R DIRECTION SET button 10
- 7 POWER switch 10
- 8 CAMERA SELECT buttons 11
- 9 AT mode buttons
AT ON/OFF button 14
OFF SET button 15
ENTRY button 17
CHASE button 13
AE button 15
AUTO ZOOM button 15

- 10 MD mode buttons
MD ON/OFF button 18
FRAME button 19
DETECT button 19
- 11 POSITION buttons 12
Numeric buttons (Button 1 also works as the STD button./Button 2 also works as the REV button.) 15
PRESET button
RESET button
- 12 PAN-TILT/CURSOR button 10 14 15 19
Arrow buttons
HOME button
- 13 PAN-TILT RESET button 10
- 14 ZOOM buttons 11
SLOW T button
SLOW W button
FAST T button
FAST W button

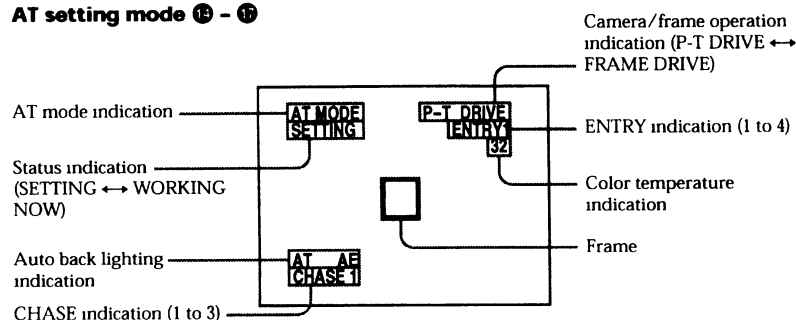
SECTION 1 GENERAL

This section is extracted from instruction manual (3-856-663-04).

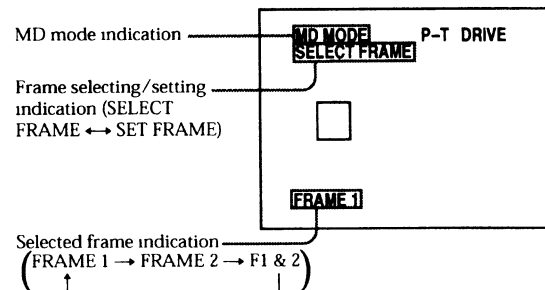
Locations of Controls (continued)

Screen indications

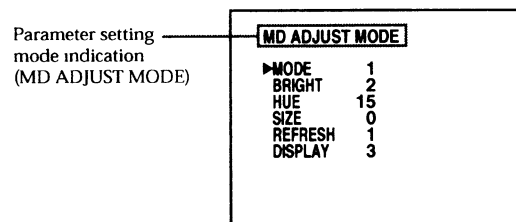
AT setting mode 18 - 19



MD setting mode 18 19



MD adjusting mode 20



Precautions

- The name plate indication operating voltage, power consumption, etc. is located on the bottom exterior.
- After operating the unit with an AC power adaptor, disconnect the AC power adaptor from the wall outlet if the set is not to be used for an extended period of time. The POWER switch on the rear of the main unit, does not turn the AC adaptor off.

Brightness of a subject

Color Video Camera might not work with its best performance in a place where brightness exceeds the illumination range (such as a place exposed to direct sunlight).

Avoid specialized application

Avoid using Color Video Camera for monitoring application where it would be forced to focus on a stationary object for a long period of time. Also avoid focusing the camera on an extremely bright object such as sunlight or a fluorescent lamp. Otherwise the color filter might be damaged.

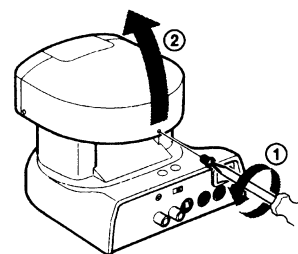
Precaution on copyright

Television programs, pictures, magazines, and other materials may be copyrighted. Unauthorized recording or storing of such materials violates the provision of the copyright laws.

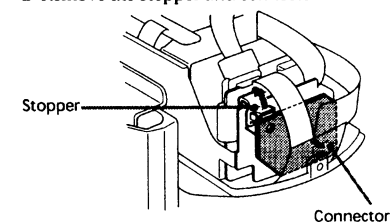
When you discard Color Video Camera

For environmental reasons, take out a lithium battery from the camera and discard it accordingly.

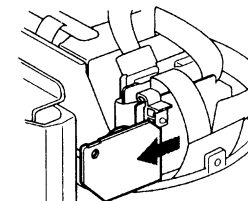
- 1 Remove the screw at the rear of the camera head using a Phillips type screw driver and detach the cabinet.



- 2 Remove the stopper and connector.



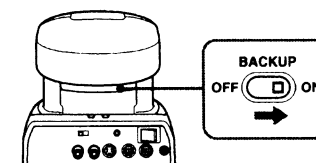
- 3 Remove the lithium battery together with the board.



Dispose of the lithium battery according to the local law.

About backup

The memories of the settings such as the clock, camera's position and MD function are erased when the POWER switch on the main unit is set to OFF. To retain those memories, set the BACK UP switch, at the rear of the camera head, to ON.



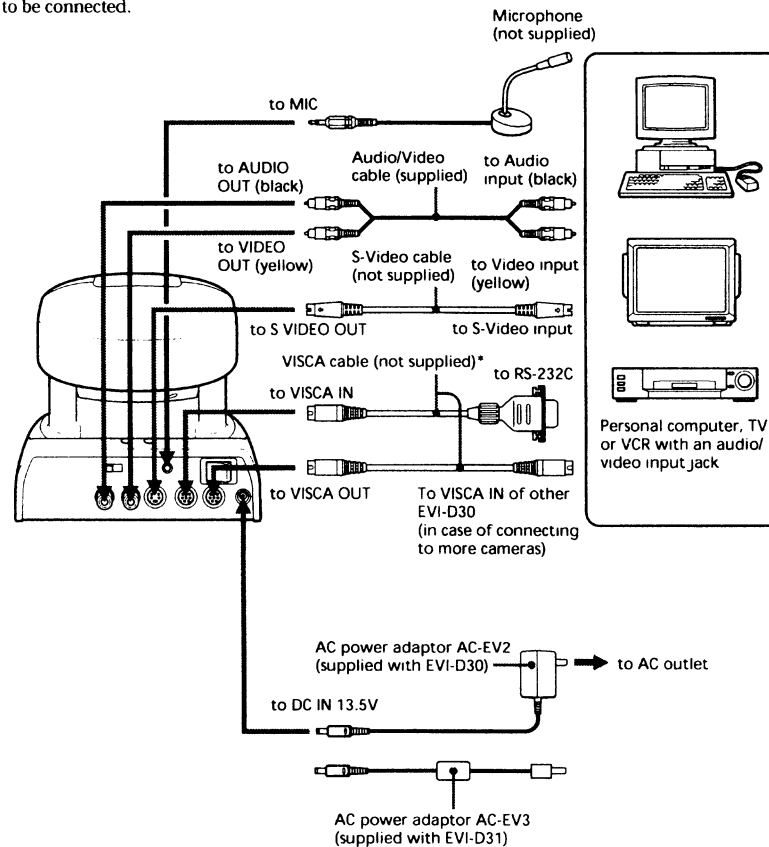
Notes

- In this unit, the built-in lithium battery acts as the power source for retaining the memories and is kept charged as long as the unit is used. If the unit is used for shorter period of time with the BACKUP switch set to ON, however, the battery is gradually discharged. Besides, if you do not use the unit at all for almost 12 weeks, the battery is completely discharged. To retain the memories of the settings, you should recharge the battery.
- To recharge the battery, plug in the unit to an AC outlet with the AC power adaptor and leave it for approximately 48 hours with the POWER switch on the main unit set to ON.

Preparations

Connections

Connect your Color Video Camera to a personal computer, TV or VCR equipped with an audio/video input. Some connections may require extra cables. Refer to the instructions manual of the equipment to be connected.



* When the video camera is connected to a personal computer with a VISCA cable, you can operate the video camera with the personal computer.

If you have a personal computer or audio/video equipment with the S-Video input

You can connect it to your Color Video Camera with a commercially available S-video cable.

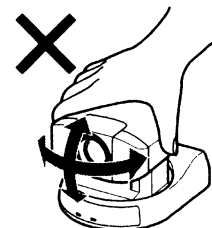
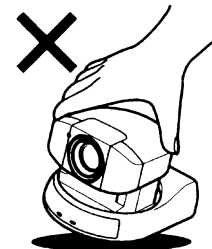
Notes

- You cannot connect your Color Video Camera to a personal computer that is not equipped with either audio/video input or S-Video input jack. And you might not be able to use your existing personal computer with your Color Video Camera unless you provide the computer with a video capture board, sound board, and/or software. Consult your computer dealer or manufacturer for details.
- Use only the AC-EV2 (for EVI-D30)/AC-EV3 (for EVI-D31) AC power adaptor (supplied). Do not use any other AC power adaptor.

Polarity of the plug



- Do not grasp the camera head when carrying the video camera.
- Do not turn the camera head manually. Doing so will result in the camera malfunctioning.

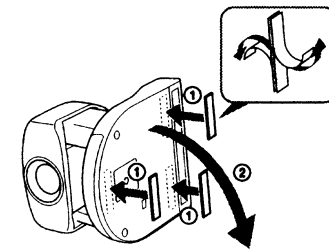


Installation

Be sure to place the main unit on a flat surface.



Secure the camera in place with the supplied Velcro tape.



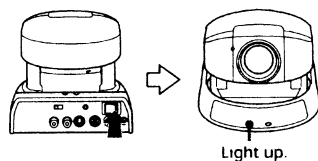
If you operate more than one camera with the remote commander

Notice the CAMERA NO. switch at the rear of the main unit. Set the CAMERA NO. switch to the position that is different from the positions to that of what the other cameras' CAMERA NO. switches are set. (See page 11.)



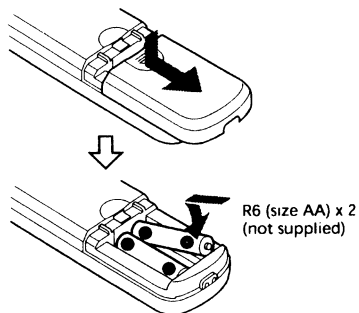
Turning on the Power

- 1 Turn on the POWER switch at the rear of the main unit.
The POWER lamp lights up.
As long as the POWER switch on the main unit is set to ON, you can turn on or off the camera with the POWER switch on the remote commander.
When the power is turned on, the camera will automatically face toward the lower right-hand side and then the front, which is the home position of the camera. (Pan/tilt reset action)



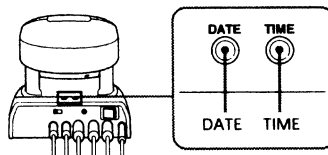
- 2 Turn on the peripheral devices.

Installing batteries



Setting the Clock

Use the buttons on the main unit to set the clock.



- 1 Press the DATE and TIME buttons at the same time and hold them down for about 2 seconds. Release your hand as the month and date appear and the year starts flashing.

EVI-D30



EVI-D31



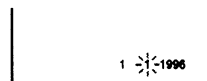
- 2 Repeat pressing the DATE button to select the year.

- 3 Press the TIME button to set the year.

EVI-D30



EVI-D31



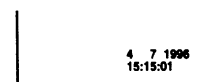
- 4 Repeat the steps 2 and 3 to set the other time elements in the order of month, date, hour, and minute.

The clock starts operating as you press the TIME button to set the minute.

EVI-D30



EVI-D31



Having the clock displayed

You can select the clock display from either time or date.

To have the time displayed, press the TIME button.

To have the date displayed, press the DATE button.

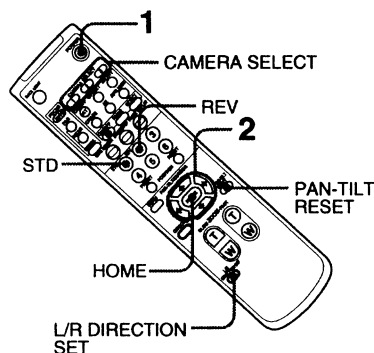
To turn off the clock display, press the corresponding button again.

Note

When the POWER switch on the main unit is set to OFF, the clock will be as originally was. To retain the memory of the clock setting even if the power is turned off, set the BACKUP switch, at the rear of the camera head, to ON. (See "About backup" on page 25.)

Basic Operations

Pan/Tilt Operation



- 1** Press the POWER button.
The camera will be turned on, performing the pan/tilt reset action automatically.
- 2** Press the arrow button to perform the pan/tilt operation.
While checking the picture on the screen, press a desired arrow button.
To move the camera inch by inch, press the button for a moment.
To move the camera in a wide range, press and hold down the button.
To move the camera diagonally, press the arrow button (↖ or ↗) while holding down the arrow button (← or →).

To face the camera back to the front

Press the HOME button.

If you accidentally move the camera with your hand

Press the PAN-TILT RESET button to reset the pan/tilt position.
The deviation from the position that the camera memorizes will be corrected and the operation will be back in order.

If you wish to face the camera toward the opposite direction in which the arrow on a pressed button points

The camera is preset to face toward the right whenever the arrow (→) button is pressed. You might wish to face the camera toward the opposite direction in which the arrow on a pressed button points, in such a case when you change the direction of the camera while checking the picture on the screen. In this case, press the REV button while holding down the L/R DIRECTION SET button. To reset that setting, press the STD button while holding down the L/R DIRECTION SET button.

Arrow button	Movement of the camera	Setting
		While holding down L/R DIRECTION SET Press STD ①
		While holding down L/R DIRECTION SET Press REV ②

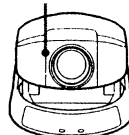
Note

Repeat the above-mentioned procedure for each remote commander if you are using more than one remote commander. This is because the setting is performed by changing the signal emitted from each remote commander, not by changing the setting of the camera itself.

If the lamp at the side of the lens flashes red

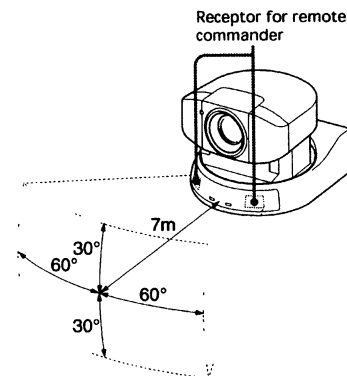
The micro computer inside the camera might not memorize the current pan/tilt position properly. Press the PAN-TILT RESET button to reset the pan/tilt position.

Flashes.



Operating range of the remote commander

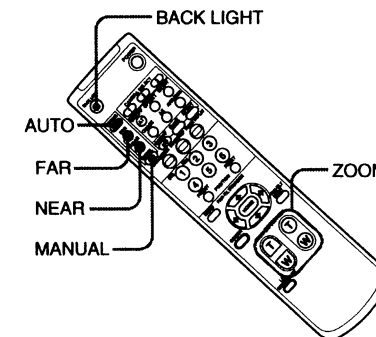
Use the remote commander within the range described below, facing it toward the receptor for the remote commander.



Operating more than one camera with the remote commander

Notice the CAMERA NO. switch at the rear of the camera to be operated.
Press a CAMERA SELECT button whose number is the same as the number to which the CAMERA NO. switch is set.
A pressed CAMERA SELECT button lights up when either of the other button is pressed.

Adjusting the Camera



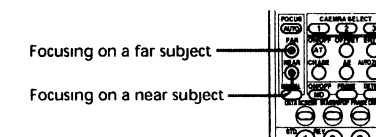
Focusing on a subject

To focus the camera on a subject automatically

Press the AUTO button.
The camera focuses on the subject at the center of the screen automatically.

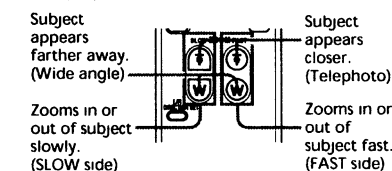
To focus the camera on a subject manually

After pressing the MANUAL button, press either FAR or NEAR button to have the camera focus on the subject.



Zooming

Press either of the four ZOOM buttons.



Shooting with back lighting

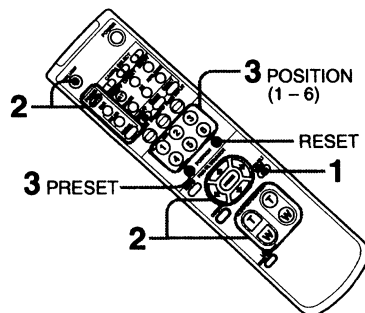
When you shoot a subject with a light source behind it, the subject becomes dark. In such a case, press the BACK LIGHT button.

To cancel the function, press the BACK LIGHT button again.

Having the Camera Memorize the Setting

—Presetting feature

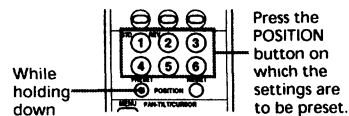
Up to six combinations of the setting (position, zooming, focusing and back lighting) can be preset.



1 Press the PAN-TILT RESET button to reset the pan/tilt position.

2 Adjust the position, zooming, focusing, and back lighting of the camera. (See on page 11.)

3 While holding down the PRESET button, press either of the POSITION buttons 1 – 6.

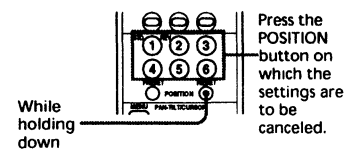


Recalling the memorized setting

Press either of the POSITION buttons 1 – 6.

Canceling the preset memory

While holding down the RESET button, press the POSITION button on which the settings are to be canceled.



Notes

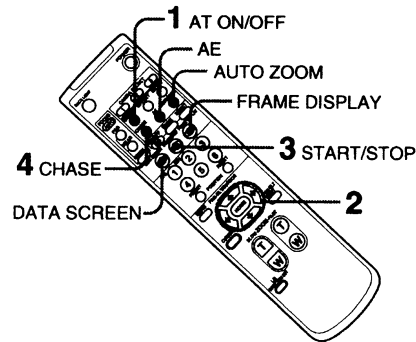
- Before presetting, be sure to reset the pan/tilt position. Otherwise the correct position will not be memorized.
- The memorized information is retained until the power of the main unit is turned off. To retain the memory even if the power is turned off, set the BACKUP switch, at the rear of the camera head, to ON. (See "About backup" on page 25.)

Advanced Operations

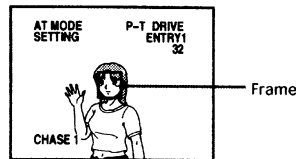
Tracking a Subject Automatically

—AT (Auto target tracking) function

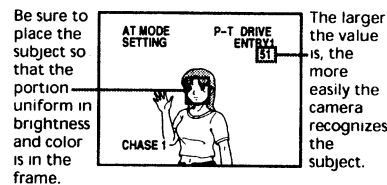
You can have the camera memorize certain color and brightness so that it automatically tracks a subject having the memorized color and brightness.



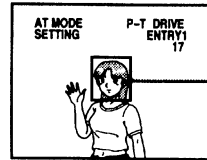
- 1 Press the AT ON/OFF button to enter into the AT setting mode. The frame and setting value appear.



- 2 Press the arrow button to perform the pan/tilt operation so that a subject is placed into the frame.

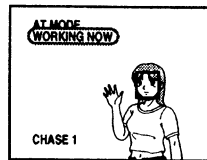


Example of the case when a subject is hardly recognized



The camera might not recognize a subject if the portion different from the subject in brightness and color, such as the backdrop, is placed together in the frame.

- 3 Press the START/STOP button to activate the AT function. Try moving the subject to see if the frame tracks it automatically.



When the frame tracks the subject, proceed with the step 4.

When the frame does not track the subject, repeat the step 3 until the frame starts tracking the subject while adjusting the lighting and the position of the subject so that the color and brightness of the subject is optimized. If the frame still does not track the subject, see "If the subject cannot be recognized or captured" on page 17.

- 4 Repeat pressing the CHASE button to select a desired CHASE mode. Each time that button is pressed, the mode is cyclically changed as follows: CHASE 1 → CHASE 2 → CHASE 3



MODE	Tracking method	Intended use
CHASE 1	The pan/tilt action is not performed. (Camera does not move.) The frame tracks a subject only in the range of the screen.	Used to check if the subject is recognized.
CHASE 2	The frame tracks a subject while the pan/tilt action is performed. In this mode, the subject is always placed in the middle of the screen.*	Used to perform normal tracking operation.
CHASE 3	Uses the same tracking method as that of CHASE 1 except that if a subject almost goes out of the screen, the camera performs the pan/tilt action so that the subject is placed in the middle of the screen.*	Used when you wish to limit the camera movement as possible, in such a case when you perform the image transmission.

* The position in which the subject is to be placed can be changed from the middle of the screen. See "Changing the frame position" on page 16.

If the frame is repeatedly extended to the full screen

The camera does not recognize the subject. Press the START/STOP button and go back to the step 2. If doing so does not solve the problem, see "If a subject cannot be recognized or captured" on page 17.

To turn off the setting value and/or frame

If the setting value and/or frame are displayed as you record a picture, those come with the recorded picture.

To turn off the setting value, press the DATA SCREEN button.

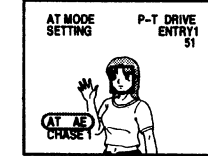
To turn off the frame, press the FRAME DISPLAY button.

Note

Once the setting value is turned off, the setting value is not displayed until the next time you press the DATA SCREEN button. However, the setting value is displayed automatically when the unit enters into the AT setting mode for the first time after the power is turned back on.

To keep the brightness of the subject as is (Auto back lighting function)

After the step 2, press the AE button.



To deactivate the function, press that button again.

Note

Be sure to press the AE button before proceeding with the step 3. This function is not activated after the START/STOP button is pressed.

To keep the size of the memorized subject as is

After the step 2, press the AUTO ZOOM button.

To cancel the function, press that button again.

To cancel the AT function

Press the START/STOP button.

The information of the memorized subject is erased.

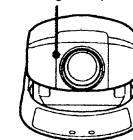
To exit from the AT setting mode, press the AT ON/OFF button.

If the lamp at the side of the lens light up

The camera is not capturing the memorized subject correctly.

Press the arrow button to perform the pan/tilt operation so that the subject comes into the screen. Or have the subject memorized onto the camera again.

Lights up.

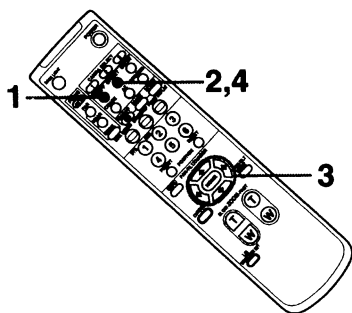


Tracking a Subject Automatically (continued)

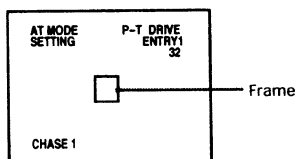
Fine-tuning the setting

Changing the frame position

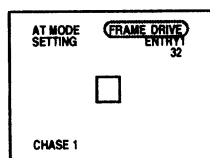
Although the frame normally appears on the middle of the screen, you can change its position to a different place. (In the CHASE 1 mode, the frame tracks a subject within the range of the screen.)



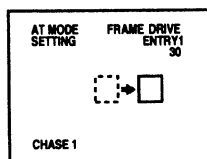
- 1 Press the AT ON/OFF button to enter into the AT setting mode.
The frame and setting value appear. If the setting value does not appear, press the DATA SCREEN button to have the value displayed.



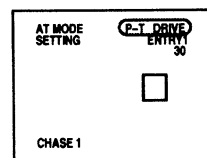
- 2 Press the OFF SET button to enter into the AT frame position setting mode.



- 3 Press the arrow button to move the frame to a desired position.



- 4 Press the OFF SET button to fix the frame position.

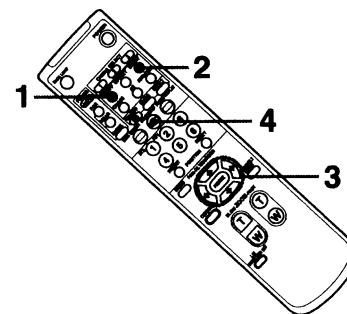


After the setting is completed, go back to the step 2 of "Tracking a subject automatically."

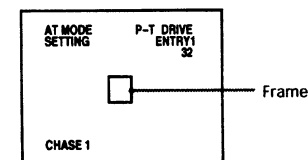
If a subject cannot be recognized or captured

Depending on the characteristic or condition of a subject, the camera might hardly recognize the subject. If the AT function still does not work after the procedures mentioned in pages 14 and 15 are repeated, select an ENTRY mode that is matched to conditions under which the camera is used. Normally, select the ENTRY 1.

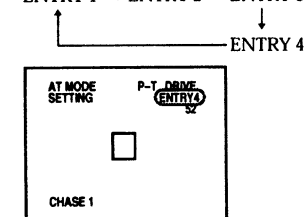
Problem	ENTRY mode to be selected
A subject cannot be recognized because its color is too thin.	ENTRY 2
The camera repeats mistakenly recognizing a near object whose color is almost identical to that of a subject. (The frame moves from the subject to an object whose color is almost identical to that of the subject.)	ENTRY 2
The camera repeats mistakenly recognizing the backdrop such as the wall or ceiling. (The frame moves from the subject to the backdrop.)	ENTRY 4
The camera does not capture a subject correctly when the brightness of the subject changes as the position of the subject changes.	ENTRY 3



- 1 Press the AT ON/OFF button to enter into the AT setting mode.
The frame and setting value appear. If the setting value does not appear, press the DATA SCREEN button to have the value displayed.



- 2 Repeat pressing the ENTRY button to select a desired ENTRY mode.
Each time that button is pressed, the mode is cyclically changed as follows:
ENTRY 1 → ENTRY 2 → ENTRY 3



- 3 Have the camera memorize a subject by pressing the arrow button to move the subject into the frame.
The position to which you place the subject varies depending on an ENTRY mode you select.
ENTRY 2: Place the subject so that the portion uniform to a certain extent in color and brightness is in the frame.
ENTRY 3: Place the subject so that it hangs over the frame slightly.
ENTRY 4: Place the subject so that it becomes largest within the frame, its backdrop being out of the frame.

Tracking a Subject Automatically (continued)

- 4** Press the START/STOP button to activate the AT function.

Try moving the subject to see if the frame tracks it automatically.

If you have selected the ENTRY 3, the frame flashes for about 5 seconds after the START/STOP button is pressed. Within that period, repeat changing the angle of the subject so that the camera recognizes the various brightness of the subject.

Notes

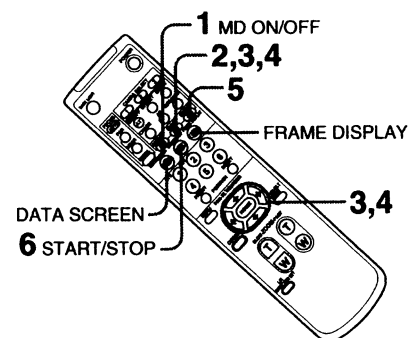
- If you use the ENTRY 2 or 4 mode for a subject that can be recognized even in the ENTRY 1 mode, the subject might be hardly recognized. This is because the color and brightness the camera can recognize are limited in the ENTRY 2 and 4 modes.
- Even if you try changing the ENTRY mode, a subject still might not be recognized depending on its characteristics. In such a case, try changing the subject to the one whose color is more bright or the one whose color is different from that of its backdrop, or changing the lighting.
- There might be a case in which the AT function will not activated in any way depending on the size, color, brightness and so on of a subject.

Detecting the Change Taking Place in the Picture

— MD (Motion Detector) function

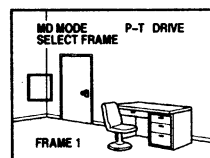
If the position of the camera is fixed, you can set the camera to detect a change taking place in a picture. When the camera detects a change taking place in the picture, the frame appears, showing the portion in which the change takes place, and the lamp at the side of the lens lights up red. (At that time, the detection signal is output from the VISCA IN.)

You can specify up to two portions in which the change is detected, by using the two frames (FRAME 1 and FRAME 2) that you can change in position and size as desired.

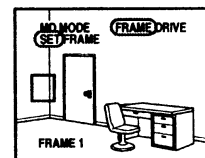


- 1** Press the MD ON/OFF button to enter into the MD setting mode.

The frame and setting value appear.

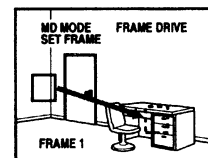


- 2** Press the FRAME button to enter into the detection frame setting mode.

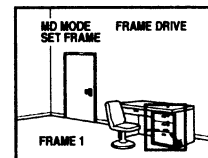


- 3** Decide the position and size of the FRAME 1.

- ① Press the arrow button to set the position of the FRAME 1. Then press the FRAME button.



- ② Press the arrow button to set the size of the FRAME 1. Then press the FRAME button.



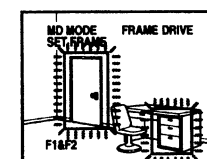
That completes the settings of the FRAME 1's position and size, and enter into the setting mode of the FRAME 2. If you choose not to set the FRAME 2, proceed with the step 5.

- 4** Repeat the procedure of the step 3 to set the FRAME 2's position and size.

- 5** Repeat pressing the DETECT button to select a frame to be used.

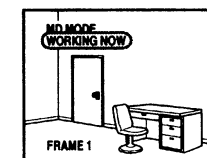
Each time that button is pressed, the frame to be used is cyclically changed as follows:

FRAME 1 → FRAME 2 → F1 & F2*



* If a change is detected even in either of FRAME 1 or FRAME 2, the lamp at the side of the lens lights up red.

- 6** Press the START/STOP button to activate the MD function.



To turn off the setting value and/or frame

If the setting value and/or frame are displayed as you record a picture, those come with the recorded picture.

To turn off the setting value, press the DATA SCREEN button.

To turn off the frame, press the FRAME DISPLAY button.

To cancel the MD function

Press the START/STOP button.

To exit from the MD mode, press the MD ON/OFF button.

Note

Once the frame is set, it remains memorized until the power is turned off.

To retain the memory of the frame setting even if the power is turned off, set the BACKUP switch, at the rear of the camera head, to ON. (See "About backup" on page 25.)

Detecting the Change Taking Place in the Picture (continued)

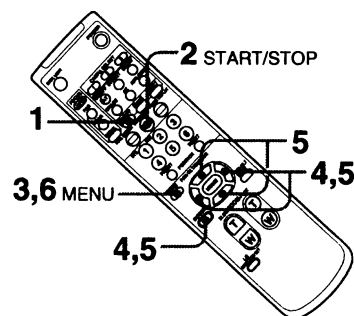
Fine-tuning the settings

The MD function works in the following manner: the camera memorizes a picture of a certain moment as the "reference picture," and compares the current picture with the reference picture to detect whether or not a change takes place.

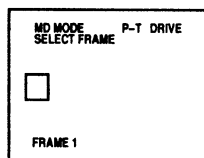
Although the camera is factory-set to refresh a reference picture after a certain period of time, you can change the timing when a reference picture is refreshed or can set the camera not to refresh the reference picture, according to conditions under which the camera is used.

In addition, you can adjust the parameter that sets the camera to detect a certain kind of change such as color and brightness.

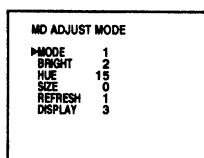
Condition under which the camera is used	Reference picture refreshing mode to be selected	When to refresh
Sunlight comes in, and the light source changes over time.	MODE 1	The reference picture is automatically refreshed after a certain period of time (Factory-setting : approx. 0.1 second)
- Sunlight comes in, and the quantity of light changes over time. - You wish to have the camera detect only a sudden change.	MODE 2	The reference picture is automatically refreshed after a certain period of time unless a change has taken place in the picture. When a change is being detected, the reference picture is not refreshed.
- Sunlight does not come in, and the brightness of the light source does not change. - You wish to have the camera detect even a slight change.	MODE 3	The reference picture is always as originally was.



- Press the MD ON/OFF button to enter into the MD setting mode. The frame and setting value appear. If the setting value does not appear, press the DATA SCREEN button to have the setting value displayed.



- Press the START/STOP button to start the detection operation.
- Press the MENU button to enter into the MD ADJUST MODE.



- While holding down the CURSOR button, press the arrow button (↔ or ↵) to select a desired reference picture refreshing mode (1 – 3).

- Adjust each parameter.

- While holding down the CURSOR button, press the arrow button (↔ or ↵) to select a desired parameter.
- While holding down the CURSOR button, press the arrow button (↔ or ↵) to select a desired value.

Adjust the value of each parameter as specified below, in the order from top to bottom.

	MODE 1	MODE 2	MODE 3
BRIGHT	2	2	2
HUE	15	15	15
SIZE	0	0	0
REFRESH	1	8	–*
DISPLAY	3	0	0

*When the MODE 3 is selected, you cannot change the value of REFRESH since the reference picture is not refreshed in that mode.

- Press the MENU button to complete the setting.

If the detection operation is not performed properly, see "Adjusting the value of each parameter."

Adjusting the value of each parameter

At the step 5 of "Fine-tuning the setting," you can adjust the value of each parameter as desired.

Refer to the following information provided below and adjust the value of each parameter while checking how the detection operation is performed.

Parameter	Content/Tips in setting	Adjustable range
BRIGHT* ¹ (Sensitivity to brightness)	Sets the sensitivity to a change in brightness. The lesser the value, the more sensitively the camera detects the change. Adjust this value within the range in which an error does not occur.	0 to 14, 15 (Parameter disabled)
HUE* ² (Sensitivity to hue)	Sets the sensitivity to a change in color. The lesser the value, the more subtle change in color the camera detects. Adjust this value when the camera hardly detects the change with only the BRIGHT adjusted, in such a case when the brightness of a subject to be captured is almost identical to that of its backdrop.	0 (5 %) to 14 (75 %), 15 (Parameter disabled)
SIZE* ³ (Sensitivity to size)	Sets the sensitivity to the size of the frame area being taken up by a changed portion. Adjust this value in such a case when you wish to have the camera detect only a greater change.	0 (approx. 0.3%) to 15 (approx. 20%)
REFRESH* ⁴ (Reference picture refreshing timing)	Sets the period of time for which the reference picture is retained.	0 (0.07 sec.) to 15 (60 min.)
DISPLAY (Signal output duration)	Sets the period of time for which the detection signal continues to be generated once a change has been detected.	0 (0.07 sec.) to 14 (30 min.), 15 (continuous)

*¹ After the value of the BRIGHT has been changed, the value of the HUE is automatically set to 15 and the value of the SIZE to 0.

*² After the value of the HUE has been changed, the value of the BRIGHT is automatically set to 15 and the value of the SIZE to 0.

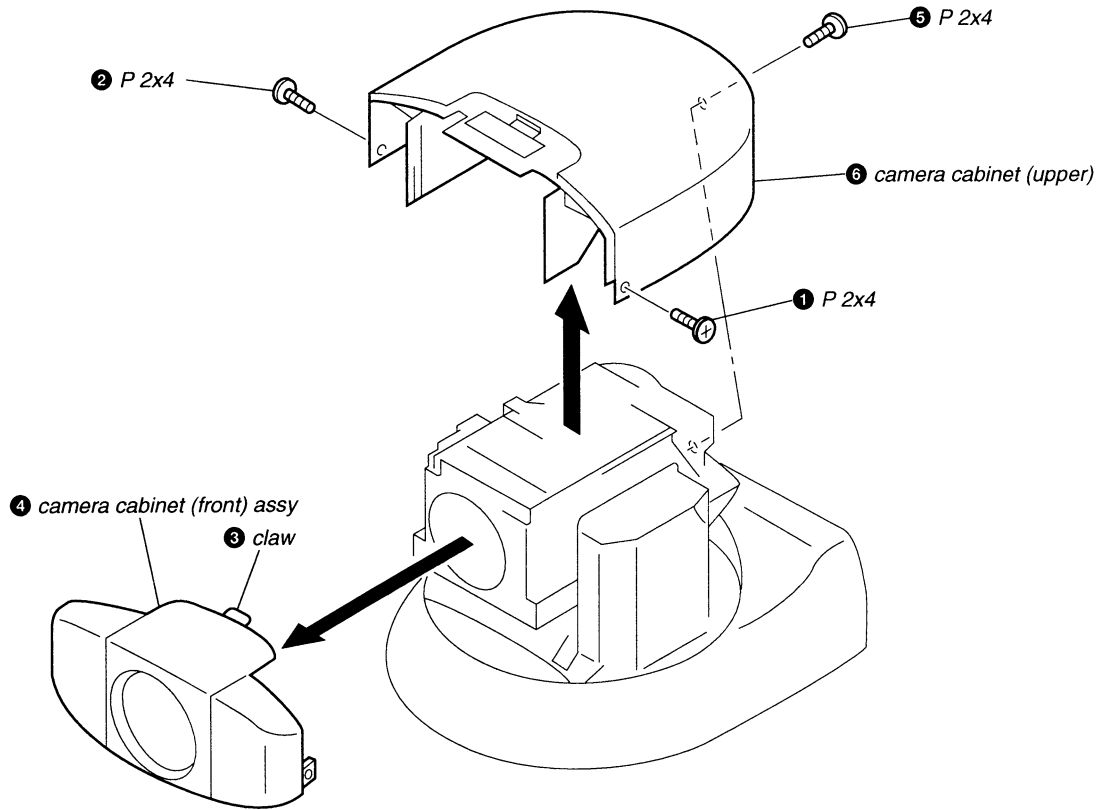
*³ Be sure to adjust the value of the SIZE after adjusting the values of the BRIGHT and HUE.
• The camera might not be able to detect a change if both the size of the frame and the value of the SIZE are too small.

*⁴ Can be adjusted only when the camera is in the MODE 1 or MODE 2.

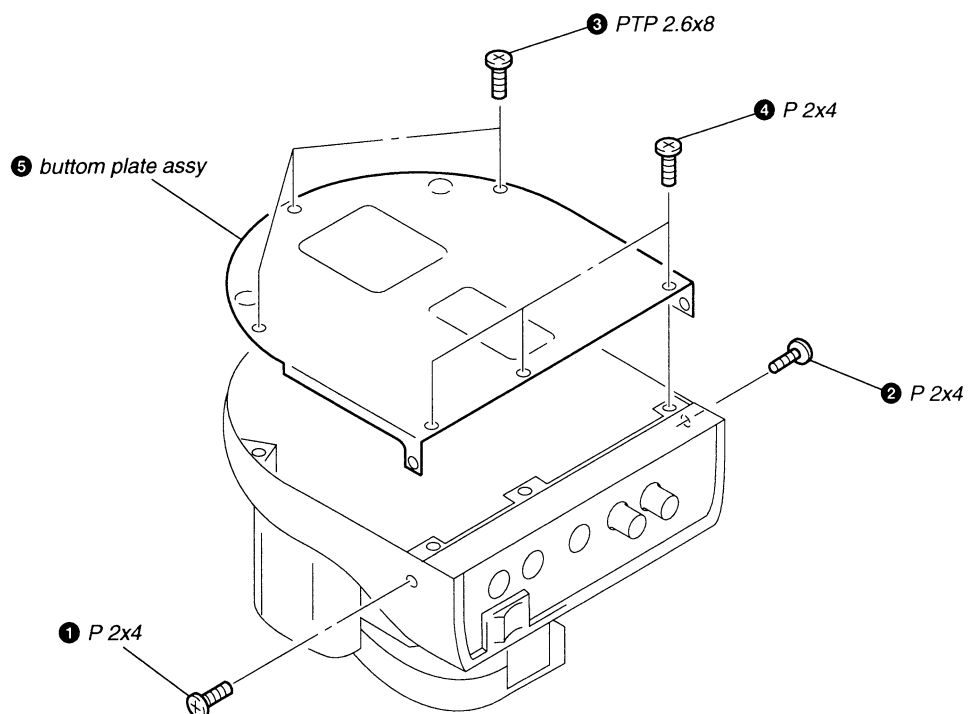
SECTION 2 DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

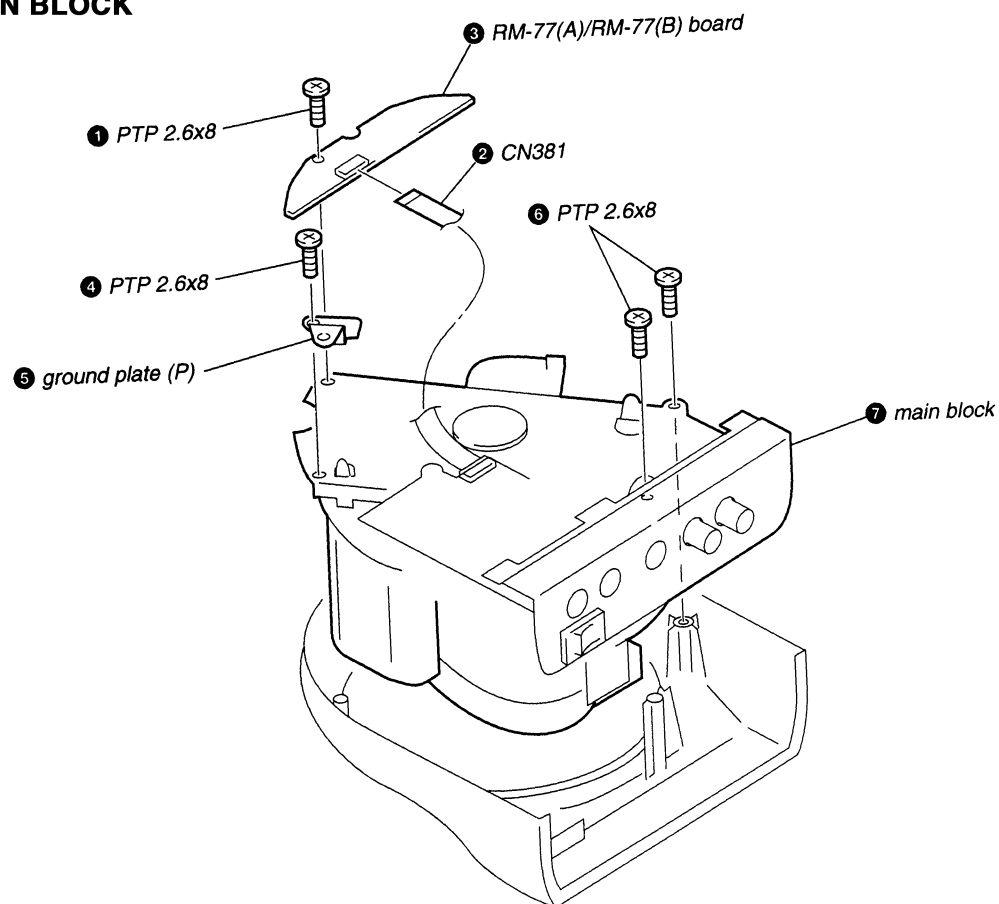
2-1. CAMERA CABINET (UPPER)



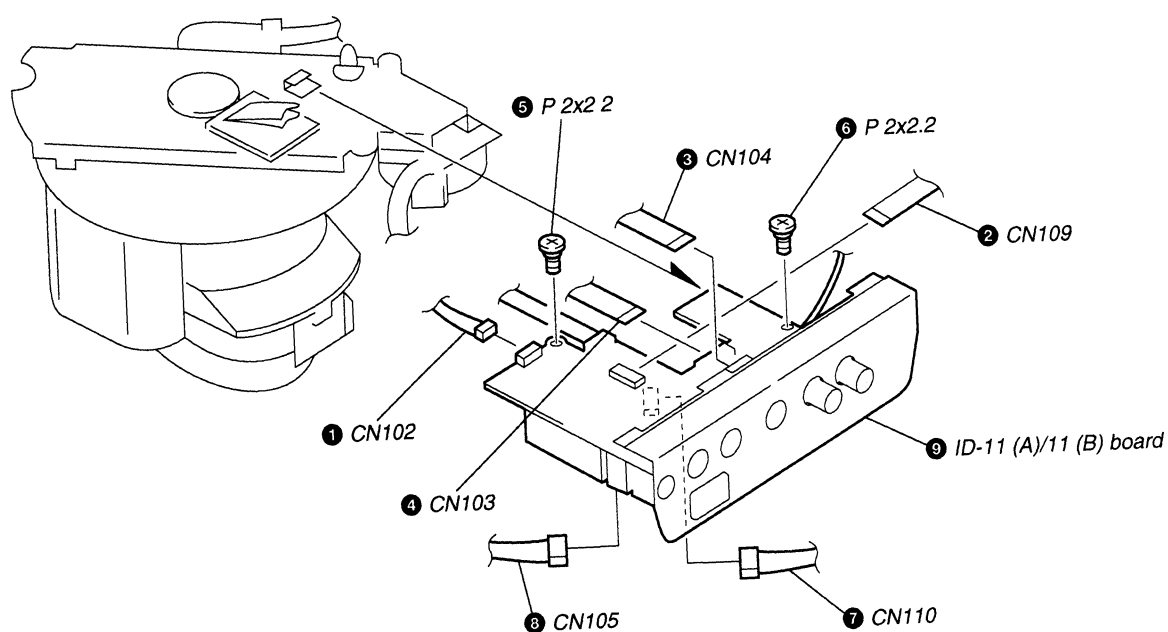
2-2. BOTTOM PLATE ASSY



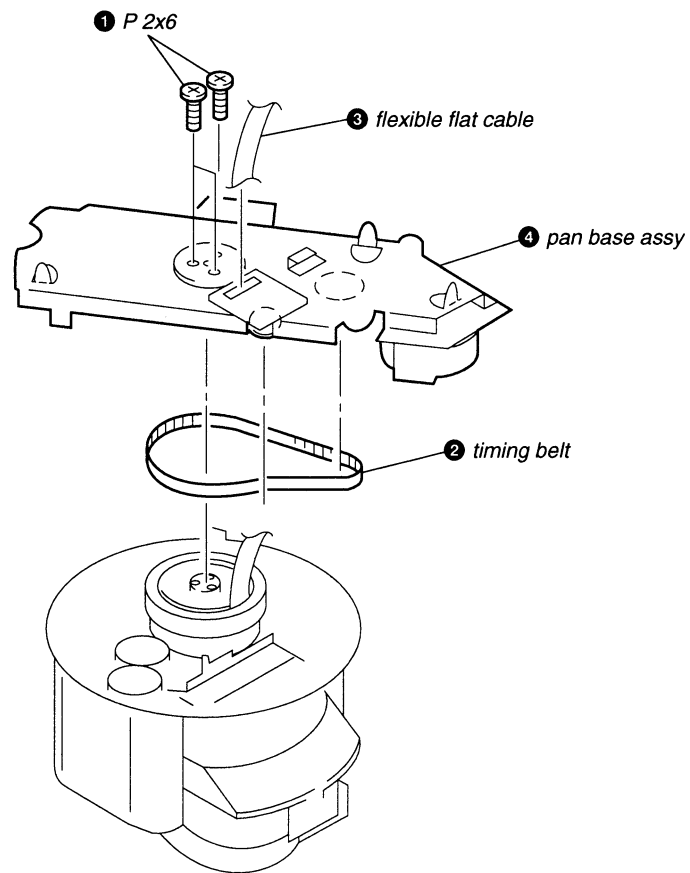
2-3. MAIN BLOCK



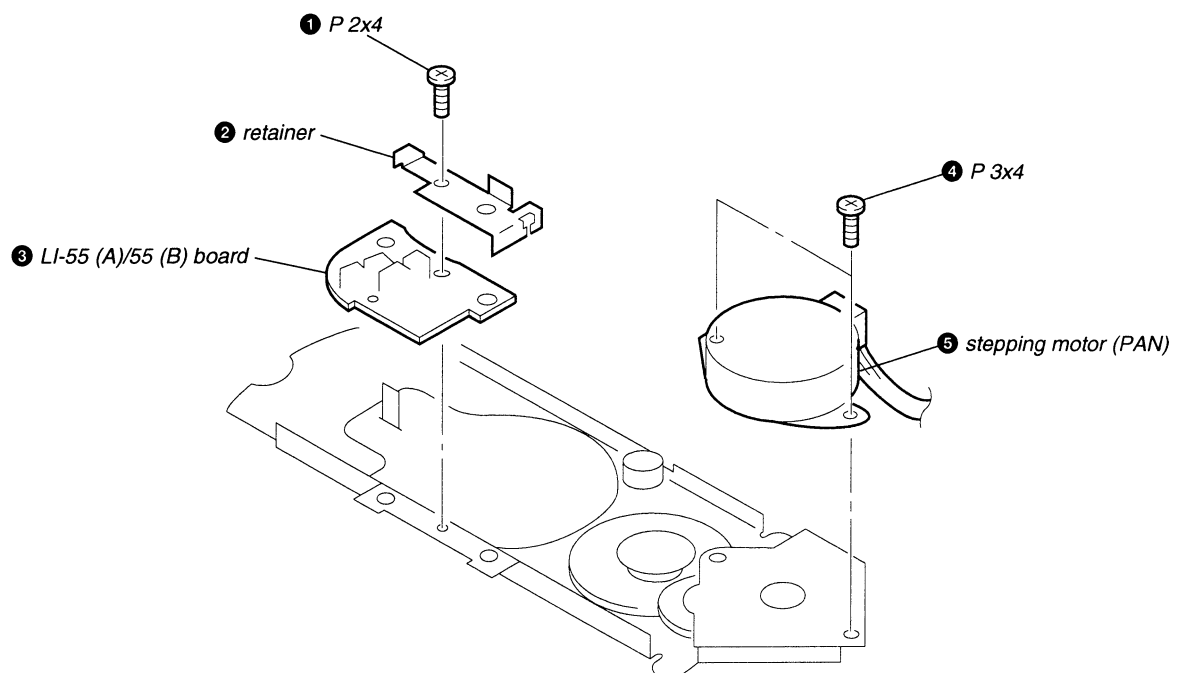
2-4. ID-11 (A)/11 (B) BOARD



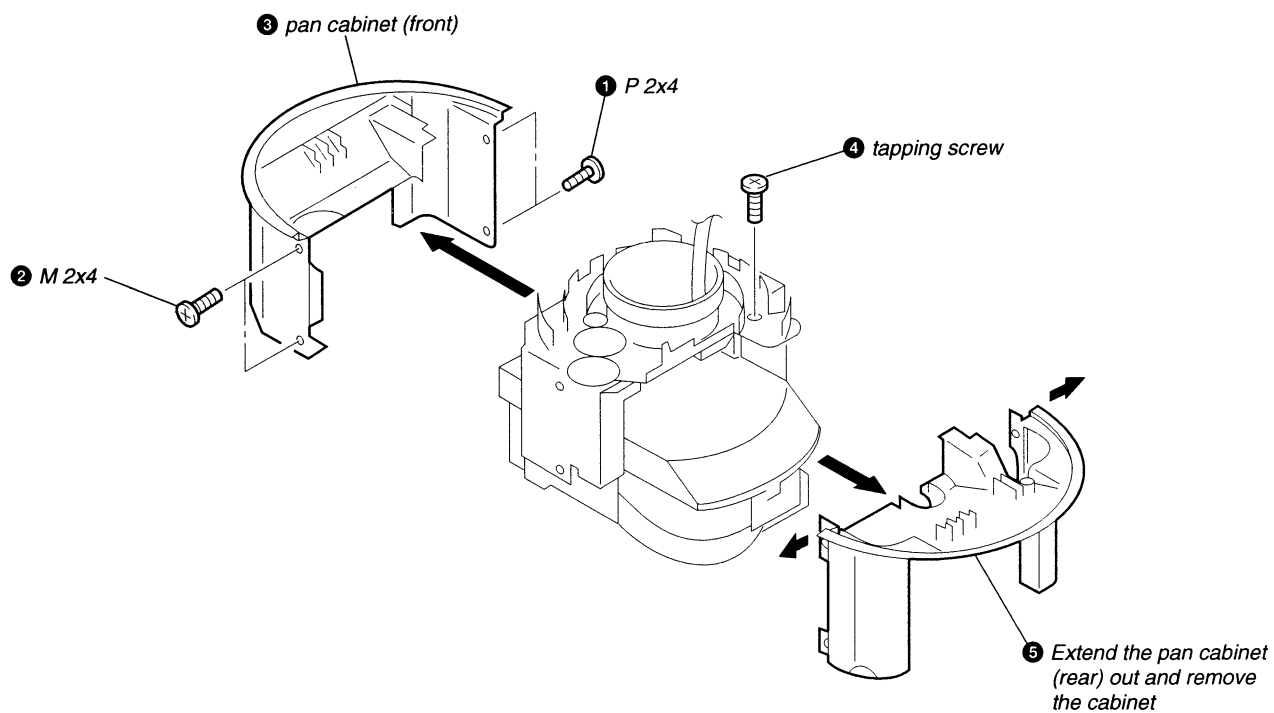
2-5. PAN BASE ASSY



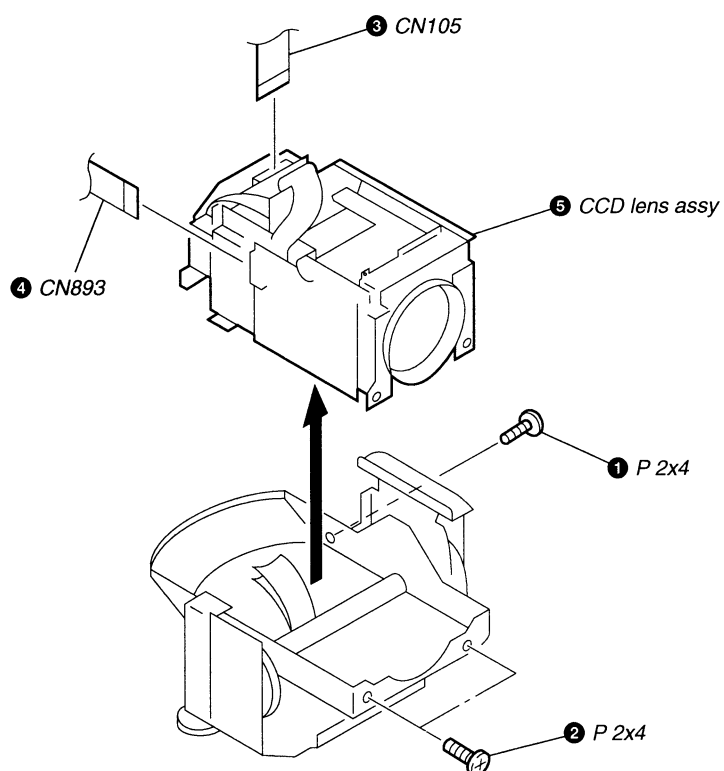
2-6. LI-55 (A)/55 (B) BOARD



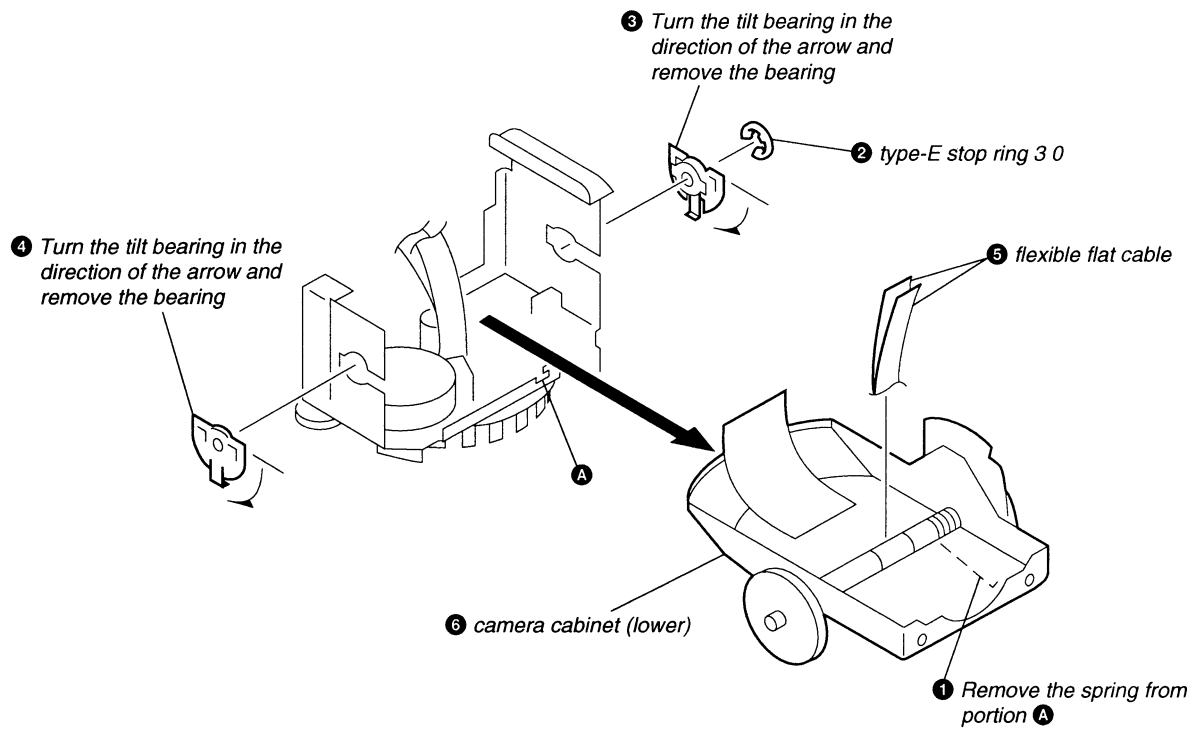
2-7. PAN CABINET



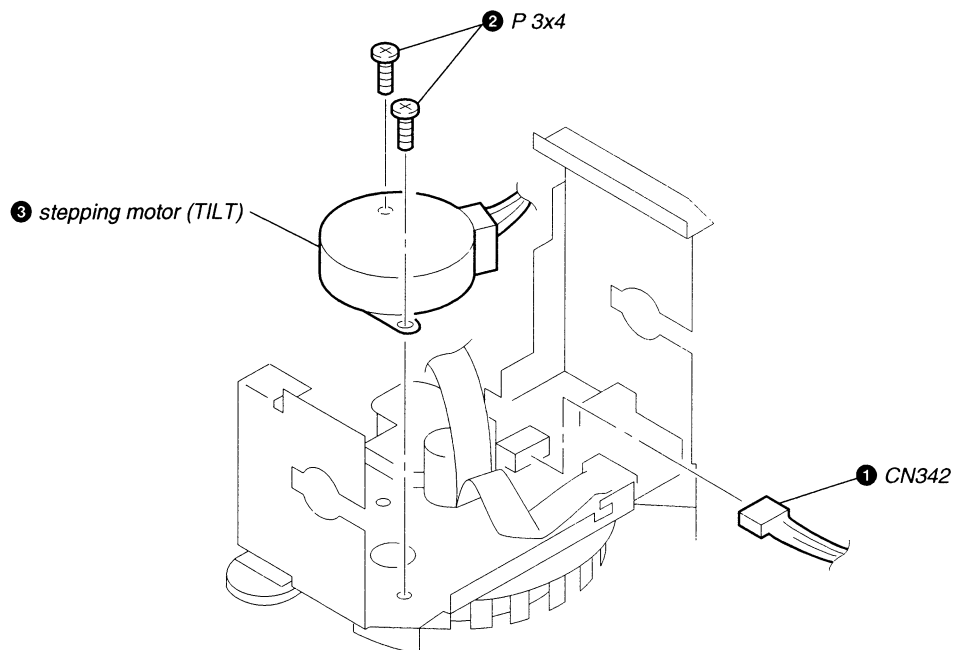
2-8. CCD LENS ASSY



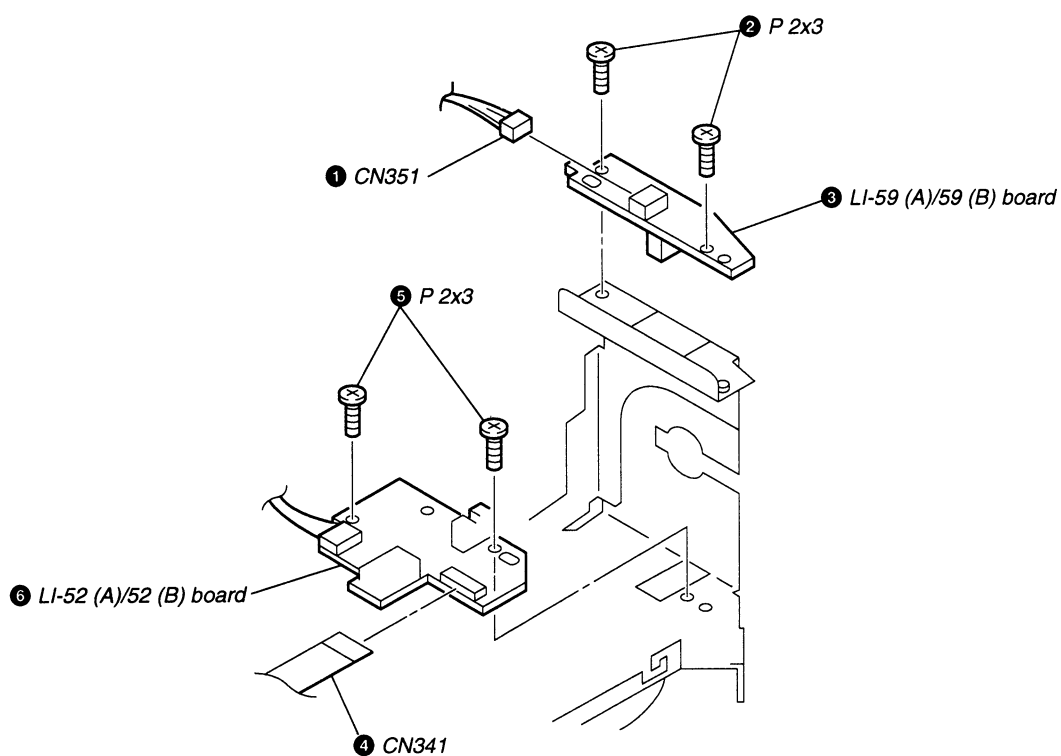
2-9. CAMERA CABINET (LOWER)



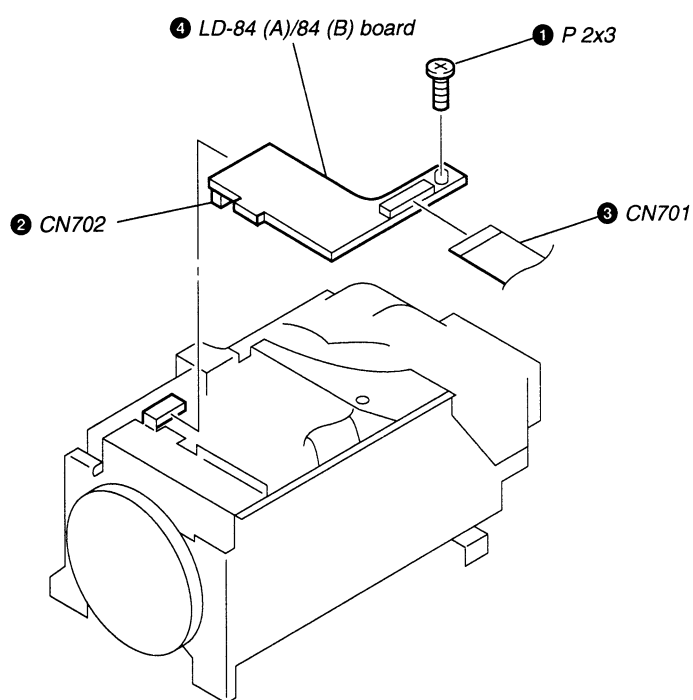
2-10. STEPPING MOTOR



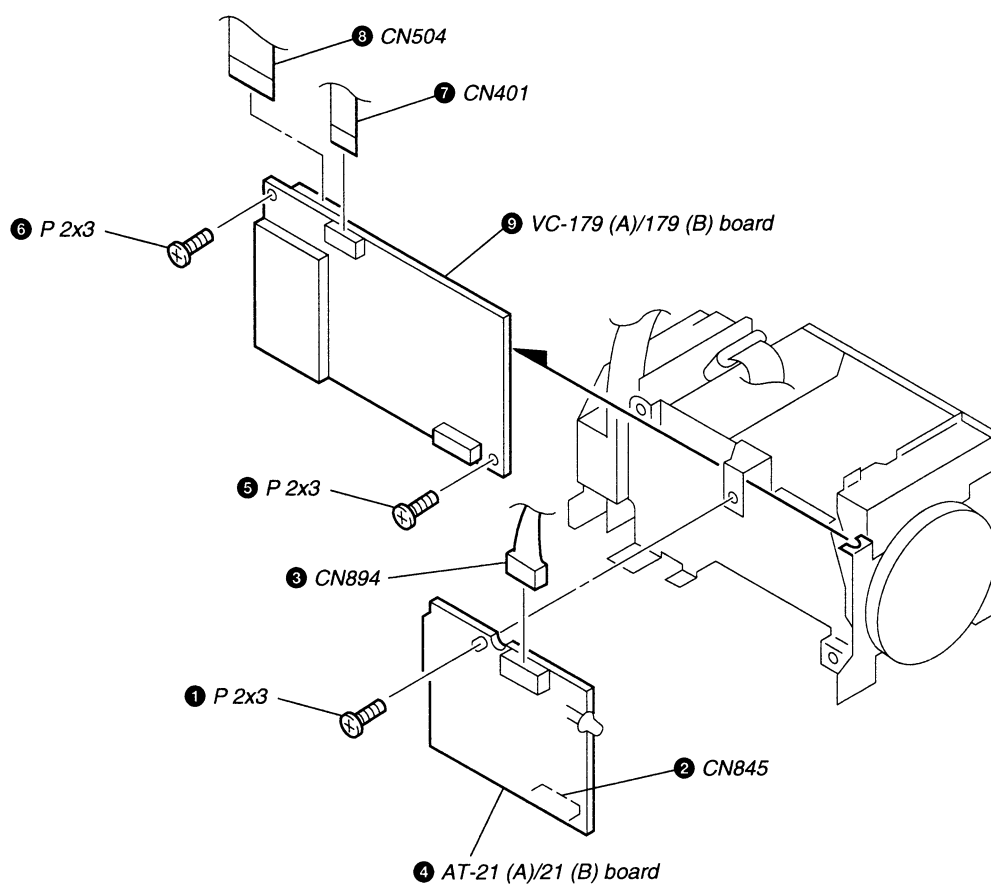
2-11. LI-59 (A)/59 (B) BOARD



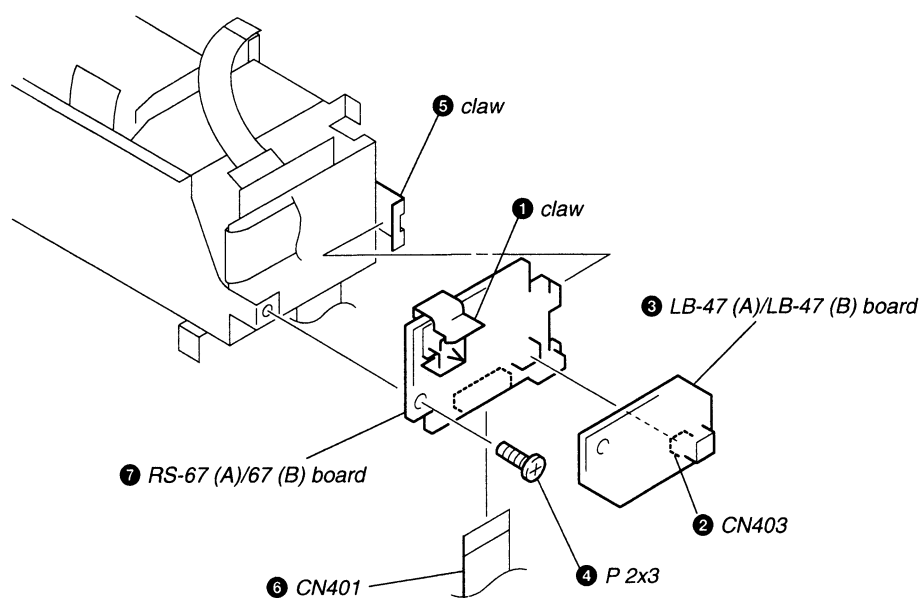
2-12. LD-84 (A)/84 (B) BOARD



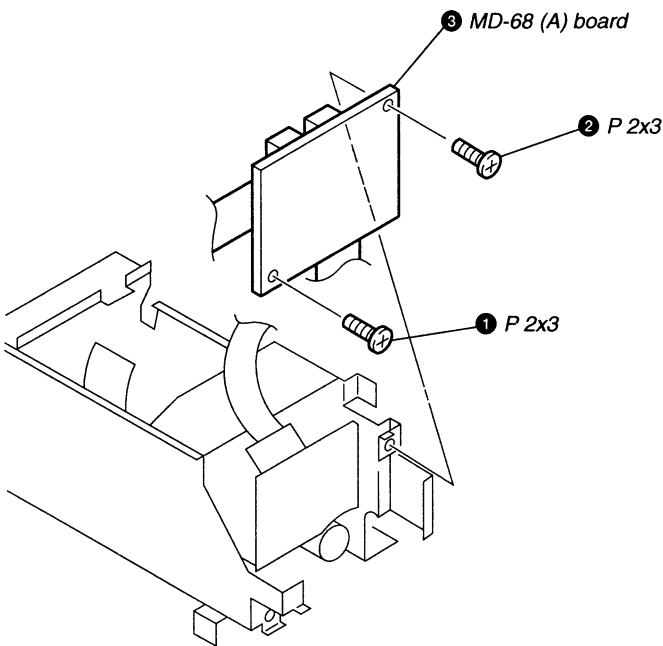
2-13. VC-179 (A)/179 (B) BOARD



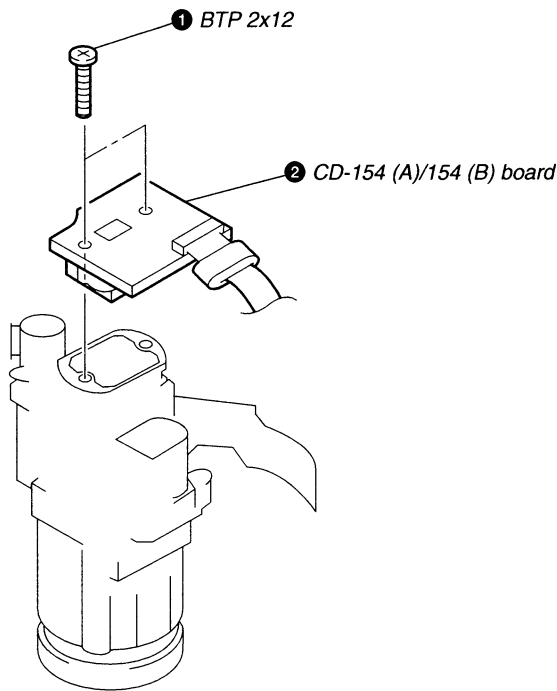
2-14. RS-67 (A)/67 (B), LB-47 (A)/47 (B) BOARD



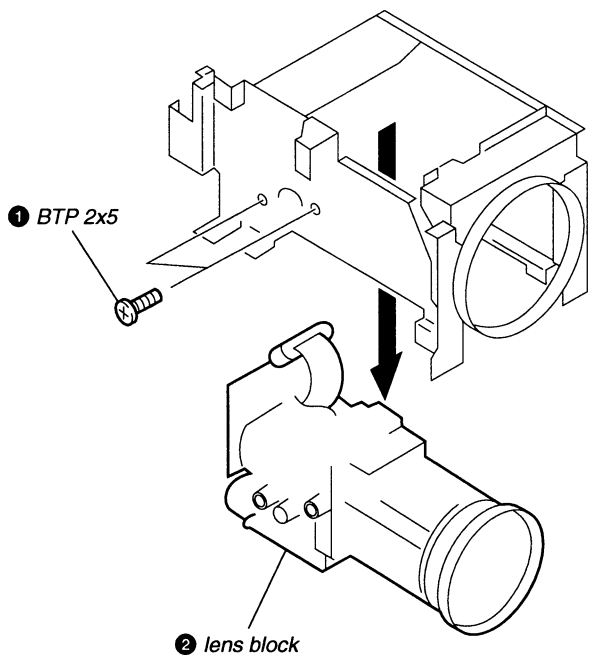
2-15. MD-68 (A) BOARD



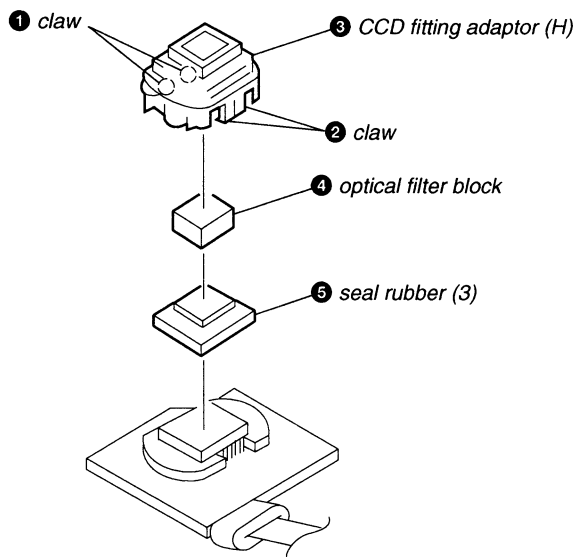
2-17. CD-154 (A)/154 (B) BOARD



2-16. LENS BLOCK

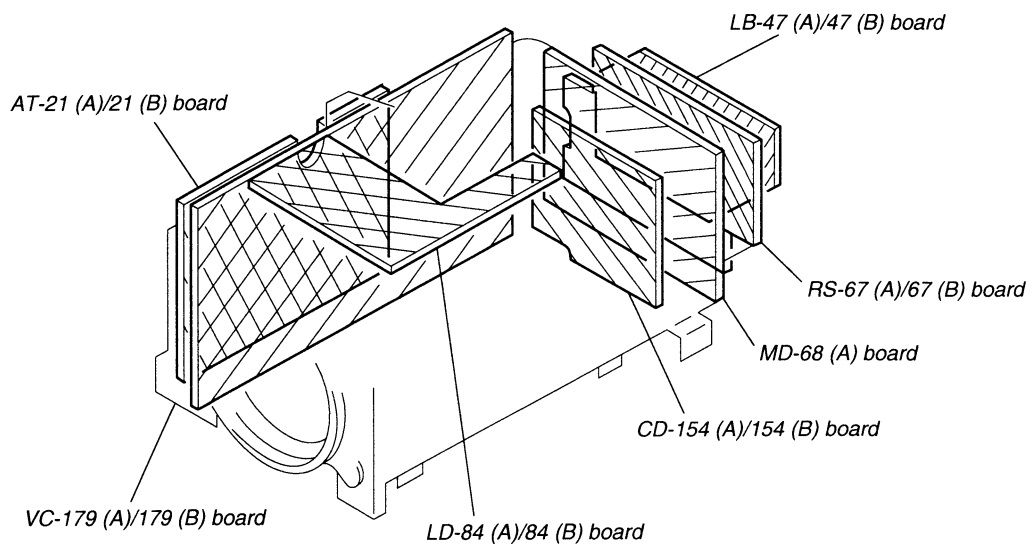
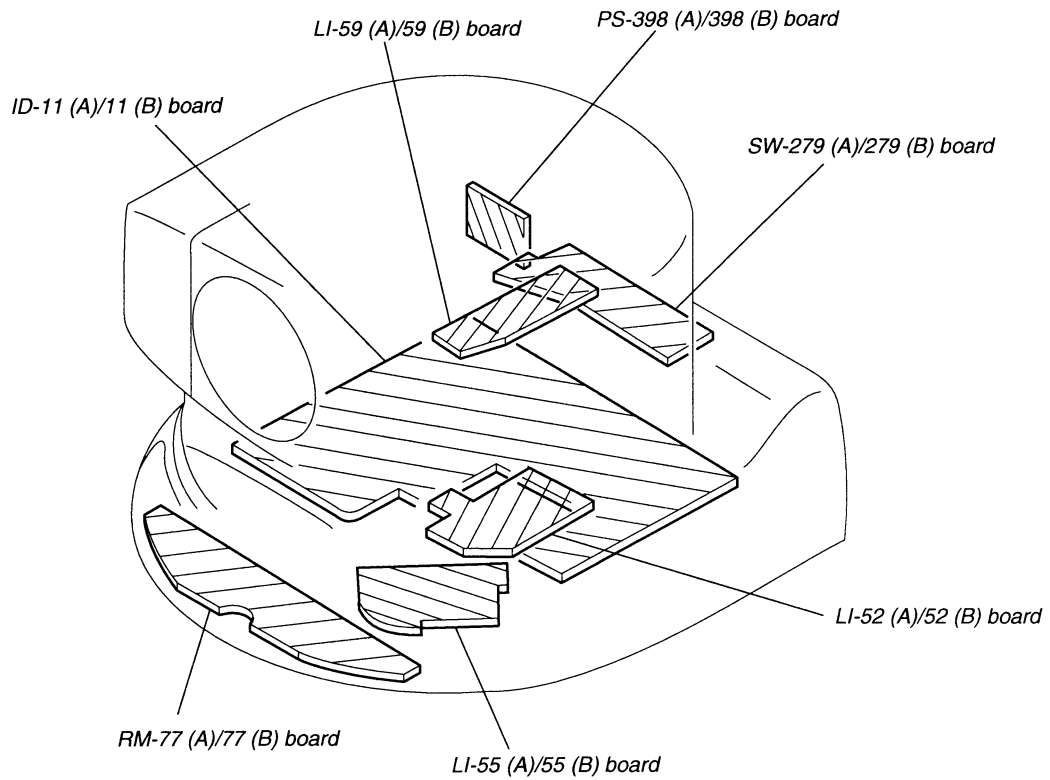


2-18. CCD FITTING ADAPTOR (H)



SECTION 4 PRINTED WIRING BOARDS

4-1. CIRCUIT BOARDS LOCATION



4-2. PRINTED WIRING BOARDS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS.

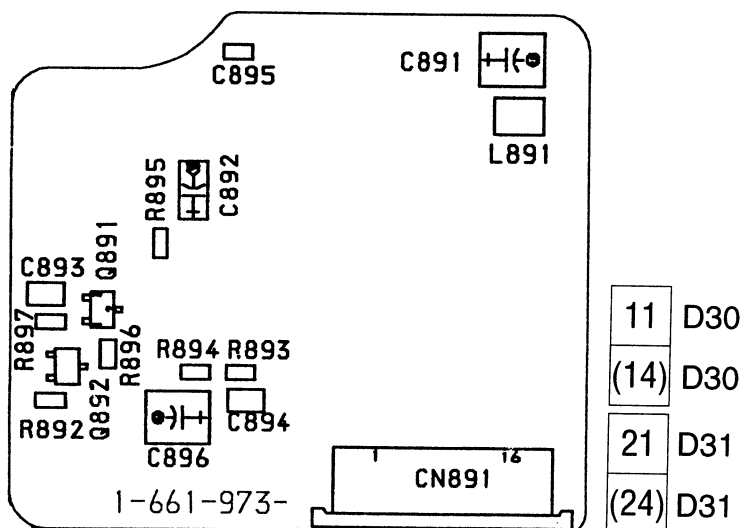
• For printed wiring boards.

- Through hole is omitted
- Pattern is omitted

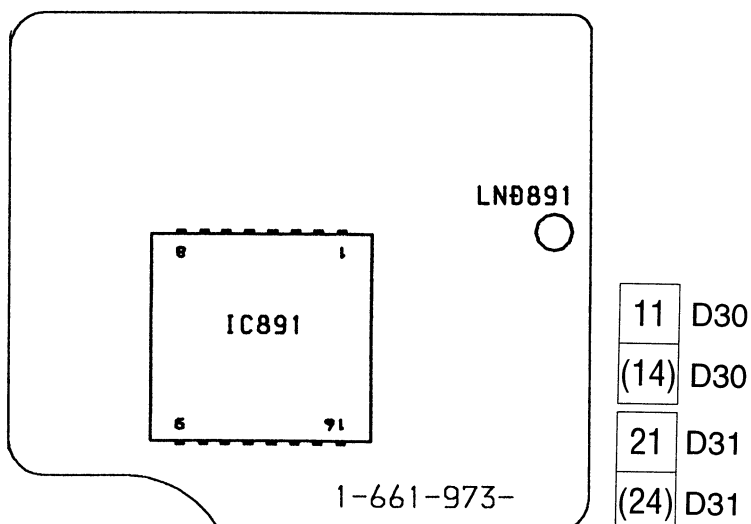
CD-154 (A)/154 (B) (CCD IMAGER) PRINTED WIRING BOARD

– Ref. No. CD-154 (A)/154 (B) BOARD : 1,000 series –

【 CD-154 (A) /154 (B) BOARD】 (SIDE A)



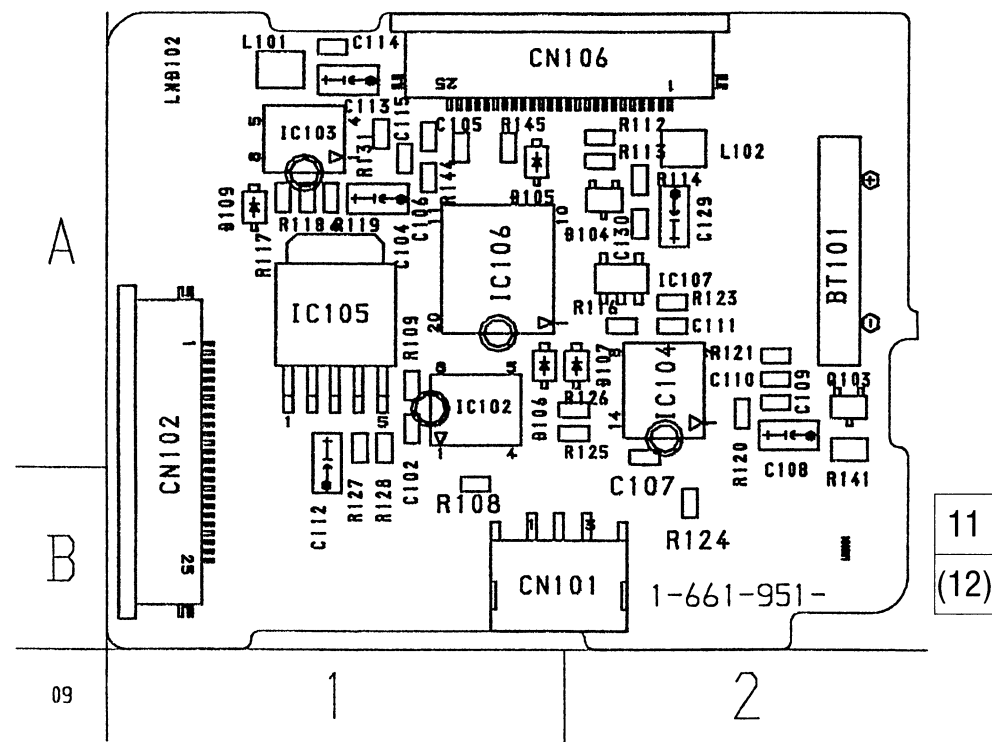
【 CD-154 (A) /154 (B) BOARD】 (SIDE B)



MD-68 (A) (MODE CONTROL) RS-67 (A)/67 (B) (BACK UP) PRINTED WIRING BOARDS

- Ref. MD-68 (A) BOARD : 1,000 series, RS-67 (A)/67 (B) BOARD : 2,000 series -

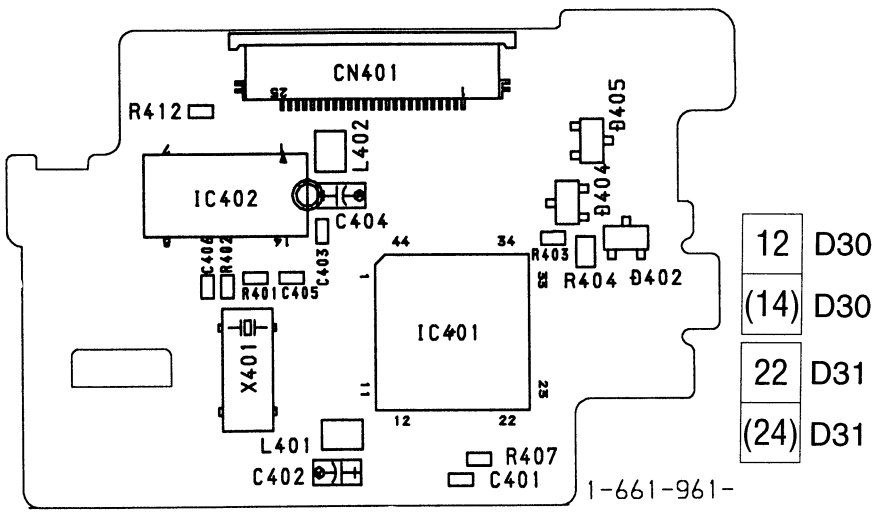
【MD-68 (A) BOARD】(SIDE A)



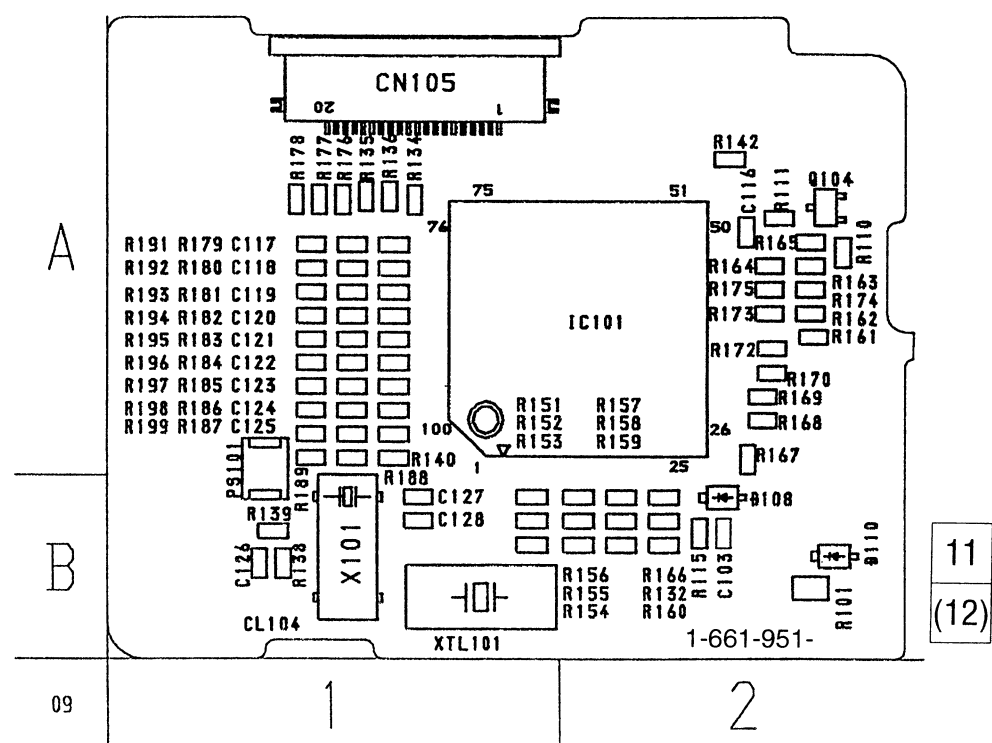
MD-68 (A)
BOARD (SIDE A)

D104	A-1
D105	A-1
D106	A-1
D107	A-2
D109	A-1
IC102	A-1
IC103	A-1
IC104	A-2
IC105	A-1
IC106	A-1
IC107	A-2
Q103	A-2

【RS-67 (A) /67 (B) BOARD】(SIDE A)



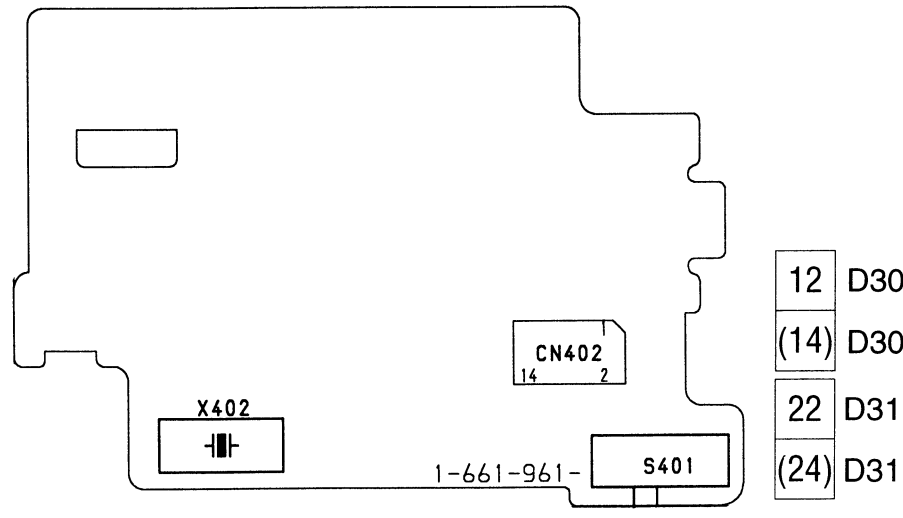
【MD-68 (A) BOARD】(SIDE B)



MD-68 (A)
BOARD (SIDE B)

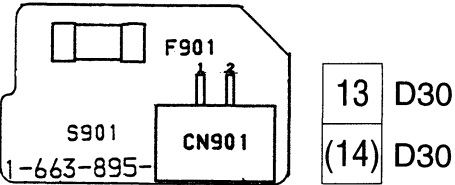
D108	B-2
D110	B-2
IC101	A-2
Q104	A-2

【RS-67 (A) /67 (B) BOARD】(SIDE B)

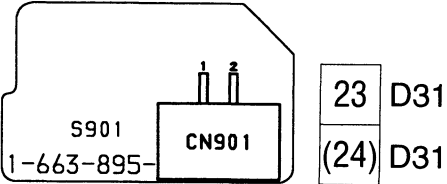


PS398 (A)/398 (B) (POWER SWITCH) LB-47 (A)/47 (B) (BATTERY) ID-11 (A)/11 (B) (MOTOR DRIVE, INPUT/OUTPUT) PRINTED WIRING BOARDS
- Ref. No. id-11 (A)/11 (b) BOARD . 2,000 series, ps-398 (A)/398 (B) BOARD : 2,000 series -

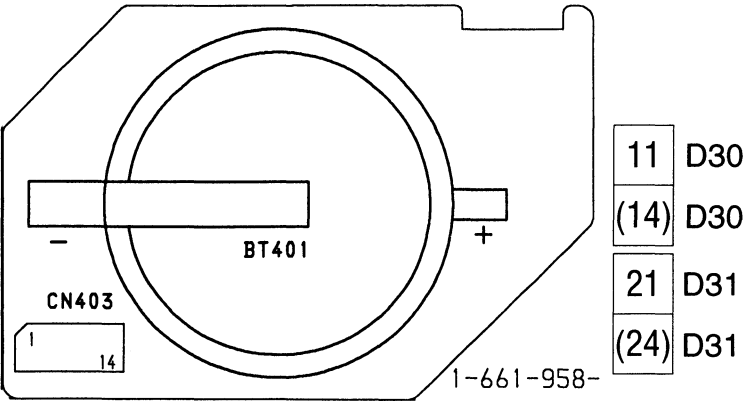
【PS-398 (A) BOARD】



【PS-398 (B) BOARD】



【LB-47 (A) /47 (B) BOARD】



ID-11 (A) / 11 (B)
BOARD (SIDE A)
D162 B-3
D167 A-1

IC101 A-2
IC103 A-2
IC105 B-3
IC106 A-2
IC109 C-3

Q101 A-2
Q102 A-2
Q105 A-2
Q110 B-3
Q118 B-3
Q119 C-3
Q120 B-3
Q121 B-3

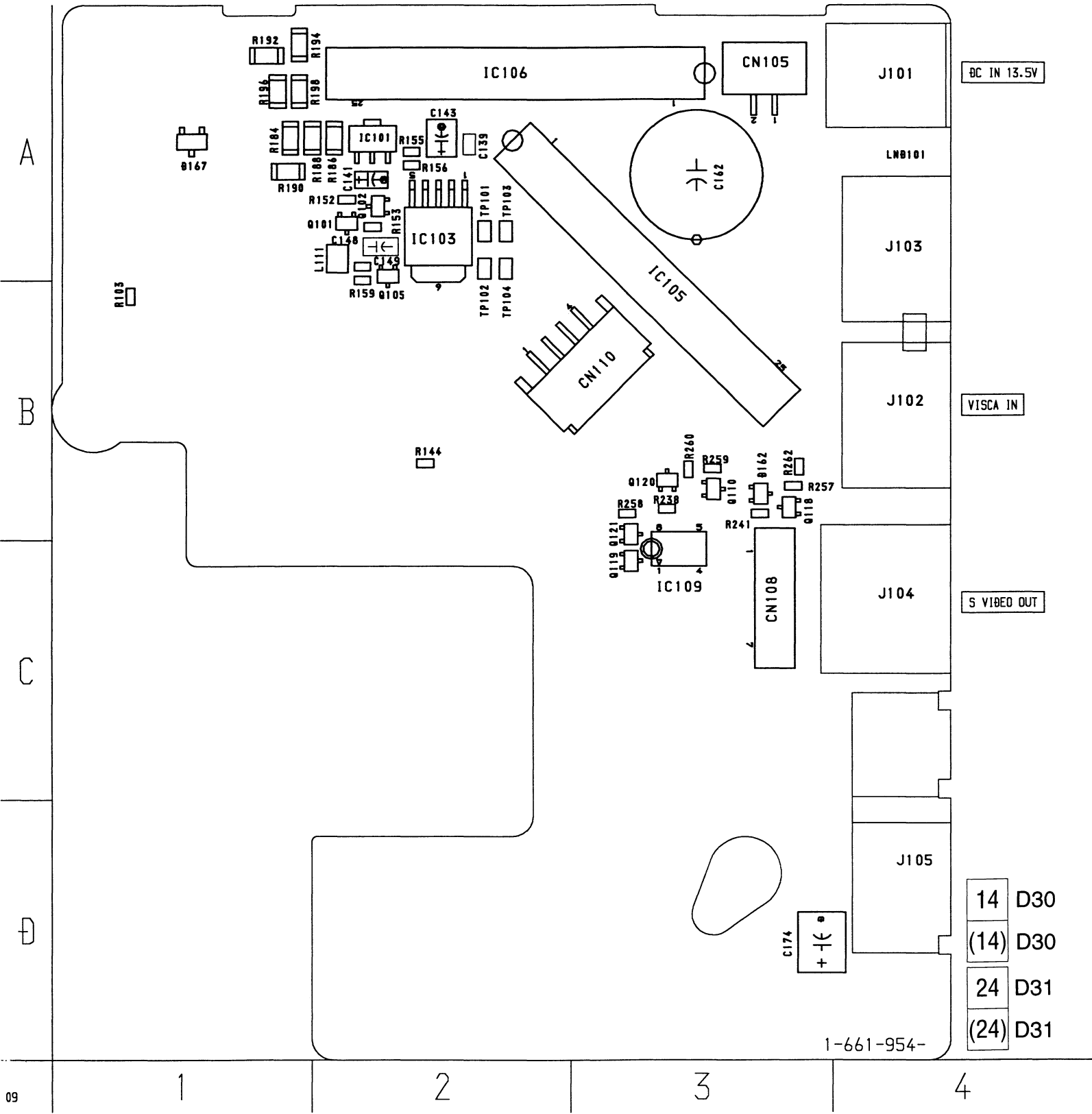
ID-11 (A) / 11 (B)
BOARD (SIDE B)

D101 D-1
D102 C-1
D103 C-1
D104 B-3
D105 B-3
D106 B-3
D109 B-1
D110 B-1
D112 B-2
D113 A-3
D114 B-2
D115 A-3
D116 B-2
D117 A-3
D118 B-2
D119 A-3
D121 D-1
D151 D-2
D152 D-2
D153 D-1
D154 C-1
D155 D-1
D156 D-2
D157 B-1
D158 C-1
D159 B-1
D160 A-1
D161 D-2
D163 C-1
D164 B-1
D165 B-1
D166 A-1
D168 A-1
D169 A-2
D170 A-2

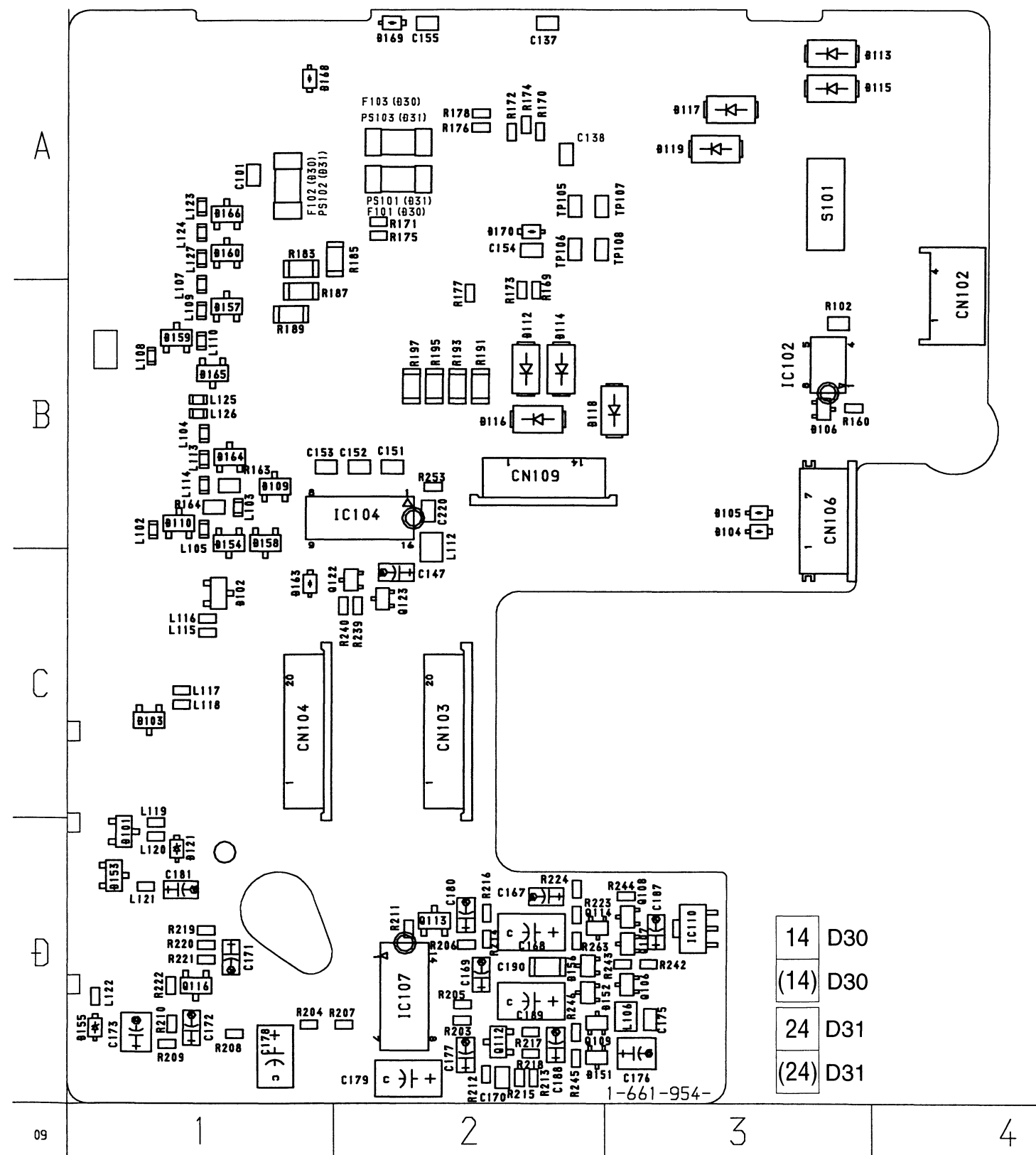
IC102 B-3
IC104 B-2
IC107 D-2
IC110 D-3

Q106 D-3
Q107 D-3
Q108 D-3
Q109 D-2
Q112 D-2
Q113 D-2
Q114 D-1
Q116 B-3
Q122 C-2
Q123 C-2

【ID-11 (A) /11 (B) BOARD】 (SIDE A)



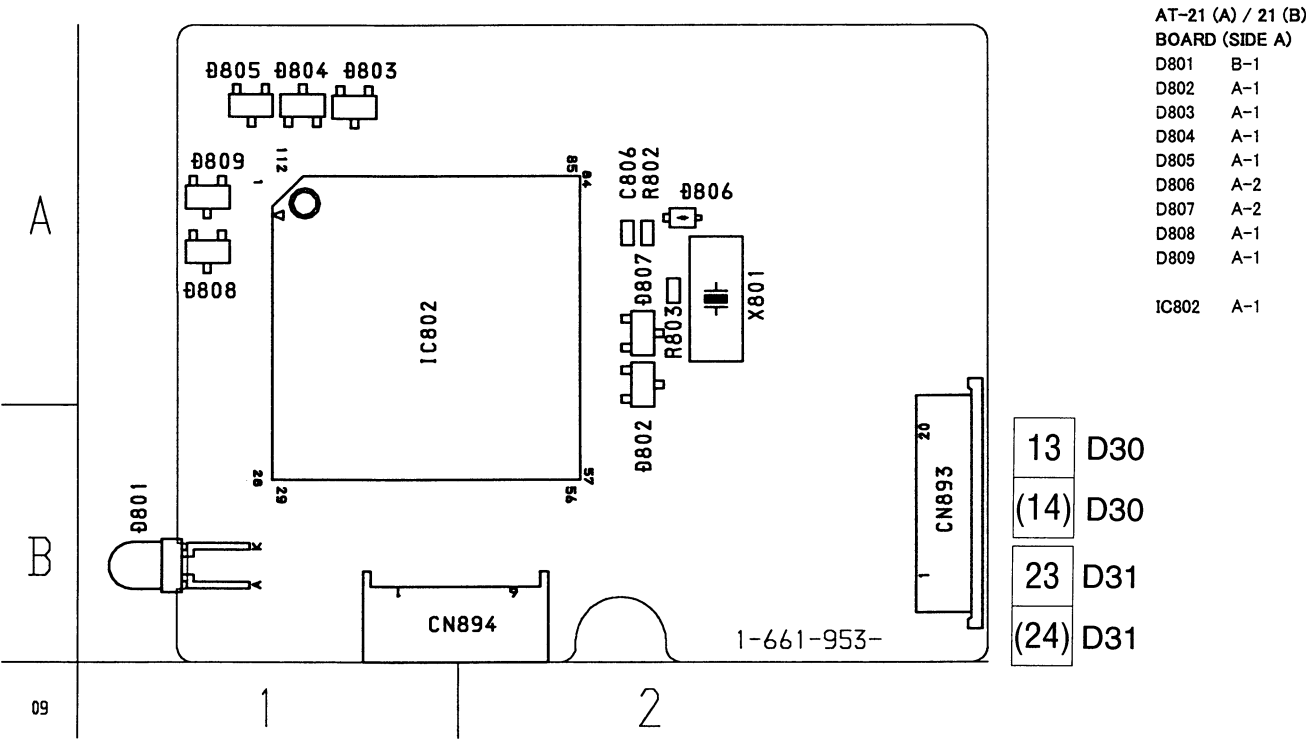
【 IĐ-11 (A) /11 (B) BOARD】 (SIDE B)



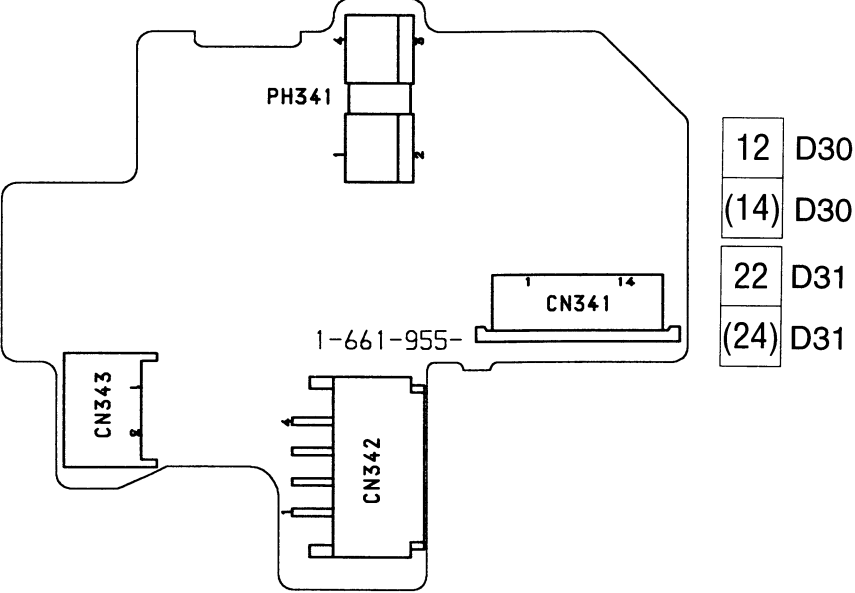
AT-21 (A)/21 (B) (VIDEO PROCESS, MAIN CONTROL) LI-52 (A)/52 (B) (TILT END SENSOR) LI-59 (A)/59 (B) (TILT R SENSOR) LI-55 (A)/55 (B) (PAN R SENSOR) PRINTED WIRING BOARDS

- Ref. No. AT-21 (A)/21 (B) BOARD : 1,000 series, LI-52 (A)/52 (B) BOARD : 2,000 SERIES, LI-59 (A)/59 (B) BOARD : 2,000 SERIES, LI-55 (A)/55 (B) BOARD : 2,000 SERIES -

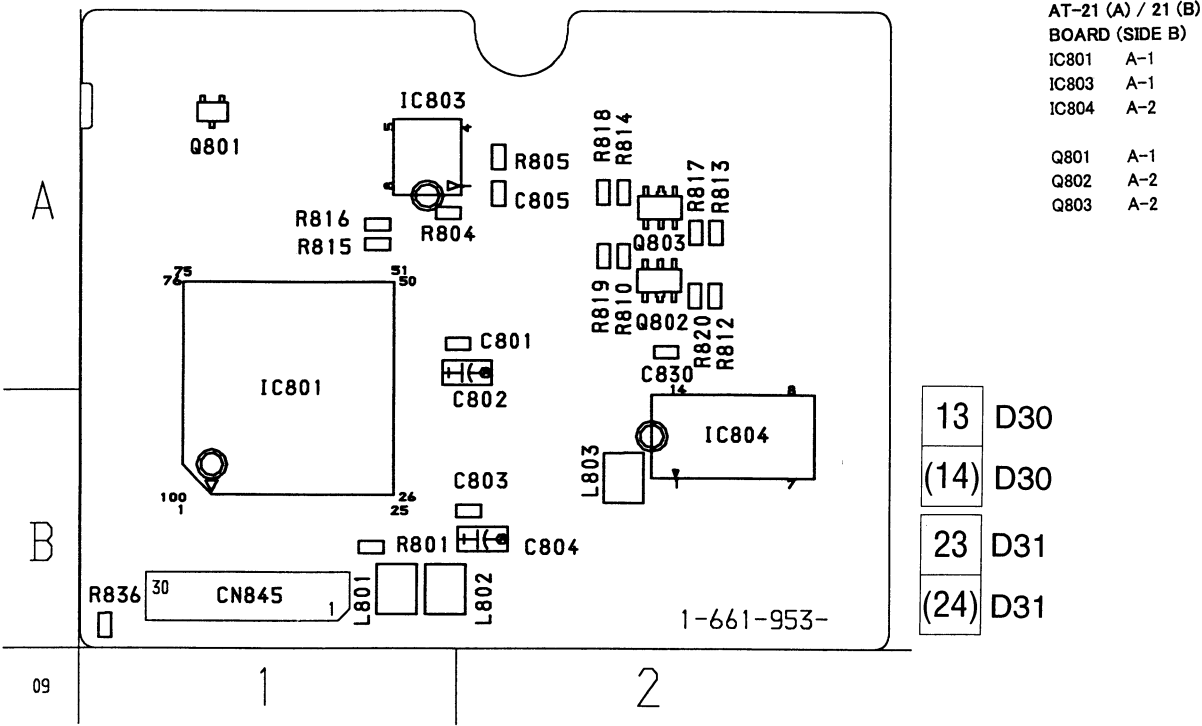
【 AT-21 (A) /21 (B) BOARD】 (SIDE A)



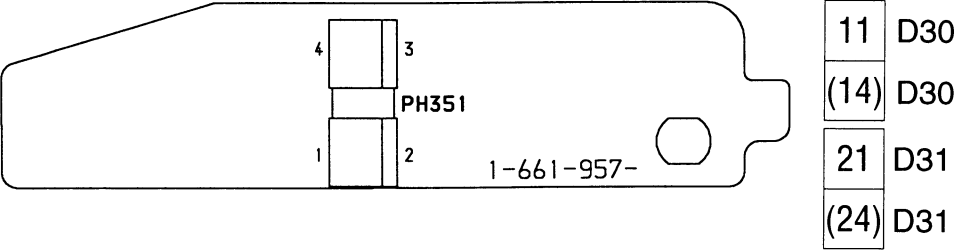
【 LI-52 (A) /52 (B) BOARD】



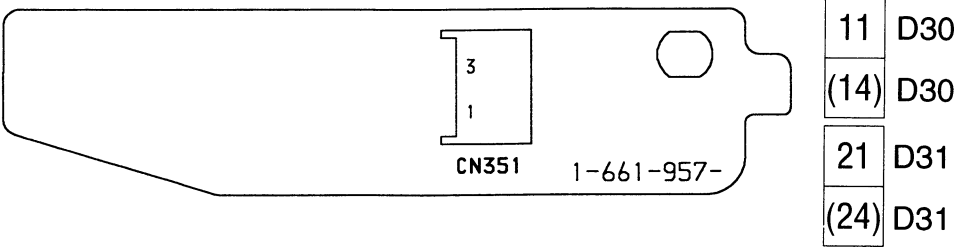
【 AT-21 (A) /21 (B) BOARD】 (SIDE B)



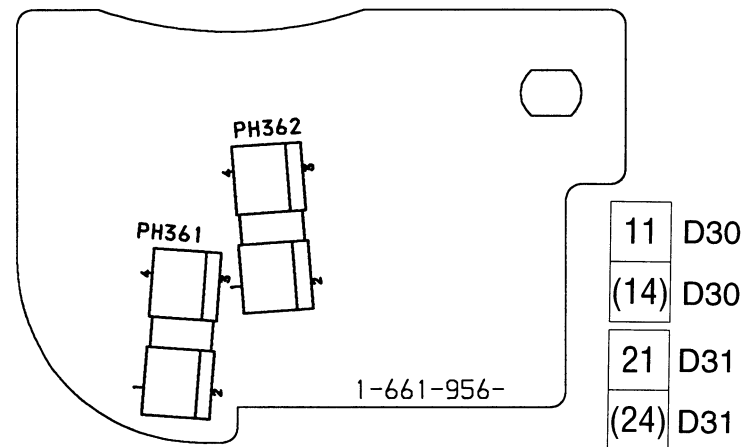
【 LI-59 (A) /59 (B) BOARD】 (SIDE A)



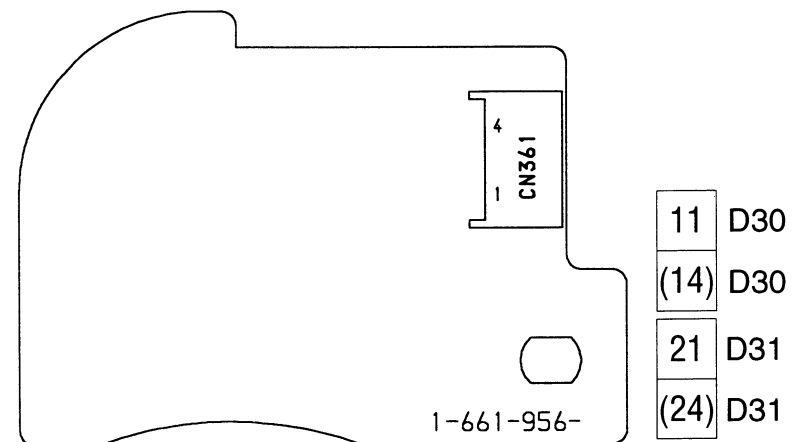
【 LI-59 (A) /59 (B) BOARD】 (SIDE B)



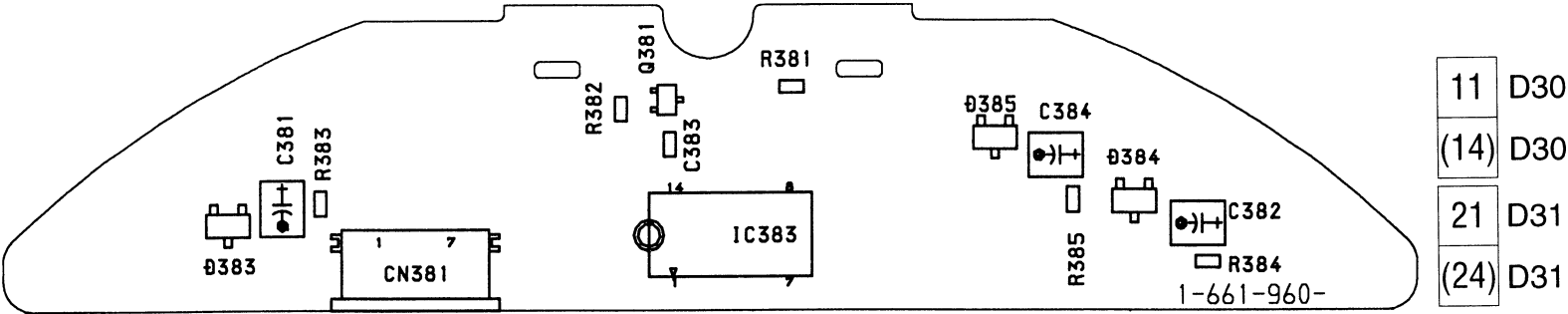
【LI-55 (A) /55 (B) BOARD】 (SIDE A)



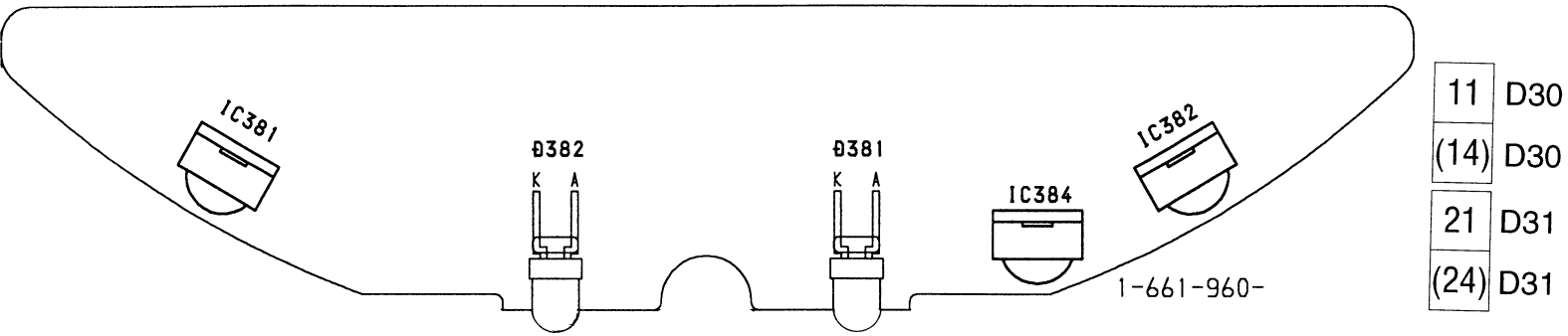
【LI-55 (A) /55 (B) BOARD】 (SIDE B)



【 RM-77 (A) /77 (B) BOARD 】 (SIDE A)



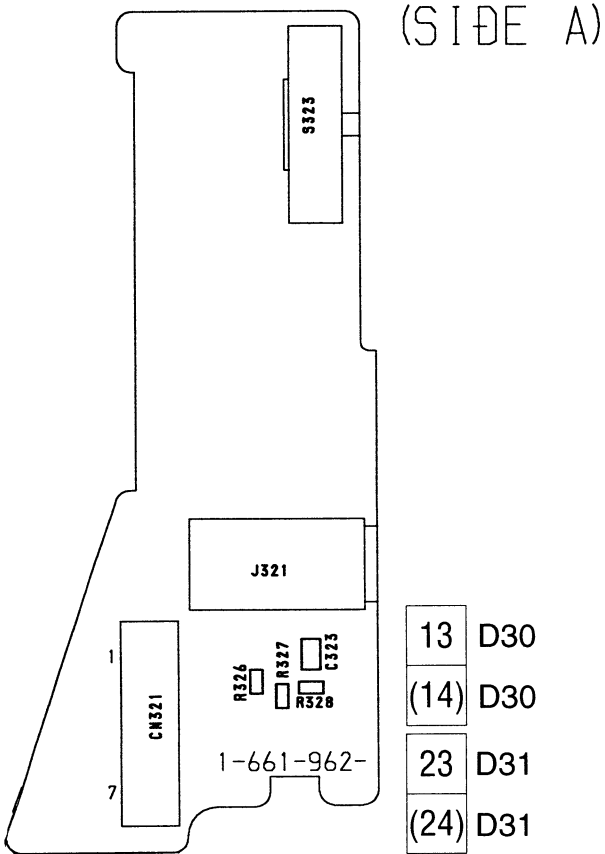
【 RM-77 (A) /77 (B) BOARD 】 (SIDE B)



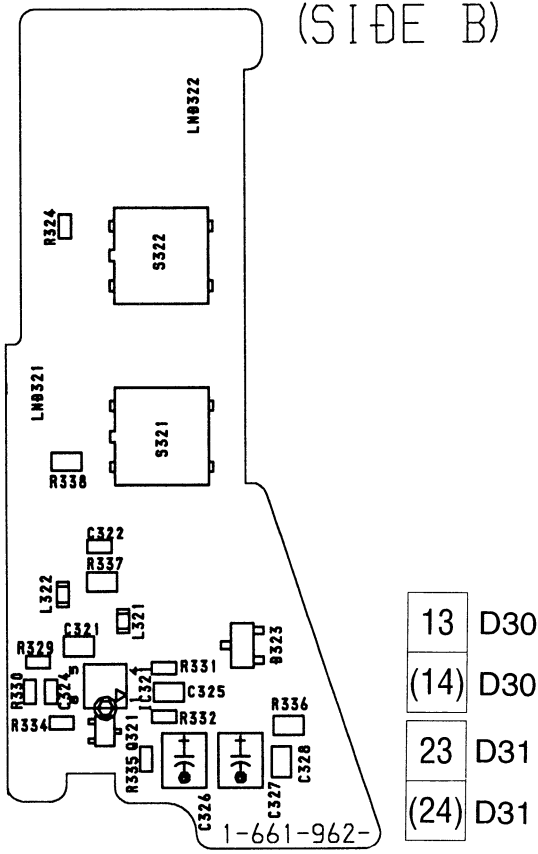
SW-279 (A)/279 (B) (MIC AMP) LD-84 (A)/84 (B) (LENS DRIVE) PRINTED WIRING BOARDS

– Ref. SW-279 (A)/279 (B) BOARD : 2,000 series, LD-84 (A)/84 (B) BOARD : 2,000 series –

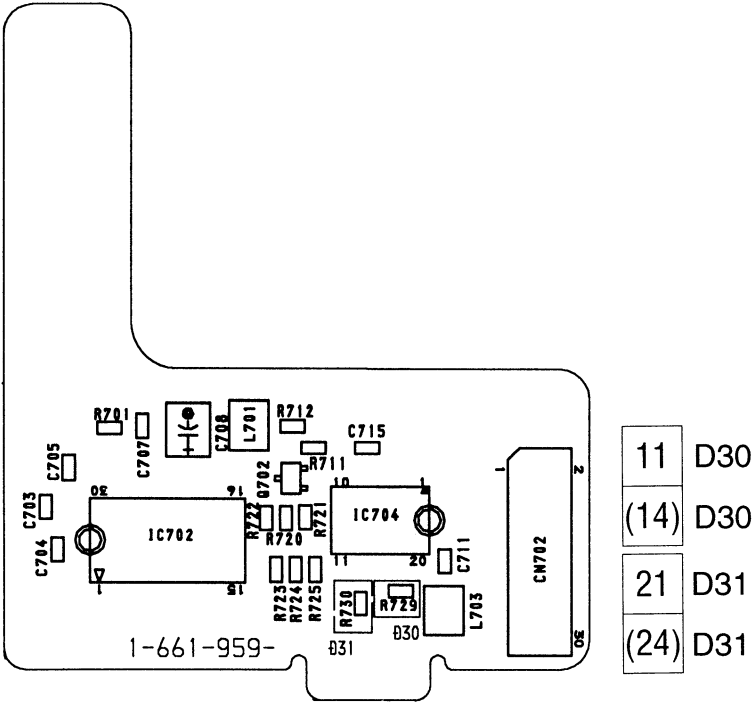
【SW-279 (A) /279 (B) BOARD】



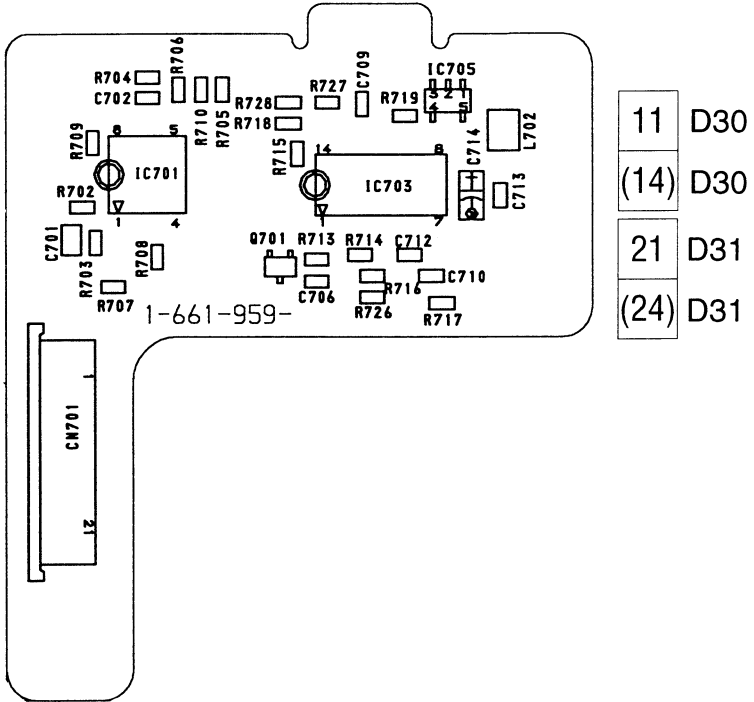
【SW-279 (A) /279 (B) BOARD】



【LD-84 (A) /84 (B) BOARD】(SIDE A)



【LD-84 (A) /84 (B) BOARD】(SIDE B)



SECTION 5 ADJUSTMENTS

5-1. PREPARATION FOR ADJUSTMENT

5-1-1. List of Servicing Jigs

- Oscilloscope • Regulated power supply • Audio generator • Audio level meter
- Color monitor • Vectorscope • Desk-top calculator • Digital voltmeter

Ref. No.	Name	Part No.	Use
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	White balance check
	ND filter 0.3	J-6080-818-A	White balance check
J-3	Pattern box PTB-450	J-6082-200-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Siemens star	J-6080-875-A	For checking the flange back
J-6	Extension cable (30P, 0.8mm)	J-6082-189-A	For extension between LD-84 (A)/84 (B) board (CN702) and VC-179 (A)/179 (B) board (CN501), AT-21 (A)/21 (B) board (CN845) and VC-179 (A)/179 (B) board (CN502).
J-7	Adjusting remote commander (*1) (RM-95 remodeled partly)	J-6082-053-B	
J-8	Extension cable 3	J-6082-291-A	For adjusting remote commander (J-7)
J-9	Video/S video out cable	J-6082-293-A	For checking the video signal
J-10	DC-57 harness (2P)	1-951-473-11	For DC-supply to VC-179 (A)/179 (B) board (CN301)
J-11	RS-232C cable (8P DIN-8P DIN)	1-590-879-11	For connection between VISCA IN jack and Macintosh PC
J-12	RS-232C cable (8P DIN-25P DSUB)	1-751-195-11 SMF-532A (79-6363-00)	For connection between VISCA IN jack and NEC PC98
J-13	RS-232C cable (8P DIN-9P DSUB female)	1-690-391-21 SMF-533 (48-5233-00)	For connection between VISCA IN jack and IBM PC, Quarter-L
J-14	VISCA Control Software	J-6082-297-A	For IBM PC/NEC PC98
		J-6082-296-A	For Macintosh PC
	AC Adaptor (Output voltage: 13.5Vdc)	1-473-789-11	AC-EV2 (AC120V)
		1-473-790-11	AC-EV3 (AC220-230V)
	Remote commander	8-917-560-90	RMT-D30

- * 1 Microcomputer IC in the adjusting remote commander except for μ PD7503G-C56-12 (8-759-148-35) does not allow the page selecting. Replace the microcomputer in such a case.

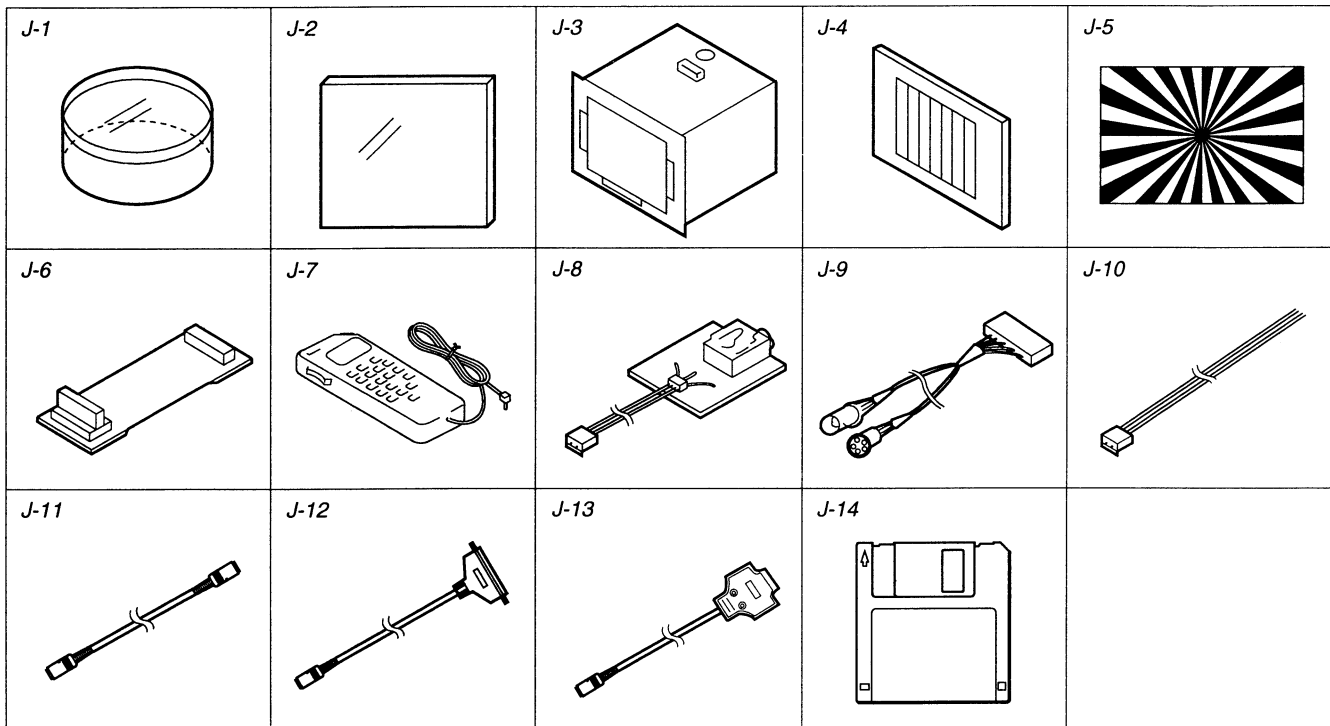


Fig. 5-1.

5-1-2. Preparations

Note: When adjusting only, it is not needed to remove the camera block from the pan tilt mechanism chassis. The adjustments can be performed only by removing the camera cabinet.

- 1) Connect the equipments for adjusting as shown in Fig. 5-3.
- 2) Turning OFF the auto focus using the adjusting remote commander.
 1. Set data: 01 to page: 6, address: 25.
(The auto focus will turn OFF. The focus can be adjusted using the focus button on the adjusting remote commander. But the HOLD switch must be set to OFF.)
 2. After completing the adjustment/operation check, set data: 00 to page: 6, address: 25.
- 3) To adjust the camera block only, there are two procedures.
 1. Adjust with the camera block mounted to the pan tilt mechanism chassis. (Fig. 5-2 (1), Fig. 5-3 (1))
 2. Remove the camera block from the pan tilt mechanism chassis and perform adjustment to the camera block only. (Fig. 5-2 (2), Fig. 5-3 (2))

Note: Be sure to change the data of page: D, address: 01 to 00 (NTSC) or 01 (PAL). Then, remove the camera block from the pan tilt mechanism chassis. After this adjustment, be sure to perform the operation described in 5-2-20 and 5-2-22.

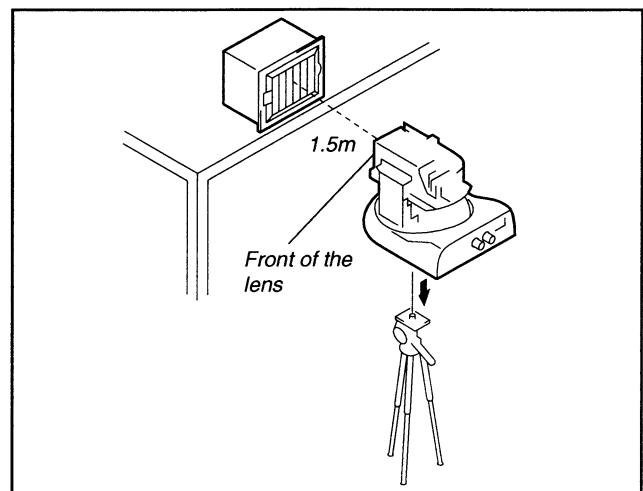


Fig. 5-2 (1) .

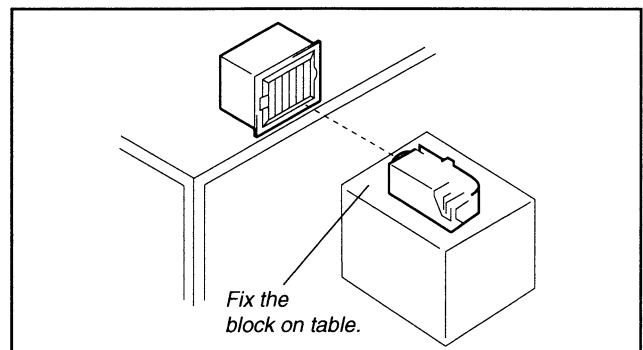


Fig. 5-2 (2) .

Note: The camera block has no screw plate for tripod. So, fix the block on a table when adjusting

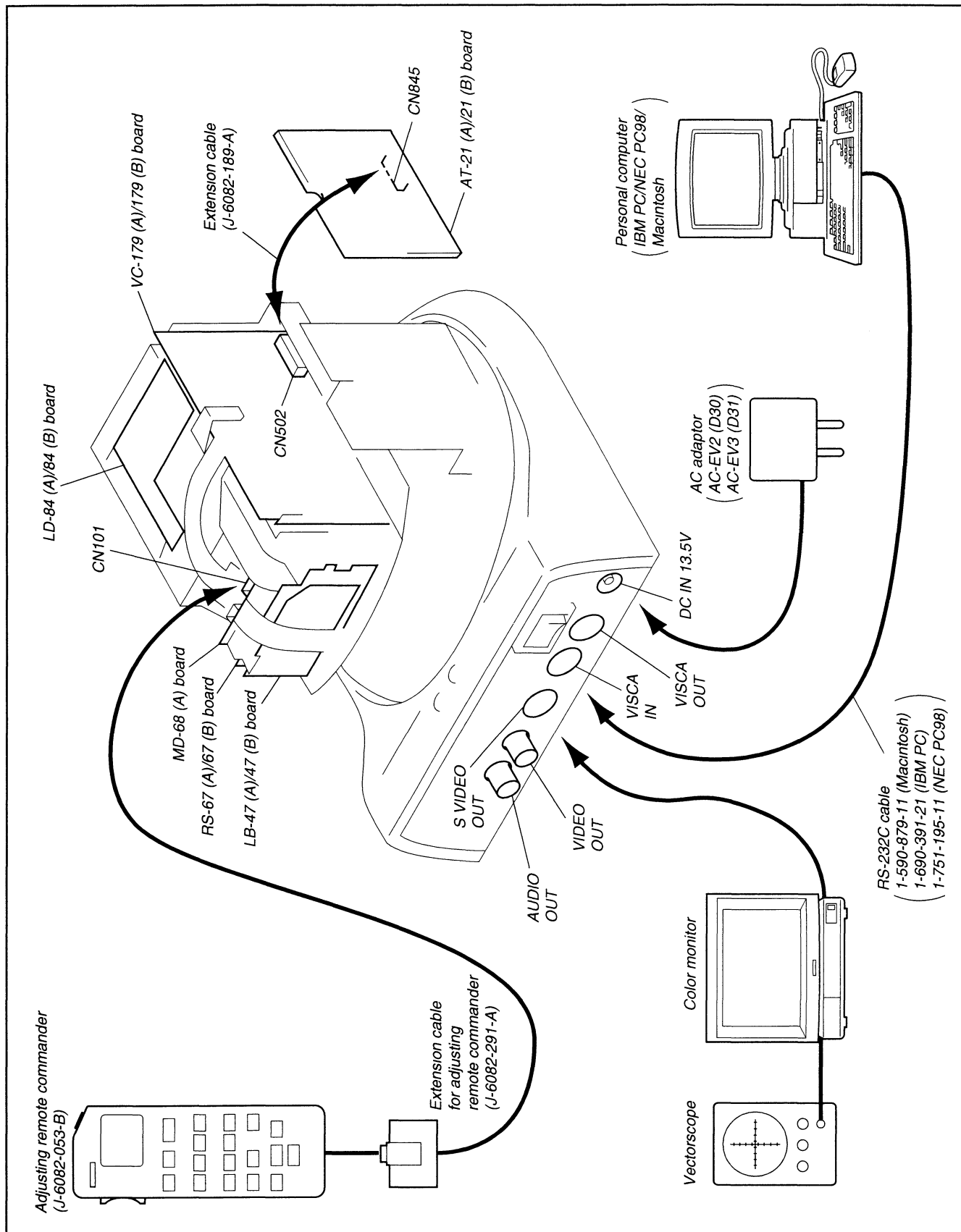


Fig. 5-3 (1).

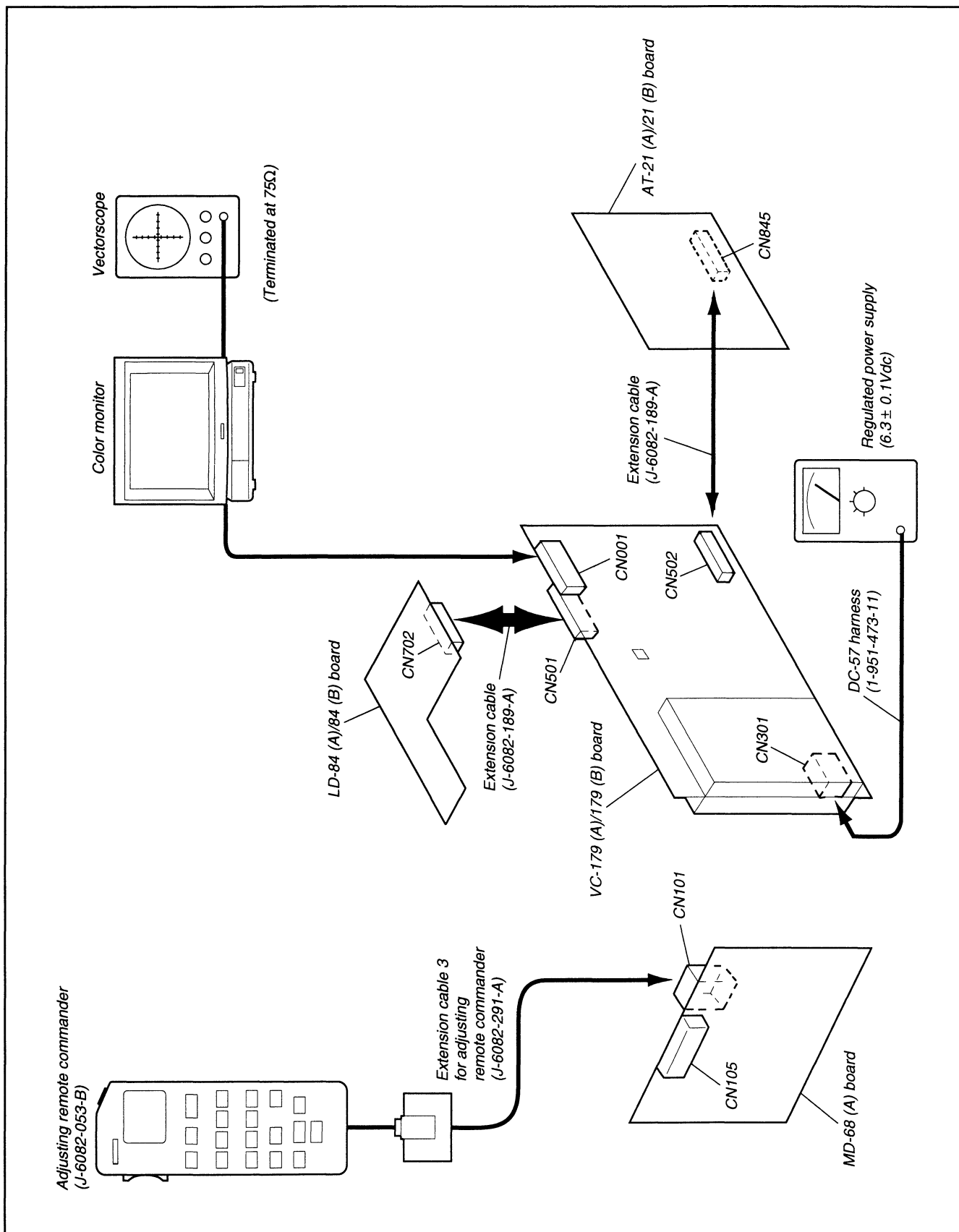


Fig. 5-3 (2).

5-1-3. Precautions

1. Switch settings

Adjust the switches to the following positions, and adjust unless specified otherwise.

1. Back up switch (RS-67 (A)/67 (B) board S401) Off
2. Camera number switch (SW-279 (A)/279 (B) board S323) . 1
3. IR out switch (ID-11 (A)/11 (B) board S101) Off

2. Adjusting Procedure

Adjust in the given order.

3. Subject

- 1) Color bar chart (Standard picture frame)
Adjust the picture frame as shown in Fig. 5-4. if adjustments are performed using the color bar chart. (Standard picture frame)
- 2) White pattern (Standard picture frame)
Remove the color bar chart from the pattern box, and so that the white pattern will be displayed.
Don't touch the zoom switch.

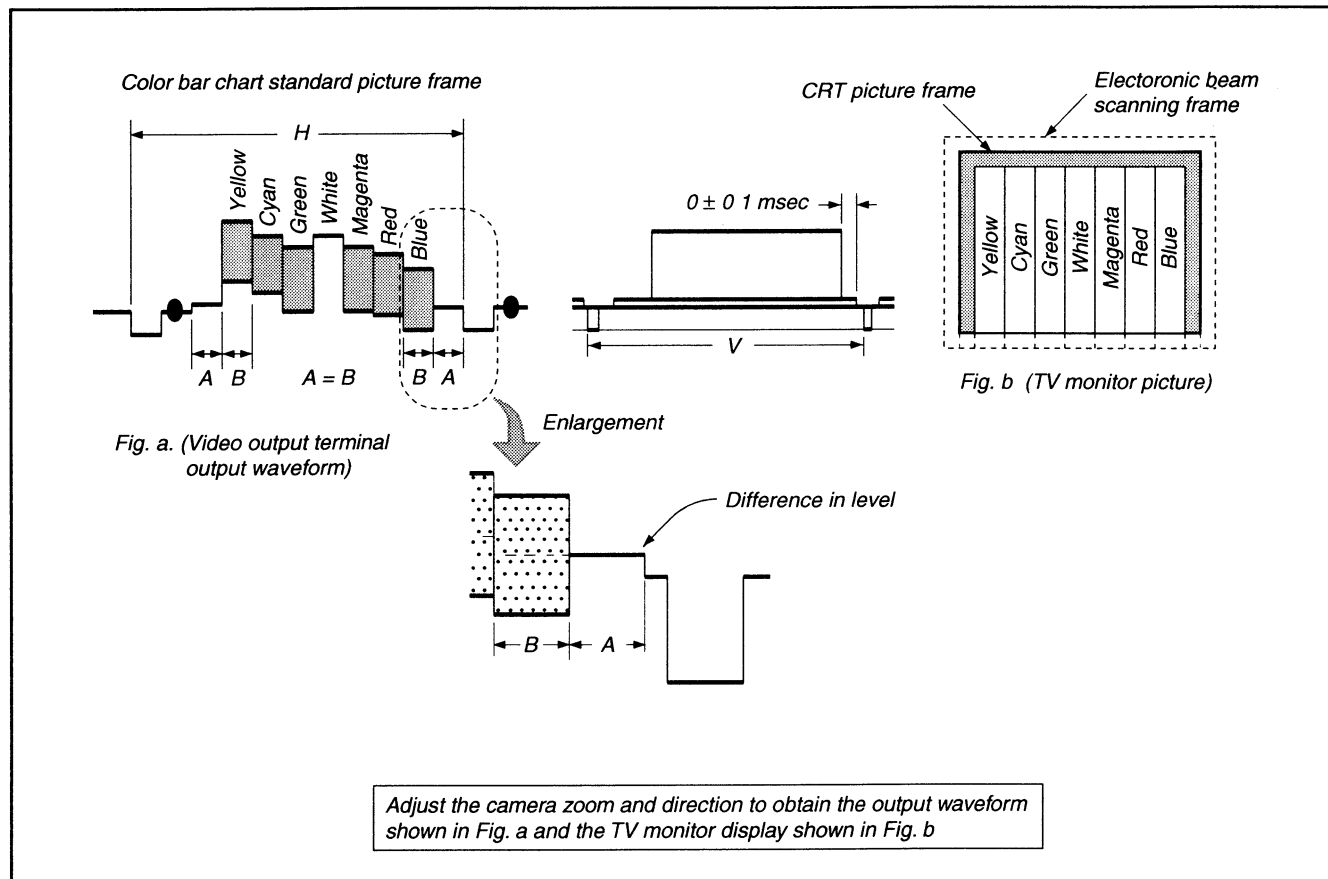


Fig. 5-4.

3) Chart for flange back adjustment

Combine a white A0 size (1189 mm × 841 mm) paper to a black one, and make the chart shown in Fig. 5-5.

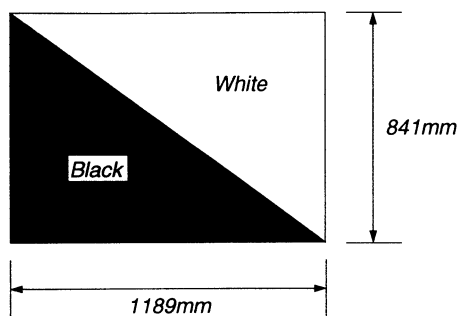


Fig. 5-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat

5-1-4. Adjusting Remote Commander

Use the adjusting remote commander to change the coefficient of the digital signal processing or the EVR data.

The adjusting remote commander uses the remote commander signal line (ECCP) to perform the bidirectional communication with the camera microprocessor. The effect data of the bidirectional communication must be written in the nonvolatile memory.

1. Using the adjusting remote commander

- 1) Connect the adjusting remote commander to the ECCP terminal (MD-68 (A) board CN101).
- 2) Adjust the HOLD switch of the adjusting remote commander to "HOLD" (SERVICE position).

If it has been properly connected, the LCD on the adjusting remote commander will display as shown in Fig. 5-6.

- 3) Operate the adjusting remote commander as follows.

- Changing the page

The page increases when the EDIT SEARCH + button is pressed, and decreases when the EDIT SEARCH - button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal LCD Display	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Decimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Decimal notation Conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 5-1.

- Changing the address

The address increases when the FF (▶▶) button is pressed, and decreases when the REW (◀◀) button is pressed.

There are altogether 256 addresses, from 00 to FF.

- Changing the data (Data setting)

The data increases when the PLAY (▶) button is pressed, and decreases when the STOP (■) button is pressed.

There are altogether 256 data, from 00 to FF.

- Writing the adjustment data

The PAUSE button must be pressed to write the adjustment data (F page) in the nonvolatile memory.

(The new adjustment data will not be recorded in the nonvolatile memory if this step is not performed.)

- 4) Select page: 6, address: 00, and adjust the data to 01
This releases the write protect of Page F, and enables the camera section (Addresses 01 to BF of page F) to be adjusted.
- 5) After completing all adjustments, turn off the main power supply once.

2. Precautions upon using the adjusting remote commander

Mishandling of the adjusting remote commander may erase the correct adjustment data at times. To prevent this, it is recommended that all adjustment data be noted down before beginning adjustments and new adjustment data after each adjustment.

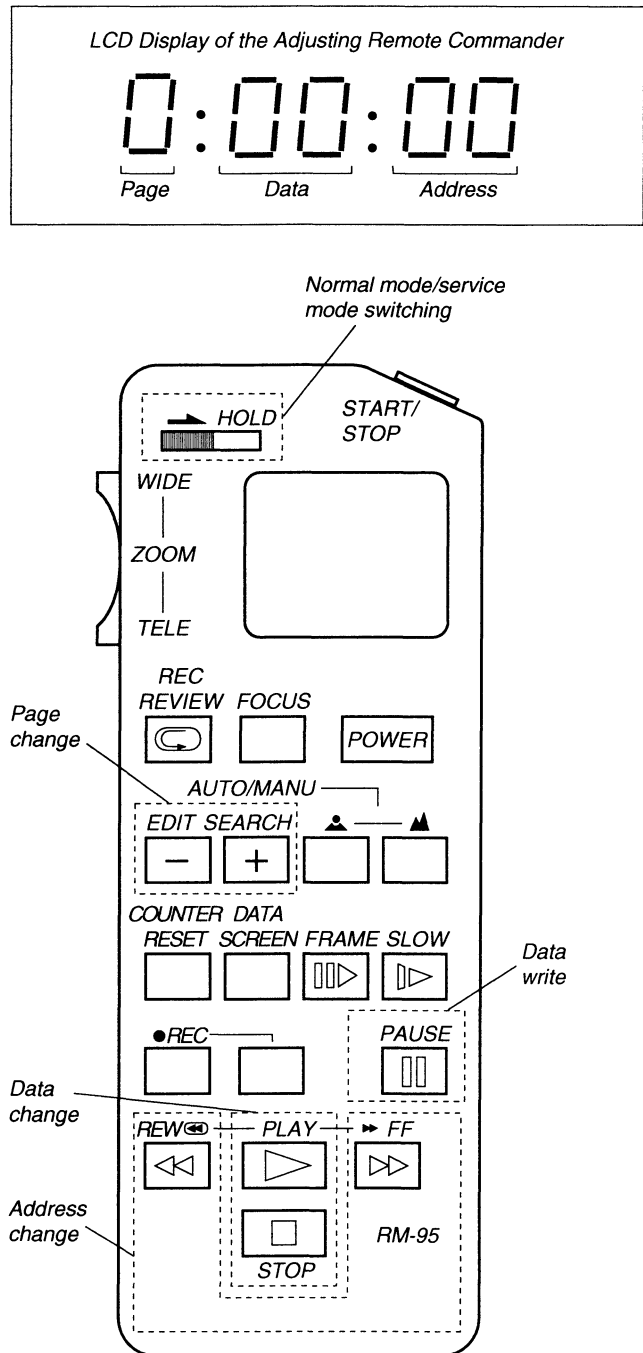


Fig. 5-6. Adjusting remote commander RM-95 (J-6082-053-B)

5-1-5. Page D Address List

Note 1: The adjustment data initial value is the data input before performing camera section adjustments (Page D) if the Page D data has been erased due to some reason.

Note 2: The data written in the adjustment data memo column are fixed.

After adjusting, check that these data have not been re-written by mistake.

Note 3: In some case, data have been input to the page D address 71 to FF. This has no relation to the adjustment.

Note 4: No mark : EVI-D30 series

() : EVI-D31 series

Note 5: * EVI-D30 (NTSC): 04 (Only Camera Block 00)

EVI-D31 (PAL): 05 (Only Camera Block 01)

Caution: When adjusting the camera with only the camera block mounted, use the data for Only Camera Block.

After the adjustment, assemble the camera block to the pan tilt mechanism chassis, then input the above data and complete the procedure.

Address	Adjustment data	
	Initial value	Memo column
00	00	
01	00 (01)	*
02	00	90
03	00	03
04	00	00
05	00	00
06	00	00
07	72	72
08	60	60
09	00	00
0A	00	32
0B	00	00
0C	00	00
0D	00	00
0E	00	00
0F	00	00
10	00	00
11	30	30
12	00	00
13	2C	2C
14	00	00
15	08	08
16	06	06
17	00	00
18	00	00
19	00	00
1A	00	00
1B	00	00
1C	00	00
1D	00	00
1E	00	00
1F	30	30
20	00	00
21	2C	2C
22	00	00
23	08	08
24	06	06
25	00	00
26	00	00
27	00	00
28	00	00
29	00	00
2A	00	00
2B	00	00

Table. 5-2 (1).

Address	Adjustment data	
	Initial value	Memo column
2C	00	00
2D	30	30
2E	00	00
2F	2C	2C
30	00	00
31	08	08
32	06	06
33	00	00
34	00	00
35	00	00
36	00	00
37	00	00
38	00	00
39	00	00
3A	00	00
3B	30	30
3C	00	00
3D	2C	2C
3E	00	00
3F	08	08
40	06	06
41	00	00
42	00	00
43	00	00
44	00	00
45	00	00
46	00	00
47	00	00
48	00	00
49	30	30
4A	00	00
4B	2C	2C
4C	00	00
4D	08	08
4E	06	06
4F	00	00
50	06	06
51	00	00
52	00	00
53	00	00
54	00	00
55	00	00
56	00	00
57	30	30
58	00	00
59	2C	2C
5A	00	00

Table. 5-2 (2).

Address	Adjustment data	
	Initial value	Memo column
5B	08	08
5C	06	06
5D	00	00
5E	00	00
5F	00	00
60	00	00
61	00	00
62	18	18 (1C)
63	14	14 (18)
64	02	02
65	0F	0F
66	00	00
67	00	00
68	03	03
69	01	01
6A	00	00
6B	00	00
6C	00	00
6D	00	00
6E	FE	FE
6F	FE	FE
70	FE	FE
71 to FF		

Table. 5-2 (3).

5-1-6. Page F Address List

Note 1: The data already listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are values just after executing “Page F Data Initialization” and “Page F Data Modification”. They are different from the values after executing all adjustments.

Note 3: In some cases, data have been input to the page F addresses C0 to EF. This has no relation to the adjustments.

Note 4: No mark : EVI-D30 series
() : EVI-D31 series

Address	Adjustment data	
	Initial value	Memo column
00	00	9C (9D)
01	00 (21)	00 (21)
02	00	00
03	40	40
04	80	
05	80	
06	80	
07	80	
08	2D	
09	26	
0A	FA	
0B	F1	
0C	30	
0D	00	
0E	58	
0F	00	
10	E0	E0
11	8F	
12	6C	
13	36	
14	3C	
15	60	
16	0D	
17	A3	
18	12	
19	8E	
1A	10	
1B	E2	
1C	0C	0C
1D	00	00
1E	80	
1F	80	
20	79	79
21	79	79
22	80	
23	77	77
24	5E (71)	77 (8A)
25	75	75
26	45	45
27	3F	3F
28	23	23
29	0B (0E)	0B (0E)

Table. 5-3 (1).

Address	Adjustment data	
	Initial value	Memo column
2A	28 (2C)	28 (2C)
2B	40	40
2C	FF	FF
2D	26 (42)	26 (42)
2E	16	16
2F	26	26
30	00	00
31	00	00
32	46 (4A)	46 (4A)
33	00	00
34	50	50
35	35	35
36	02	02
37	00	00
38	83	83
39	6A	6A
3A	50	50
3B	80	80
3C	20	20
3D	C0	C0
3E	00	
3F	00	
40	00	
41	00	
42	00	
43	00	
44	00	
45	00	
46	00	
47	00	
48	00	
49	00	
4A	00	
4B	00	
4C	00	
4D	00	
4E	00	
4F	20	20
50	02	02
51	02	02
52	66	66
53	18	18

Table. 5-3 (2).

Address	Adjustment data	
	Initial value	Memo column
54	6B	6B
55	9F	9F
56	66	66
57	6C	6C
58	5C	5C
59	83	83
5A	67	67
5B	5C	5C
5C	5C	5C
5D	4A	4A
5E	20	20
5F	5C	5C
60	3C	3C
61	33	33
62	0C	0C
63	26	26
64	24	24
65	A0	A0
66	04	04
67	05	05
68	00	00
69	00	00
6A	04 (00)	04 (00)
6B	00	00
6C	04 (00)	04 (00)
6D	00	00
6E	02	02
6F	33	33
70	B0	B0
71	18	18
72	0F	0F
73	0F	0F
74	00 (02)	00 (02)
75	43	47
76	1B	1B
77	E8 (D8)	E8 (D8)
78	A0	A0
79	30 (28)	30 (28)
7A	10 (0D)	10 (0D)
7B	50	50
7C	58	58
7D	88	88

Table. 5-3 (3).

Address	Adjustment data	
	Initial value	Memo column
7E	66	66
7F	46	46
80	8F	8F
81	00	00
82	20	20
83	18	18
84	02	02
85	08	08
86	40	40
87	20	20
88	40	40
89	30	30
8A	50	50
8B	60	60
8C	80	80
8D	23 (27)	23 (27)
8E	60 (6C)	60 (6C)
8F	00	00
90	00	00
91	77	77
92	00	00
93	FB	FB
94	04	04
95	32	32
96	6B	6B
97	8D	8D
98	A1	A1
99	30	30
9A	30	30
9B	21	21
9C	91	91
9D	72	72
9E	00	00
9F	00	00
A0	00	00
A1	00	00
A2	00	00
A3	00	00
A4	02	02
A5	80	80
A6	00	00
A7	80	80

Table. 5-3 (4).

Address	Adjustment data	
	Initial value	Memo column
A8	00	00
A9	80	80
AA	00	00
AB	80	80
AC	00	00
AD	00	00
AE	02	02
AF	44 (87)	44 (87)
B0	3D (39)	3D (39)
B1	25	25
B2	3D (39)	3D (39)
B3	25	25
B4	12 (32)	12 (32)
B5	4B (4A)	4B (4A)
B6	40	40
B7	68	68
B8	00	00
B9	80	80
BA	00	00
BB	00	00
BC	00	00
BD	00	00
BE	6B (6C)	6B (6C)
BF	2F (33)	2F (33)
C0 to EF		
F0		
F1		
F2		
F3		
F4		
F5		
F6		
F7		
F8		
F9		
FA		
FB		
FC		
FD		
FE		
FF		

Table. 5-3 (5).

5-1-7. Page 5 Address List

Note 1: The adjustment data initial value is the data input before performing camera section adjustments (Page 5) if the Page 5 data has been erased due to some reason.

Note 2: The data written in the adjustment data memo column are fixed.

After adjusting, check that these data have not been rewritten by mistake.

Note 3: In some case, data have been input to the page 5 address A0 to FF. This has no relation to the adjustment.

Note 4: No mark : EVI-D30 series
() : EVI-D31 series

Address	Adjustment data	
	Initial value	Memo column
00		
01	00 (01)	00 (01)
02	04 (03)	04 (03)
03	2A	2A
04	03	03
05	1B (1C)	1B (1C)
06	6C (7C)	6C (7C)
07	14 (18)	14 (18)
08	7C (8C)	7C (8C)
09	14 (18)	14 (18)
0A	20 (24)	20 (24)
0B	0C (0E)	0C (0E)
0C	00	00
0D	00	00
0E	0A	0A
0F	1D	1D
10	00	00
11	01	01
12	02	02
13	10	10
14	11	11
15	12	12
16	13	13
17	14	14
18	10	10
19	12 (10)	12 (10)
1A	10	10
1B	10 (0C)	10 (0C)
1C	16	16

Table. 5-4 (1).

Address	Adjustment data	
	Initial value	Memo column
1D	96	96
1E	A0	A0
1F	8C	8C
20	6E	6E
21	82	82
22	10	10
23	12 (10)	12 (10)
24	10	10
25	10 (0C)	10 (0C)
26	16	16
27	B4	B4
28	8C	8C
29	64	64
2A	82	82
2B	FF	FF
2C	01	01
2D	09	09
2E	04	04
2F	16	16
30	19	19
31	0F	0F
32	14	14
33	02	02
34	01	01
35	07	07
36	02	02
37		
38	3C	3C
39	78	78
3A	02	02
3B	3C	3C
3C	64	64
3D	00	00
3E	00	00
3F	00	00
40	02	02
41	00	00
42	0F	0F
43	10	10
44	18	18
45	00	00
46	03	03
47	02	02
48	7F	7F

Table. 5-4 (2).

Address	Adjustment data	
	Initial value	Memo column
49	FF	FF
4A	7F	7F
4B	FF	FF
4C	7F	7F
4D	FF	FF
4E	7F	7F
4F	FF	FF
50	03	
51	5E	
52	01	
53	1A	
54	06	
55	BC	
56	02	
57	34	
58	02	
59	03	
5A	0B	0B
5B	0B	0B
5C	44	44
5D	74	74
5E	48	40
5F	04	04
60	09	09
61	06	06
62	12	12
63	12	12
64	04	04
65	04	04
66	05	05
67	05	05
68	07 (08)	07 (08)
69	07 (08)	07 (08)
6A	0C (0A)	0C (0A)
6B	0C (0A)	0C (0A)
6C	00	00
6D	0E	0E
6E	00	00
6F	16	16
70	00	00
71	50	50
72	00	00
73	60	60
74	0C	0C

Table. 5-4 (3).

Address	Adjustment data	
	Initial value	Memo column
75	06	06
76	06	06
77	03	03
78	14 (17)	14 (17)
79	14	14
7A	05 (04)	05 (04)
7B	30	30
7C	30	30
7D	81	81
7E	18 (1C)	18 (1C)
7F	14 (18)	14 (18)
80	02	02
81	02	02
82	02	02
83	02	02
84	02	02
85	0A	0A
86	0F	0F
87	96	96
88	20	20
89		
8A		
8B		
8C	00	00
8D		
8E		
8F		
90	28	28
91	6C	6C
92	02	02
93	06	06
94	46	46
95	40	40
96	50	50
97	0B	0B
98	04	04
99	64	64
9A	30	30
9B	0A	0A
9C	06	06
9D	04	04
9E	0C	0C
9F	00	00
A0 to FF		

Table. 5-4 (4).

5-1-8. Data Processing

The calculation of the adjusting remote commander display data (hexadecimal notation) is required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data.

Table. 5-5. indicates the hexadecimal notation-the decimal notation calculation table.

Hexagecimal notation-Decimal notation

②

The lower digits of the hexadecimal notation The upper digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (H)	B (b)	C (c)	D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (H)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
①→ B (b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: () indicate the adjusting remote commander display.

(Example) In the case that the adjusting remote commander display is BD (bd).

As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection “189” of the ① and ② in the above table is the decimal notation to be calculated.

Note: () indicate the adjusting remote commander display.

(Example) In the case that the adjusting remote commander display is BD (bd).

As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection “189” of the ① and ② in the above table is the decimal notation to be calculated.

Table. 5-5.

5-2. CAMERA SYSTEM ADJUSTMENT

5-2-1. Power Supply Voltage Check

(VC-179 (A)/179 (B) board)

Subject	Option
Measuring instrument	Digital voltmeter
MT5V check	
Measurement point	Pins ⑥ and ⑧ of CN501
Specified value	4.9 ± 0.1 Vdc
D3.5V check	
Measurement point	Pin ⑬ and ⑭ of CN504
Specified value	3.55 ± 0.1 Vdc
CAM4.9V check	
Measurement point	Pin ⑰ and ⑱ of CN504
Specified value	4.9 ± 0.1 Vdc
CAM15V check	
Measurement point	Pin ① of CN401
Specified value	15.2 ± 0.3 Vdc
CAM – 8.5V check	
Measurement point	Pin ③ of CN401
Specified value	$-8.5 \pm_{-0.4}^{+0.25}$ Vdc

Checking method:

- 1) Check that each power supply voltage satisfies the specified value.

5-2-2. Page D Data Initialization

Initializing method:

- 1) Page: 1, address: 00, data: 01.
- 2) Check that the data of page: 1, address: 03 is 00.
- 3) • EVI-D30 (NTSC)
Set data: 01 to page: 1, address: 02, and press the PAUSE button of the adjusting remote commander
• EVI-D31 (PAL)
Set data: 02 to page: 1, address: 02, and press the PAUSE button of the adjusting remote commander.
- 4) Check that the data of page: 1, address: 03 is 01.
- 5) Set data: 00 to page: 1, address: 02, and press the PAUSE button of the adjusting remote commander.
- 6) After performing “Page D data modification”, perform all the adjustments of the camera section (page D).

5-2-3. Page D Data Modification 1

The data (initial data) that is automatically written on page D after the initialization of the page D data will differ according to some camera micro processor versions. Change the data by manual input, arrange it.

Note 1: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote commander every time the new data is set.

EVI-D30		EVI-D31	
Address	Data	Address	Data
01	*	01	*
02	90	02	90
03	03	03	03

Note 2: *EVI-D30: 00

EVI-D31: 01

After the camera adjustment, input the data given below.

EVI-D30: 04

EVI-D31: 05

(Refer to 5-2-20. Page D Data Modification 2)

5-2-4. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized

Initializing method:

- 1) Page: 6, address: 00, data: 01
- 2) Check that the data of page: 6, address: 11 is 00
- 3) • EVI-D30 (NTSC)
Set data: 2D to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander
• EVI-D31 (PAL)
Set data: 2F to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander
- 4) Check that the data of page: 6, address: 11 is 01
- 5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander
- 6) After performing “Page F data modification”, perform all the adjustments of the camera section (page F)

5-2-5. Page F Data Modification

The data (initial data) that is automatically written on page F after the initialization of the page F data will differ according to some camera micro processor versions. Change the data by manual input, and arrange it.

Note 1: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote commander every time the new data is set.

Note 2: When changing address: 00, set the data of page: 6, address: 00 to 80

EVI-D30		EVI-D31	
Address	Data	Address	Data
24	77	24	8A
70	47	70	47

[Distinguishing the Camera Micro Processor (VC-179 (A)/179 (B) Board IC502) Versions]

Each version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 10.

Version	Part Name	Page: 6 Address: 10
Ver. 2.0	SC424624	20

5-2-6. 28 MHz Original Oscillation Adjustment (VC-179 (A)/179 (B) board)

Adjust the 28 MHz oscillation of the synchronization clock.
If the oscillation is not 28 MHz, the period will be inaccurate or the image will not be in color.

Subject	Not required
Measurement Point	CL401 (IC402 ⑫ pin)
Measuring Instrument	Frequency counter
Adjustment Page	F
Adjustment Address	22
Specified Value	14318181 ± 71Hz (NTSC)
	14187500 ± 70Hz (PAL)

Adjusting method:

- 1) Set data: 01 to page: 6, address: 00.
- 2) Change the data of page: F, address: 22 to adjust the oscillation frequency to 14318181 ± 71Hz (14187500 ± 70Hz).

5-2-7. V SUB Adjustment

Set the CCD imager V SUB voltage to the voltage specified for the imager.

Subject	Not required
Adjustment Page	F
Adjustment Address	04

Adjusting method:

- 1) Read the V SUB voltage code of the CCD imager.
Obtain the corresponding V SUB data from the following table.
- 2) Set data: 01 to page: 6, address: 00.
- 3) Set the V SUB data to page: F, address: 04.
- 4) Press the PAUSE button of the adjusting remote commander.

V SUB			V SUB		
Voltage Code	Data	Voltage (Vdc)*1	Voltage Code	Data	Voltage (Vdc)*1
e	70	9.0	q	AC	14.0
f	77	9.5	r	B2	14.5
g	7C	10.0	s	B8	15.0
h	82	10.5	t	BE	15.5
j	88	11.0	u	C4	16.0
k	8E	11.5	v	CA	16.5
l	94	12.0	w	D0	17.0
m	9A	12.5	x	D6	17.5
n	A0	13.0	y	DD	18.0
p	A6	13.5	z	E2	18.5

5-2-8. VRG Adjustment

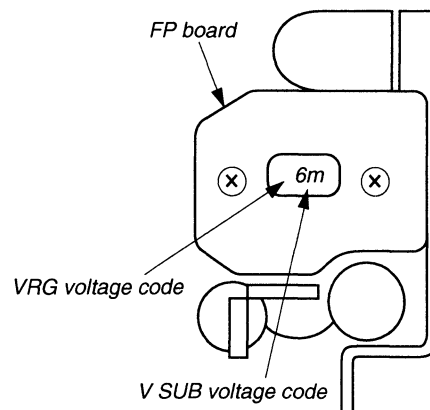
Set the CCD imager V RG voltage to the voltage specified for the imager.

Subject	Not required
Adjustment Page	F
Adjustment Address	05

Adjusting method:

- 1) Read the VRG voltage code of the CCD imager.
Obtain the corresponding VRG data from the following table
- 2) Set data: 01 to page: 6, address: 00.
- 3) Set the VRG data to page: F, address: 05
- 4) Press the PAUSE button of the adjusting remote commander.

VRG		
Voltage Code	Data	Voltage (Vdc)*2
1	34	1.0
2	4E	1.5
3	69	2.0
4	83	2.5
5	9E	3.0
6	B8	3.5
7	D3	4.0



(Example) When “6m” is displayed:
The V SUB voltage code is “m” and therefore the V SUB data will be “9A”
The VRG voltage code is “6” and therefore the VRG data will be “B8”.

Fig. 5-7.

The flange back adjustment for the inner focus lens is performed automatically.

Subject	Chart for flange back adjustment $\left(2000 \pm 5\text{mm from the front side of the lens} \right)$ Luminance: 300 ± 50 lux
Measurement Point	Check the operation on the
Measuring Instrument	TV monitor
Adjustment Page	F
Adjustment Address	16, 17, 18, 19, 1A, 1B

Adjusting method:

- 1) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
- 2) Set data: 01 to page: 6, address: 00.
- 3) Check that the data of page: 6, address: 21 is 00.
- 4) Check that the page: F, address: 16 to 1B data is at the initial value. (Refer to Table. 5-3. "Page F address list".)
- 5) Set data: 13 to page: 6, address: 01 and press the PAUSE button of the adjusting remote commander.
- 6) Set data: 15 to page 6, address: 01, and press the PAUSE button of the adjusting remote commander
 (The adjustment data is automatically input to page: F, addresses: 16 to 1B.)
- 7) Check that the data of page: 6, address: 21 is 01.
 (Display indicating flange back adjustment completion)

Processing after completing adjustments

- 1) Turn off the main power supply.

5-2-10. Flange Back Check

Subject	Siemens star (2m from the front of the lens)
Measurement Point	TV monitor
Measuring Instrument	
Specified Value	Focused at the TELE end and WIDE end.

Checking method:

- 1) Place the Siemens star 2m from the front of the lens.
- 2) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image.
- 3) Shoot the siemens star with the zoom TELE end.
- 4) Turn ON the auto focus.
- 5) When the lens is focused, turn OFF the auto focus.
- 6) Shoot the siemens star with the zoom WIDE end.
- 7) Check that the lens is focused.

Note 1: When the auto focus is ON, the lens can be checked if it is focused or not by observing the data on page A of the adjusting remote commander

- 1) Set data: 0C to page: 6, address: 02.
- 2) Page A shows the state of the focus.

A: 00: XX

→ (Odd: Focused
Even: Unfocused

Processing after completing adjustments

- 1) Set data: 00 to page: 6, address: 02.

5-2-11. Hall Adjustment

To eliminate the differences in the outputs of the hall element attached to the iris for detecting the position of the lens iris, adjust the hall AMP gain and hall offset.

Subject	Not required
Measurement Point	Lower 2 digits of the date of the page
Measuring Instrument	A displayed
Adjustment Page	F
Adjustment Address	06, 07
Specified Value	33 to 37 during IRIS OPEN B4 to B8 during IRIS CLOSE

Adjusting method:

- 1) Set data: 01 to page: 6, address: 00.
- 2) Set data: 03 to page: 6, address: 02.
- 3) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
- 4) Set data: 80 to page: F, address: 07, and press the PAUSE button of the adjusting remote commander.
- 5) Set data: 40 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
- 6) Read the page A display data, and this data is named W2.
- 7) Set data: 30 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
- 8) Read the page A display data, and this data is named W1.
- 9) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
- 10) Read the page A display data, and this data is named K1.
- 11) Set data: 40 to page: F, address: 06, and press the PAUSE button.
- 12) Read the page A display data, and this data is named K2.
- 13) Convert W1, W2, K1, K2 to decimal notation, and obtain W1', W2', K1', K2'. (Refer to Table. 5-5. "Hexadecimal notation-decimal notation conversion table".)
- 14) Calculate X1' using the following equations (decimal notation calculation).

$$A' = W2' + K1' - W1' - K2' \dots\dots\dots \text{Equation 1}$$

$$B' = W1' - K1' \dots\dots\dots \text{Equation 2}$$

$$X1' = \frac{2064 + (48 \times A') - (16 \times B')}{A'} \dots\dots\dots \text{Equation 3}$$

- 15) Convert X1' to hexadecimal notation, and obtain X1. (Round off to one decimal place)
- 16) Set data: X1 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
- 17) Change the data of page: F, address: 07, and adjust the page A display data to "35".
- 18) Press the PAUSE button of the adjusting remote commander.
- 19) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
- 20) Read the page A display data, and this data is named W0. If W0 lies within the "B4" to "B8" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
- 21) Convert W0 to hexadecimal notation, and obtain W0'.
- 22) Calculate X2' using the following equations (decimal notation calculation)

$$C' = W0' - B' - 52 \dots\dots\dots \text{Equation 4}$$

$$X2' = \frac{(129 - B') \times (X1' - 48) + 48 \times C'}{C'} \dots\dots\dots \text{Equation 5}$$
 (X1' and B' are values obtained from equations 2 and 3)
- 23) Convert X2' to hexadecimal notation and obtain X2. (Round off to one decimal place)
- 24) Set data: X2 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
- 25) Change the data of page: F, address: 07, and adjust the page A display data to "B6".
- 26) Press the PAUSE button of the adjusting remote commander.
- 27) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
- 28) Check that the page A display data lies within the "33" to "37" range.

Processing after Completing Adjustments

- 1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.

5-2-12. Picture Frame Setting

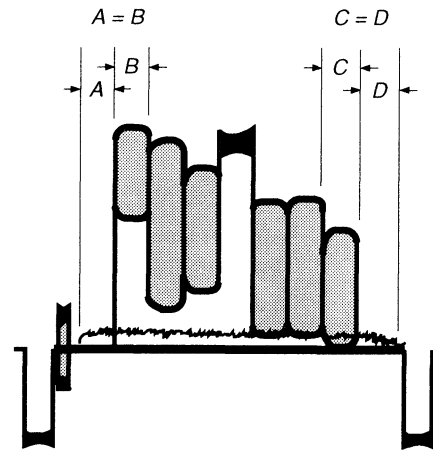
Subject	Color bar chart standard picture frame
Measurement Point	VIDEO OUT terminal
Measuring Instrument	Oscilloscope and TV monitor
Specified Value	$A=B, C=D, t=0 \begin{smallmatrix} +0.1 \\ -0 \end{smallmatrix} \text{ msec}$

Setting method:

- 1) Turn the auto focus off.
- 2) Adjust the focus.
- 3) Adjust the zoom and the camera direction, and set to the specified position.
- 4) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame"

Check on the oscilloscope

1. Horizontal period



2. Vertical period

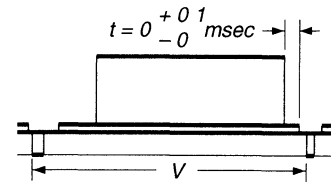


Fig. 5-8.

Check on the TV monitor

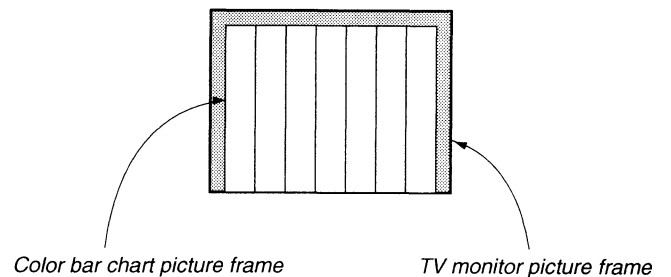


Fig. 5-9.

5-2-13. Color Reproduction Adjustment

Adjust the color separation matrix coefficient so that the proper color reproduction is produced.

Subject	Color bar chart standard picture frame
Measurement Point	VIDEO OUT terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	08, 09, 0A, 0B
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

- 1) Set data: 01 to page: 6, address: 00.
- 2) Set data: 00 to page: 6, address: 03.
- 3) Set data: F1 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
- 4) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
- 5) Change the data of addresses 08, 09, 0A and 0B of page: F, and settle each color luminance point in each color reproduction frame.

Note 1: Be sure to press the PAUSE button of the adjusting remote commander before changing the addresses.

If not, the new data will not be written to the memory.

- 6) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

- 1) Set data: E0 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
- 2) Set data: 26 to page: F, address: 63, and press the PAUSE button of the adjusting remote commander.
- 3) Set data: 10 to page: 6, address: 03.

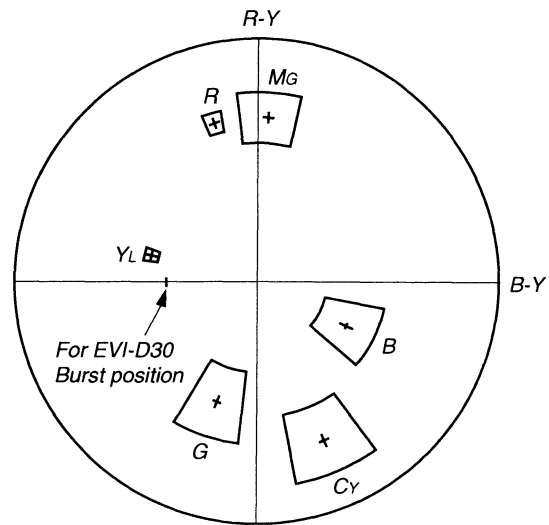


Fig. 5-10.

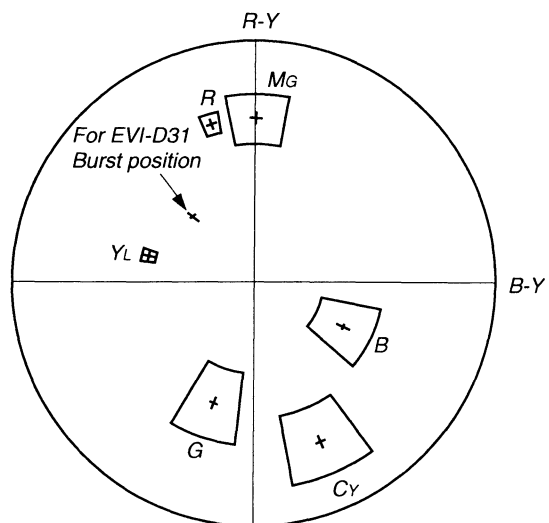


Fig. 5-11.

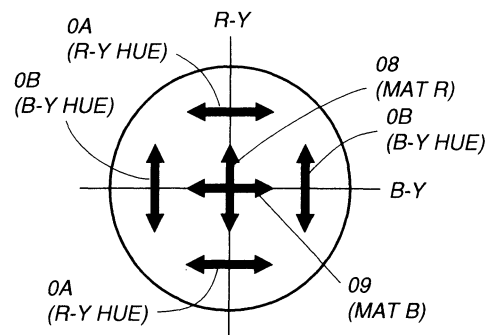


Fig. 5-12. Direction of the Movements of the Adjustment Address and Luminance Point.

5-2-14. Iris IN/OUT Adjustment (VC-179 (A)/179 (B) board)

For the unit to judge if the white balance is indoors or outdoors in auto white balance operations, measure the light level and write it in the EEPROM.

If the level is not correct, the white balance will not be accurate.

Subject	White pattern
Measurement Point	Lower 2 digits of the date of the page
Measuring Instrument	A displayed
Adjustment Page	F
Adjustment Address	13, 14

Adjusting method:

- 1) Set data: 01 to page: 6, address: 00.
- 2) Set data: 0E to page: 6, address: 02
- 3) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
- 4) Read the page A display data (Note 1), and take the upper two digits as D1 and the lower two as D2
- 5) Convert D1 to a decimal number and obtain D1'. (Refer to Table 5-5. "Hexadecimal Notation-Decimal Notation Conversion Table".)
- 6) Calculate D3' using the following equations. (Equations 1 and 2 are for decimal notation calculation)
 - When $D2 \geq D0$
 $D3' = D1' - 21$ Equation 1
 - When $D2 < D0$
 $D3' = D1' - 22$ Equation 2
- 7) Convert D3' to a hexadecimal number and obtain D3.
- 8) Set D3 to page: F, address: 13, and press the PAUSE button of the adjusting remote commander.
- 9) Set data: 09 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander (IND0.5 SHUTTER mode setting)
- 10) Read the page A display data (Note 1), and take the upper two digits as D4 and the lower two as D5
- 11) Convert D4 to decimal number and obtain D4' (Refer to Table 5-5. "Hexadecimal Notation-Decimal Notation Conversion Table".)
- 12) Calculate D6' using the following equations. (Equations 3 and 4 are for decimal notation calculation)
 - When $D5 \geq F0$
 $D6' = D4' - 13$ Equation 3
 - When $D5 < F0$
 $D6' = D4' - 14$ Equation 4
- 13) Convert D6' to a hexadecimal number and obtain D6
- 14) Set D6 to page: F, address: 14, and press the PAUSE button of the adjusting remote commander.

Note 1: The right four digits of the display data at the right bottom side of the monitor TV is the LIGHT LEVEL data.

If the lower digits change severely and cannot be read, record it on a tape once, play it back by frame feeding, and obtain the average value.

Processing after Completing Adjustments

- 1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander
- 2) Set data: 00 to page: 6, address: 02.

5-2-15. Max Gain Adjustment (VC-179 (A)/179 (B) board)

Correct the differences in the minimum illuminance

If the illuminance is not consistent, the image level required for taking subjects in low illuminance will not be produced (dark).

Subject	White pattern standard picture frame
Measurement Point	VIDEO OUT terminal
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	15
Specified Value	EVI-D30 A=450mV EVI-D31 A=460mV

Adjusting method:

- 1) Set data: 01 to page: 6, address: 00.
- 2) Set data: 04 to page: F, address: 2D.
- 3) Set data: 19 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
- 4) Change the data of page: F, address: 15, and adjust so that the signal level (A) becomes the specified value.
Note: The data of address: 15 should be 70 to FF
- 5) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

- 1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander
- 2) Return the data page: F, address: 2D to an initialized value.

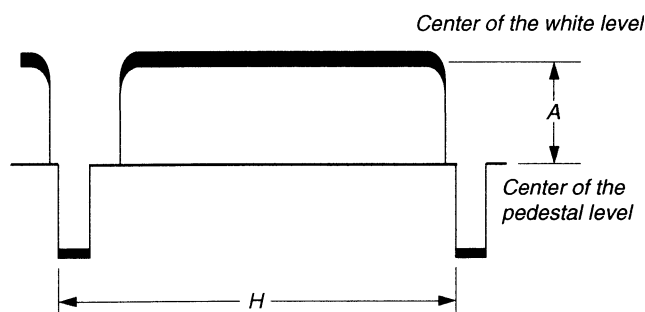


Fig. 5-13.

5-2-16. Auto White Balance Standard Data Input

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	0C, 0D, 0E, 0F

Adjusting method:

- 1) Turn the power of the unit OFF/ON.
- 2) Set data: 01 to page: 6, address: 00.
- 3) Check that the data of page: 6, address: 11 is 00.
- 4) Wait for 2 seconds.
- 5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
- 6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
(When the standard data is taken in, the data will be automatically input to addresses 0C to 0F of page F.)
- 7) Check that the data of page: 6, address: 11 is 01.

Processing after completing adjustments

- 1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.

5-2-17. Auto White Balance Adjustment

Adjust to the proper auto white balance output data

If it is not correct, auto white balance and color reproducibility will be poor

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the 2 digits of page A
Measuring Instrument	displayed
Adjustment Page	F
Adjustment Address	11, 12
Specified Value	R ratio: 2B40 to 2BC0 B ratio: 5E00 to 5F00

Adjusting method:

- 1) Place the C14 filter for color temperature correction on the lens.
- 2) Set data: 01 to page: 6, address: 00.
- 3) Set data: D0 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
- 4) Set data: 04 to page: 6, address: 02.
- 5) Change the data of page: F, address: 11, and adjust the average value of the page A display data to the R ratio specified value.
- 6) Press the PAUSE button of the adjusting remote commander
- 7) Set data: 05 to page: 6, address: 02.
- 8) Change the data of page: F, address: 12, and adjust the average value of the page A display data to the B ratio specified value.
- 9) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

- 1) Set data: E0 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
- 2) Set data: 00 to page: 6, address: 02.

5-2-18. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	VIDEO OUT terminal
Measuring Instrument	Vectorscope
Specified Value	7-14 A to C

Checking method:

- 1) Check that the lens is not covered with either filter.
- 2) Set data: 01 to page: 6, address: 00.
- 3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander
- 4) Check that the center of the white luminance point is within the circle shown in Fig. 5-14. A.
- 5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
- 6) Set data: 23 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
- 7) Place the C14 filter on the lens.
- 8) Check that the center of the white luminance point settles in the circle shown in Fig. 5-14. B.
- 9) Remove the C14 filter, and place the ND filter 1.3 (1.0 + 0.3) on the lens.
- 10) Check that the center of the white luminance point settles in the circle shown in Fig. 5-14. C.

Processing after completing adjustments

- 1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
- 2) Set data: 00 to page: 6, address: 00, and press the PAUSE button.

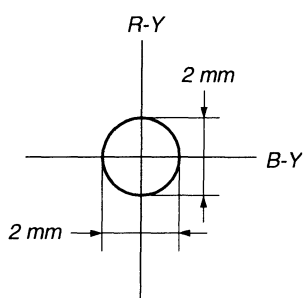


Fig. 5-14. A

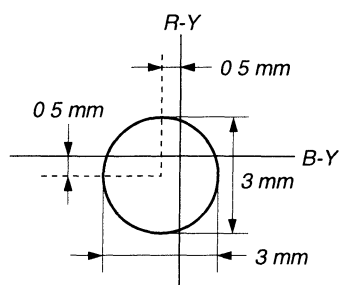


Fig. 5-14. B

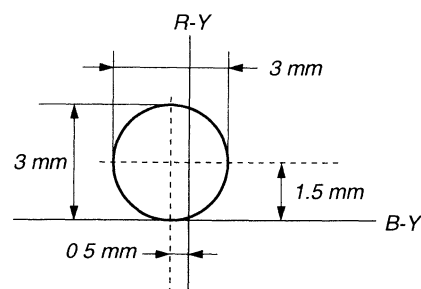


Fig. 5-14. C

5-2-19. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	VIDEO OUT terminal (Terminated at 75Ω)
Measuring Instrument	Oscilloscope
Specified Value	Y level = $650 \pm 60\text{mV}$ (NTSC) = $630 \pm 60\text{mV}$ (PAL) SYNC level = $286 \pm 40\text{mV}$ (NTSC) = $300 \pm 40\text{mV}$ (PAL) BURST level = $286 \pm 40\text{mV}$ (NTSC) = $300 \pm 40\text{mV}$ (PAL)

Checking method:

- 1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

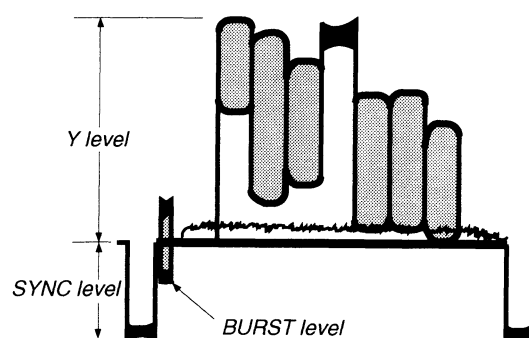


Fig. 5-15.

5-2-20. Page D Data Modification 2

After the camera adjustment, change the data of page D and address 01 to the following:

EVI-D30 (NTSC) Data: 04
EVI-D31 (PAL) Data: 05

5-2-21. Page 5 Data Initialization

Initializing method:

- 1) Page: B, address: 00, data: 01.
- 2) Check that the data of page: B, address: 02 is 00.
- 3) • EVI-D30 (NTSC)
Set data: 80 to page: B, address: 01 and press the PAUSE button of the adjusting remote commander.
• EVI-D31 (PAL)
Set data: 81 to page: B, address: 01 and press the PAUSE button of the adjusting remote commander.
- 4) Check that the data of page: B, address: 02 is 01.
- 5) Turn off the main power supply once.

5-2-22. Home Position Adjustment

Home position adjustment for Pan-Tilter is performed automatically.

Adjusting method:

Adjustment Page	5
Adjustment Address	50, 51, 52, 53, 54, 55, 56, 57, 58, 59

- 1) Set data: 01 to page: B, address: 00.
- 2) Check that the data of page: B, address: 02 is 00.
- 3) Set data: 10 to page: B, address: 01 and press the PAUSE button of the adjusting remote commander.
- 4) Check that the data of page: B, address: 02 is 01
- 5) Set data: 40 to page: 5, address: 5E and press the PAUSE button of the adjusting remote commander.
- 6) Turn off the main power supply once

Note: When the camera block has been removed from the pan tilt mechanism chassis, be sure to perform Home Position Adjustment.

5-3. ELECTRICAL BLOCK CHECK

5-3-1. MIC IN/AUDIO OUT Check

Measurement Point	AUDIO OUT terminal
Measurement Instrument	Audio generator, Audio level meter
Signal	1kHz, Sine wave, - 66dBs
Specified value	- 10 ± 4dBs

Checking method:

- 1) Input a sine wave of - 66dBs and 1kHz to the MIC IN on the rear of the set.
- 2) Connect level meter to AUDIO OUT on the rear of the set and measure the level.
- 3) The output level should satisfy the specified value

5-3-2. Pan Tilter Operation Check

Checking method:

- 1) Use the infrared remote commander or VISCA to send the commands to move the pan tilter horizontally and vertically.
- 2) Drive the pan tilter to the top and bottom end points and to left and right end points.
- 3) Check that the tilter operates normally

5-3-3. DATE and TIME Switch Check

Checking method:

- 1) Simultaneously press and hold down DATE switch and TIME switch for two seconds to enter the date and time setting mode.
- 2) Use DATE switch to send "Year" data, then use TIME switch to determine the year
- 3) Repeat step 2) and set "Month", "Days", "Hours" and "Minutes"
- 4) Check that the date and time can be set normally

5-3-4. Camera No Switch Check

Checking method:

- 1) Set CAMERA No switch on the rear of the set to "1". Press CAMERA No. "1" on the infrared remote commander and press "P-T RESET" button.
- 2) Perform step (1) for CAMERA No. "2" on the set and on the infrared remote commander.
- 3) Check that SIRCS LED (ORG) indicator is lit on the front of the set and the pan tilt reset operation is executed

SECTION 6

VISCA COMMAND LIST

6-1. VISCA Summary

EVI-D30/D31 uses a protocol called VISCA. In VISCA, the computer or other device issuing the commands is called the controller and the EVI-D30/D31 or other device receiving those commands is called the peripheral device. Under VISCA, up to 7 EVI-D30/D31 can be connected to one controller using RS-232C communications. The RS-232C parameters are communications speed of 9600 baud, data length of 8 bits, 1 stop bit, 1 start bit, and no parity. Flow control, such as XON/XOFF and RTS/CTS, is not used. The EVI-D30/D31 are connected in a daisy chain. The actual internal connections form a one-way ring, as shown in the figure below, so messages pass through all the EVI-D30/D31 and return to the controller. Each device has an address on this network. The address of the controller is always 0. The addresses of the EVI-D30/D31 are numbered 1, 2, 3, etc., in order from closer to the controller to farther away. As part of the initialization operations, the controller sends the address command to set the addresses for the EVI-D30/D31.

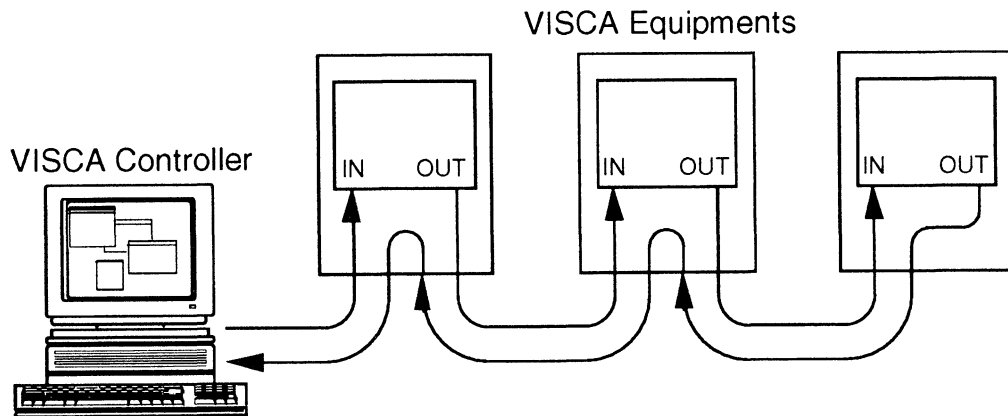


Fig. 6-1. VISCA Network

EVI-D30/D31 has a VISCA IN port and a VISCA OUT port. As viewed from the outside, both the VISCA IN and VISCA OUT ports have the connector pin layout shown in Fig. 6-2. During control by a computer, set the EVI-D30/D31 DTR input (the computer's S output) high.

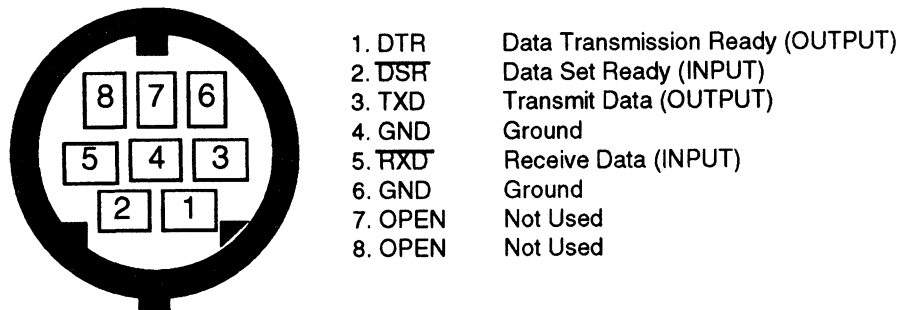


Fig. 6-2. VISCA Connector

6-2. EVI-D30/D31-VISCA Connection

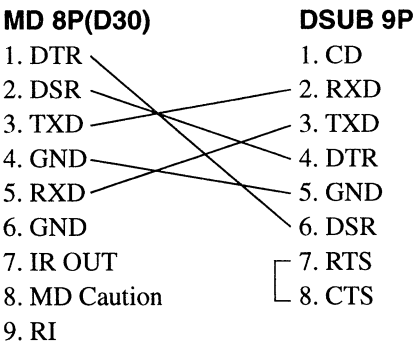


Fig. 6-3. VISCA Connection (Windows)

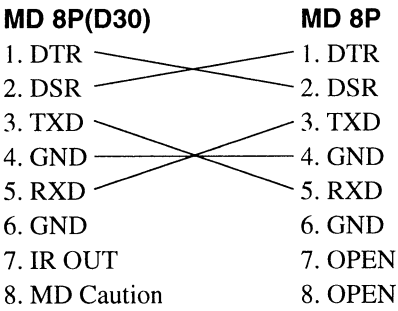


Fig. 6-4. VISCA Connection (Mac)

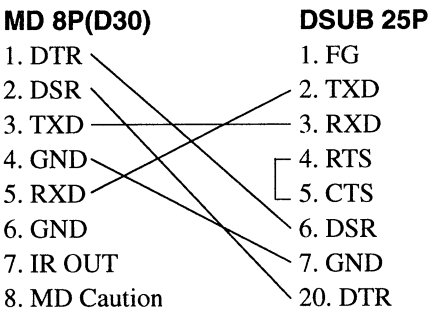


Fig. 6-5. VISCA Connection (PC98)

IR out

7pin is IR out port. Other remote comanders (carrier fruquency is 38KHz) is available.
out put level IR OUT switch (bottum of the camera S101) ON : 0 to 5Vdc
OFF : 0Vdc

When daisy chain, switch on only one camera, Its IR out is avilable.

MD caution

8pin is MD caution
out put level MD undetect : 0Vdc
MD detecting : 5Vdc

6-3. VISCA Communication Formats

6-3-1. VISCA Packet Structure

The basic unit for VISCA communications is the packet (shown in Fig. 6-6.). The first byte 1 in the packet is the header. It contains the sender and destination addresses. For example, the header for a packet sent from the computer at address 0 to EVI-D30/D31 at Address 1 is 81H (hexadecimal).

A packet sent to EVI-D30/D31 at Address 2 has a header of 82H. In the tables after pages, the header is listed as 8X. Insert the EVI-D30/D31 address in place of the X. The header for a packet sent in response from the EVI-D30/D31 at Address 1 is 90H. For a response packet from the EVI-D30/D31 at Address 2, the header is A0H.

Some of EVI-D30/D31 the setting commands can be sent to all the equipment at one time (broadcast). For a broadcast, the header is 88H. The terminator, FFH, ends the packet.

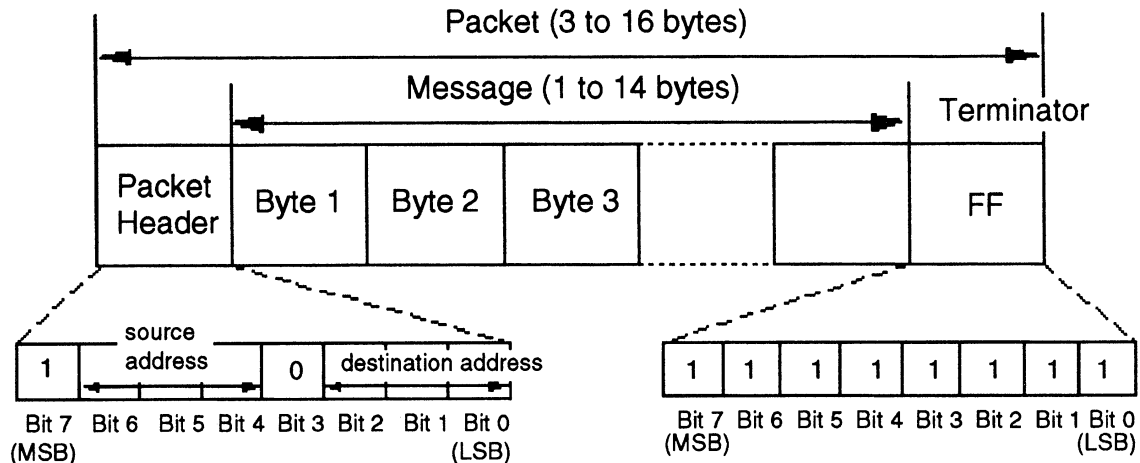


Fig. 6-6. VISCA Message Packet

6-3-2. Commands and Inquiries

Commands: Instruct the EVI-D30/D31 to carry out operations.

Inquiries: Instruct the EVI-D30/D31 to Inquire about the condition.

	Command Packet	Note
Command	8X 01 RR ... FF	RR = category code*
Inquiry	8X 09 RR ... FF	RR = category code*
*category code = 00 (Interface) , 04 (camera), 06 (pan/tilter)		
*X = 1 to 7 : Address of EVI-D30/D31.		

6-3-3. Responses to Commands and Inquiries

ACK message: Returned by EVI-D30/D31 when it has received a command.

Completion message: Returned by EVI-D30/D31 when it has completed execution of a command or inquiry. Please notice that it is returned when the micon of the camera starts to carry out the operation. For example Pan/Tilt, Zoom Tele/Focus Far/Near, it is returned before it has completed execution. Inspection for an inquiry instruction, the response data is from the 3rd byte on of the message packet.

	Reply Packet	Note
Ack	X0 4Y FF	Y = socket number
Completion (commands)	X0 5Y FF	Y = socket number
Completion (Inquiries)	X0 5Y ... FF	Y = socket number
X = 9 to F : EVI-D30/D31 address + 8		

Error message: The EVI-D30/D31 returns an error message instead of a Completion message when it cannot execute a command or inquiry instruction, or execution fails.

Error Packet	Description
X0 6Y 01 FF	Message length error (>14bytes)
X0 6Y 02 FF	Syntax Error
X0 6Y 03 FF	Command buffer full
X0 6Y 04 FF	Command cancelled
X0 6Y 05 FF	No socket (to be cancelled)
X0 6Y 41 FF	Time out
X0 6Y 42 FF	Search Error
X0 6Y 43 FF	Condition Error
X = 1 to 7 . EVI-D30/D31 address, Y = socket number	

6-3-4. Socket Number

When a command message is sent to a EVI-D30/D31, the controller usually waits for the completion message or error message from that EVI-D30/D31 before sending the next message. However, in order to provide higher level usage, the EVI-D30/D31 has two command buffers (memories) so it can receive up to two commands (including the one it is executing) at a time. When the EVI-D30/D31 receives a command, it sets the socket number in the ACK message to tell the controller which command buffer is used.

Since this socket number is also included in the completion message or error message, the controller can see which command was completed. Even when the EVI-D30/D31 is using both commands and inquiries, no ACK message is returned, but rather a completion message with Socket Number 0 is returned.

6-3-5. Command Execution Stop

To cancel a command that you have already sent, send the IF_Clear command. To cancel just one command when you have already sent two, use a cancel.

	Cancel Packet	Note
Cancel	8X 2Y FF	Y = socket number
X = 1 to 7 : EVI-D30/D31 address, Y = socket number		

6-4. EVI-D30/D31 Setting Commands (Network setting)

Before starting EVI-D30/D31 control, always broadcast the Address command and the IF_Clear command.

6-4-1. VISCA Network Management Commands

Address: Set the address for EVI-D30/D31. This command is used when the network is initialized and when the network change message below is received.

Network Change: This command is sent from EVI-D30/D31 to the controller when a device is removed from or added to the network. When this message is received, the controller needs to reset the address.

	Packet	Notes
Address	88 30 01 FF	Always broadcasted.
Network Change	X0 38 FF	
X = 9 to F : EVI-D30/D31 address + 8		

6-4-2. VISCA Interface Commands

IF_Clear: Clears the command buffers in the EVI-D30/D31 and stops the instruction being executed.

	Command Packet	Reply Packet
IF_Clear	8X 01 00 01 FF	X0 50 FF
IF_Clear (broadcast)	88 01 00 01 FF	88 01 00 01 FF
X = 1 to 7 : EVI-D30/D31 address (Inquiry packet)		
= 9 to F : EVI-D30/D31 address + 8 (reply packet)		

6-5. EVI-D30/D31 Functions

CAM_WB

1) Auto white balance (AWB)

For this unit's AWB, the TTL method is adopted to reproduce the colors of the subject as closely as possible by calculating the color data of the whole screen

Furthermore, the white balance area is limited to prevent operations that show all objects as white from being performed when white balance operations are performed.

The area for performing the auto white balance is also changed by determining whether it is indoors or outdoors according to the brightness.

2) Preset white balance

The preset white balance can be selected from fixed indoors (3200K) and fixed outdoors (5800K).

3) One push white balance

The one push white balance is a function which, when once the subject is set to certain lighting conditions, will expose the subject under these conditions by gaining white forcibly

The color is reproduced naturally without being affected by the surrounding conditions of the subject.

When set, the one-push white balance trigger is sent assuming that the white subject occupies more than 1/2 of the screen.

The one-push white balance data is provided when the lithium backup SW is ON even though the power is off (2 hours for fully-charged battery). When the lithium backup SW is off, the data will be lost when the power is turned off. Therefore, when turning off the power, set the one-push white balance again.

CAM_AE

1) Full auto

When the automatic exposure (AE) mode is set, the auto-iris, AGC (auto-gain), 1/60 sec shutter (EVI-D31 is 1/50 sec shutter) will operate.

When the power supply is turned on with the lithium backup off, the automatic exposure mode will be set.

2) Manual

When the manual mode is set, iris, gain and shutter will be set separately.

3) Bright Control

Bright Control is an adjustment function of the brightness with the combination of gain and iris. When in darkness, gain controls exposure and when in the brightness, iris controls exposure. Since both gain and iris are fixed, this function is useful when capturing images under fixed brightness condition. The status at auto exposure will be held once when changing the mode from auto exposure to Bright Control.

STEP	GAIN	IRIS	STEP	GAIN	IRIS	STEP	GAIN	IRIS
1	18dB	F1.8	9	0dB	F2.4	17	0dB	F9.6
2	15dB	F1.8	10	0dB	F2.8	18	0dB	F11
3	12dB	F1.8	11	0dB	F3.4	19	0dB	F14
4	9dB	F1.8	12	0dB	F4	20	0dB	F16
5	6dB	F1.8	13	0dB	F4.8	21	0dB	F19
6	3dB	F1.8	14	0dB	F5.6	22	0dB	F22
7	0dB	F1.8	15	0dB	F6.8	23	0dB	F28
8	0dB	F2.0	16	0dB	F8	24	0dB	CLOSE

Table. 6-1.

4) Shutter priority mode

The iris value is automatically adjusted to the electronic shutter selected (28 levels). Gain is also adjusted automatically.

5) Iris priority mode

Corresponding to selected iris position (17 different positions), shutter speed is adjusted automatically. Gain is in auto mode.

CAM_Back light

The backlight compensation function increases the brightness in the automatic exposure mode and shutter priority exposure mode (auto-iris AGC). It is useful for correcting the images of subjects which have turned out dark due to background light (sunlight, lamps, etc)

The brightness, when this function is off (auto iris, AGC), is taken as a reference, and the brightness can be increased up to 12 dB. Although the subject becomes brighter, the background will become white and saturate.

The iris and gain operations remain in the auto mode.

CAM_Position Preset

Camera functions can be preset in 6 different ways using the position preset function

Using this function pan/tilt, zoom position, focus (auto, manual positions), white balance, shutter, bright control (iris, gain) can be set to the desired state instantaneously without adjusting backlight compensation each time.

AT (Aut tracing) Mode

MD (Motion Detector) Mode

Please refer to Operating Instruction.

6-6. EVI-D30/D31 Commands

Command Set	Command	VISCA Packet	Comments
CAM_Power	On	8x 01 04 00 02 FF	
	Off	8x 01 04 00 03 FF	
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele (Standard)	8x 01 04 07 02 FF	
	Wide (Standard)	8x 01 04 07 03 FF	
	Tele (Variable)	8x 01 04 07 2Z FF	
	Wide (Variable)	8x 01 04 07 3Z FF	
	Direct	8x 01 04 47 0Z 0Z 0Z 0Z FF	
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far	8x 01 04 08 02 FF	
	Near	8x 01 04 08 03 FF	
	Auto focus on	8x 01 04 38 02 FF	
	Manual focus on	8x 01 04 38 03 FF	
	Auto/Manual	8x 01 04 38 10 FF	
	Direct	8x 01 04 48 0Z 0Z 0Z 0Z FF	
CAM_WB	Auto	8x 01 04 35 00 FF	
	Indoor mode	8x 01 04 35 01 FF	
	Outdoor mode	8x 01 04 35 02 FF	
	OnePush mode	8x 01 04 35 03 FF	
	OnePush trigger	8x 01 04 10 05 FF	
CAM_AE	Full Auto	8x 01 04 39 00 FF	
	Manual	8x 01 04 39 03 FF	
	Shutter priority	8x 01 04 39 0A FF	
	Iris priority	8x 01 04 39 0B FF	
	Bright control	8x 01 04 39 0D FF	
CAM_Bright	Reset	8x 01 04 0D 00 FF	
	Up	8x 01 04 0D 02 FF	
	Down	8x 01 04 0D 03 FF	
CAM_Shutter	Reset	8x 01 04 0A 00 FF	
	Up	8x 01 04 0A 02 FF	
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 0Z 0Z 0Z 0Z FF	
			ZZZZ : 0000 (1/60) to 001B (1/10000sec.)

Table. 6-2 (1).

Command Set	Command	VISCA Packet	Comments
CAM_Iris	Reset	8x 01 04 0B 00 FF	
	Up	8x 01 04 0B 02 FF	
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 0Z 0Z 0Z 0Z FF	
CAM_Gain	Reset	8x 01 04 0C 00 FF	
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 4C 0Z 0Z 0Z 0Z FF	
CAM_Backlight	On	8x 01 04 33 02 FF	
	Off	8x 01 04 33 03 FF	
CAM_Preset	Reset	8x 01 04 3F 00 0Z FF	Z : 0 (position1) to 5 (position6)
	Set	8x 01 04 3F 01 0Z FF	
	Recall	8x 01 04 3F 02 0Z FF	
CAM_KeyLock	Off	8x 01 04 17 00 FF	
	On	8x 01 04 17 02 FF	
IR_Reseive	On	8x 01 06 08 02 FF	not receive IR
	Off	8x 01 06 08 03 FF	
	On/Off	8x 01 06 08 10 FF	
IR_ReseiveReturn	On	8x 01 7D 01 03 00 00 FF	When receive IR, output the data
	Off	8x 01 7D 01 13 00 00 FF	
Wide_conLensSet		8x 01 07 26 00 0Z FF	When using wide con lens, compensats AT sensitivity. Z : 0 (not using) to 7 (x0 6)
AddressSet	broadcast	88 30 01 FF	Refer to 6-4 page
		8x 30 01 FF	
IF_Clear	broadcast	88 01 00 01 FF	Refer to 6-4 page
		8x 01 00 01 FF	
CommandCancel		8x 2Z FF	Z : socket No. 0 or 1

Table. 6-2 (2).

Command Set	Command	VISCA Packet	Comments
Pan-tiltDrive	Up	8x 01 06 01 VV WW 03 01 FF	VV : pan speed 01 to 18 (01 to 1C for D31) WW : tilt speed 01 to 14 (01 to 18 for D31)
	Down	8x 01 06 01 VV WW 03 02 FF	
	Left	8x 01 06 01 VV WW 01 03 FF	
	Right	8x 01 06 01 VV WW 02 03 FF	
	UpLeft	8x 01 06 01 VV WW 01 01 FF	
	UpRight	8x 01 06 01 VV WW 02 01 FF	
	DownLeft	8x 01 06 01 VV WW 01 02 FF	
	DownRight	8x 01 06 01 VV WW 02 02 FF	
	Stop	8x 01 06 01 VV WW 03 03 FF	
	Absolute position	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	YYYY : pan position FC90 to 0370 (center 0000)
	Relative position	8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	ZZZZ : tilt position FED4 to 012C (center 0000) W : 0 UpRight, 1 DownLeft
	Home	8x 01 06 04 FF	
	Reset	8x 01 06 05 FF	
Pan-tiltLimitSet	Limit set	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	YYYY : pan position FC90 to 0370 (center 0000)
	Limit clear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	ZZZZ tilt position FED4 to 012C (center 0000) W : 0 UpRight, 1 DownLeft

Table. 6-2 (3).

Command Set	Command	VISCA Packet	Comments
DataScreen	On	8x 01 06 06 02 FF	
	Off	8x 01 06 06 03 FF	
	On/Off	8x 01 06 06 10 FF	
AT_Mode	On	8x 01 07 01 02 FF	
	Off	8x 01 07 01 03 FF	
	On/Off	8x 01 07 01 10 FF	
AT_AE	On	8x 01 07 02 02 FF	
	Off	8x 01 07 02 03 FF	
	On/Off	8x 01 07 02 10 FF	
AT_AutoZoom	On	8x 01 07 03 02 FF	
	Off	8x 01 07 03 03 FF	
	On/Off	8x 01 07 03 10 FF	
AT/MD_Frame _ Display	On	8x 01 07 04 02 FF	
	Off	8x 01 07 04 03 FF	
	On/Off	8x 01 07 04 10 FF	
AT_Offset	On	8x 01 07 05 02 FF	
	Off	8x 01 07 05 03 FF	
	On/Off	8x 01 07 05 10 FF	
AT/MD_Start/Stop	Start/Stop	8x 01 07 06 10 FF	
AT_Chase	Chase1	8x 01 07 07 00 FF	
	Chase2	8x 01 07 07 01 FF	
	Chase3	8x 01 07 07 02 FF	
AT_Entry	Entry1	8x 01 07 15 00 FF	
	Entry2	8x 01 07 15 01 FF	
	Entry3	8x 01 07 15 02 FF	
	Entry4	8x 01 07 15 03 FF	
MD_Mode	On	8x 01 07 08 02 FF	
	Off	8x 01 07 08 03 FF	
	On/Off	8x 01 07 08 10 FF	
MD_Frame	Setting	8x 01 07 09 FF	
MD_Detect	Frame1/2/1 or 2	8x 01 07 0A 10 FF	
AT_LostInfo		8x 01 06 20 07 20 FF	
MD_LostInfo		8x 01 06 20 07 21 FF	
MD_Adjust	Y Level	8x 01 07 0B 00 0Z FF	
	Hue Level	8x 01 07 0C 00 0Z FF	
	Size	8x 01 07 0D 00 0Z FF	
	Display time	8x 01 07 0F 00 0Z FF	
	Refresh mode1	8x 01 07 10 00 FF	
	Refresh mode2	8x 01 07 10 01 FF	
	Refresh mode3	8x 01 07 10 02 FF	
	Refresh time	8x 01 07 0B 00 0Z FF	Z=0 to F

Table. 6-2 (4).

6-7. EVI-D30/D31 Inquiry Commands

Inquiry	Packet Inq	Packet Reply	Description
CAM_PowerInq	8x 09 04 00 FF	Y0 50 02 FF	On
		Y0 50 03 FF	Off
CAM_ZoomPosInq	8x 09 04 47 FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ : 0000 to 03FF
CAM_FocusAFModeInq	8x 09 04 38 FF	Y0 50 02 FF	Auto
		Y0 50 03 FF	Manual
CAM_FocusPosInq	8x 09 04 48 FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ : 0000 to FFFF
CAM_WBModeInq	8x 09 04 35 FF	Y0 50 00 FF	Auto
		Y0 50 01 FF	Indoor mode
		Y0 50 02 FF	Outdoor mode
		Y0 50 03 FF	OnePush mode
CAM_AEModeInq	8x 09 04 39 FF	Y0 50 00 FF	Full Auto
		Y0 50 03 FF	Manual
		Y0 50 0A FF	Shutter priority
		Y0 50 0B FF	Iris priority
		Y0 50 0D FF	Bright control
CAM_ShutterPosInq	8x 09 04 4A FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ : position
CAM_IrisPosInq	8x 09 04 4B FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ : position
CAM_GainPosInq	8x 09 04 4C FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ : position
CAM_Backlight ModeInq	8x 09 04 33 FF	Y0 50 02 FF	On
		Y0 50 03 FF	Off
CAM_MemoryInq	8x 09 04 3F FF	Y0 50 0Z FF	Z : 0 to 5
CAM_KeyLockInq	8x 09 04 17 FF	Y0 50 00 FF	Off
		Y0 50 02 FF	On
CAM_IDInq	8x 09 04 22 FF	Y0 50 00 00 0Z 0Z FF	ZZ : ID
IR_ReceiveModeInq	8x 09 06 08 FF	Y0 50 02 FF	On
		Y0 50 03 FF	Off
VideoSystemInq	8x 09 06 23 FF	Y0 50 00 FF	NTSC
		Y0 50 01 FF	PAL
Wide_conLensInq	8x 09 07 26 FF	Y0 50 00 0Z FF	Z : lens No.
Pan-tiltModeInq	8x 09 06 10 FF	Y0 50 ZZ ZZ FF	ZZZZ : status
Pan-tiltMaxSpeedInq	8x 09 06 11 FF	Y0 50 WW ZZ FF	WW : pan (00 to 18), ZZ : tilt (00 to 14)
Pan-tiltPosInq	8x 09 06 12 FF	Y0 50 0W 0W 0W 0W 0Z 0Z 0Z 0Z FF	WWWW : pan (FC90 to 0370) ZZZZ : tilt (FED4 to 012C)

Table. 6-3 (1).

Inquiry	Packet Inq	Packet Reply	Description
DatascreeInq	8x 09 06 06 FF	Y0 50 02 FF	On
		Y0 50 03 FF	Off
AT/MD_ModeInq	8x 09 07 22 FF	Y0 50 00 FF	Normal mode
		Y0 50 01 FF	AT mode
		Y0 50 02 FF	MD mode
AT_ModeInq	8x 09 07 23 FF	Y0 50 ZZ ZZ FF	ZZZZ : status
AT_EntryInq	8x 09 07 15 FF	Y0 50 00 FF	entry mode1
		Y0 50 01 FF	entry mode2
		Y0 50 02 FF	entry mode3
		Y0 50 03 FF	entry mode4
MD_ModeInq	8x 09 07 24 FF	Y0 50 ZZ ZZ FF	ZZ : status
AT_ObjectPosInq	8x 09 07 20 FF	Y0 50 VV WW 0Z FF	VV : X (04 to 2A), WW : Y (03 to 1B) ZZ : status 00 (setting), 01 (working), 10 (lost a subject), 11 (memorizing)
MD_ObjectPosInq	8x 09 07 21 FF	Y0 50 VV WW 0Z FF	VV : X (04 to 2A), WW : Y (03 to 1B) ZZ : status 00 (setting), 01 (undetected) 02 (detecting), 03 (memorizing)
MD_Y LevelInq	8x 09 07 0B FF	Y0 50 00 0Z FF	Z : 0 to F
MD_Hue LevelInq	8x 09 07 0C FF	Y0 50 00 0Z FF	
MD_SizeInq	8x 09 07 0D FF	Y0 50 00 0Z FF	
MD_Dis. TimeInq	8x 09 07 0F FF	Y0 50 00 0Z FF	
MD_Ref. ModeInq	8x 09 07 10 FF	Y0 50 00 FF	Refresh mode1
		Y0 50 01 FF	Refresh mode2
		Y0 50 02 FF	Refresh mode3
MD_Ref. TimeInq	8x 09 07 11 FF	Y0 50 00 0Z FF	Z : 0 to F
IR_ReceiveReturn		Y0 07 7D 01 04 00 FF	Power ON/OFF
		Y0 07 7D 01 04 07 FF	Zoom Tele/Wide
		Y0 07 7D 01 04 38 FF	AF ON/OFF
		Y0 07 7D 01 04 33 FF	CAM_Backlight
		Y0 07 7D 01 04 3F FF	CAM_Memory
		Y0 07 7D 01 06 FF	Pan-tiltDrive
		Y0 07 7D 01 07 23 FF	AT_Mode ON/OFF
		Y0 07 7D 01 07 24 FF	MD_Mode ON/OFF

Table. 6-3 (2).

6-8. Code List

Code list for Shutter, Iris, Gain and Wide con lens

Code	Shutter (1/X sec.)	Iris	Gain (dB)
0	60 (D31 : 50)	CLOSE	- 3
1	60	F28	0
2	75	F22	3
3	90	F19	6
4	100	F16	9
5	125 (D31 : 120)	F14	12
6	150	F11	15
7	180	F9.6	18
8	215	F8	
9	250	F6.8	
A	300	F5.6	
B	350	F4.8	
C	425	F4	
D	500	F3.4	
E	600	F2.8	
F	725	F2.4	
10	850	F2	
11	1000	F1.8	
12	1250		
13	1500		
14	1750		
15	2000		
16	2500		
17	3000		
18	3500		
19	4000		
1A	6000		
1B	10000		

Code	Wide Con lens No.
0	1.0
1	0.9
2	0.85
3	0.8
4	0.75
5	0.7
6	0.65
7	0.6

Code list for Pan/Tilter status

Z	Z	Z	Z	
0---	----	0---	---1	Pan left end
0---	----	0---	--1-	Pan right end
0---	----	0---	-1--	Tilt up end
0---	----	0---	1---	Tilt down end
0---	----	--00	----	Pan normal
0---	----	--01	----	Pan position error
0---	----	--10	----	Pan mechanical failure
0---	--00	0---	----	Tilt normal
0---	--01	0---	----	Tilt position error
0---	--10	0---	----	Tilt mechanical failure
0---	00--	0---	----	Pan/Tilt no move
0---	01--	0---	----	Pan/Tilt moving
0---	10--	0---	----	Pan/Tilt moving finished
0---	11--	0---	----	Pan/Tilt moving failed
0-00	----	0---	----	Pan/Tilt not initialized
0-01	----	0---	----	Pan/Tilt under initialize
0-10	----	0---	----	Pan/Tilt initialize finished
0-11	----	0---	----	Pan/Tilt initialize failed

Code list for AT mode status

0---	----	0---	--00	AT frame chase
0---	----	0---	--01	AT Pan chase
0---	----	0---	--10	AT frame/Pan chase
0---	----	0---	-1--	AT offset
0---	----	0---	1---	AT AE on/off
0---	----	0--1	----	AT zoom on/off
0---	----	0-1-	----	AT frame display on/off
0---	--00	0---	----	AT setting
0---	--01	0---	----	AT working
0---	--10	0---	----	AT lost
0---	--11	0---	----	AT memorizing

Code list for MD mode status

0---	----	0---	-000	MD detection method
0---	----	0---	-001	MD setting
0---	----	0---	-01x	MD undetect
0---	----	0---	-10x	MD detecting
0---	----	0---	-11x	MD memorizing
0---	----	0--0	1---	MD frame 1
0---	----	0--1	0---	MD frame 2
0---	----	0--1	1---	MD frame 1 or 2
0---	----	0-1-	0-1-	MD frame display

6-9. VISCA Communications Examples

Network initialization (The receiving data is for when 3 VISCA devices are connected)

Sending	Receiving	Function
88 01 00 01 FF	88 01 00 01 FF	Clear message (broadcast) Reply to Clear message
88 30 01 FF	88 30 04 FF	Address message (broadcast) Reply to Address message (broadcast)

The 3rd byte of the reply to an address message is the number of connected devices plus 1. In this example, three devices are connected, so this byte is 04.

Setting the focus position of the first EVI-D30/D31 to 0105H.

Sending	Receiving	Function
88 01 04 48 00 01 00 05 FF	90 41 FF 90 51 FF	Focus Direct command ACK of Focus Direct command Focus Direct command completed

Setting the focus position of the first EVI-D30/D31 to 0105H.

Sending	Receiving	Function
81 01 04 07 02 FF	90 41 FF 90 51 FF	Zoom Tele command ACK of Zoom Tele command Zoom Tele command completed (zoom tele starts)
81 01 04 07 00 FF	90 41 FF 90 51 FF	Zoom Stop command ACK of Zoom Stop command Zoom Stop command completed (zoom tele stops)

CAM_Zoom Tele/Wide and CAM_Focus Far/Near work until Camera_Zoom Stop, Camera_Focus Stop or other command is sent. CAM_Zoom Tele/Wide and CAM_Focus Far/Near can not be sent simultaneously.

Inquiry about whether AF is ON or OFF, the position of zoom and the position of focus
(In case it is inquired continually)

Sending	Receiving	Function
81 09 04 47 FF	90 41 FF	ZoomInq command ACK of ZoomInq command (socket 1)
81 09 04 38 FF	90 50 02 FF	AFModeInq command Auto Focus Mode
81 09 04 48 FF	90 42 FF 90 51 00 02 01 0E FF 90 52 00 01 00 05 FF	FocusInq command ACK of FocusInq command (socket 2) Zoom Position 021EH (socket 1) Focus Position 0105H (socket 2)

In case of Inquiry command, it might take around 0.5 second to receive the reply after the command is sent.

In case of sending the second command before receiving the first reply, ACK socket number and the completion message socket number should be checked.

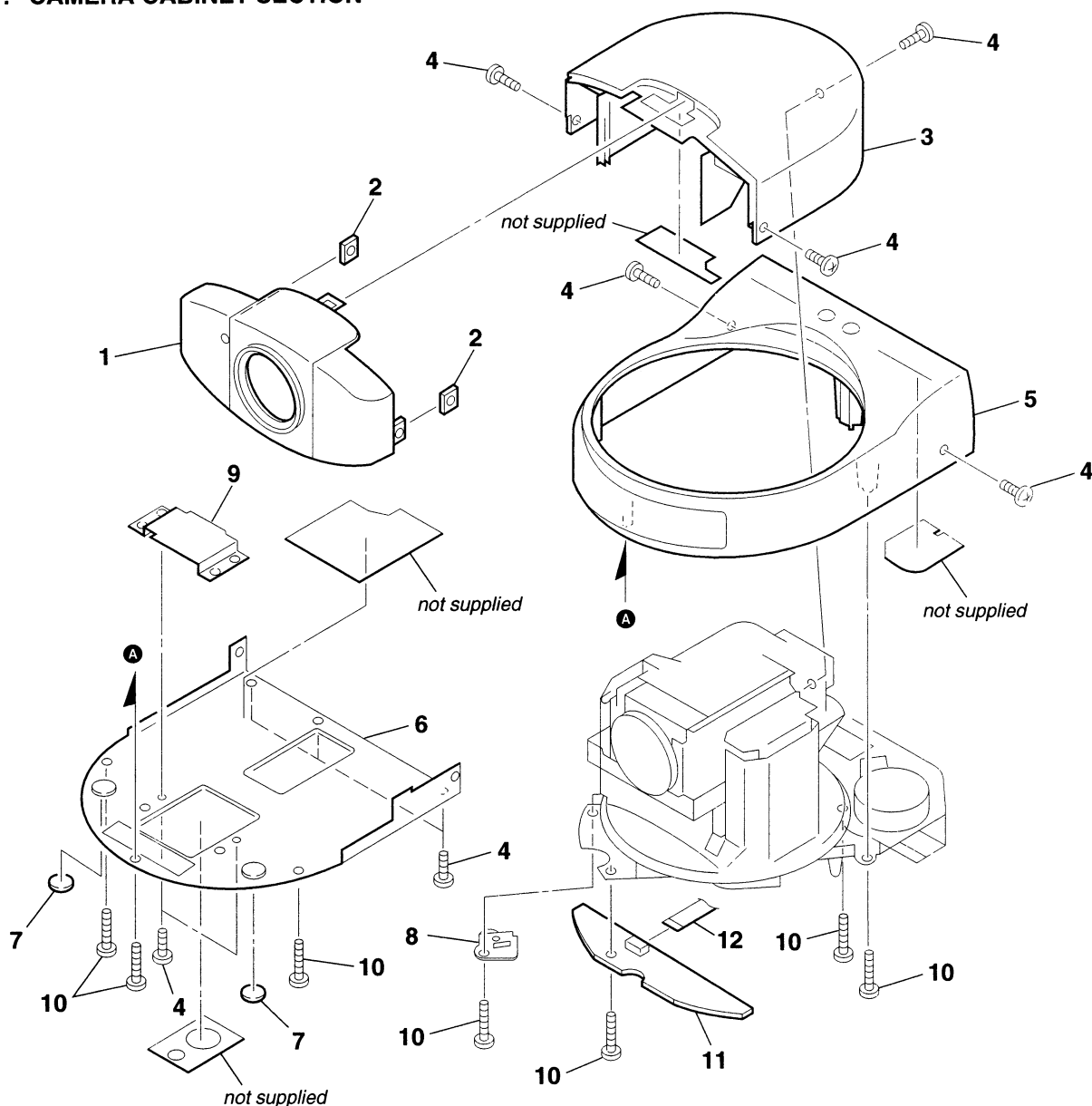
SECTION 7 REPAIR PARTS LIST

7-1. EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX and -X mean standardized parts, so they may have some difference from the original one
- Accessories and packing materials are given in the last of this parts list

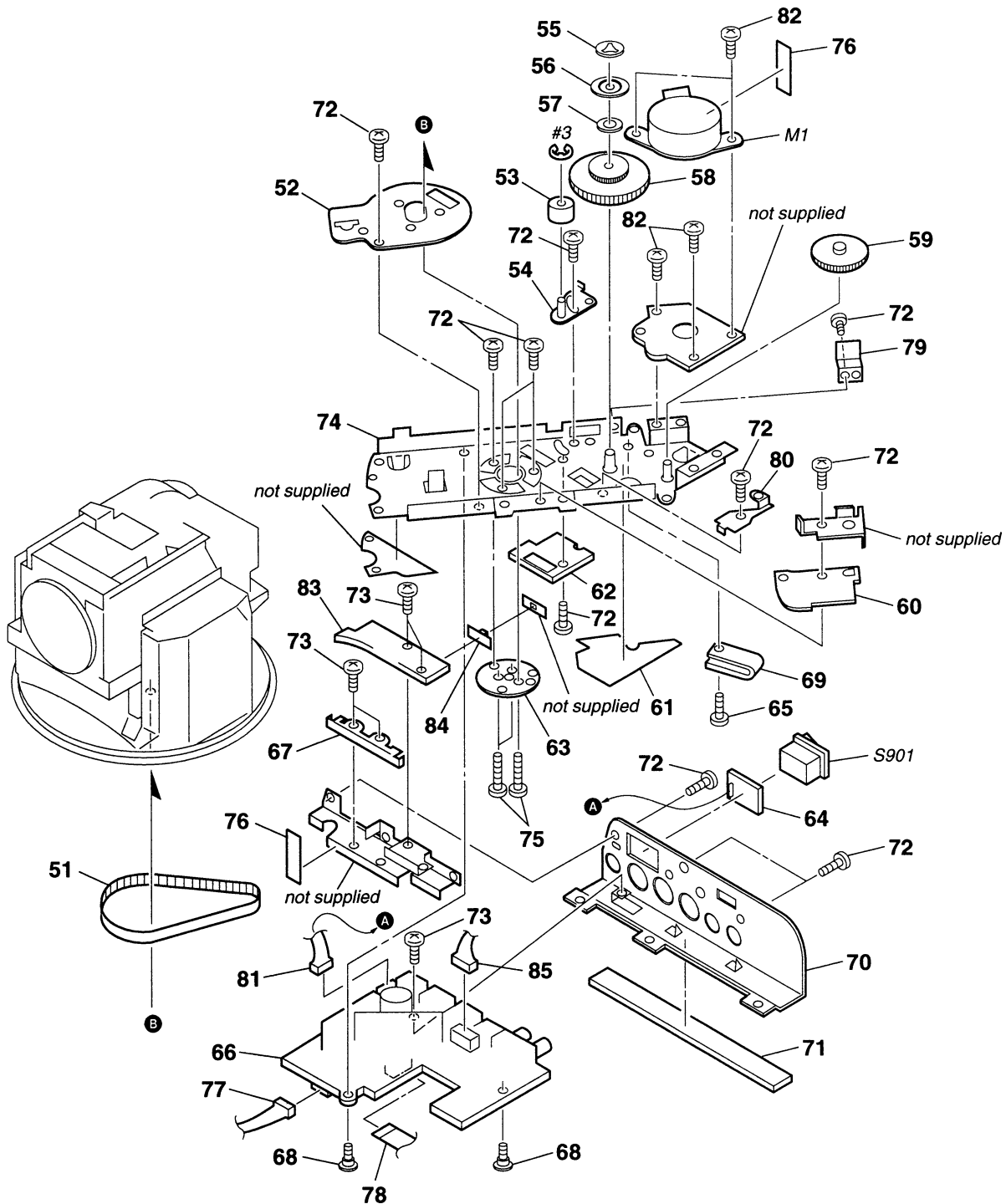
7-1-1. CAMERA CABINET SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	X-3946-600-2	CABINET (FRONT) ASSY, CAMERA		7	3-740-607-01	CUSHION	
2	3-718-233-01	NUT, PLATE		* 8	3-971-400-01	PLATE (P), GROUND	
3	3-971-324-02	CABINET (UPPER), CAMERA		* 9	3-971-383-01	LID, TRIPOD	
4	3-719-381-01	SCREW (M2X4)		10	3-971-322-01	SCREW (2 6X8)	
5	X-3946-599-3	CABINET ASSY, MAIN		* 11	A-7070-768-A	RM-77 (A) MOUNT (D30)	
* 6	X-3946-422-1	PLATE ASSY, BOTTOM		* 11	A-7070-798-A	RM-77 (B) MOUNT (D31)	
				12	1-777-304-11	CABLE, FLAT 7P	

7-1-2. PAN BASE SECTION

#3 7-624-104-04 STOPRING 2 0, TYPE -E



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	3-971-346-01	BELT, TIMING		* 67	3-972-542-01	PLATE, ID GROUND	
52	3-972-548-01	PLATE, PAN SLIDER		68	3-730-107-01	SCREW (M2X2.2)	
53	3-971-354-01	PULLEY, TENSION		* 69	3-971-641-01	HOLDER (LOWER), PAN	
* 54	X-3946-396-1	ARM ASSY, PULLEY		* 70	3-971-393-02	PANEL, REAR	
* 55	3-650-537-01	WASHER		71	3-971-634-01	FOOT (REAR)	
56	3-971-398-01	STOPPER, BELT EXTRACT		72	3-719-381-01	SCREW (M2X4)	
57	3-972-547-01	WASHER, PULLEY		73	3-713-786-91	SCREW (M2X3)	
58	3-971-343-01	PULLEY		* 74	X-3946-394-2	BASE ASSY, PAN	
59	3-971-342-01	GEAR, PAN DECELERATION		75	3-719-381-21	SCREW (M2X6)	
* 60	1-661-956-11	PWB, LI-55 (D30)		76	3-849-226-01	CLOTH, UNWEAVED (25X6X0.5)	
* 60	1-661-956-21	PWB, LI-55P (D31)		77	1-956-267-11	HARNESS (IL-52)	
* 61	3-971-381-01	INSULATOR, PAN BASE		78	1-777-302-11	CABLE, FLEXIBLE FLAT FFC-186 14P	
* 62	3-971-640-01	HOLDER (UPPER), PAN		79	3-973-626-01	STOPPER, P	
* 63	3-971-399-01	BRACKET, MAIN SHAFT		80	3-973-625-02	SPRING, PULLEY	
* 64	1-663-895-13	PWB, PS-398 (D30)		81	1-956-781-11	HARNESS (PS-97)	
* 64	1-661-895-23	PWB, PS-398P (D31)		82	4-906-127-01	SCREW (3X4) (G), TAPPING, (+) P	
65	3-719-381-71	SCREW (M2X8)		* 83	A-7072-770-A	SW-279 (A) MOUNT (D30)	
* 66	A-7072-762-A	ID-11 (A) MOUNT (D30)		* 83	A-7072-800-A	SW-279 (B) MOUNT (D31)	
* 66	A-7072-792-A	ID-11 (B) MOUNT (D31)		84	3-952-317-01	BUTTON, DBB	
				85	1-956-268-11	HARNESS (IS-55)	
				M1	1-698-797-12	MOTOR, DC (STEPPING MOTOR) (PAN)	
				S901	1-762-902-11	SWITCH, POWER (POWER)	

**** Note ****

Take note of the combination of the following parts (power switch, harness, PS-398/398P boards, fuse) in replacements.
Except for cases 1, 2, and 3, parts cannot be combined.

EVI-D30

	PS-398 board	Fuse (F901)	Switch (S901)	Harness (No. 81)
Case 1	None	None	1-762-025-11	PW-52 1-956-271-11
Case 2	1-663-895-12	2.5A 1-533-804-21	1-762-902-11	PS-97 1-956-781-11
Case 3	1-663-895-13	3.15A 1-576-269-21	1-762-902-11	PS-97 1-956-781-11

For case 1 : ① If the switch or harness is faulty, replace all parts of case 3.

For case 2 : ① If the switch or harness is faulty, replace all faulty parts.

② If the fuse or board is faulty, replace the parts of case 3.

For case 3 : ① Replace the faulty parts.

EVI-D31

	PS-398P board	Fuse (F901)	Switch (S901)	Harness (No. 81)
Case 1	None	None	1-762-025-11	PW-52 1-956-271-11
Case 2	1-663-895-22	None	1-762-902-11	PS-97 1-956-781-11
Case 3	1-663-895-23	None	1-762-902-11	PS-97 1-956-781-11

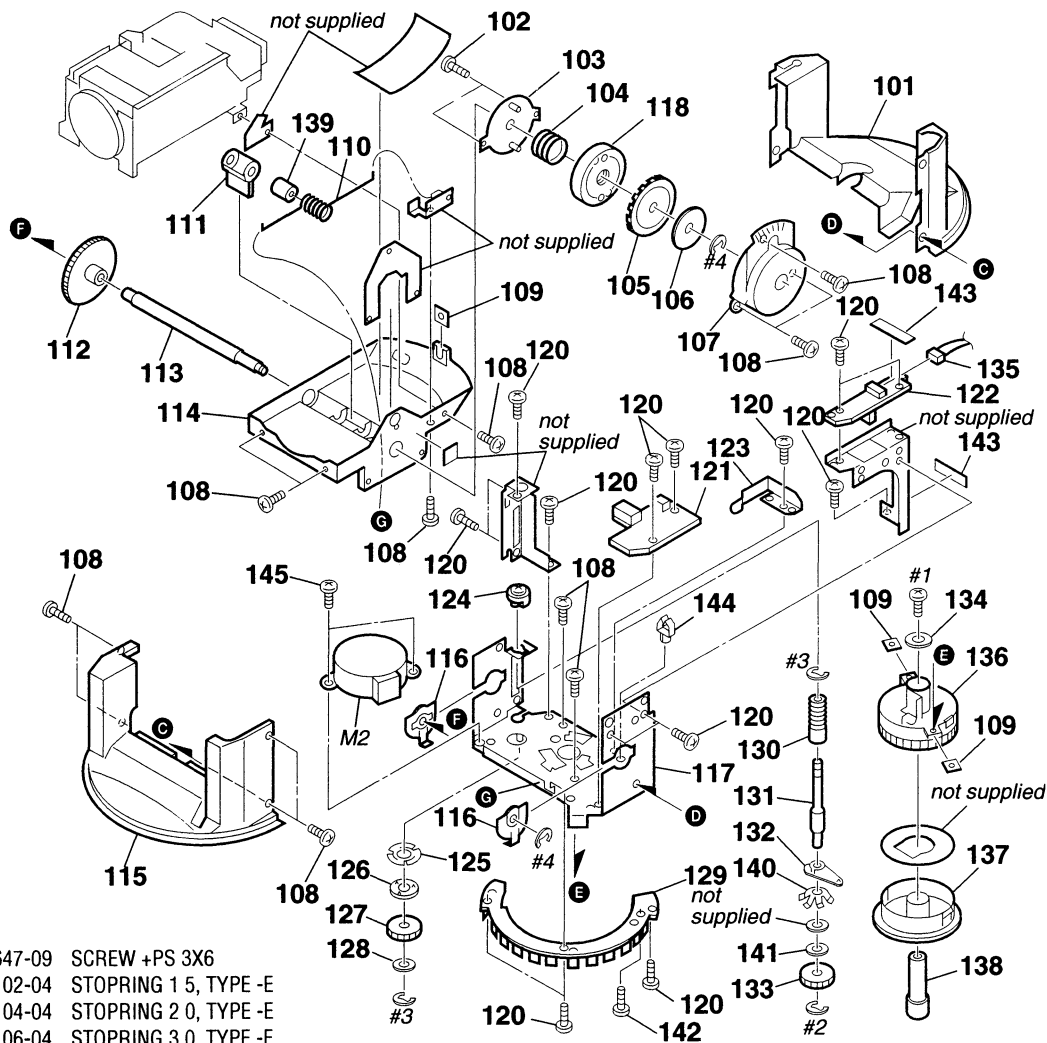
For case 1 : ① If the switch or harness is faulty, replace all parts of case 3.

For case 2 : ① If the board is faulty, replace all parts of case 3.

② If the switch or harness is faulty, replace the faulty parts.

For case 3 : ① Replace the faulty parts.

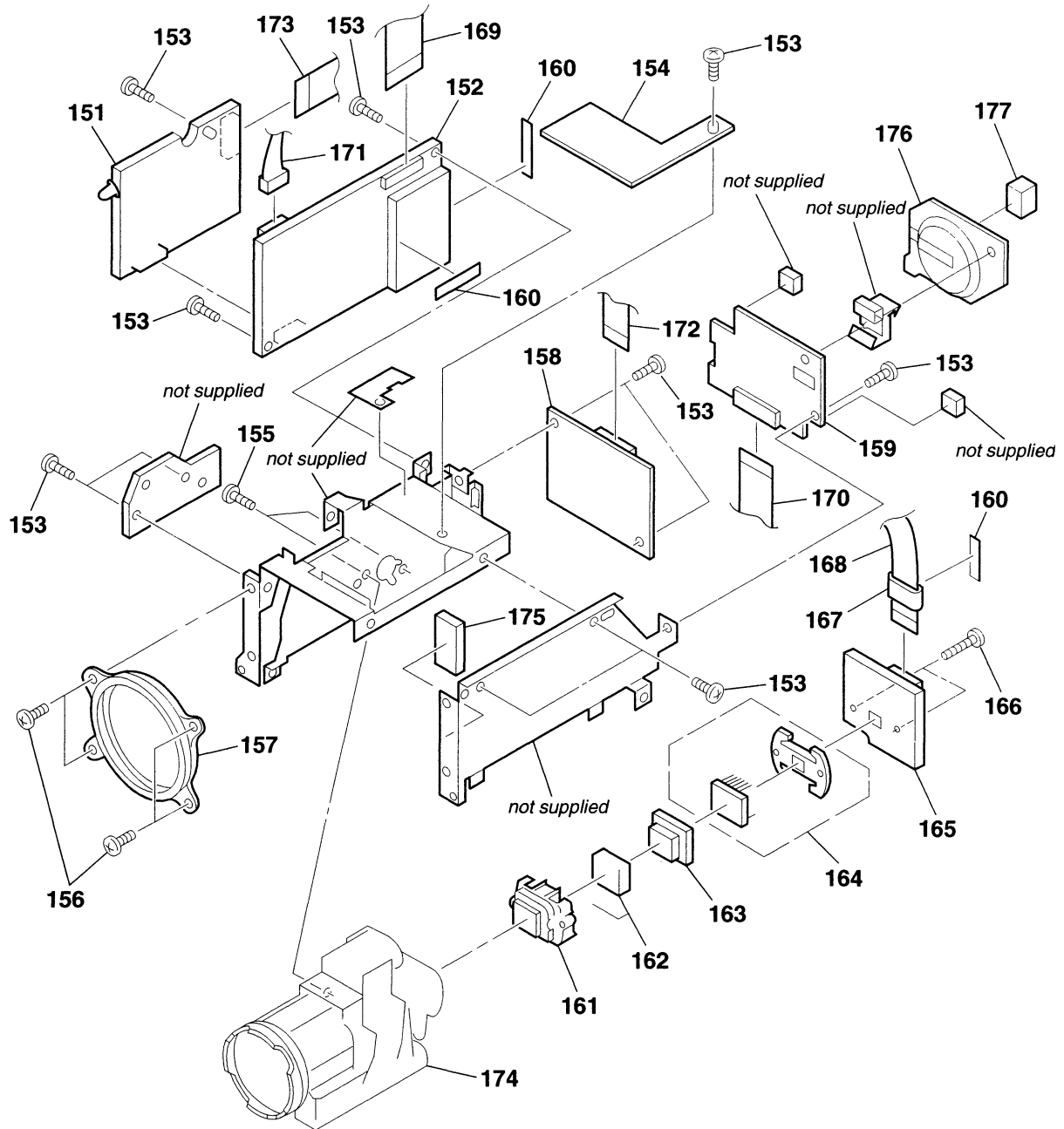
7-1-3. TILT BASE SECTION



#1	7-682-647-09	SCREW +PS 3X6
#2	7-624-102-04	STOPRING 1 5, TYPE -E
#3	7-624-104-04	STOPRING 2 0, TYPE -E
#4	7-624-106-04	STOPRING 3 0, TYPE -E

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	3-971-362-02	CABINET (REAR), PAN		* 123	3-971-349-01	PLATE, MAIN SHAFT GROUND	
102	3-945-884-31	SCREW		124	3-971-341-01	BEARING (B), WORM	
* 103	X-3946-397-1	RETAINER ASSY		125	3-971-636-01	SPRING, FRICTION	
104	3-971-368-01	SPRING, COMPRESSION		* 126	3-971-639-01	PLATE, GEAR	
105	3-971-372-01	DISK		127	3-971-334-01	GEAR, TILT DECELERATION	
106	3-971-374-01	REINFORCEMENT, ROTARY		128	3-701-439-11	WASHER	
107	3-971-328-03	CASE, CLUTCH		* 129	3-971-377-02	WING, PAN SENSOR	
108	3-719-381-01	SCREW (M2X4)		130	3-971-356-02	GEAR, WORM	
109	3-718-233-01	NUT, PLATE		131	3-971-335-01	SHAFT, TILT WORM	
110	3-971-360-01	SPRING, TORSION		132	3-971-340-01	BEARING (A), WORM	
111	3-971-327-01	JOINT, FLEXIBLE		133	3-971-333-01	GEAR, TILT (MIDWAY)	
112	3-971-357-01	GEAR, TILT		134	3-971-323-01	WASHER	
* 113	3-971-329-01	SHAFT, TILT		135	1-956-270-11	HARNESS (LL-51)	
114	3-971-326-02	CABINET (LOWER), CAMERA		136	3-971-364-01	BEARING, MAIN SHAFT	
115	3-971-361-02	CABINET (FRONT), PAN		137	3-971-344-01	PULLEY, PAN	
116	3-971-330-01	BEARING, TILT		138	3-971-348-01	SHAFT, MAIN	
* 117	X-3946-395-1	BASE ASSY, TILT		139	3-973-487-01	SLEEVE, TILT	
118	3-971-367-01	PLATE, CLICK		140	3-973-488-01	SPRING, T FRICTION	
120	3-713-786-91	SCREW (M2X3)		141	3-973-489-01	WASHER, T	
* 121	1-661-955-12	PWB, LI-52 (D30)		142	3-948-339-41	SCREW, TAPPING	
* 121	1-661-955-22	PWB, LI-52P (D31)		143	3-849-226-01	CLOTH, UNWEAVED (25X6X0 5)	
* 122	1-661-957-11	PWB, LI-59 (D30)		144	3-972-239-01	CLAMP, MINIATURE	
* 122	1-661-957-21	PWB, LI-59P (D31)		145	4-906-127-01	SCREW (3X4) (G), TAPPING, (+) P	
				M2	1-698-797-22	MOTOR, DC (STEPPING MOTOR) (TILT)	

7-1-4. LENS SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 151	A-7072-761-A	AT-21 (A) MOUNT (D30)		163	3-960-149-01	RUBBER (3), SEAL	
* 151	A-7072-791-A	AT-21 (B) MOUNT (D31)		164	A-8045-273-A	CCD BLOCK ASSY (AUTO) (D30)	
* 152	A-7072-759-A	VC-179 (A) MOUNT (D30)		164	A-8045-279-A	CCD BLOCK ASSY (AUTO) (D31)	
* 152	A-7072-790-A	VC-179 (B) MOUNT (D31)		* 165	A-7072-771-A	CD-154 (A) MOUNTED PWB (D30)	
153	3-713-786-91	SCREW (M2X3)		* 165	A-7072-801-A	CD-154 (B) MOUNTED PWB (D31)	
* 154	A-7072-764-A	LD-84 (A) MOUNTED PWB (D30)		166	3-947-268-01	TITE (2), +B TAPPING (P)	
* 154	A-7072-794-A	LD-84 (B) MOUNTED PWB (D31)		167	1-500-227-31	BEAD, FERRITE	
155	3-945-884-31	SCREW		168	1-657-183-11	PC BOARD, FP-314 FLEXIBLE	
156	3-971-319-01	SCREW (M2.6X3)		169	1-777-299-11	CABLE, FLEXIBLE FLAT (FFC-186) 25P	
* 157	3-956-683-21	ADAPTOR, F FITTING		170	1-777-303-11	CABLE, FLEXIBLE FLAT (FFC-187) 25P	
* 158	A-7072-760-A	MD-68 (A) MOUNT		171	1-956-269-11	HARNESS (VA-54)	
* 159	A-7072-769-A	RS-67 (A) MOUNT (D30)		172	1-777-301-11	CABLE, FLEXIBLE FLAT (FFC-185) 20P	
* 159	A-7072-799-A	RS-67 (B) MOUNT (D31)		173	1-777-300-11	CABLE, FLEXIBLE FLAT (FFC-184) 20P	
160	3-849-226-01	CLOTH, UNWEAVED (25X6X0.5)		174	1-547-716-31	LENS, ZOOM (VCL-5412WA)	
161	3-946-856-11	ADAPTOR (H), CCD FITTING		175	3-973-270-01	SPACER, LENS	
162	1-547-735-51	FILTER BLOCK, OPTICAL		* 176	1-661-958-11	PWB, LB-47 (D30)	
				* 176	1-661-958-21	PWB, LB-47P (D31)	
				177	3-973-269-01	SPACER, LB	

7-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal oxide-film resistor
F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service
Some delay should be anticipated when ordering these items
- SEMICONDUCTORS
In each case, u : μ , for example:
uA : μ A uPA : μ PA
uPB : μ PB uPC : μ PC uPD : μ PD
- CAPACITORS
uF : μ F
- COILS
uH : μ H

When indicating parts by reference number, please include the board

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-7072-761-A	AT-21 (A) MOUNT (D30)				< RESISTOR >	
*	A-7072-791-A	AT-21 (B) MOUNT (D31)		R801	1-216-841-11	METAL CHIP 47K 5%	1/16W
		*****		R802	1-216-833-91	RES,CHIP 10K 5%	1/16W
		(Ref No 1,000 series)		R803	1-216-857-11	METAL CHIP 1M 5%	1/16W
		< CAPACITOR >		R804	1-216-841-11	METAL CHIP 47K 5%	1/16W
C801	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V		R805	1-216-833-91	RES,CHIP 10K 5%	1/16W
C802	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V		R810	1-216-841-11	METAL CHIP 47K 5%	1/16W
C803	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V		R812	1-216-841-11	METAL CHIP 47K 5%	1/16W
C804	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V		R813	1-216-841-11	METAL CHIP 47K 5%	1/16W
C805	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V		R814	1-216-841-11	METAL CHIP 47K 5%	1/16W
C806	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V		R815	1-216-833-91	RES,CHIP 10K 5%	1/16W
C830	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V		R816	1-216-833-91	RES,CHIP 10K 5%	1/16W
		< CONNECTOR >		R817	1-216-841-11	METAL CHIP 47K 5%	1/16W
CN845	1-691-519-11	CONNECTOR, BOARD TO BOARD 30P		R818	1-216-841-11	METAL CHIP 47K 5%	1/16W
CN893	1-750-342-21	CONNECTOR, FFC/EPC (ZIF) 20P		R819	1-216-841-11	METAL CHIP 47K 5%	1/16W
* CN894	1-580-789-21	PIN, CONNECTOR (SMD) 6P		R820	1-216-841-11	METAL CHIP 47K 5%	1/16W
		< DIODE >		R836	1-216-814-11	METAL CHIP 270 5%	1/16W
D801	8-719-938-69	DIODE GL3PR8				< VIBRATOR >	
D802	8-719-420-83	DIODE MA3075WA-(TX)		X801	1-579-553-11	VIBRATOR (12MHz)	
D803	8-719-420-83	DIODE MA3075WA-(TX)				*****	
D804	8-719-420-83	DIODE MA3075WA-(TX)					
D805	8-719-420-83	DIODE MA3075WA-(TX)		*	A-7072-771-A	CD-154 (A) MOUNT (D30)	
				*	A-7072-801-A	CD-154 (B) MOUNT (D31)	

D806	8-719-422-91	DIODE MA8091-TX				< CAPACITOR >	
D807	8-719-420-83	DIODE MA3075WA-(TX)		C891	1-135-214-21	TANTAL CHIP 4.7uF 20% 20V	
D808	8-719-420-83	DIODE MA3075WA-(TX)		C892	1-135-210-11	TANTALUM CHIP 4.7uF 20% 10V	
D809	8-719-420-83	DIODE MA3075WA-(TX)		C894	1-164-346-11	CERAMIC CHIP 1uF 16V	
		< IC >		C895	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
IC801	8-759-391-16	IC CXD8497R		C896	1-104-908-11	TANTAL CHIP 47uF 20% 4V	
IC802	8-759-527-29	IC HD6437034AR05F				< CONNECTOR >	
IC803	8-759-464-95	IC AK6420AF-E2		CN891	1-750-340-21	CONNECTOR, FFC/EPC (ZIF) 16P	
IC804	8-759-438-74	IC TC74AC05F(EL)				< COIL >	
		< COIL >		L891	1-412-963-11	INDUCTOR 100uH	
L801	1-412-058-11	INDUCTOR CHIP 10uH				< TRANSISTOR >	
L802	1-412-058-11	INDUCTOR CHIP 10uH		Q891	8-729-232-86	TRANSISTOR 2SK1875-(TE85L)	
L803	1-412-058-11	INDUCTOR CHIP 10uH		Q892	8-729-144-28	TRANSISTOR 2SC4178-F13F14-T1	
		< TRANSISTOR >					
Q801	8-729-029-14	TRANSISTOR DTC144EUA-T106					
Q802	8-729-420-12	TRANSISTOR XN4213-TW					
Q803	8-729-420-12	TRANSISTOR XN4213-TW					

Ref. No.	Part No.	Description	Remark		
< RESISTOR >					
R892	1-216-829-11	METAL CHIP 4 7K	5%	1/16W	
R893	1-216-840-11	METAL CHIP 39K	5%	1/16W	
R894	1-216-820-11	METAL CHIP 820	5%	1/16W	
R895	1-216-845-11	METAL CHIP 100K	5%	1/16W	
R896	1-216-809-11	METAL CHIP 100	5%	1/16W	
R897	1-216-833-91	RES,CHIP 10K	5%	1/16W	

*	A-7072-762-A	ID-11 (A) MOUNT (D30)			
*	A-7072-792-A	ID-11 (B) MOUNT (D31)			

< CAPACITOR >					
C101	1-163-025-11	CERAMIC CHIP 0 001uF		50V	
C137	1-165-319-11	CERAMIC CHIP 0 1uF		50V	
C138	1-165-319-11	CERAMIC CHIP 0 1uF		50V	
C139	1-165-319-11	CERAMIC CHIP 0 1uF		50V	
C141	1-104-851-11	TANTAL CHIP 10uF	20%	10V	
C143	1-104-913-11	TANTAL. CHIP 10uF	20%	16V	
C147	1-104-851-11	TANTAL CHIP 10uF	20%	10V	
C148	1-104-851-11	TANTAL. CHIP 10uF	20%	10V	
C149	1-162-974-11	CERAMIC CHIP 0 01uF		50V	
C151	1-164-004-11	CERAMIC CHIP 0 1uF	10%	25V	
C152	1-164-004-11	CERAMIC CHIP 0 1uF	10%	25V	
C153	1-164-004-11	CERAMIC CHIP 0 1uF	10%	25V	
C154	1-163-015-91	CERAMIC CHIP 0.0033uF	10%	50V	
C155	1-163-015-91	CERAMIC CHIP 0 0033uF	10%	50V	
C162	1-126-942-61	ELECT 1000uF	20%	25V	
C168	1-104-919-11	TANTAL CHIP 10uF	20%	25V	
C169	1-135-099-91	TANTALUM CHIP 2 2uF	20%	6 3V	
C170	1-164-346-11	CERAMIC CHIP 1uF		16V	
C171	1-135-099-91	TANTALUM CHIP 2 2uF	20%	6 3V	
C172	1-135-091-91	TANTALUM CHIP 1uF	20%	16V	
C173	1-104-849-91	TANTAL CHIP 22uF	20%	6 3V	
C174	1-135-227-11	TANTAL CHIP 100uF	20%	6 3V	
C175	1-165-319-11	CERAMIC CHIP 0 1uF		50V	
C176	1-104-752-11	TANTAL CHIP 33uF	20%	6 3V	
C177	1-135-099-91	TANTALUM CHIP 2 2uF	20%	6 3V	
C178	1-104-753-11	TANTAL CHIP 47uF	20%	6.3V	
C179	1-104-753-11	TANTAL CHIP 47uF	20%	6 3V	
C180	1-135-099-91	TANTALUM CHIP 2 2uF	20%	6.3V	
C181	1-135-259-11	TANTAL CHIP 10uF	20%	6 3V	
C187	1-104-851-11	TANTAL CHIP 10uF	20%	10V	
C188	1-135-099-91	TANTALUM CHIP 2 2uF	20%	6 3V	
C189	1-104-753-11	TANTAL CHIP 47uF	20%	6.3V	
C190	1-115-565-11	CERAMIC CHIP 2 2uF	10%	10V	
C220	1-164-004-11	CERAMIC CHIP 0 1uF	10%	25V	
< CONNECTOR >					
* CN102	1-580-057-11	PIN, CONNECTOR (SMD) 4P			
CN103	1-750-355-21	CONNECTOR, FFC/FPC (ZIF) 20P			
CN104	1-750-355-21	CONNECTOR, FFC/FPC (ZIF) 20P			
* CN105	1-770-469-21	PIN, CONNECTOR (PC BOARD) 2P			
CN106	1-691-486-11	CONNECTOR, FFC/FPC 7P			
* CN108	1-764-177-11	PIN, CONNECTOR (SMD)(1.5MM) 7P			
CN109	1-750-352-11	CONNECTOR, FFC/FPC (ZIF) 14P			
* CN110	1-750-005-11	PIN, CONNECTOR (PC BOARD) 4P			

Ref. No.	Part No.	Description	Remark
< DIODE >			
D101	8-719-421-59	DIODE MA3130WA-TX	
D102	8-719-421-59	DIODE MA3130WA-TX	
D103	8-719-421-59	DIODE MA3130WA-TX	
D104	8-719-404-50	DIODE MA111-TX	
D105	8-719-404-50	DIODE MA111-TX	
D106	8-719-059-51	DIODE MA3J142E0LSO	
D109	8-719-421-59	DIODE MA3130WA-TX	
D110	8-719-421-59	DIODE MA3130WA-TX	
D112	8-719-050-90	DIODE MA736-TX	
D113	8-719-050-90	DIODE MA736-TX	
D114	8-719-050-90	DIODE MA736-TX	
D115	8-719-050-90	DIODE MA736-TX	
D116	8-719-050-90	DIODE MA736-TX	
D117	8-719-050-90	DIODE MA736-TX	
D118	8-719-050-90	DIODE MA736-TX	
D119	8-719-050-90	DIODE MA736-TX	
D121	8-719-422-91	DIODE MA8091-TX	
D151	8-719-820-41	DIODE 1SS302-TE85L	
D152	8-719-059-51	DIODE MA3J142E0LSO	
D153	8-719-421-59	DIODE MA3130WA-TX	
D154	8-719-421-59	DIODE MA3130WA-TX	
D155	8-719-422-91	DIODE MA8091-TX	
D156	8-719-059-51	DIODE MA3J142E0LSO	
D157	8-719-421-59	DIODE MA3130WA-TX	
D158	8-719-421-59	DIODE MA3130WA-TX	
D159	8-719-421-59	DIODE MA3130WA-TX	
D160	8-719-421-59	DIODE MA3130WA-TX	
D161	8-719-820-41	DIODE 1SS302-TE85L	
D162	8-719-059-53	DIODE MA3J14700LSO	
D163	8-719-421-27	DIODE MA728-TX	
D164	8-719-421-59	DIODE MA3130WA-TX	
D165	8-719-421-59	DIODE MA3130WA-TX	
D166	8-719-421-59	DIODE MA3130WA-TX	
D167	8-719-421-59	DIODE MA3130WA-TX	
D168	8-719-422-91	DIODE MA8091-TX	
D169	8-719-422-91	DIODE MA8091-TX	
D170	8-719-422-91	DIODE MA8091-TX	
< FUSE >			
F101	1-533-380-21	FUSE, CHIP (1A/12V) (D30)	
F102	1-533-380-21	FUSE, CHIP (1A/12V) (D30)	
F103	1-533-380-21	FUSE, CHIP (1A/12V) (D30)	
< IC >			
IC101	8-759-711-58	IC NJM78L05UA-TE1	
IC102	8-759-428-66	IC TC7W04F(TE12R)	
IC103	8-759-259-77	IC PQ20VZ5U	
IC104	8-759-265-40	IC MAX202CSE-T	
IC105	8-759-354-60	IC TA8435H	
IC106	8-759-354-60	IC TA8435H	
IC107	8-759-255-62	IC BA3308F-E2	
IC109	8-759-366-35	IC TC4W66F(TE12R)	
IC110	8-759-711-58	IC NJM78L05UA-TE1	

ID-11 (A)/11 (B)

Ref. No.	Part No.	Description	Remark
		< JACK >	
J101	1-774-741-11	JACK, DC	
J102	1-573-112-11	SOCKET, CONNECTOR 8P	
J103	1-573-112-11	SOCKET, CONNECTOR 8P	
J104	1-566-849-11	CONNECTOR, (S) TERMINAL 4P	
J105	1-580-441-31	JACK, PIN 2P	
		< COIL >	
L102	1-414-226-21	INDUCTOR CHIP 0	
L103	1-414-226-21	INDUCTOR CHIP 0	
L104	1-414-226-21	INDUCTOR CHIP 0	
L105	1-414-226-21	INDUCTOR CHIP 0	
L106	1-414-081-11	INDUCTOR 33uH	
L107	1-414-226-21	INDUCTOR CHIP 0	
L108	1-414-226-21	INDUCTOR CHIP 0	
L109	1-414-226-21	INDUCTOR CHIP 0	
L110	1-414-226-21	INDUCTOR CHIP 0	
L111	1-414-078-11	INDUCTOR 10uH	
L112	1-414-078-11	INDUCTOR 10uH	
L113	1-500-113-22	FERRITE	
L114	1-500-113-22	FERRITE	
L115	1-500-113-22	FERRITE	
L116	1-500-113-22	FERRITE	
L117	1-500-113-22	FERRITE	
L118	1-500-113-22	FERRITE	
L119	1-500-113-22	FERRITE	
L120	1-500-113-22	FERRITE	
L121	1-500-113-22	FERRITE	
L122	1-500-113-22	FERRITE	
L123	1-500-113-22	FERRITE	
L124	1-500-113-22	FERRITE	
L125	1-500-113-22	FERRITE	
L126	1-500-113-22	FERRITE	
L127	1-500-113-22	FERRITE	
		< IC LINK >	
PS101	1-533-400-11	LINK, CHIP IC (1A/60V) (D31)	
PS102	1-533-400-11	LINK, CHIP IC (1A/60V) (D31)	
PS103	1-533-400-11	LINK, CHIP IC (1A/60V) (D31)	
		< TRANSISTOR >	
Q101	8-729-026-52	TRANSISTOR 2SA1576A-T106-QR	
Q102	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q105	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q106	8-729-026-52	TRANSISTOR 2SA1576A-T106-QR	
Q107	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q108	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q109	8-729-026-52	TRANSISTOR 2SA1576A-T106-QR	
Q110	8-729-905-38	TRANSISTOR 2SC4081T106R	
Q112	8-729-231-72	TRANSISTOR 2SC3326N-TE85L-AB	
Q113	8-729-231-72	TRANSISTOR 2SC3326N-TE85L-AB	
Q114	8-729-026-52	TRANSISTOR 2SA1576A-T106-QR	
Q116	8-729-231-72	TRANSISTOR 2SC3326N-TE85L-AB	
Q118	8-729-905-38	TRANSISTOR 2SC4081T106R	
Q119	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q120	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q121	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q122	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q123	8-729-029-14	TRANSISTOR DTC144EUA-T106	

Ref. No.	Part No.	Description	Remark
		< RESISTOR >	
R102	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R103	1-216-815-11	METAL CHIP 330 5% 1/16W	
R144	1-216-815-11	METAL CHIP 330 5% 1/16W	
R152	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R153	1-216-833-91	RES,CHIP 10K 5% 1/16W	
R155	1-218-294-11	RES,CHIP 30K 5% 1/16W	
R156	1-216-826-11	METAL CHIP 2 7K 5% 1/16W	
R159	1-216-833-91	RES,CHIP 10K 5% 1/16W	
R160	1-216-855-11	METAL CHIP 680K 5% 1/16W	
R163	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R164	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R169	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R170	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R171	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R172	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R173	1-216-829-11	METAL CHIP 4 7K 5% 1/16W	
R174	1-216-829-11	METAL CHIP 4 7K 5% 1/16W	
R175	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R176	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R177	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R178	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R183	1-216-150-91	RES,CHIP 10 5% 1/8W	
R184	1-216-150-91	RES,CHIP 10 5% 1/8W	
R185	1-216-150-91	RES,CHIP 10 5% 1/8W	
R186	1-216-150-91	RES,CHIP 10 5% 1/8W	
R187	1-216-150-91	RES,CHIP 10 5% 1/8W	
R188	1-216-150-91	RES,CHIP 10 5% 1/8W	
R189	1-216-150-91	RES,CHIP 10 5% 1/8W	
R190	1-216-150-91	RES,CHIP 10 5% 1/8W	
R191	1-216-150-91	RES,CHIP 10 5% 1/8W	
R192	1-216-150-91	RES,CHIP 10 5% 1/8W	
R193	1-216-150-91	RES,CHIP 10 5% 1/8W	
R194	1-216-150-91	RES,CHIP 10 5% 1/8W	
R195	1-216-150-91	RES,CHIP 10 5% 1/8W	
R196	1-216-150-91	RES,CHIP 10 5% 1/8W	
R197	1-216-150-91	RES,CHIP 10 5% 1/8W	
R198	1-216-150-91	RES,CHIP 10 5% 1/8W	
R203	1-216-828-11	METAL CHIP 3 9K 5% 1/16W	
R204	1-216-804-11	METAL CHIP 39 5% 1/16W	
R205	1-216-804-11	METAL CHIP 39 5% 1/16W	
R206	1-216-828-11	METAL CHIP 3 9K 5% 1/16W	
R207	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R208	1-216-809-11	METAL CHIP 100 5% 1/16W	
R209	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R210	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R211	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R212	1-216-829-11	METAL CHIP 4 7K 5% 1/16W	
R213	1-216-833-91	RES,CHIP 10K 5% 1/16W	
R214	1-216-828-11	METAL CHIP 3 9K 5% 1/16W	
R215	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R216	1-216-824-11	METAL CHIP 1 8K 5% 1/16W	
R217	1-216-829-11	METAL CHIP 4 7K 5% 1/16W	
R218	1-216-833-91	RES,CHIP 10K 5% 1/16W	
R219	1-216-825-11	METAL CHIP 2 2K 5% 1/16W	
R220	1-216-825-11	METAL CHIP 2 2K 5% 1/16W	

ID-11 (A)/11 (B)

LB-47 (A)/47 (B)

LD-84 (A)/84 (B)

Ref. No.	Part No.	Description			Remark
R221	1-216-818-11	METAL CHIP	560	5%	1/16W
R222	1-216-853-11	METAL CHIP	470K	5%	1/16W
R223	1-216-833-91	RES,CHIP	10K	5%	1/16W
R224	1-216-864-11	SHORT	0		
R238	1-216-841-11	METAL CHIP	47K	5%	1/16W
R239	1-216-841-11	METAL CHIP	47K	5%	1/16W
R240	1-216-841-11	METAL CHIP	47K	5%	1/16W
R241	1-216-835-11	METAL CHIP	15K	5%	1/16W
R242	1-216-837-11	METAL CHIP	22K	5%	1/16W
R243	1-216-833-91	RES,CHIP	10K	5%	1/16W
R244	1-216-841-11	METAL CHIP	47K	5%	1/16W
R245	1-216-845-11	METAL CHIP	100K	5%	1/16W
R246	1-216-841-11	METAL CHIP	47K	5%	1/16W
R253	1-216-822-11	METAL CHIP	1 2K	5%	1/16W
R257	1-216-839-11	METAL CHIP	33K	5%	1/16W
R258	1-216-833-91	RES,CHIP	10K	5%	1/16W
R259	1-216-822-11	METAL CHIP	1 2K	5%	1/16W
R260	1-216-841-11	METAL CHIP	47K	5%	1/16W
R262	1-216-841-11	METAL CHIP	47K	5%	1/16W
R263	1-216-827-11	METAL CHIP	3 3K	5%	1/16W
< SWITCH >					
S101	1-553-977-11	SWITCH, SLIDE (IR OUT)			
< TEST PIN >					
TP101	1-535-757-11	CHIP, CHECKER			
TP102	1-535-757-11	CHIP, CHECKER			
TP103	1-535-757-11	CHIP, CHECKER			
TP104	1-535-757-11	CHIP, CHECKER			
TP105	1-535-757-11	CHIP, CHECKER			
TP106	1-535-757-11	CHIP, CHECKER			
TP107	1-535-757-11	CHIP, CHECKER			
TP108	1-535-757-11	CHIP, CHECKERU			

	A-7072-763-A	LB-47 (A) MOUNT (D30)		not supplied	
	A-7072-793-A	LB-47 (B) MOUNT (D31)		not supplied	
*	1-661-958-11	PWB, LB-47 (D30)			
*	1-661-958-21	PWB, LB-47P (D31)			

< BATTERY >					
BT401	1-528-694-11	BATTERY, V/L RICHARGEABL			
< CONNECTOR >					
CN403	1-573-522-21	CONNECTOR, BOARD TO BOARD 14P			

*	A-7072-764-A	LD-84 (A) MOUNT (D30)			
*	A-7072-794-A	LD-84 (B) MOUNT (D31)			

< CAPACITOR >					
C701	1-164-004-11	CERAMIC CHIP	0 1uF	10%	25V
C702	1-162-964-11	CERAMIC CHIP	0 001uF	10%	50V
C703	1-162-974-11	CERAMIC CHIP	0 01uF		50V
C704	1-162-974-11	CERAMIC CHIP	0 01uF		50V
C705	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C706	1-164-156-11	CERAMIC CHIP	0 1uF		25V
C707	1-162-974-11	CERAMIC CHIP	0 01uF		50V
C708	1-104-752-11	TANTAL CHIP	33uF	20%	6 3V

Ref. No.	Part No.	Description	Remark		
C709	1-164-156-11	CERAMIC CHIP	0 1uF		25V
C710	1-162-974-11	CERAMIC CHIP	0 01uF		50V
C711	1-164-156-11	CERAMIC CHIP	0 1uF		25V
C712	1-162-974-11	CERAMIC CHIP	0 01uF		50V
C713	1-164-156-11	CERAMIC CHIP	0 1uF		25V
C714	1-135-181-21	TANTALUM CHIP	4 7uF	20%	6 3V
C715	1-162-974-11	CERAMIC CHIP	0 01uF		50V
< CONNECTOR >					
CN701	1-766-833-21	CONNECTOR, FFC/FPC (ZIF) 21P			
CN702	1-691-539-11	CONNECTOR, BOARD TO BOARD 30P			
< IC >					
IC701	8-759-349-19	IC NJM3414AM-TE2			
IC702	8-759-492-31	IC MPC17A134VMEL			
IC703	8-759-060-02	IC BA10324AF-E2			
IC704	8-752-365-65	IC CXD2126N-T4			
IC705	8-759-209-15	IC TC4SU69F(TE85R)			
< COIL >					
L701	1-412-062-11	INDUCTOR CHIP	47uH		
L702	1-414-078-11	INDUCTOR	10uH		
L703	1-412-058-11	INDUCTOR CHIP	10uH		
< TRANSISTOR >					
Q701	8-729-420-29	TRANSISTOR 2SD1819A-QRS-TX			
Q702	8-729-015-77	TRANSISTOR UN5211-TX			
< RESISTOR >					
R701	1-216-809-11	METAL CHIP	100	5%	1/16W
R702	1-216-821-11	METAL CHIP	1K	5%	1/16W
R703	1-216-845-11	METAL CHIP	100K	5%	1/16W
R704	1-216-848-11	METAL CHIP	180K	5%	1/16W
R705	1-216-855-11	METAL CHIP	680K	5%	1/16W
R706	1-216-848-11	METAL CHIP	180K	5%	1/16W
R707	1-216-833-91	RES,CHIP	10K	5%	1/16W
R708	1-216-837-11	METAL CHIP	22K	5%	1/16W
R709	1-216-837-11	METAL CHIP	22K	5%	1/16W
R710	1-216-826-11	METAL CHIP	2 7K	5%	1/16W
R711	1-216-841-11	METAL CHIP	47K	5%	1/16W
R712	1-216-841-11	METAL CHIP	47K	5%	1/16W
R713	1-216-820-11	METAL CHIP	820	5%	1/16W
R714	1-216-837-11	METAL CHIP	22K	5%	1/16W
R715	1-216-841-11	METAL CHIP	47K	5%	1/16W
R716	1-216-827-11	METAL CHIP	3 3K	5%	1/16W
R717	1-216-837-11	METAL CHIP	22K	5%	1/16W
R718	1-216-828-11	METAL CHIP	3 9K	5%	1/16W
R719	1-216-851-11	METAL CHIP	330K	5%	1/16W
R720	1-216-821-11	METAL CHIP	1K	5%	1/16W
R721	1-216-821-11	METAL CHIP	1K	5%	1/16W
R722	1-216-821-11	METAL CHIP	1K	5%	1/16W
R723	1-216-821-11	METAL CHIP	1K	5%	1/16W
R724	1-216-821-11	METAL CHIP	1K	5%	1/16W
R725	1-216-821-11	METAL CHIP	1K	5%	1/16W
R726	1-216-833-91	RES,CHIP	10K	5%	1/16W
R727	1-218-865-11	METAL CHIP	5 6K	0 50%	1/16W
R728	1-218-855-11	METAL CHIP	2 2K	0 50%	1/16W
R729	1-216-864-11	SHORT	0		(D31)
R730	1-216-864-11	SHORT	0		(D30)

LI-52 (A)/52 (B)
LI-55 (A)/55 (B)
LI-59 (A)/59 (B)
MD-68 (A)

Ref. No.	Part No.	Description	Remark
	A-7072-765-A	LB-52 (A) MOUNT (D30)	not supplied
	A-7072-795-A	LB-52 (B) MOUNT (D31)	not supplied
*	1-661-955-12	PWB,LI-52 (D30)	
*	1-661-955-22	PWB,LI-52P (D31)	

		< CONNECTOR >	
CN341	1-750-352-11	CONNECTOR, FFC/FPC (ZIF) 14P	
* CN342	1-750-005-11	PIN, CONNECTOR (PC BOARD) 4P	
* CN343	1-580-056-21	PIN, CONNECTOR (SMD) 3P	
		< PHOTO INTERRUPTER >	
PH341	8-749-012-73	PHOTO INTERRUPTER TLP830	

	A-7072-766-A	LI-55 (A) MOUNT (D30)	not supplied
	A-7072-796-A	LI-55 (B) MOUNT (D31)	not supplied
*	1-661-956-11	PWB,LI-55 (D30)	
*	1-661-956-21	PWB,LI-55P (D31)	

		< CONNECTOR >	
* CN361	1-580-057-11	PIN, CONNECTOR (SMD) 4P	
		< PHOTO INTERRUPTER >	
PH361	8-749-012-73	PHOTO INTERRUPTER TLP830	
PH362	8-749-012-73	PHOTO INTERRUPTER TLP830	

	A-7072-767-A	LI-59 (A) MOUNT (D30)	not supplied
	A-7072-797-A	LI-59 (B) MOUNT (D31)	not supplied
*	1-661-957-11	PWB,LI-59 (D30)	
*	1-661-957-21	PWB,LI-59P (D31)	

		< CONNECTOR >	
* CN351	1-580-056-21	PIN, CONNECTOR (SMD) 3P	
		< PHOTO INTERRUPTER >	
PH351	8-749-012-73	PHOTO INTERRUPTER TLP830	

*	A-7072-760-A	MD-68 (A) MOUNT	

		(Ref No 1,000 series)	
		< CAPACITOR >	
C102	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C103	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C104	1-107-685-11	TANTAL CHIP 15uF	20% 6.3V
C105	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C106	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C107	1-164-361-11	CERAMIC CHIP 0.047uF	16V
C108	1-135-091-91	TANTALUM CHIP 1uF	20% 20V
C109	1-164-361-11	CERAMIC CHIP 0.047uF	16V
C110	1-164-361-11	CERAMIC CHIP 0.047uF	16V
C111	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C112	1-104-851-11	TANTAL. CHIP 10uF	20% 10V
C113	1-107-685-11	TANTAL CHIP 15uF	20% 6.3V
C114	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C115	1-162-968-11	CERAMIC CHIP 0.0047uF	10% 50V
C116	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C117	1-164-361-11	CERAMIC CHIP 0.047uF	16V
C118	1-164-361-11	CERAMIC CHIP 0.047uF	16V

Ref. No.	Part No.	Description	Remark
C119	1-164-361-11	CERAMIC CHIP 0.047uF	16V
C120	1-164-361-11	CERAMIC CHIP 0.047uF	16V
C121	1-164-361-11	CERAMIC CHIP 0.047uF	16V
C122	1-164-361-11	CERAMIC CHIP 0.047uF	16V
C123	1-164-361-11	CERAMIC CHIP 0.047uF	16V
C124	1-164-361-11	CERAMIC CHIP 0.047uF	16V
C125	1-164-361-11	CERAMIC CHIP 0.047uF	16V
C126	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C127	1-162-919-11	CERAMIC CHIP 22PF	5% 50V
C128	1-162-918-11	CERAMIC CHIP 18PF	5% 50V
C129	1-135-259-11	TANTAL CHIP 10uF	20% 6.3V
C130	1-162-974-11	CERAMIC CHIP 0.01uF	50V
		< CONNECTOR >	
* CN101	1-580-056-21	PIN, CONNECTOR (SMD) 3P	
CN102	1-774-201-11	CONNECTOR, FFC/FPC 25P	
CN105	1-750-342-21	CONNECTOR, FFC/EPC (ZIF) 20P	
CN106	1-774-201-11	CONNECTOR, FFC/FPC 25P	
		< DIODE >	
D104	8-719-059-51	DIODE MA3J142E0LSO	
D105	8-719-421-27	DIODE MA728-TX	
D106	8-719-421-27	DIODE MA728-TX	
D107	8-719-421-27	DIODE MA728-TX	
D108	8-719-422-91	DIODE MA8091-TX	
D109	8-719-422-91	DIODE MA8091-TX	
D110	8-719-422-91	DIODE MA8091-TX	
		< IC >	
IC101	8-759-458-91	IC MB89098RPFV-G-153-BND	
IC102	8-759-464-95	IC AK6420AF-E2	
IC103	8-759-295-62	IC S-8423DFS-T2	
IC104	8-759-536-72	IC TL1596CPW-ELM2000	
IC105	8-759-259-77	IC PQ20VZ5U	
IC106	8-759-336-96	IC uPD6461GS-814-GLG-E2	
IC107	8-759-031-58	IC SC7SU04FER	
		< COIL >	
L101	1-414-081-11	INDUCTOR 33uH	
L102	1-414-078-11	INDUCTOR 10uH	
		< IC LINK >	
PS101	1-576-123-21	LINK, IC (0.8A)(CP2E20)	
		< TRANSISTOR >	
Q103	8-729-028-91	TRANSISTOR DTA144EUA-T106	
Q104	8-729-029-14	TRANSISTOR DTC144EUA-T106	
		< RESISTOR >	
R101	1-216-295-91	SHORT	0
R108	1-216-845-11	METAL CHIP 100K	5% 1/16W
R109	1-216-845-11	METAL CHIP 100K	5% 1/16W
R110	1-216-811-11	METAL CHIP 150	5% 1/16W
R111	1-216-841-11	METAL CHIP 47K	5% 1/16W
R112	1-216-836-11	METAL CHIP 18K	5% 1/16W
R113	1-216-836-11	METAL CHIP 18K	5% 1/16W
R114	1-216-851-11	METAL CHIP 330K	5% 1/16W
R115	1-216-817-11	METAL CHIP 470	5% 1/16W
R116	1-216-821-11	METAL CHIP 1K	5% 1/16W
R117	1-216-821-11	METAL CHIP 1K	5% 1/16W
R118	1-216-845-11	METAL CHIP 100K	5% 1/16W

MD-68 (A)

PS-398 (A)/398 (B)

RM-77 (A)/77 (B)

Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description			Remark
R119	1-216-845-11	METAL CHIP	100K	5%	1/16W	R188	1-216-821-11	METAL CHIP	1K	5%	1/16W
R120	1-216-864-11	SHORT	0			R189	1-216-821-11	METAL CHIP	1K	5%	1/16W
R121	1-216-826-11	METAL CHIP	2 7K	5%	1/16W						
R123	1-216-848-11	METAL CHIP	180K	5%	1/16W	R191	1-216-833-91	RES,CHIP	10K	5%	1/16W
R124	1-216-809-11	METAL CHIP	100	5%	1/16W	R192	1-216-833-91	RES,CHIP	10K	5%	1/16W
R125	1-216-833-91	RES,CHIP	10K	5%	1/16W	R193	1-216-833-91	RES,CHIP	10K	5%	1/16W
R126	1-216-833-91	RES,CHIP	10K	5%	1/16W	R194	1-216-833-91	RES,CHIP	10K	5%	1/16W
R127	1-216-834-11	METAL CHIP	12K	5%	1/16W	R195	1-216-833-91	RES,CHIP	10K	5%	1/16W
R128	1-216-826-11	METAL CHIP	2 7K	5%	1/16W	R196	1-216-833-91	RES,CHIP	10K	5%	1/16W
R131	1-216-841-11	METAL CHIP	47K	5%	1/16W	R197	1-216-833-91	RES,CHIP	10K	5%	1/16W
R132	1-216-811-11	METAL CHIP	150	5%	1/16W	R198	1-216-833-91	RES,CHIP	10K	5%	1/16W
R134	1-216-829-11	METAL CHIP	4 7K	5%	1/16W	R199	1-216-833-91	RES,CHIP	10K	5%	1/16W
R135	1-216-841-11	METAL CHIP	47K	5%	1/16W			< VIBRATOR >			
R136	1-216-841-11	METAL CHIP	47K	5%	1/16W	X101	1-760-458-21	VIBRATOR, CRYSTAL (32.768 KHz)			
R138	1-216-849-11	METAL CHIP	220K	5%	1/16W	XTL101	1-579-369-21	VIBRATOR (10MHz)			
R139	1-216-853-11	METAL CHIP	470K	5%	1/16W			*****			
R140	1-216-851-11	METAL CHIP	330K	5%	1/16W		A-7072-979-A	PS-398 (A) MOUNT (D30)		not supplied	
R141	1-216-049-91	RES,CHIP	1K	5%	1/10W		A-7072-987-A	PS-398 (B) MOUNT (D31)		not supplied	
R142	1-216-864-11	SHORT	0			*	1-663-895-13	PWB,PS-398 (D30)			
R144	1-216-864-11	SHORT	0			*	1-663-895-23	PWB,PS-398P(D31)			
R145	1-216-864-11	SHORT	0					*****			
R151	1-216-864-11	SHORT	0					< CONNECTOR >			
R152	1-216-864-11	SHORT	0			* CN901	1-770-469-21	PIN, CONNECTOR (PC BOARD) 2P			
R153	1-216-864-11	SHORT	0					< FUSE >			
R154	1-216-864-11	SHORT	0			F901	1-576-269-21	FUSE (SMD) (D30)			
R155	1-216-864-11	SHORT	0					*****			
R156	1-216-864-11	SHORT	0			*	A-7072-768-A	RM-77 (A) MOUNT (D30)			
R157	1-216-864-11	SHORT	0			*	A-7072-798-A	RM-77 (B) MOUNT (D31)			
R158	1-216-864-11	SHORT	0					*****			
R159	1-216-864-11	SHORT	0					< CAPACITOR >			
R160	1-216-864-11	SHORT	0			C381	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
R161	1-216-864-11	SHORT	0			C382	1-104-752-11	TANTAL CHIP	33uF	20%	6.3V
R162	1-216-864-11	SHORT	0			C383	1-162-974-11	CERAMIC CHIP	0 01uF		50V
R163	1-216-864-11	SHORT	0			C384	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
R164	1-216-864-11	SHORT	0					< CONNECTOR >			
R165	1-216-864-11	SHORT	0			CN381	1-691-486-11	CONNECTOR, FFC/FPC 7P			
R167	1-216-821-11	METAL CHIP	1K	5%	1/16W			< DIODE >			
R168	1-216-821-11	METAL CHIP	1K	5%	1/16W	D381	8-719-987-33	DIODE GL3HS8			
R169	1-216-821-11	METAL CHIP	1K	5%	1/16W	D382	8-719-938-67	DIODE GL3EG8			
R170	1-216-821-11	METAL CHIP	1K	5%	1/16W	D383	8-719-420-83	DIODE MA3075WA-(TX)			
R172	1-216-821-11	METAL CHIP	1K	5%	1/16W	D384	8-719-420-83	DIODE MA3075WA-(TX)			
R173	1-216-821-11	METAL CHIP	1K	5%	1/16W	D385	8-719-420-83	DIODE MA3075WA-(TX)			
R174	1-216-821-11	METAL CHIP	1K	5%	1/16W			< IC >			
R175	1-216-821-11	METAL CHIP	1K	5%	1/16W	IC381	8-759-016-29	IC RPM6938			
R176	1-216-821-11	METAL CHIP	1K	5%	1/16W	IC382	8-749-016-29	IC RPM6938			
R177	1-216-821-11	METAL CHIP	1K	5%	1/16W	IC383	8-759-235-15	IC TC74HC04AF(EL)			
R178	1-216-821-11	METAL CHIP	1K	5%	1/16W	IC384	8-749-016-29	IC RPM6938			
R179	1-216-821-11	METAL CHIP	1K	5%	1/16W			< TRANSISTOR >			
R180	1-216-821-11	METAL CHIP	1K	5%	1/16W	Q381	8-729-029-14	TRANSISTOR DTC144EUA-T106			
R181	1-216-821-11	METAL CHIP	1K	5%	1/16W			< RESISTOR >			
R182	1-216-821-11	METAL CHIP	1K	5%	1/16W	R381	1-216-815-11	METAL CHIP	330	5%	1/16W
R183	1-216-821-11	METAL CHIP	1K	5%	1/16W	R382	1-216-821-11	METAL CHIP	1K	5%	1/16W
R184	1-216-821-11	METAL CHIP	1K	5%	1/16W	R383	1-216-805-11	METAL CHIP	47	5%	1/16W
R185	1-216-821-11	METAL CHIP	1K	5%	1/16W	R384	1-216-805-11	METAL CHIP	47	5%	1/16W
R186	1-216-821-11	METAL CHIP	1K	5%	1/16W	R385	1-216-805-11	METAL CHIP	47	5%	1/16W
R187	1-216-821-11	METAL CHIP	1K	5%	1/16W			*****			

RS-67 (A)/67 (B)

SW-279 (A)/279 (B)

VC-179 (A)/179 (B)

Ref. No.	Part No.	Description	Remark
*	A-7072-769-A	RS-67 (A) MOUNT (D30)	
*	A-7072-799-A	RS-67 (B) MOUNT (D31)	

		< CAPACITOR >	
C401	1-162-974-11	CERAMIC CHIP 0 01uF	50V
C402	1-135-259-11	TANTAL CHIP 10uF	20% 6.3V
C403	1-162-974-11	CERAMIC CHIP 0 01uF	50V
C404	1-135-259-11	TANTAL CHIP 10uF	20% 6.3V
C405	1-162-914-11	CERAMIC CHIP 9PF	0.5PF 50V
C406	1-162-915-11	CERAMIC CHIP 10PF	0.5PF 50V
		< CONNECTOR >	
CN401	1-774-202-21	CONNECTOR, FFC/FPC 25P	
* CN402	1-691-922-11	CONNECTOR, BOARD TO BOARD 14P	
		< DIODE >	
D402	8-719-938-72	DIODE SB01-05CP-TB	
D404	8-719-420-83	DIODE MA3075WA-(TX)	
D405	8-719-420-83	DIODE MA3075WA-(TX)	
		< IC >	
IC401	8-759-149-05	IC uPD71051GB-10-3B4	
IC402	8-759-235-15	IC TC74HC04AF(EL)	
		< COIL >	
L401	1-414-081-11	INDUCTOR 33uH	
L402	1-414-081-11	INDUCTOR 33uH	
		< RESISTOR >	
R401	1-219-570-11	RES,CHIP 10M	5% 1/16W
R402	1-216-850-11	METAL CHIP 270K	5% 1/16W
R403	1-216-813-11	METAL CHIP 220	5% 1/16W
R404	1-216-295-91	SHORT 0	
R407	1-216-841-11	METAL CHIP 47K	5% 1/16W
R412	1-216-857-11	METAL CHIP 1M	5% 1/16W
		< SWITCH >	
S401	1-570-114-11	SWITCH, SLIDE (BACK UP)	
		< VIBRATOR >	
X401	1-767-169-11	VIBRATOR, CRYSTAL (153.6KHz)	
X402	1-579-369-21	VIBRATOR (10MHz)	

*	A-7072-770-A	SW-279 (A) MOUNT (D30)	
*	A-7072-800-A	SW-279 (B) MOUNT (D31)	

		< CAPACITOR >	
C321	1-164-004-11	CERAMIC CHIP 0 1uF	10% 25V
C322	1-162-927-11	CERAMIC CHIP 100PF	5% 50V
C323	1-164-344-11	CERAMIC CHIP 0.068uF	10% 25V
C324	1-162-964-11	CERAMIC CHIP 0 001uF	10% 50V
C325	1-164-346-11	CERAMIC CHIP 1uF	16V
C326	1-104-752-11	TANTAL. CHIP 33uF	20% 6.3V
C327	1-104-752-11	TANTAL CHIP 33uF	20% 6.3V
C328	1-165-319-11	CERAMIC CHIP 0 1uF	50V
		< CONNECTOR >	
* CN321	1-764-177-11	PIN, CONNECTOR (SMD)(1.5MM) 7P	
		< DIODE >	
D323	8-719-420-83	DIODE MA3075WA-(TX)	

Ref. No.	Part No.	Description	Remark
		< IC >	
IC321	8-759-080-34	IC TA75W01FU-TE12R	
		< JACK >	
J321	1-568-027-11	JACK, SMALL TYPE	
		< COIL >	
L321	1-543-949-22	FERRITE	
L322	1-543-949-22	FERRITE	
		< TRANSISTOR >	
Q321	8-729-905-38	TRANSISTOR 2SC4081T106R	
		< RESISTOR >	
R324	1-216-833-91	RES,CHIP 10K	5% 1/16W
R326	1-216-831-11	METAL CHIP 6.8K	5% 1/16W
R327	1-216-838-11	METAL CHIP 27K	5% 1/16W
R328	1-216-844-11	METAL CHIP 82K	5% 1/16W
R329	1-216-831-11	METAL CHIP 6.8K	5% 1/16W
R330	1-216-840-11	METAL CHIP 39K	5% 1/16W
R331	1-216-839-11	METAL CHIP 33K	5% 1/16W
R332	1-216-836-11	METAL CHIP 18K	5% 1/16W
R334	1-216-809-11	METAL CHIP 100	5% 1/16W
R335	1-216-829-11	METAL CHIP 4.7K	5% 1/16W
R336	1-216-011-91	METAL CHIP 27	5% 1/10W
R337	1-216-295-91	SHORT 0	
R338	1-216-302-91	METAL CHIP 2.7	5% 1/10W
		< SWITCH >	
S321	1-572-078-11	SWITCH, TACTILE	
S322	1-572-078-11	SWITCH, TACTILE	
S323	1-571-177-11	SWITCH, SLIDE	

*	A-7072-759-A	VC-179 (A) MOUNT (D30)	
*	A-7072-790-A	VC-179 (B) MOUNT (D31)	

		< CAPACITOR >	
C001	1-162-974-11	CERAMIC CHIP 0 01uF	50V
C002	1-162-974-11	CERAMIC CHIP 0 01uF	50V
C004	1-135-259-11	TANTAL CHIP 10uF	20% 6.3V
C005	1-164-326-91	CERAMIC CHIP 0 47uF	16V
C006	1-135-338-91	TANTAL CHIP 220uF	20% 4V
C007	1-135-181-21	TANTALUM CHIP 4.7uF	20% 6.3V
C008	1-135-259-11	TANTAL CHIP 10uF	20% 6.3V
C009	1-162-974-11	CERAMIC CHIP 0 01uF	50V
C010	1-135-338-91	TANTAL CHIP 220uF	20% 4V
C011	1-162-974-11	CERAMIC CHIP 0 01uF	50V
C012	1-135-181-21	TANTALUM CHIP 4.7uF	20% 6.3V
C013	1-162-974-11	CERAMIC CHIP 0 01uF	50V
C014	1-162-974-11	CERAMIC CHIP 0 01uF	50V
C017	1-164-326-91	CERAMIC CHIP 0 47uF	16V
C019	1-162-974-11	CERAMIC CHIP 0 01uF	50V
C301	1-164-004-11	CERAMIC CHIP 0 1uF	10% 25V
C302	1-162-928-11	CERAMIC CHIP 120PF	5% 0V
C304	1-104-916-11	TANTAL CHIP 6.8uF	20% 20V
C307	1-164-004-11	CERAMIC CHIP 0 1uF	10% 25V
C309	1-164-004-11	CERAMIC CHIP 0 1uF	10% 25V
C310	1-162-965-11	CERAMIC CHIP 0 0015uF	10% 50V
C311	1-162-967-11	CERAMIC CHIP 0 0033uF	10% 50V

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C312	1-107-727-91	CERAMIC CHIP	0 022uF 10% 16V	C435	1-164-346-11	CERAMIC CHIP	1uF 16V
C313	1-164-730-11	CERAMIC CHIP	0 0012uF 10% 50V	C436	1-135-181-21	TANTALUM CHIP	4 7uF 20% 6.3V
C315	1-164-004-11	CERAMIC CHIP	0 1uF 10% 25V	C437	1-162-974-11	CERAMIC CHIP	0 01uF 50V
C316	1-162-962-11	CERAMIC CHIP	470PF 10% 50V	C501	1-162-974-11	CERAMIC CHIP	0 01uF 50V
C317	1-162-962-11	CERAMIC CHIP	470PF 10% 50V	C502	1-162-974-11	CERAMIC CHIP	0 01uF 50V
C318	1-162-962-11	CERAMIC CHIP	470PF 10% 50V	C503	1-135-181-21	TANTALUM CHIP	4 7uF 20% 6 3V
C319	1-162-964-11	CERAMIC CHIP	0 001uF 10% 50V	C506	1-162-974-11	CERAMIC CHIP	0 01uF 50V
C320	1-162-963-11	CERAMIC CHIP	680PF 10% 50V	C507	1-162-964-11	CERAMIC CHIP	0 001uF 10% 50V
C321	1-162-963-11	CERAMIC CHIP	680PF 10% 50V	C508	1-162-974-11	CERAMIC CHIP	0 01uF 50V
C322	1-162-962-11	CERAMIC CHIP	470PF 10% 50V	C509	1-135-181-21	TANTALUM CHIP	4 7uF 20% 6 3V
C323	1-162-963-11	CERAMIC CHIP	680PF 10% 50V	C511	1-107-685-11	TANTAL CHIP	15uF 20% 6 3V
C326	1-165-178-11	CERAMIC CHIP	6 8uF 16V	C512	1-162-974-11	CERAMIC CHIP	0 01uF 50V
C327	1-165-178-11	CERAMIC CHIP	6 8uF 16V	C514	1-164-156-11	CERAMIC CHIP	0 1uF 25V
C328	1-104-760-11	CERAMIC CHIP	0 047uF 10% 50V	C515	1-164-156-11	CERAMIC CHIP	0 1uF 25V
C329	1-165-178-11	CERAMIC CHIP	6 8uF 16V	C516	1-164-360-11	CERAMIC CHIP	0 1uF 16V (D31)
C330	1-165-178-11	CERAMIC CHIP	6 8uF 16V	C518	1-164-156-11	CERAMIC CHIP	0 1uF 25V
C331	1-165-178-11	CERAMIC CHIP	6 8uF 16V	C519	1-164-156-11	CERAMIC CHIP	0 1uF 25V
C332	1-164-506-11	CERAMIC CHIP	4 7uF 16V	C524	1-135-091-91	TANTALUM CHIP	1uF 20% 16V
C333	1-107-682-11	CERAMIC CHIP	1uF 10% 16V	C525	1-164-004-11	CERAMIC CHIP	0 1uF 10% 25V
C334	1-135-259-11	TANTAL CHIP	10uF 20% 6.3V	C526	1-165-176-11	CERAMIC CHIP	0 047uF 10% 16V
C335	1-164-337-11	CERAMIC CHIP	2 2uF 16V	C527	1-162-946-11	CERAMIC CHIP	27PF 5% 50V
C336	1-164-337-11	CERAMIC CHIP	2 2uF 16V	C528	1-162-946-11	CERAMIC CHIP	27PF 5% 50V
C339	1-162-638-11	CERAMIC CHIP	1uF 16V	C529	1-162-974-11	CERAMIC CHIP	0 01uF 50V
C340	1-135-181-21	TANTALUM CHIP	4 7uF 20% 6.3V	C530	1-164-346-11	CERAMIC CHIP	1uF 16V
C401	1-162-637-11	CERAMIC CHIP	0 47uF 16V	C531	1-162-974-11	CERAMIC CHIP	0 01uF 50V
C402	1-163-021-91	CERAMIC CHIP	0 01uF 10% 50V	C532	1-135-181-21	TANTALUM CHIP	4 7uF 20% 6 3V
C403	1-164-346-11	CERAMIC CHIP	1uF 16V			< CONNECTOR >	
C404	1-164-156-11	CERAMIC CHIP	0 1uF 25V	* CN001	1-580-789-21	PIN, CONNECTOR (SMD) 6P	
C405	1-135-145-11	TANTALUM CHIP	0 47uF 10% 35V	* CN301	1-580-055-21	PIN, CONNECTOR (SMD) 2P	
C406	1-164-156-11	CERAMIC CHIP	0 1uF 25V	CN401	1-750-340-21	CONNECTOR, FFC/EPC (ZIF) 16P	
C407	1-164-156-11	CERAMIC CHIP	0 1uF 25V	CN501	1-691-519-11	CONNECTOR, BOARD TO BOARD 30P	
C408	1-135-214-21	TANTAL. CHIP	4 7uF 20% 20V	* CN502	1-691-529-11	CONNECTOR, BOARD TO BOARD 30P	
C409	1-162-964-11	CERAMIC CHIP	0 001uF 10% 50V	CN504	1-774-202-21	CONNECTOR, FFC/FPC 25P	
C410	1-164-156-11	CERAMIC CHIP	0.1uF 25V			< DIODE >	
C411	1-162-974-11	CERAMIC CHIP	0 01uF 50V	D001	8-719-059-51	DIODE MA3J142E0LSO	
C412	1-135-259-11	TANTAL. CHIP	10uF 20% 6.3V	D302	8-719-027-77	DIODE MA796-TX	
C413	1-162-974-11	CERAMIC CHIP	0 01uF 50V	D401	8-719-404-50	DIODE MA111-TX	
C414	1-135-259-11	TANTAL CHIP	10uF 20% 6.3V	D402	8-719-404-50	DIODE MA111-TX	
C415	1-162-949-11	CERAMIC CHIP	47PF 5% 50V	D403	8-719-404-50	DIODE MA111-TX	
C417	1-162-964-11	CERAMIC CHIP	0 001uF 10% 50V	D404	8-719-404-50	DIODE MA111-TX	
C418	1-162-964-11	CERAMIC CHIP	0 001uF 10% 50V	D406	8-713-102-28	DIODE 1T379-04-T8A	
C420	1-162-922-11	CERAMIC CHIP	39PF 5% 50V			< FILTER >	
C421	1-162-916-11	CERAMIC CHIP	12PF 5% 50V	FL501	1-239-352-11	FILTER, LOW PASS	
C422	1-162-964-11	CERAMIC CHIP	0 001uF 10% 50V			< IC >	
C423	1-162-974-11	CERAMIC CHIP	0 01uF 50V	IC001	8-752-061-70	IC CXA1409AQ-T4	
C424	1-135-259-11	TANTAL CHIP	10uF 20% 6.3V	IC302	8-759-060-93	IC MB3785APFV-G-BND-ER	
C425	1-135-145-11	TANTALUM CHIP	0 47uF 10% 35V	IC401	8-752-372-35	IC CXD1267AN-T4	
C426	1-164-492-11	CERAMIC CHIP	0 15uF 10% 16V	IC402	8-752-374-25	IC CXD2415R-T4	
C427	1-135-145-11	TANTALUM CHIP	0.47uF 10% 35V	IC403	8-752-073-11	IC CXA2006Q-T4	
C428	1-162-974-11	CERAMIC CHIP	0 01uF 50V	IC404	8-759-064-36	IC MB88346BPFV-EF	
C429	1-164-492-11	CERAMIC CHIP	0 15uF 10% 16V	IC405	8-752-375-12	IC CXD2407BR-T4	
C430	1-164-156-11	CERAMIC CHIP	0 1uF 25V	IC406	8-759-495-27	IC AD876JST-REEL	
C434	1-164-346-11	CERAMIC CHIP	1uF 16V	IC501	8-759-464-95	IC AK6420AF-E2	
				IC502	8-759-458-92	IC MC68HC11MA8FU-SC424626FU	

VC-179 (A)/179 (B)

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
IC503	8-752-375-10	IC CXD2150BR-T6		R312	1-218-876-11	METAL CHIP 16K	0 50% 1/16W
IC504	8-752-376-29	IC CXD2151AR-T6		R313	1-216-834-11	METAL CHIP 12K	5% 1/16W
IC505	8-759-288-14	IC CXD2133CR-T6		R314	1-218-874-11	METAL CHIP 13K	0 50% 1/16W
		< COIL >		R315	1-218-891-11	METAL CHIP 68K	0 50% 1/16W
L001	1-412-058-11	INDUCTOR CHIP 10uH		R316	1-218-875-11	METAL CHIP 15K	0 50% 1/16W
L002	1-500-113-22	FERRITE		R318	1-218-885-11	METAL CHIP 39K	0 50% 1/16W
L003	1-500-113-22	FERRITE		R319	1-216-832-11	METAL CHIP 8 2K	5% 1/16W
L004	1-500-113-22	FERRITE		R320	1-216-830-11	METAL CHIP 5 6K	5% 1/16W
L304	1-424-653-11	INDUCTOR 10uH		R321	1-216-845-11	METAL CHIP 100K	5% 1/16W
				R322	1-216-847-11	METAL CHIP 150K	5% 1/16W
L305	1-424-653-11	INDUCTOR 10uH		R323	1-218-879-11	METAL CHIP 22K	0 50% 1/16W
L306	1-424-674-11	INDUCTOR 22uH		R325	1-218-875-11	METAL CHIP 15K	0 50% 1/16W
L307	1-424-674-11	INDUCTOR 22uH		R326	1-218-873-11	METAL CHIP 12K	0 50% 1/16W
L308	1-424-674-11	INDUCTOR 22uH		R327	1-218-881-11	METAL CHIP 27K	0.50% 1/16W
L309	1-412-026-11	INDUCTOR CHIP 1uH		R329	1-218-865-11	METAL CHIP 5 6K	0 50% 1/16W
L310	1-412-033-11	INDUCTOR CHIP 220uH		R330	1-216-832-11	METAL CHIP 8 2K	5% 1/16W
L311	1-412-033-11	INDUCTOR CHIP 220uH		R332	1-218-875-11	METAL CHIP 15K	0.50% 1/16W
L313	1-412-028-11	INDUCTOR CHIP 4.7uH		R333	1-216-819-11	METAL CHIP 680	5% 1/16W
L315	1-412-028-11	INDUCTOR CHIP 4 7uH		R334	1-216-864-11	SHORT 0	
L401	1-412-058-11	INDUCTOR CHIP 10uH		R335	1-218-847-11	METAL CHIP 1K	0 50% 1/16W
L402	1-414-078-11	INDUCTOR 10uH		R336	1-216-845-11	METAL CHIP 100K	5% 1/16W
L403	1-412-058-11	INDUCTOR CHIP 10uH		R337	1-216-033-91	METAL CHIP 220	5% 1/10W
L404	1-414-078-11	INDUCTOR 10uH		R338	1-216-027-91	METAL CHIP 120	5% 1/10W
L405	1-414-078-11	INDUCTOR 10uH		R339	1-216-041-91	METAL CHIP 470	5% 1/10W
L501	1-412-058-11	INDUCTOR CHIP 10uH		R340	1-216-041-91	METAL CHIP 470	5% 1/10W
L502	1-414-078-11	INDUCTOR 10uH		R341	1-216-821-11	METAL CHIP 1K	5% 1/16W
L503	1-414-078-11	INDUCTOR 10uH		R342	1-216-009-91	RES,CHIP 22	5% 1/10W
L504	1-414-078-11	INDUCTOR 10uH		R344	1-216-841-11	METAL CHIP 47K	5% 1/16W
L505	1-412-959-11	INDUCTOR 47uH (D31)		R345	1-216-828-11	METAL CHIP 3 9K	5% 1/16W
L505	1-412-961-11	INDUCTOR 68uH (D30)		R346	1-211-989-11	METAL CHIP 68	0 50% 1/16W
L506	1-414-078-11	INDUCTOR 10uH		R401	1-216-845-11	METAL CHIP 100K	5% 1/16W
		< TRANSISTOR >		R402	1-216-845-11	METAL CHIP 100K	5% 1/16W
Q304	8-729-804-52	TRANSISTOR 2SB1122-T-TD		R403	1-216-857-11	METAL CHIP 1M	5% 1/16W
Q305	8-729-823-84	TRANSISTOR FP102-TL		R404	1-216-833-91	RES,CHIP 10K	5% 1/16W
Q306	8-729-823-84	TRANSISTOR FP102-TL		R405	1-216-845-11	METAL CHIP 100K	5% 1/16W
Q307	8-729-823-84	TRANSISTOR FP102-TL		R406	1-218-876-11	METAL CHIP 16K	0 50% 1/16W
Q308	8-729-403-35	TRANSISTOR UN5113-TX		R407	1-218-847-11	METAL CHIP 1K	0 5% 1/16W
Q401	8-729-403-27	TRANSISTOR XN4401-(TW)		R408	1-216-864-11	SHORT 0	
Q501	8-729-420-24	TRANSISTOR 2SB1218A-QRS-TX		R409	1-216-864-11	SHORT 0	
Q502	8-729-420-24	TRANSISTOR 2SB1218A-QRS-TX		R410	1-216-864-11	SHORT 0	
Q503	8-729-420-29	TRANSISTOR 2SD1819A-QRS-TX		R411	1-216-864-11	SHORT 0	
Q504	8-729-420-24	TRANSISTOR 2SB1218A-QRS-TX		R412	1-216-811-11	METAL CHIP 150	5% 1/16W
		< RESISTOR >		R413	1-216-823-11	METAL CHIP 1 5K	5% 1/16W
R001	1-216-807-11	METAL CHIP 68	5% 1/16W	R414	1-216-803-11	METAL CHIP 33	5% 1/16W
R005	1-216-807-11	METAL CHIP 68	5% 1/16W	R415	1-216-853-11	METAL CHIP 470K	5% 1/16W
R006	1-216-837-11	METAL CHIP 22K	5% 1/16W	R417	1-216-864-11	SHORT 0	(D31)
R007	1-216-837-11	METAL CHIP 22K	5% 1/16W	R420	1-216-864-11	SHORT 0	
R008	1-216-807-11	METAL CHIP 68	5% 1/16W	R501	1-216-857-11	METAL CHIP 1M	5% 1/16W
R009	1-216-824-11	METAL CHIP 1.8K	5% 1/16W	R502	1-216-851-11	METAL CHIP 330K	5% 1/16W
R010	1-216-829-11	METAL CHIP 4 7K	5% 1/16W	R503	1-216-833-91	RES,CHIP 10K	5% 1/16W
R011	1-216-837-11	METAL CHIP 22K	5% 1/16W	R504	1-216-833-91	RES,CHIP 10K	5% 1/16W
R012	1-216-837-11	METAL CHIP 22K	5% 1/16W	R505	1-216-821-11	METAL CHIP 1K	5% 1/16W
R033	1-216-821-11	METAL CHIP 1K	5% 1/16W	R506	1-216-841-11	METAL CHIP 47K	5% 1/16W
R302	1-218-865-11	METAL CHIP 5 6K	0.50% 1/16W	R507	1-216-841-11	METAL CHIP 47K	5% 1/16W
R303	1-216-837-11	METAL CHIP 22K	5% 1/16W	R508	1-216-841-11	METAL CHIP 47K	5% 1/16W
R306	1-216-842-11	METAL CHIP 56K	5% 1/16W				
R307	1-216-837-11	METAL CHIP 22K	5% 1/16W				
R310	1-216-841-11	METAL CHIP 47K	5% 1/16W				

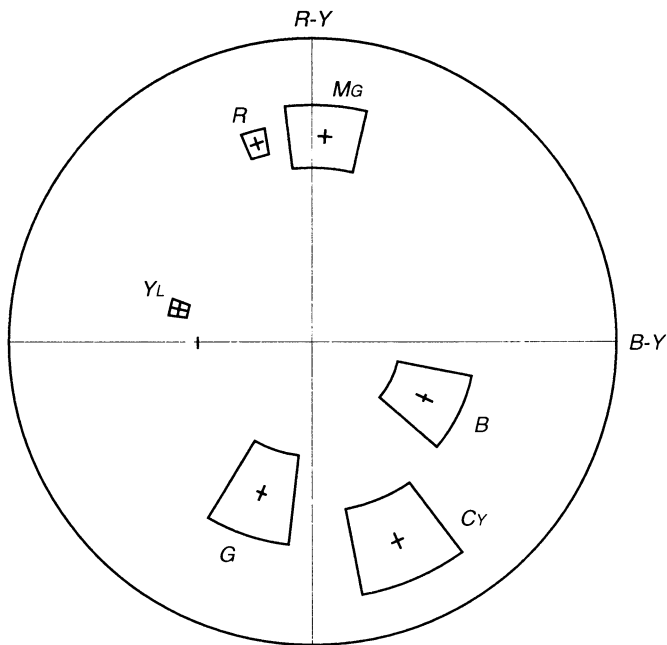
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R509	1-216-841-11	METAL CHIP	47K 5%	1/16W			
R510	1-216-821-11	METAL CHIP	1K 5%	1/16W (D31)			
R511	1-216-844-11	METAL CHIP	82K 5%	1/16W (D31)			
R512	1-216-864-11	SHORT	0	(D30)			
R513	1-216-833-91	RES,CHIP	10K 5%	1/16W			
R514	1-216-819-11	METAL CHIP	680 5%	1/16W			
R515	1-216-863-11	RES,CHIP	3 3M 5%	1/16W (D31)			
R516	1-216-833-91	RES,CHIP	10K 5%	1/16W			
R517	1-216-821-11	METAL CHIP	1K 5%	1/16W			
R518	1-216-825-11	METAL CHIP	2 2K 5%	1/16W			
R519	1-216-819-11	METAL CHIP	680 5%	1/16W			
R520	1-216-845-11	METAL CHIP	100K 5%	1/16W			
R521	1-216-837-11	METAL CHIP	22K 5%	1/16W			
R522	1-216-839-11	METAL CHIP	33K 5%	1/16W			
R523	1-216-815-11	METAL CHIP	330 5%	1/16W			
R524	1-216-833-91	RES,CHIP	10K 5%	1/16W			
R525	1-216-821-11	METAL CHIP	1K 5%	1/16W			
R526	1-216-827-11	METAL CHIP	3 3K 5%	1/16W			
R527	1-216-821-11	METAL CHIP	1K 5%	1/16W			
R528	1-216-825-11	METAL CHIP	2.2K 5%	1/16W			
R529	1-216-823-11	METAL CHIP	1 5K 5%	1/16W (D30)			
R529	1-216-817-11	METAL CHIP	470 5%	1/16W (D31)			
R530	1-216-841-11	METAL CHIP	47K 5%	1/16W			
R531	1-216-841-11	METAL CHIP	47K 5%	1/16W			
R532	1-216-821-11	METAL CHIP	1K 5%	1/16W			
R533	1-216-825-11	METAL CHIP	2 2K 5%	1/16W			
R534	1-216-825-11	METAL CHIP	2 2K 5%	1/16W			
R536	1-216-864-11	SHORT	0				
R538	1-216-864-11	SHORT	0				
< TRANSFORMER >							
T301	1-450-976-11	TRANSFORMER, CONVERTER					
< VIBRATOR >							
X401	1-760-320-11	VIBRATOR,CRYSTAL (28 6363MHz) (D30)					
X401	1-760-321-11	VIBRATOR,CRYSTAL (28 375MHz) (D31)					
X501	1-760-081-21	VIBRATOR, CERAMIC					

ACCESSORIES							

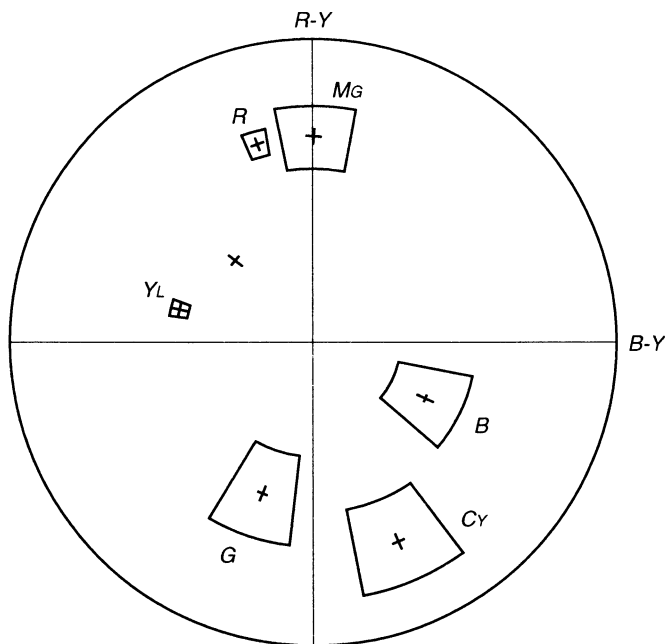
	1-473-789-11	ADAPTOR, AC (AC-EV2) (D30)					
	1-473-790-11	ADAPTOR, AC (AC-EV3) (D31)					
	1-696-862-21	CORD, CONNECTION					
	1-770-019-12	ADAPTOR, CONVERSION PLUG 3P (D31)					
	3-856-663-04	MANUAL, INSTRUCTION					

*	3-972-546-01	TAPE, FIXED					
	4-978-977-01	LID, BATTERY CASE					
	8-917-560-90	REMOTE COMMANDER, SONY RMT-D30					

FOR CAMERA COLOR REPRODUCTION ADJUSTMENT



EVI-D30 (NTSC)



EVI-D31 (PAL)